

Emergency

Resuscitation

Basic life support (BLS) - adult/child DRSABCD resuscitation, the collapsed patient

Recommend¹⁻⁴

- Good quality CPR and reducing time to defibrillation are the highest priorities in resuscitation from sudden cardiac arrest
- Airway takes precedent over any injury, including possibility of spinal injury - handle gently with no twisting or bending of spinal column or neck¹
- If pregnant, once CPR in progress put padding such as a towel under the woman's right hip to tilt the hips about 15–30°, but leave her shoulders flat
- Child/infant - central pulse palpation may be used to assess circulation. If a pulse cannot be definitely identified within 10 seconds (or HR < 60 with signs of poor circulation) start CPR⁵

Background²

- Agonal breaths (occasional irregular gasps) are common in early stages of cardiac arrest

1. May present with²

- Sudden collapse
- Unresponsive and absent or abnormal breathing eg gasping

2. Immediate management¹⁻⁶

- **DRSABCD** as per **Basic life support flowchart**
- **Danger** - check the environment/patient surroundings are safe before proceeding. PPE as needed
- **Response** - verbal and tactile stimuli (talk and touch)
- **Send for help** - shout for help. If help not arrived in 1 minute go get help⁵ + contact MO/NP/RSQ
- **If trauma related** control [catastrophic haemorrhage, p. 134](#)
- **Airway** (leave person in position found):^{1,5}
 - open using **head tilt–chin lift** or **jaw thrust** (if neck injury, only use jaw thrust) +
 - child - head in 'sniffing position'
 - infant < 1 year - head in neutral position
 - **if fluid/matter obstructs airway** at any time:
 - use suction if available OR if unavailable, roll on to side to clear airway¹
 - if visible material, remove if possible eg using rescuer's fingers¹
- **Breathing:**
 - **Look** (movement of chest/abdomen), **Listen** (for breath sounds), **Feel** (air on rescuer's cheek)⁵
 - if unresponsive but breathing normally, see [Unconscious patient, p. 60](#)
- **If unresponsive + breathing absent or NOT normal, place on firm surface and start CPR:**
 - 30 compressions: 2 ventilations² (adult + child) **OR**
 - if paediatric BLS trained - **child**: 2 ventilations (first): 15 compressions⁵
 - 100–120 compressions per minute
- **Defibrillation - attach automated external defibrillator (AED) as soon as available and follow prompts:**
 - **adult and child > 8** use adult pads. **Child 1–8** use paediatric pads (or adult size if not available)
 - continue CPR + minimise interruptions to chest compressions

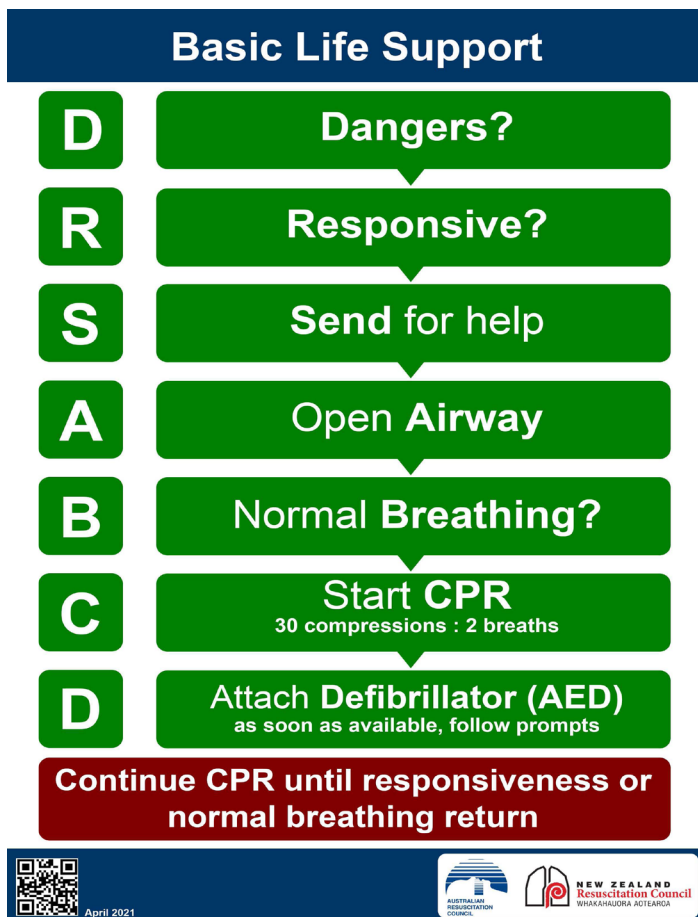
- alternate person doing compressions when AED advises to stop (eg to analyse rhythm/shock) or if fatigued
- **Get ALS trained clinician(s) if available**
- Continue CPR until responsive, normal breathing returns, or MO/NP instructs otherwise

3. Clinical assessment - see Immediate management

4. Management

- Control bleeding, protect from weather + other first aid measures depending on circumstances

Basic life support flowchart



5. Follow up

- According to patient's condition/presentation

6. Referral/consultation

- As above

Advanced life support (ALS) - adult/child

Recommend¹

- As soon as possible use ALS treatments to supplement BLS
- Good quality CPR and reducing time to defibrillation are the highest priorities in resuscitation
- Child/infant - central pulse palpation may be used to assess circulation. If a pulse cannot be definitely identified within 10 seconds (or HR < 60 with signs of poor circulation) start CPR²
- In Qld, refer to **Children's resuscitation emergency drug dosage (CREDD)** <https://www.childrens.health.qld.gov.au/qpec-paediatric-resuscitation-tools/#tab-6ff1bb73468033104a2>

1. May present with^{1,2}

- Sudden collapse
- Unresponsive and absent or abnormal breathing eg gasping

2. Immediate management¹⁻³

- **DRSABCD** + when able, contact MO/NP/RSQ
- If trauma related⁴ control [catastrophic haemorrhage, p. 134](#)
- **CPR:**
 - **adult** - 30 compressions: 2 ventilations
 - **child/infant** - 2 ventilations (first): 15 compressions
 - 100–120 compressions per minute (**1 loop**)
- **Attach defibrillator pads + assess rhythm as soon as defibrillator available**

If **SHOCKABLE** rhythm - VF or pulseless VT

- **Administer a single shock:**
 - adult and child > 8 years: **as per AED** or if manual defibrillator **200 joules** for all shocks³
 - infant and child to 8 years: **4 joules/kg**. See [Estimated weight \(kg\) based on age, p. 49](#)
- **Immediately resume CPR for 2 minutes:**
 - unless responsiveness or breathing normally
- **After 2 minutes** reassess rhythm:
 - direct treatment as per rhythm eg if shockable administer another shock
- **Continue above loop** (ie shock, CPR for 2 minutes, reassess rhythm, treat as per rhythm)
- **Give IV/intraosseous:**^{2,5}
 - **adrenaline (epinephrine)** after **2nd shock** then every 2nd loop of CPR (3–5 minutely)
 - **amiodarone** after **3 shocks** on MO/NP order

If **NON-SHOCKABLE** rhythm - asystole or Pulseless Electrical Activity (PEA)¹

- Continue CPR - do not shock
- **Give adrenaline (epinephrine) IV/intraosseous** + then every 2nd loop of CPR (3–5 minutely)^{2,5}

ALS interventions - do during CPR in all cases (minimising interruptions to CPR)^{1,2}

- 100% O₂ when available
- IV or [Intraosseous, p. 57](#) access
- Consider airway adjuncts eg oro/nasopharyngeal airway, [LMA, p. 56](#) (once inserted, continue CPR without breaks for ventilation)
- Waveform capnography (end-tidal CO₂) monitoring if available

S3	Adrenaline (epinephrine)			Extended authority NIL
MID, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Injection	1:10,000 (1 mg/10 mL) OR if unavailable dilute 1:1,000 (1 mg/mL) with 9 mL sodium chloride 0.9%	IV/ Intraosseous	Adult 1 mg	stat then every 2nd loop (3–5 minutely) Rapid injection Then flush with sodium chloride 0.9% (small bolus for child; 20–30 mL for adult)
	Child Birth (term)–18 years 10 microg/kg (max. 1 mg) Note: 10 microg = 0.1 mL adrenaline (epinephrine) 1:10,000			
Management of associated emergency: Consult MO/NP				2,5,6

S4	Amiodarone			Prescribing guide
MID, RIPRN and RN only. Must be ordered by an MO/NP				
Form	Strength	Route	Dose	Duration
Injection	150 mg/ 3 mL	IV/Intraosseous Dilute in 20 mL of glucose 5% (see CREDD for child dilution)	Adult 300 mg Repeat dose of 150 mg can be considered	stat after 3rd shock Inject over 1–2 minutes
			Child 1 month–18 years 5 mg/kg (max. 300 mg) Can be repeated	Then flush with glucose 5% (small bolus for child; 20–30 mL for adult)
Note: Incompatible with sodium chloride 0.9%. If necessary the dose can be injected undiluted and followed immediately with at least 20 mL glucose 5% or sodium chloride 0.9%				
Management of associated emergency: Contact MO/NP				
2,5,7				

Estimated weight (kg) based on age ⁸										
Birth (term)	1 month	2 months	3 months	4 months	6 months	9 months	1 year	2 years	3 years	4 years
3.5	4	5	6	7	8	9	10	12	14	16
5 years	6 years	7 years	8 years	9 years	10 years	11 years	12 years	13 years	14 years	
18	20	22	25	28	30	35	40	45	50	

Look for + correct reversible causes in collaboration with MO/NP^{1,2}

- Get rapid history from witnesses if able:
 - physical circumstances
 - medicines/allergies
 - precipitating events/symptoms
- Consider 4 Hs and 4 Ts:**
 - Hypoxaemia** - 100% O₂ via bag-valve-mask
 - Hypovolaemia** - rapid IV sodium chloride 0.9% 20 mL/kg. Stop obvious bleeding/other causes
 - Hyper/hypokalaemia + metabolic disorders.** Consider i-STAT - UE + BGL
 - Hyper/hypothermia:**⁹
 - T - remove wet clothing/rewarm as per [Hypothermia, p. 186](#)
 - T - rapid cooling as per [Hyperthermia, p. 188](#)
 - Tension pneumothorax** - do [Needle decompression, p. 141](#)
 - Tamponade**

- **Toxins/poisons/drugs** - if possible remove source ± Poisons Information Centre ☎ 13 11 26
- **Thrombosis** pulmonary/coronary. If adult with suspected [PE, p. 125](#) MO/NP may consider fibrinolysis

3. Clinical assessment

- See **Immediate management**

4. Management

- Be guided by MO/NP as to when to cease CPR + in consultation with family if present
- **Prolonged CPR recommended in some circumstances** eg:
 - poisonings - get advice from toxicologist if possible¹⁰
 - electrical injury, lightning strike - fixed and dilated pupils may be transient¹¹
 - box jellyfish stings¹²
 - drowning¹³
 - hypothermia - until rewarmed to T at least 32 or as per MO/NP¹⁴
 - if PE and fibrinolysis given⁵

Return of spontaneous circulation (ROSC)

- Suspect ROSC if regular respiratory effort, movement, or readings from monitors compatible with ROSC/pulse. Check for a pulse, if palpable continue with post resuscitation care, otherwise continue CPR¹⁵

Post resuscitation care^{16,17}

- Commences once ROSC occurs:
- Re-evaluate patient - ABCDE
- Urgent evacuation
- In collaboration with MO/NP, monitor/do:
 - vital signs:
 - SpO₂ - aim for 94–98%
 - systolic BP - aim for > 100 (adult). As guided by MO/NP for child
 - temperature - aim for 36–37.5 (if still unresponsive can be as low as 32)
 - avoid [Hyperthermia, p. 188](#) + treat aggressively if occurs¹⁷
 - BGL frequently. As needed, see [Hypoglycaemia, p. 91](#)
 - ECG + continuous cardiac monitoring
 - ± chest x-ray
- MO/NP may consider antiarrhythmic to prevent recurrent VF
- Assess for resuscitation related injuries + continue to investigate for reversible causes

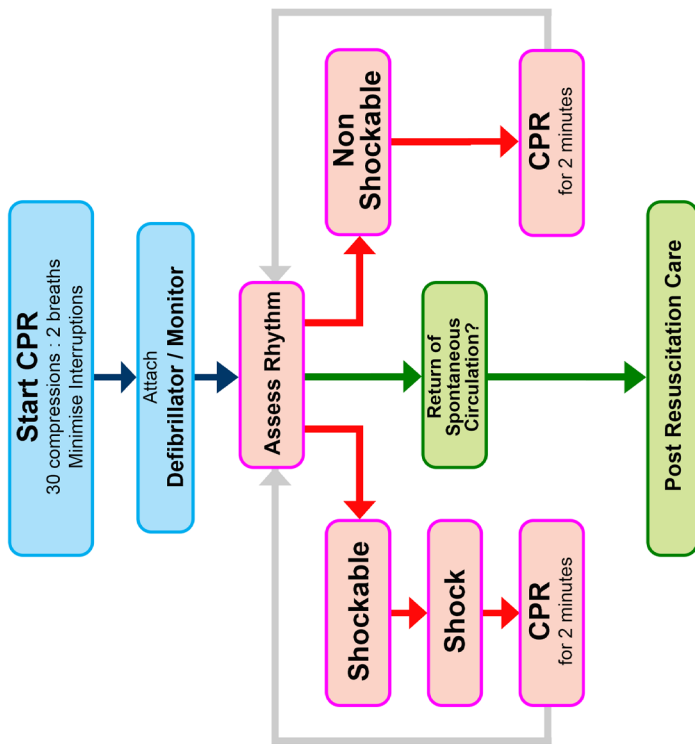
5. Follow up¹

- Sensitive, professional debriefing of people involved in resuscitation is valuable
- Provide support for family members
- If required, see [Patient death in absence of MO, p. 561](#)

6. Referral/consultation

- Always contact MO/NP

Advanced Life Support for Adults



During CPR

- Airway adjuncts (LMA / ETT)
- Oxygen
- Waveform capnography
- IV / IO access
- Plan actions before interrupting compressions (e.g. charge manual defibrillator)

Drugs

Shockable

- * Adrenaline 1 mg after 2nd shock (then every 2nd loop)
- * Amiodarone 300mg after 3 shocks

Non Shockable

- * Adrenaline 1 mg immediately (then every 2nd loop)

Consider and Correct

- Hypoxia
- Hypovolaemia
- Hyper / hypokalaemia / metabolic disorders
- Hypothermia / hyperthermia
- Tension pneumothorax
- Tamponade
- Toxins
- Thrombosis (pulmonary / coronary)

Post Resuscitation Care

Re-evaluate ABCDE

12 lead ECG

Treat precipitating causes

Aim for: SpO2 94-98%, normocapnia and normoglycaemia

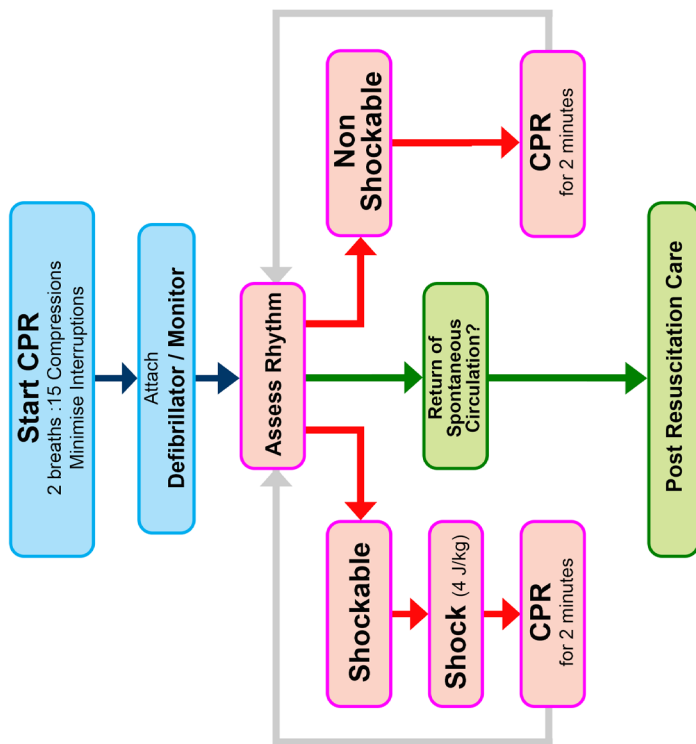
Targeted temperature management



January 2016



Advanced Life Support for Infants and Children



During CPR
Airway adjuncts (LMA / ETT)
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions
(e.g. charge manual defibrillator to 4 J/kg)

Drugs
Shockable
* Adrenaline 10 mcg/kg after 2nd shock
(then every 2nd loop)
* Amiodarone 5mg/kg after 3 shocks
Non Shockable
* Adrenaline 10 mcg/kg immediately
(then every 2nd loop)

Consider and Correct
Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis (pulmonary / coronary)

Post Resuscitation Care
Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Re-evaluate oxygenation and ventilation
Targeted Temperature Management



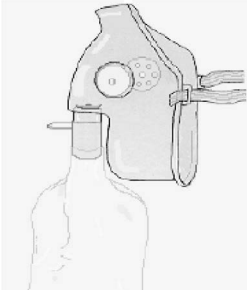
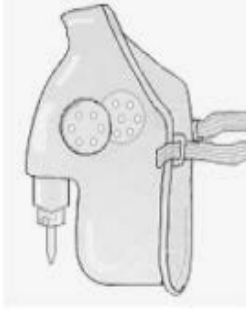
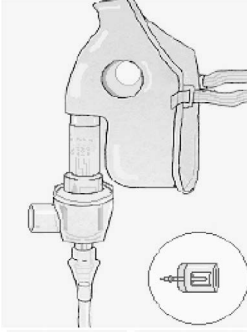

Oxygen delivery

Oxygen delivery - adult/child

Recommend

- Oxygen is a therapeutic intervention + should only be given if clinically indicated¹

Oxygen use in specific scenarios ¹⁻³		
Scenario	Recommendation	Target SpO ₂
Shock Major trauma Sepsis Other critical illnesses	<ul style="list-style-type: none"> • Give high flow O₂ with non-rebreathing mask at 15 L/minute until stable 	≥ 94%
Acute stroke	<ul style="list-style-type: none"> • Give if SpO₂ < 92% 	
Hypotension	<ul style="list-style-type: none"> • Give until hypoxia can definitely be excluded 	
Carbon monoxide poisoning eg house fire	<ul style="list-style-type: none"> • 15 L/minute O₂ with non-rebreather mask for 6 hours • Keep at rest to minimise O₂ needs • Pulse oximetry is unreliable + may give false normal or high reading 	
Suspected decompression illness or pulmonary barotrauma after diving	<ul style="list-style-type: none"> • Give near 100% O₂ as soon as possible + even if pulse oximetry indicates ↑ SpO₂ • Continue until advised by MO/NP 	
Paraquat poisoning Previous treatment with Bleomycin	<ul style="list-style-type: none"> • Do not routinely administer O₂ - can be hazardous • Only give if arterial O₂ saturation falls below 90% 	88–92%
Patients at risk of hypercapnic respiratory failure (HRF) eg <ul style="list-style-type: none"> • Previous HRF • COPD, bronchiectasis, cystic fibrosis • History of heavy smoking • Obstructive sleep apnoea • BMI > 40 • Severe kyphoscoliosis or ankylosing spondylitis • Neuromuscular disorders with respiratory muscle weakness • Use of opioids, benzodiazepines • Patients with acute asthma who are tiring 	<ul style="list-style-type: none"> • Do not routinely administer O₂ - can be hazardous • Normal SpO₂ is sometimes 90–92% • Excess O₂ can lead to elevated SpO₂ > 95% which ↓ respiratory drive leading to under-ventilation • Use capnometry if available 	88–92%

Oxygen delivery systems ^{1,4,5}			L/minute
Non-rebreathing mask (mask with reservoir)	<ul style="list-style-type: none"> Partial or full non-rebreathing High flow device Ensure O₂ flow keeps reservoir inflated 		8–15
Simple face mask (Hudson mask)	<ul style="list-style-type: none"> If require > 10 L/minute use non-rebreathing mask 		5–10
Venturi face mask	<ul style="list-style-type: none"> Colour coded dilution jets delivering various % of high flow O₂ Select the appropriate jet + O₂ flow rate according to manufacturer's instructions 		As per manufacturer's instructions
Nasal prongs	<ul style="list-style-type: none"> Neonate max. 1 L/minute Child < 2 years max. 2 L/minute Child > 2 years–adult max. 4 L/minute If requires more than 4 L/minute use a face mask 		0.125–4

Continuous positive airway pressure (CPAP) if skilled^{5,6}

- Use local guidelines eg > 16 years Qld Ambulance Service *Respiratory/non-invasive ventilation - CPAP* <https://www.ambulance.qld.gov.au/CPPTable.html>
- **Indications:**
 - acute pulmonary oedema
 - life-threatening asthma
- **Only use if:**
 - GCS > 8, conscious +
 - able to protect own airway + manage respiratory secretions
- **Set up equipment** as per manufacturer's instructions
- **Ensure a good seal:**
 - check that inner circumference of air cushion of face mask encompasses bridge of nose, side of mouth + lower border of bottom lip with mouth slightly open⁵
- **Oxygen flow rate:**
 - adult - initially 8 L/minute to generate 5 cm H₂O of CPAP. Gradually increase to max. 15 cm H₂O
 - < 16 years - consult MO/NP
- Maintain SpO₂ 90% or as per MO/NP
- Stay with patient where possible
- Nurse sitting up or semi recumbent. Consider side lying if obese abdomen or pregnant

Monitor closely:

- Continuous:
 - SpO₂
 - cardiac monitoring
- Chest sounds, chest wall movement, accessory muscle use
- Patient comfort, skin integrity under mask/straps + mouth/eye care prn
- **Monitor for:**
 - nausea/vomiting (risk of aspiration)
 - gastric distension
 - ↓ BP
 - [Pneumothorax, p. 140](#)

Laryngeal mask airway (LMA) insertion

LMA - adult/child

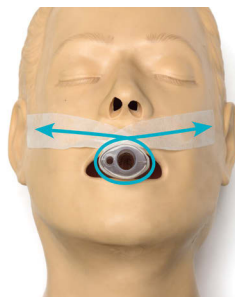
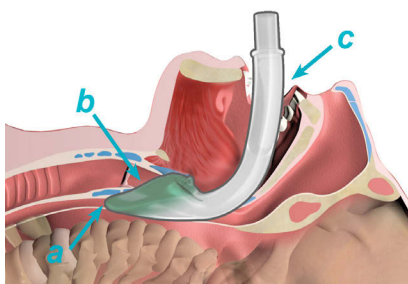
Instructions for i-gel® supraglottic airway¹ (concept is similar for other LMAs - check first)

- See i-gel training and guidance videos <https://au.intersurgical.com/info/igel-videos>
- Select appropriate i-gel size
- Lubricate back, sides + front of cuff with thin layer of lubricant
- If using i-gel O₂® check supplementary O₂ port is capped²

Age	i-gel® size
Neonate 2–5 kg	1.0
Infant 5–12 kg	1.5
Child 10–25 kg	2.0
25–35 kg	2.5
Adult 30–60 kg	3
50–90 kg	4
90+ kg	5

- Grasp i-gel along the bite block + position so that the cuff outlet is facing towards the chin
- Place patient's head in the 'sniffing position'
- Open the mouth by gently pressing the chin
- Introduce soft tip into the mouth towards hard palate
- Glide i-gel downwards + backwards along hard palate with a continuous but gentle push until a definitive resistance is felt
- No need to insert fingers into patient's mouth
- **Do not apply excessive force**
- A black line across the bite block indicates approx. position of teeth when positioned correctly
- The tip of the i-gel should be located in the upper oesophageal opening (a) and the cuff against the laryngeal framework (b). The teeth resting on the bite block (c)
- **Secure i-gel** by taping maxilla to maxilla
- If patient no longer tolerates i-gel or unable to ventilate effectively, remove it

If adult and no c-spine injury suspected, extend head with neck flexed¹



Also see Qld Ambulance Service Clinical Practice Procedure - supraglottic airway - i-gel®
<https://www.ambulance.qld.gov.au/CPPTable.html>

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Intraosseous access

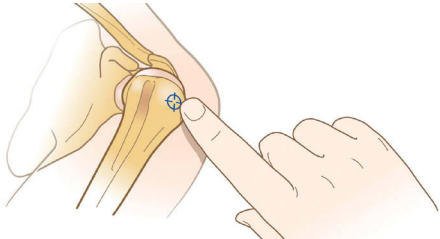
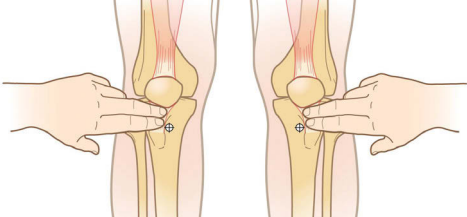
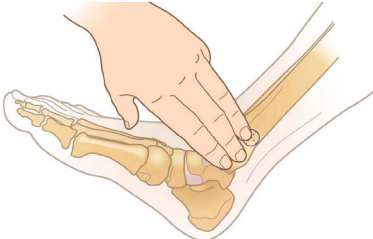
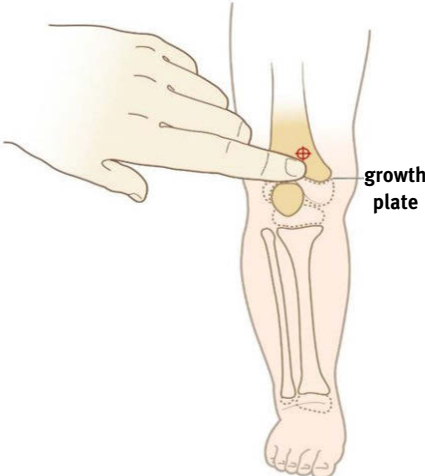
HMP Intraosseous access - adult/child

Recommend

- Use if urgent need for fluids/medications + difficult/failed IVC access¹
- Pain from intraosseous infusion under pressure is more severe than insertion²
- **Check for contraindications:**²
 - fracture in or adjacent to the target bone
 - excessive tissue ± absence of adequate anatomical landmarks
 - infection at site
 - previous significant orthopaedic procedure at the site, prosthetic joint
 - intraosseous access/attempted access in targeted bone within last 48 hours
- **Prepare equipment + site:**
 - select site + needle set, as per **Insertion guide** (next page)^{1,2}
 - clean site using antiseptic + aseptic technique
 - **note:** lidocaine (lignocaine) is not usually needed for insertion of intraosseous needle
 - if responsive to pain, **before infusion** prime extension set with lidocaine (lignocaine) 1% approx. 1 mL (10 mg)¹
- **Insert intraosseous needle** (instructions next page)
- **Once inserted:**^{1,3}
 - place stabilising dressing over the hub
 - aspirate for blood/bone marrow. The inability to withdraw/aspirate blood does not mean unsuccessful insertion, consider re-trying after the flush
 - attach primed extension set + flush with lidocaine (lignocaine) 1% OR sodium chloride 0.9% if unresponsive
 - connect fluids. Infusion may need to be pressurised to get desired rate ie pressure bag or pump

S4	Lidocaine (lignocaine)			Prescribing guide	
MID, RIPRN and RN only. Must be ordered by an MO/NP					
Form	Strength	Route	Dose	Duration	
Injection	1% 50 mg/ 5 mL	Intraosseous	Adult 40 mg	Remember to calculate including dose in primed IV extension Give over 2 minutes, allow to dwell in intraosseous space for 1 minute, then rapidly flush with sodium chloride 0.9% child 5 mL adult 10 mL	
			Child < 16 years 0.5 mg/kg (max. 40 mg)		
			Additional half doses		
			Adult 20 mg	Give over 1 minute Repeat doses as per MO/NP max. of once in 45 minutes	
			Child < 16 years 0.25 mg/kg (max. 20 mg)		
Note: Monitor for extravasation, hypersensitivity + other side effects with each injection ie dizziness, paraesthesia, nystagmus, rash, drowsiness, confusion, seizures, ↓RR, ↓HR, ↓BP					
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82					

1,3

Insertion guide	
<p>Needle set</p> <ul style="list-style-type: none"> Select needle set based on patient weight, anatomy + clinical judgment 	<ul style="list-style-type: none"> 45 mm needle set (yellow hub) proximal humerus > 40 kg + patients with excessive tissue over any insertion site 25 mm needle set (blue hub) > 3 kg 15 mm needle set (pink hub) approx. 3–39 kg
<p>Proximal humerus²</p> <ul style="list-style-type: none"> Place patient's hand over the abdomen, place your palm on the shoulder anteriorly. The 'ball' under your palm is the general target area. Aim needle set tip downward at approx. 45° angle Note: abduction of arm after placement will dislodge needle 	 <p>An illustration showing a hand placed over the shoulder of a patient. The thumb is positioned over the 'ball' of the shoulder joint, indicating the target area for needle insertion. A blue crosshair marks the insertion point on the proximal humerus.</p>
<p>Proximal tibia²</p> <ul style="list-style-type: none"> Extend the leg, feel for flat aspect of tibia Approx. 3 cm (1–2 cm in infant/child) below the patella + approx. 2 cm medial (1 cm in infant/child) to the tibial tuberosity along the flat aspect of the tibia (depending on anatomy). Aim needle set tip at a 90° angle to the bone 	 <p>Two illustrations showing the proximal tibia insertion site. The left illustration shows a hand palpating the tibia, with a blue crosshair marking the insertion point. The right illustration shows a hand palpating the tibia, with a blue crosshair marking the insertion point.</p>
<p>Distal tibia²</p> <ul style="list-style-type: none"> Approx. 3 cm (infant 1 cm/1 finger) above most prominent aspect of medial malleolus. Feel for anterior and posterior borders of tibia to assure that insertion site is in the flat centre of the bone + 90° or perpendicular to the surface of bone 	 <p>An illustration showing a hand palpating the distal tibia. A blue crosshair marks the insertion point, which is located approximately 3 cm above the medial malleolus.</p>
<p>Distal femur²</p> <ul style="list-style-type: none"> Secure site with leg outstretched to ensure knee does not bend. Feel for patella, insertion site is just proximal to superior border (max. 1–2 cm) and approx. 1–2 cm medial 	 <p>An illustration showing a hand palpating the distal femur. A blue crosshair marks the insertion point, which is located just proximal to the superior border of the patella. A label 'growth plate' points to the area just distal to the insertion site.</p>
<p>Arrow EZ-IO Vascular Access System images courtesy of Teleflex</p>	

How to insert Arrow EZ-IO® device²

- Attach needle set to driver + remove safety cap
- Push needle tip through the skin until tip touches the bone:
 - before pressing the trigger, **check** at least 1 black line is visible above the skin to confirm adequate needle set length
- Gently drill. Immediately stop advancing + release the trigger when you feel a ‘pop’ or ‘give’ as the needle set enters the medullary space:
 - do **NOT** pull/jerk back on the driver when releasing the trigger
- Hold the hub + pull the driver straight off needle set. Continue to hold hub in place while twisting the stylet off with anticlockwise rotations
- **See instructions + video** at <https://www.teleflex.com/anz/en/product-areas/emergency-medicine/intraosseous-access/arrow-ez-io-system/clinical-resources/index.html>

Manual insertion

- Hold the needle set with the catheter hub and stylet as 1 piece. Ensure stylet + hub stay screwed together
- Rotate clockwise/anticlockwise while applying gentle, moderate steady downward pressure without rocking the needle set. Allow rotation + pressure to penetrate the bone cortex, not excessive force
- **Child** - stop when change of pressure or resistance felt as a ‘pop’ or ‘give’ indicating entry to medullary space
- **Adult** - advance needle set approx. 1–2 cm after entry into medullary space, which is felt as a change in resistance; in the proximal humerus for most adults the needle set should be advanced 2 cm or until hub is flush or against the skin

After insertion

- **Monitor closely + contact MO/NP if:**^{1,2}
 - intraosseous lidocaine (lignocaine) is not sufficient + the patient is still in pain:
 - MO/NP may consider systemic analgesia
 - change in patient’s response to medications
 - ↓ flow rate/alarms on infusion pump
 - fever or signs of:
 - extravasation/infiltration at site
 - [Compartment syndrome, p. 160](#) in limb

Critical emergencies

Unconscious/altered level of consciousness - adult/child

Recommend

- Unconsciousness is a medical emergency - early stability + diagnosis are vital¹
- Assume a serious cause until proven otherwise¹

1. May present with²

- Unconscious/altered level of consciousness (LOC)

2. Immediate management²

- **DRSABCD** as per [BLS, p. 46](#)
- Assist patient onto the ground/bed + position on side
- Do NOT leave sitting in a chair or put head between their knees
- Open airway - airway takes precedence over any injury:
 - handle gently, avoid twisting or forward movement of head + spine
 - use head tilt/chin lift for adult + child > 1 years
 - infant - keep head neutral
- **Call for help + contact MO/NP urgently**
- Stop any bleeding
- **Do:**
 - vital signs:
 - note pattern + regularity of breathing:¹
 - deep, laboured (Kussmaul respiration) - often associated with [DKA, p. 89](#)
 - shallow with extremely ↓ RR - seen in opioid overdose
 - hyperventilation
 - give O₂ if required to maintain SpO₂ ≥ 94%
 - BGL - if < 4 treat immediately. See [Hypoglycaemia, p. 91](#)
 - insert IVC x 2
 - neurological observations ie:³
 - [GCS, p. 562](#) - if ≤ 8 requires secured airway, consider [LMA, p. 56](#) until patient can be intubated¹
 - pupil size + reaction to light
 - motor response in limbs
 - fontanelle in infant
 - continuous cardiac monitoring + ECG
 - screen for [Sepsis, p. 64](#)
 - If hypotensive, give rapid IV sodium chloride 0.9% 10–20 mL/kg. See [Shock, p. 62](#)

3. Clinical assessment

- Do not leave patient alone if possible
- Constantly re-check for any change, including:^{2,4}
 - airway for any signs of obstruction eg:
 - laboured/noisy breathing, or no sound of breathing
 - ↑↑ WOB eg intercostal recession, nasal flaring in infants
 - abdomen moves in/out, but loss of natural rise of chest

- [GCS, p. 562](#) - if drops ≥ 2 points urgently contact MO/NP
- **Get rapid history** from friends/relatives or bystanders:¹
 - was the loss of consciousness witnessed
 - when/what happened prior/what were they doing
 - prior headache/chest pain/other symptom
 - ingestions, IV drug use
 - trauma
 - seizures/abnormal movements
- **Look for clues/causes eg:**¹
 - trauma
 - signs of stroke
 - overdose eg suicide note, empty medicine packet(s), needle + syringe
 - if suspected opioid give [naloxone, p. 221](#)
 - see [Toxicology assessment, p. 212](#)
 - alcohol or substance/drug use
 - **note:** if alcohol intoxication suspected, continue to look for other causes¹
 - infection, especially the elderly
 - bruising/minor injuries
 - snake bite/other envenomation. If suspected see [Bites and stings, p. 222](#)
 - indications of known allergies eg jewellery/accessory eg key ring, USB stick, shoe tag, anklet, watch, tattoo

Possible causes of altered LOC¹

Neurological	Metabolic
<ul style="list-style-type: none"> • Head injury/trauma, consider non-accidental injury in child • Stroke • Seizure/post seizure • Meningitis, encephalitis • Epilepsy • Tumour 	<ul style="list-style-type: none"> • Hypo/hyperglycaemia • Intoxication - alcohol, inhalants • Poisoning or overdose • Sepsis • Electrolyte derangement • Encephalopathy • Liver failure, kidney failure
Low oxygen/hypoxia	Heart + circulation
<ul style="list-style-type: none"> • Airway obstruction, respiratory failure • Choking/foreign body • Allergy/anaphylaxis • Croup/epiglottitis • Asthma/COPD • Burns • Toxic gas/smoke/steam inhalation • Drowning/near drowning • Pneumonia • PE, pulmonary oedema 	<ul style="list-style-type: none"> • Hypotension • Trauma/haemorrhage • GI bleed • Ectopic pregnancy • Ruptured aortic aneurysm • Cardiac arrest/arrhythmia • Intracranial haemorrhage • Hypo/hyperthermia

- **Get past history** as able (from relatives/friends/medical records):
 - known underlying illness eg epilepsy, diabetes, cancer
 - allergies
 - medications eg anticoagulants
 - recent surgery/hospitalisation

- **Do physical examination**, including:¹
 - urinalysis + pregnancy test if female of reproductive age
 - listen to chest - any wheeze, crackles
 - head to toe examination - check for:
 - any odour eg fruity sweet smelling breath. **Note:** acetone - similar to paint thinner or nail polish remover - may indicate [DKA, p. 89](#)
 - skin eg rash, drug injection sites, puncture wounds
 - remove all clothing as you move down, maintain privacy + keep patient warm
- **Take bloods/i-STAT:**¹
 - FBC, lactate, glucose, UE, calcium, LFT, coagulation studies
 - toxicology screen including paracetamol, salicylate + blood alcohol level

4. Management

- Ongoing management as per MO/NP, which may include:
 - chest x-ray, eFAST (if trained/available)
 - evacuation + treatment according to suspected cause

5. Follow up

- According to possible cause - as per MO/NP

6. Referral/consultation

- As above

Shock - adult/child

Background

- Shock is a loss of effective circulation resulting in impaired tissue oxygen + nutrient delivery and causes life-threatening organ failure. Any seriously ill or seriously injured patient is at risk of developing shock¹
- Causes include - sepsis, anaphylaxis, major haemorrhage, large fluid loss + rarely obstruction of cardiac outflow + cardiogenic failure¹

1. May present with^{1,2}

- **Signs of shock:**
 - ↓ LOC
 - ↓ perfusion - mottled or pale skin, cool extremities, capillary refill > 2 seconds ± clammy
 - ↑ HR, ↑ RR

2. Immediate management

- **DRSABCD**
- Call for help + urgently contact MO/NP when able
- If signs of shock + suspected anaphylaxis:
 - give IM adrenaline (epinephrine) 1:1,000 (see [Anaphylaxis, p. 82](#) for doses)
 - repeat every 5 minutes if needed
- Lie the person down, if unconscious place on side¹
- **Start resuscitation**
- Give O₂ 15 L/minute via non-rebreather mask^{1,2}

- Insert IVC x 2 eg 18 G or [Intraosseous](#), p. 57 if 2 failed attempts
 - take bloods/i-STAT - VBG, lactate, UE, glucose. **Note:** if lactate > 2 inform MO/NP
- **Rapidly give bolus IV sodium chloride 0.9%:**²⁻⁴
 - **adult** 250–500 mL, **child** 20 mL/kg
 - reassess + repeat if no improvement in HR, LOC or perfusion
- If persisting signs of shock after fluid bolus x 2 - urgently contact MO/NP +
 - consider [Sepsis](#), p. 64 if suspected or no other cause of shock identified, initiate sepsis pathway + give broad spectrum antibiotics^{2,3}
- Monitor:
 - vital signs, [GCS](#), p. 562, capillary refill time
- Continuous cardiac monitoring²
- Look for cause of shock:
 - haemorrhage eg:
 - [Ectopic pregnancy](#), p. 371 - do pregnancy test
 - [Traumatic injuries](#), p. 134
 - **note:** if haemorrhagic shock MO/NP may order [Tranexamic acid](#), p. 139 - give within 3 hours
 - [Upper GI bleeding](#), p. 203, [Button battery](#), p. 80, [Rectal bleeding](#), p. 204
 - large fluid loss eg [Gastroenteritis](#) - adult, p. 200 or [Gastroenteritis](#) - child, p. 535
 - sepsis/septic shock, anaphylaxis, brain/spinal injuries
 - cardiac dysfunction³ eg [ACS](#), p. 107
 - blockage of blood flow in/around the heart eg [PE](#), p. 125

3. Clinical assessment

- Get rapid history, ask about:
 - recent illness, nausea/vomiting, diarrhoea
 - decreased urine output
 - immunocompromised
 - underlying conditions eg cancer, heart disease, diabetes
 - any medications
 - recent drugs or alcohol
- Do physical assessment, including:
 - listen to chest - any wheeze, crackles
 - ECG - send for urgent review by MO/NP
 - urinalysis
 - check skin - any rash, wounds, bruising
 - abdomen:
 - listen to bowel sounds - present/absent - if absent, consider [Bowel obstruction](#), p. 205
 - palpate for any tenderness, guarding, rigidity, rebound tenderness, masses

4. Management

- Ongoing management as per MO/NP + likely cause of shock

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

HMP Sepsis/septic shock - adult/child

Recommend

- Sepsis is a medical emergency - early recognition + rapid treatment is imperative for survival. Consider in every patient with fever or acute illness^{1,2}
- Initial presentation can be vague. Always have a high index of suspicion in neonates, young infants, the elderly and immunocompromised patients
- If suspected sepsis - initiate treatment + investigations until sepsis has been excluded
- Use rural + remote sepsis pathways:
 - **adult** <https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/sepsis/sepsis-resources/adult-sepsis-pathways>
 - **child** <https://www.childrens.health.qld.gov.au/chq/health-professionals/sepsis/>
 - if outside of Qld use local pathways

Background

- Sepsis = infection + organ dysfunction^{1,2}
- Children can have sepsis with normal BP. Hypotension is a late sign of shock
- Neonates + infants < 1 year are at highest risk as immature immune systems are unable to ward off severe infections
- Elevated lactate > 2 may indicate the severity of sepsis + is used to follow the therapeutic response

1. May present with

Screen ALL patients for sepsis if ANY of the following:^{1,2}

- Looks sick/toxic, may report 'the worst I've ever felt'
- You suspect they may have sepsis
- Has a suspected infection
- Unexplained severe pain or restlessness in children
- Patient, family or carer/parent has concerns
- Signs of clinical deterioration eg Q-ADDS or CEWT score ≥ 4
- Fever or hypothermia - $T < 35.5$
- Altered behaviour, confusion OR ↓ LOC
- < 3 months

2. Immediate management^{1,2}

- Do vital signs, including BP +
 - conscious level - AVPU, p. 562
 - BGL
 - weight - bare weight if < 2 years
- **If ≥ 16 years** - check for ANY Risk factors for sepsis
- **If < 16 years** - go to **Step 1 - Check for ANY features of severe illness**
- For paediatric oncology patients use the clinical pathway *Initial management of suspected neutropenic sepsis* https://qheps.health.qld.gov.au/__data/assets/pdf_file/0026/2629700/SW796_v2.00_032021.pdf

Risk factors for sepsis²

- Aboriginal and Torres Strait Islander, Pacific Islander or Maori
- Chronic disease eg diabetes or congenital condition
- Malnourished or frail
- Indwelling medical device
- Recent trauma or surgery, invasive procedure, wound - < 6 weeks
- Postpartum/miscarriage
- IV drug use or alcoholism
- Re-presentation within 48 hours
- Immunocompromised, asplenia, neutropenia, unimmunised:
 - T $\geq 38.5 \times 1$ OR $38 \times 2 - 1$ hour apart AND suspected neutropenia OR chemotherapy given < 2 weeks, **suspect febrile neutropenia**
+ use local guideline if available, if not - continue screening

AND/OR

- Is there any reason to suspect an infection - respiratory tract, urinary, abdomen/GIT, skin/ joint/prosthesis, central venous access device/PICC line, CNS/meningitis, new onset confusion, family members suspect infection, source unclear at present

YES**NO**

Go to **Step 2 - check for any features of moderate illness** (next page)

Step 1. Check for ANY features of severe illness**Child < 16 years**

- Needs O₂ to keep SpO₂ $\geq 92\%$
- Severe respiratory distress/tachypnoea/apnoea (CEWT respiratory score 3)
- Severe tachycardia or bradycardia (CEWT HR score 3)
- Hypotension (CEWT BP score ≥ 2)
- Lactate ≥ 2 if known
- Altered AVPU
- Non-blanching rash
- Hypothermia (CEWT temperature score 2)
- Capillary refill ≥ 3 seconds
- Parental/clinician concern
- Cold extremities

 ≥ 16 years–adult

- Systolic BP < 90 (or drop > 40 from normal)
- Lactate ≥ 2 if known
- Non-blanching rash/mottled ashen/cyanotic
- RR ≥ 25
- Needs O₂ to keep SpO₂ $\geq 92\%$
- HR ≥ 130
- Evidence of new or altered mental state
- Not passed urine in 18 hours
- Recent chemotherapy

NO**ANY features of severe illness**

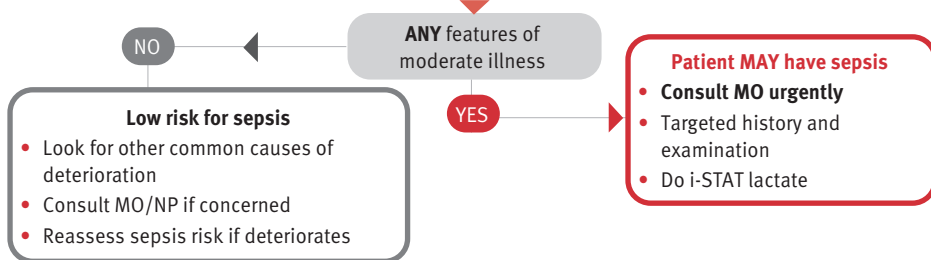
Go to **Step 2 - check for any features of moderate illness** (next page)

YES

Patient HAS sepsis or septic shock until proven otherwise
Consult MO urgently
See Step 3 (next page)

Step 2. Check for ANY features of moderate illness

Child < 16 years ¹	≥ 16 years–adult ²
<ul style="list-style-type: none"> Moderate respiratory distress/tachypnoea (CEWT respiratory score 2) Moderate tachycardia (CEWT HR score 2) Unexplained pain or restlessness Low BGL Reduced urine output 	<ul style="list-style-type: none"> RR 21–24 HR 90–129 OR new dysrhythmia Systolic BP 90–99 Not passed urine in last 12–18 hours T < 35.5 or ≥ 38.5 Relatives concerned about mental state Acute deterioration in functional ability



Step 3: If ANY indications this is likely sepsis or septic shock^{1,2}

- Call for help
- Consult MO urgently:**
 - senior MO to diagnose sepsis where possible
 - arrange early evacuation
 - use sepsis rural + remote pathways if available
- Maintain SpO₂ ≥ 94%** (88–92% if COPD). Give O₂ if needed
- Insert IVC x 2 or Intraosseous, p. 57** if 2 failed attempts
- Do lactate**
- Take bloods** unless this will delay antibiotics > 1 hour:
 - < 16 years:**
 - blood cultures - aim for 2–6 mL (1 aerobic bottle)
 - lactate/VBG + FBC. If possible add CHEM20 or LFT, UEG, CMP, CRP
 - BGL
 - ≥ 16 years–adult:**
 - blood cultures - 2 sets from 2 sites (2 sets of aerobic + anaerobic bottles)
 - lactate, FBC, UEC, BGL, LFT, lipase, VBG
 - if septic shock add coagulation studies
- Check allergies**
- Give IV/intraosseous antibiotics within 1 hour - do not delay:**
 - local patterns of resistance to be considered
 - target to source of infection if known
 - use sepsis rural + remote pathways for guidance
 - give antibiotics with shorter infusion times first
 - note:** MRSA infection risks - chronic underlying disease eg renal failure, diabetes, immunosuppression, chronic wounds or dermatitis, living in close quarters or communities with high MRSA prevalence, known colonisation with MRSA

Empirical antibiotics - if unknown source + not allergic MO/NP may order

- **< 2 months:**¹
 - cefotaxime PLUS ampicillin
 - if at risk of MRSA ADD vancomycin
- **2 months–16 years:**¹
 - cefotaxime
 - if at risk of MRSA ADD vancomycin
- **If child has septic shock/critically ill REPLACE above with:**¹
 - cefotaxime PLUS gentamicin PLUS vancomycin
- **> 16 years–adult:**²
 - gentamicin PLUS flucloxacillin
 - if at risk of MRSA ADD vancomycin
 - if meningitis cannot be excluded ADD ceftriaxone. See [Meningitis, p. 72](#)

If timely IV/intraosseous access not possible - IM route can be used for most antibiotics

Guidelines for max. mL for IM injection					
Muscle	0–18 months	18 months–3 years	3–6 years	6–15 years	› 15 years
Vastus lateralis	0.5 mL	1 mL	1.5 mL	1.5–2 mL	2–2.5 mL
Deltoid	Not recommended	*0.5 mL	0.5 mL		1 mL
Ventrogluteal		*1 mL	1.5 mL	1.5–2 mL	2–2.5 mL
*Gluteus maximus		1 mL	1.5 mL	1.5–2 mL	2–2.5 mL
*Not recommended if other sites are available					
Volumes of up to 2.4 mL in 1 injection are used in exceptional circumstances with documented informed consent where the risk of muscle necrosis is discussed with the patient/carer					

Additional considerations ALL ages^{1,2}

- During November to May (tropic wet season) - areas north of Mackay, Tennant Creek, Port Hedland:
 - **< 16 years** - follow empirical antibiotic recommendations above based for age + risk factors. Contact MO urgently to review clinical status + revise antibiotics according to the Qld paediatric sepsis pathway <https://www.childrens.health.qld.gov.au/chq/health-professionals/sepsis/>
 - **> 16 years** - MO may consider replacing antibiotic regimen above with meropenem AND vancomycin
 - for patients with significant underlying conditions who are known to be colonised with antibiotic-resistant organisms, follow empirical antibiotic recommendations above, but contact MO or infectious diseases urgently for advice
- If meningitis cannot be excluded, see [Meningitis, p. 72](#) for empirical antibiotic choices
- If encephalitis suspected ADD aciclovir. See [Meningitis, p. 72](#)

MO/NP may order IV/intraosseous sodium chloride 0.9%

- **< 16 years:**¹
 - give rapid fluid bolus 10–20 mL/kg
 - observe for hepatomegaly (enlarged liver)
 - assess response including HR, perfusion, lactate, LOC
 - MO/NP may order:
 - repeat up to 40–60 mL/kg within 1st hour
 - if hypoglycaemic - 2 mL/kg glucose 10%

- **≥ 16 years–adult:**²
 - consider weight, cardiac function, comorbidities + current volume status
 - give rapid fluid bolus 250–500 mL over 5 minutes if clinically indicated
 - assess response + give further bolus if indicated
 - further IV fluids on MO/NP orders (do not exceed 30 mL/kg without senior MO input)

3. Clinical assessment^{1,2}

- Ask about recent history of:
 - illness, operations/hospitalisation, postpartum, skin infections
 - antimicrobial use within the last 3 months - which one(s), what for
 - travel - where to/when
- Past history - diabetes, immunosuppressive medications, chemotherapy
- Ask about/look for source of infection, **note:** source might be unclear:
 - cough, sputum, breathlessness - pneumonia is the most common cause of sepsis
 - listen to chest for:
 - air entry
 - crackles or wheeze
 - dysuria, frequency:
 - do urinalysis + MSU for MCS + pregnancy test if possible
 - abdominal pain, distension
 - listen for bowel sounds - paralytic ileus may be present
 - cellulitis, septic arthritis, infected wound, device related infection
 - neck stiffness, photophobia, non-blanching rash, new onset confusion, headache, vomiting, nausea. See [Meningitis, p. 72](#)
- Check all skin surfaces for:
 - bruising/bleeding
 - rash at pressure points + under clothing. **Note:** petechiae + purpura do not fade on pressure
- Check vaccination status

4. Management^{1,2}

- Reassess + monitor response to resuscitation:
 - re-check lactate - aiming for < 2
 - do frequent:
 - vital signs - aiming for sBP in adult ≥ 100
 - capillary refill time
 - [AVPU, p. 562](#)
- Monitor fluid balance + urine output aiming for:
 - > 1 mL/kg for < 16 years/child
 - > 0.5 to 1.0 mL/kg/hour for ≥ 16 years/adult
 - consider IDC as appropriate

If no or limited improvement MO may consider:

- **< 16 years** - inotropes (on ICU specialist advice):
 - adrenaline (epinephrine) infusion - use 1 mL of 1:1000 adrenaline (epinephrine) (1 mg/mL). Mix with 49 mL glucose 5% for final concentration 0.02 mg/mL
 - infuse at 0.05–0.5 microg/kg/minute
- **≥ 16 years–adult** - vasopressors for hypotension:
 - noradrenaline (norepinephrine) 5 microg/minute

MO will urgently seek specialist/RSQ advice if patient STILL has:

- Persistent tachypnoea, hypotension, tachycardia
- Lactate ≥ 2 - adult + child
- Altered LOC despite resuscitation
- If patient critically ill at any time

S4	Cefotaxime			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	1 g 2 g	IV/Intraosseous Reconstitute 1 g vial with 9.6 mL water for injections to give concentration of 100 mg/mL OR 2 g vial: add 9 mL water for injections to give concentration of 200 mg/mL THEN Dilute dose with sodium chloride 0.9% to concentration of 150 mg/mL or weaker	Infant and child ≤ 16 years 50 mg/kg (max. 2 g)	stat IV/Intraosseous Inject slowly over at least 3–5 minutes
		IM Child See Guidelines for max. mL for IM injection, p. 67 Adult Inject deep into gluteal muscle. If volume > 4 mL divide + give in multiple sites		
Offer CMI: May cause diarrhoea, nausea, vomiting, pain at injection site, rash, headache or dizziness. Can cause severe diarrhoea (colitis) due to <i>C. difficile</i>				
Note: Rapid IV injection < 1 minute can cause life-threatening arrhythmias				
Contraindication: Severe hypersensitivity to penicillins, carbapenems and cephalosporins. Do not mix with aminoglycosides eg gentamicin				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,3,4

S4	Ampicillin			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	500 mg 1 g	IV 500 mg vial: add 4.7 mL water for injections (OR 1 g vial with 9.3 mL) to give concentration of 100 mg/mL	Neonate and infant < 2 months 50 mg/kg (max. 2 g)	stat IV Inject dose < 1 g over 3–5 minutes, otherwise over 10–15 minutes
		IM 500 mg vial: add 1.7 mL water for injections (OR 1 g vial with 3.3 mL) to give concentration of 250 mg/mL		IM See Guidelines for max. mL for IM injection, p. 67
Offer CMI: May cause rash, diarrhoea, nausea and pain at the injection site				
Contraindication: Severe hypersensitivity to penicillins, carbapenems and cephalosporins. Do not mix with aminoglycosides eg gentamicin				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

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S ₄	Vancomycin			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	500 mg 1 g	IV/Intraosseous Reconstitute 500 mg vial with 10 mL of water for injections (20 mL to 1 g) to give concentration of 50 mg/mL THEN Dilute dose in sodium chloride 0.9% to make concentration of at least 5 mg/mL CANNOT be given IM	> 1 month 15 mg/kg (max. 750 mg) > 16 years to adult 30 mg/kg loading dose ‡use Actual Body Weight	stat IV/Intraosseous Infuse over at least 60 minutes Max. rate for doses over 500 mg is 10 mg/minute
		Note: ‡see eTG for subsequent dosing or dosing in obese adults. Give through securely fastened IVC as extravasation may cause tissue necrosis. Do not infuse faster than recommended rate - can cause severe reactions ie profound hypotension + ‘red-man syndrome’ eg fever, chills, erythema, facial + upper torso rash, may be followed by hypotension, angio-oedema + itch. If ‘red-man syndrome’ decrease/stop infusion + contact MO/NP		
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

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S4	Flucloxacillin		Extended authority ATSIHP/IHW/IPAP	
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	500 mg 1 g	IV/Intraosseous Reconstitute 500 mg vial with 10 mL OR 1 g vial with 15–20 mL water for injections	> 16 years to adult 2 g	stat IV/Intraosseous Inject slowly over 6–8 minutes
		IM Reconstitute 500 mg vial with 2 mL (1 g vial with 2.5 mL) water for injections OR lidocaine (lignocaine) 1%		IM Inject deep into large muscle. No more than 1 g in each site
Offer CMI: May cause diarrhoea, nausea and pain at the injection site				
Note: Rapid IV injection may cause seizures				
Contraindication: Severe hypersensitivity to penicillins, carbapenems and cephalosporins				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

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S4	Meropenem			Prescribing guide
RIPRN and RN only. Must be ordered by an MO/NP				
Form	Strength	Route	Dose	Duration
Injection	1 g	IV/Intraosseous	> 16 years to adult	Inject over 5 minutes
		Reconstitute with 20 mL water for injections Shake well before use	1 g	
Offer CMI: May cause nausea, vomiting, headache or phlebitis of IVC site				
Note: Risk of seizures - use cautiously if CNS infections, renal dysfunction or history of seizure disorders. Not for IM injection				
Contraindication: Severe hypersensitivity to penicillins, carbapenems and cephalosporins				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

S4	Gentamicin			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	10 mg/mL 80 mg/2 mL	IV/ Intraosseous Child Dilute with sodium chloride 0.9% to convenient volume (ie to 10 mg/mL or weaker)	Term neonate ≤ 1 month 5 mg/kg	IV/Intraosseous Child Infuse over 20–30 minutes
		Adult Dilute to 20 mL with sodium chloride 0.9% to enable slow injection if required	Child > 1 month to < 10 years 7.5 mg/kg (max. 320 mg)	Adult Inject slowly over 3–5 minutes
		IM	Child 10 years to < 16 years 6 mg/kg (max. 560 mg) OR if critically ill/septic shock 7 mg/kg (max. 640 mg)	IM Child See Guidelines for max. mL for IM injection, p. 67
Note: Rapid IV injection may result in ototoxicity/vestibular toxicity. IV gentamicin is inactivated by cephalosporins + penicillins. Flush line well before giving gentamicin or give at separate sites to prevent inactivation. Adult - dose according to Ideal Body Weight (IBW) or actual body weight, which ever is less. Where actual body weight is > 20% of IBW, use Adjusted Body Weight (AdjBW). For adjusted dosing calculations or with known or likely pre-existing renal impairment see eTG or <i>Aminoglycoside dosing in adults</i> (May 2018) https://www.health.qld.gov.au/__data/assets/pdf_file/0019/713323/aminoglycoside-guidelines.pdf Can be given as a single dose in adults with sepsis, regardless of age. Child - use IBW to calculate dose, unless actual body weight is lower. If > 20% over IBW use IBW. Determine IBW by using corresponding weight for height percentile on a growth chart https://www.rch.org.au/childgrowth/about_child_growth/Growth_charts/				
Contraindication: Previous vestibular/auditory toxicity with aminoglycosides, severe allergic reaction to aminoglycoside, myasthenia gravis. Use with caution if > 80 years, pre-existing vestibular/auditory impairment, renal impairment/rapidly changing function, other nephrotic agents				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

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5. Follow up

- As per MO/NP

6. Referral/consultation

- Urgent treatment + evacuation/hospitalisation required
- Further doses of antibiotics required in 6–8 hours - contact MO/NP if still waiting to be evacuated

HMP Meningitis - adult/child

Recommend

- Meningitis is a medical emergency. Early recognition + treatment is imperative^{1,2}
- If suspected, but lumbar puncture cannot be done ≤ 30 minutes, give IV antibiotics^{1,2}
- Do NOT use hyponatraemic solutions eg glucose 4% with sodium chloride 0.18% or sodium chloride 0.45% - ↑ risk of cerebral oedema
- Suspect meningitis if sick child with no obvious source of infection
- Parents/carers may notice early, subtle changes in child's LOC - do not ignore their concerns
- Meningococcal infection is a notifiable disease ⓘ **notify Public Health Unit within 6 hours**

Background

- Children often present with non-specific symptoms and not the classic triad of fever, headache + neck stiffness²
- Meningitis is an inflammation or infection of the membranes that surround the brain + spinal cord. It can lead to serious long-term neurological complications + death
- Viral meningitis is more common than bacterial meningitis, but is usually less severe

1. May present with¹

- Typically presents with acute history of fever, neck stiffness + altered conscious state ±
 - headache, photophobia + nausea or vomiting - often prominent¹
 - petechial rash - very late sign + indicative of meningococcal sepsis
 - focal neurological deficit, seizures, shock
- Older children may present with any combination of the above² ±
 - upper or lower respiratory tract symptoms, myalgia + abdominal pain
- < 3 months - bulging fontanelle, high pitched cry, poor feeding, apnoea, seizures, vomiting²

2. Immediate management

- If fitting see [Fitting, p. 86](#) for midazolam dosing
- **Consult MO/NP urgently**
- Get rapid history + manage concurrently
- Do vital signs +
 - central capillary refill time
 - [GCS, p. 562](#)
 - BGL
- **Give O₂** to maintain SpO₂ $\geq 94\%$
- **Insert IVC x 2 or Intraosseous, p. 57** if 2 failed attempts

- **Take bloods** unless this will delay antibiotics > 30 minutes:²⁻⁴
 - meningococcal PCR (adult 4 mL in mauve top tube; child 1 mL in EDTA pink top tube)
 - VBG, FBC, coagulation studies, LFT, UE, glucose
 - blood cultures:
 - if < 16 years - aim for 2–6 mL (1 aerobic bottle)
 - if > 16 years or adult - 2 sets from 2 sites (2 sets of aerobic + anaerobic bottles)
- **Correct BGL if needed:**
 - give glucose 10% 2 mL/kg - as per MO/NP²
- Check allergies
- **MO/NP will order antibiotics - give within 30 minutes - DO NOT DELAY**
- If child > 3 months + adult, give dexamethasone before or with 1st dose of antibiotic²
- If not allergic, MO/NP may order:^{3,4}
 - **neonate + infant < 2 months:**
 - ampicillin PLUS cefotaxime
 - **child ≥ 2 months + adult:**
 - ceftriaxone OR cefotaxime
 - if critically ill immunocompetent child ≥ 2 months MO/NP may ADD:
 - gentamicin PLUS vancomycin. See [Sepsis, p. 64](#) for dosing
 - if herpes simplex encephalitis suspected MO/NP may ADD aciclovir
 - if immunocompromised, > 50 years old, history of heavy alcohol consumption, pregnant or debilitated, to cover listeria MO/NP may ADD:
 - benzylpenicillin
- IM route can be used if timely IV/intraosseous access not possible
- **Start fluid resuscitation** as clinically indicated ≤ 30 minutes:²⁻⁴
 - give sodium chloride 0.9% 20 mL/kg fluid bolus
 - repeat if needed as per MO/NP
- Arrange urgent evacuation
- Consider [Sepsis, p. 64](#) as a differential diagnosis

3. Clinical assessment

- **Note:** apparent explanation for fever (eg pharyngitis, UTI or otitis media) does not rule out diagnosis²
- **Ask about:**
 - headache, irritability, fever, rash, neck stiffness, lethargy, confusion¹
 - immunisations - Hib, meningococcal, pneumococcal + check vaccination status
 - prior use of oral antibiotics (may modify clinical features)
- **Check for risk factors:**²
 - recent contact with a case of bacterial meningitis (especially in family)
 - recent contact with HSV 'cold sores' or confirmed enterovirus infection
 - recent overseas travel
 - maternal Group B Strep (GBS) colonisation if < 3 months
 - immunocompromised
 - recent neurosurgical procedure, penetrating head injury, ventriculoperitoneal (VP) shunt, cochlear implant
- **Weight** - bare weight if < 2 years
- **Do physical examination,** including:
 - listen to chest for air entry - any crackles, wheeze

- skin for rashes including at pressure points + under nappies/clothing:
 - petechiae or purpura (do not fade on pressure)
 - **note:** if child, rash may not appear until child is rehydrated²
- Hydration assessment - adult, p. 200 or child, p. 535
- ENT
- fontanelle in infants - any fullness, bulging
- **neck stiffness:**
 - with patient lying down, put hand behind head + gently raise
 - **note:** may not complain of neck stiffness, but with passive or active flexion - cannot touch chin to chest
- +ve Brudzinski's sign - reflex flexion of the hip + knee when the neck is passively flexed **OR**
- +ve Kernig's sign - pain along spinal cord ± resistance to knee extension when hip and knee are flexed to 90°
 - may indicate bacterial meningitis²

4. Management

- **Child** - use Qld paediatric sepsis rural and remote pathway <https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/sepsis/sepsis-resources/paediatric-sepsis-pathways> **AND**
 - also see *Meningitis - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>
 - careful management of fluid + electrolyte balance is important - discuss with paediatrician as soon as possible
- **Adult** - use Qld adult sepsis rural and remote pathway <https://clinicalexcellence.qld.gov.au/priority-areas/safety-and-quality/sepsis/sepsis-resources/adult-sepsis-pathways>
- Monitor closely until evacuation:
 - vital signs + BGL
 - give analgesia + antiemetic as needed
 - fluid balance
- Check timing of further antibiotic doses if evacuation is delayed/prolonged - contact with MO/NP

S ₄	Dexamethasone		Extended authority ATSIHP/IHW/IPAP/RIPRN	
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN must consult MO/NP unless circumstances do not allow, in which case notify the MO/NP as soon as circumstances allow				
Form	Strength	Route	Dose	Duration
Injection	8 mg/2 mL 4 mg/mL	IV/Intraosseous Dilute in 10 mL sodium chloride 0.9%	Adult 10 mg	stat IV/Intraosseous Inject slowly over 3–5 minutes
		IM	Child > 3 months 0.15 mg/kg (max. 10 mg) only give IV route	IM Inject into gluteal muscle
Offer CMI: May cause transient perineal itching or burning				
Note: Give before or with first dose of antibiotic as benefit lost if given after first dose. Do not delay antibiotics if dexamethasone not available				
Contraindication: The vial formulation in patients with a known hypersensitivity to sulphites				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

2,5

S4	Ampicillin			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	500 mg 1 g	IV Reconstitute 500 mg vial with 4.7 mL water for injections (OR 1 g vial with 9.3 mL) to give a concentration of 100 mg/mL	Neonate and infant < 2 months 50 mg/kg (max. 2 g)	stat
		IM Reconstitute 500 mg vial with 1.7 mL water for injections (OR 1 g vial with 3.3 mL) to give a concentration of 250 mg/mL		IV Inject dose < 1 g over 3–5 minutes. Otherwise infuse over 10–15 minutes IM See Guidelines for max. mL for IM injection, p. 67
Offer CMI: May cause rash, diarrhoea, nausea and pain at injection site				
Contraindication: Severe hypersensitivity to penicillins, carbapenems and cephalosporins. Do not mix with aminoglycosides eg gentamicin				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

6

S4	Cefotaxime			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	1 g 2 g	IV/Intraosseous Adult/2 g dose Reconstitute with 20 mL water for injections Child/part dose Reconstitute 1 g vial with 9.6 mL water for injections to give a concentration of 100 mg/mL OR 2 g vial with 9 mL water for injections to give a concentration of 200 mg/mL THEN Dilute dose with sodium chloride 0.9% to a concentration of 150 mg/mL or weaker	Adult 2 g Neonate and child 50 mg/kg (max. 2 g)	stat IV/Intraosseous Inject slowly over at least 3–5 minutes IM Child See Guidelines for max. mL for IM injection, p. 67 Adult Inject deep into gluteal muscle. If volume > 4 mL divide + give in multiple sites
		IM <i>Can be given IM but is extremely painful*</i> Reconstitute 1 g vial with 2.6 mL OR 2 g vial with 5 mL water for injections to give a concentration of 330 mg/mL		
Offer CMI: May cause diarrhoea, nausea, vomiting, pain at injection site, rash, headache or dizziness. Can cause severe diarrhoea (colitis) due to <i>C. difficile</i>				
Note: Rapid injection < 1 minute can cause life-threatening arrhythmias. *If IM is required ceftriaxone is the preferred agent				
Contraindication: Severe hypersensitivity to penicillins, carbapenems and cephalosporins. Do not mix with aminoglycosides eg gentamicin				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				
7,8				

S ₄	Ceftriaxone		Extended authority ATSIHP/IHW/IPAP/RIPRN	
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN must consult MO/NP unless circumstances do not allow, in which case notify the MO/NP as soon as circumstances allow				
Form	Strength	Route	Dose	Duration
Injection	1 g	IV/Intraosseous Adult Reconstitute 2 g with water for injections 40 mL	Adult 2 g Child > 1 months 50 mg/kg (max. 2 g)	stat
		Child/part dose Reconstitute with water for injections 9.4 mL to give a concentration of 100 mg/mL If giving via infusion, dilute further in 40 mL sodium chloride 0.9%		IV/Intraosseous Inject over at least 5 minutes OR infuse over 30 minutes
		IM Reconstitute with lidocaine (lignocaine) 1% 2.3 mL to give a concentration of 350 mg/mL		IM Child See Guidelines for max. mL for IM injection, p. 67 Adult Inject deep into gluteal muscle. No more than 1 g in each site
Offer CMI: May cause rash, diarrhoea, nausea and pain at injection site				
Note: Rapid IV administration may result in seizures. Interacts with warfarin. ↓ dose in renal impairment				
Contraindication: Severe hypersensitivity to penicillins, carbapenems and cephalosporins. Do not use in neonates. Incompatible with calcium containing IV fluids eg Hartmann's. Do not mix with aminoglycosides				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

9,10

S4	Benzylpenicillin			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	600 mg 1.2 g	IV Reconstitute with water for injections: 600 mg vial with 5 mL 1.2 g vial with 10 mL THEN dilute in 100 mL sodium chloride 0.9%	Adult 2.4 g	stat IV Infuse over at least 30 minutes
		IM Reconstitute 600 mg vial with 1.6 mL water for injections OR 1.2 g vial with 3.2 mL to give a concentration of 300 mg/mL		IM Inject deep into large muscle. No more than 1 g in each site
Offer CMI: May cause diarrhoea, nausea and pain at the injection site				
Note: Rapid IV injection of large doses may cause seizures. Max. daily dose of 6 g in severe renal impairment				
Contraindication: Severe or immediate allergic reaction to a penicillin. Be aware of cross-reactivity between penicillins, cephalosporins and carbapenems				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

11

S4	Aciclovir			Prescribing guide
RIPRN and RN only. Must be ordered by an MO/NP				
Form	Strength	Route	Dose	Duration
Injection	250 mg 500 mg	IV/Intraosseous Reconstitute with water for injections: 250 mg with 10 mL 500 mg with 20 mL to give a concentration of 25 mg/mL THEN Dilute dose with sodium chloride 0.9% (max. concentration 5 mg/mL ie 250 mg to at least 50 mL or 500 mg to at least 100 mL) Shake to mix thoroughly	Neonate to < 12 years 20 mg/kg (max. 1000 mg) Note: dosing interval varies by age - seek specialist advice 12–16 years 10 mg/kg (max. 1000 mg) Adult 10 mg/kg	stat Infuse over at least 1 hour
		Offer CMI: May cause nausea, vomiting, diarrhoea, injection site reactions, hallucinations (high dose), headache or encephalopathy		
Note: Monitor injection site closely, extravasation can cause severe inflammation + necrosis. Stop the injection if redness/pain. Use in caution if neurological abnormalities. Adjust dose if renal impairment				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				12

5. Follow up

- Chemoprophylaxis will be required for staff/close contacts of a patient with either meningococcal or Hib meningitis. Unvaccinated contacts of Hib meningitis < 5 years should be immunised as soon as possible. Public Health Unit will advise
- Refer for audiology assessment 6–8 weeks after discharge if bacterial meningitis¹³

6. Referral/consultation

- ① For all suspected or confirmed cases of meningitis or meningococcal disease notify the Public Health Unit within 6 hours

Choking (foreign body airway obstruction) - adult/child

Background

- Abdominal thrusts (Heimlich maneuver) are not recommended¹
- Consider foreign body aspiration in any infant/toddler with acute onset respiratory distress²

1. May present with^{1,2}

- Coughing
- Clutching the neck
- Extreme anxiety, agitation, gasping sounds
- Loss of voice, hoarseness, stridor
- Cyanosis, collapse

2. Immediate management¹⁻³

- Assess for effective cough

Effective cough (mild airway obstruction)

- Give reassurance
- Encourage coughing until foreign body is expelled
- Allow to position themselves
- Do not do back blows or chest thrusts while there is an effective cough
- Continue to check until recovery or deterioration

Ineffective cough and conscious (severe airway obstruction)

- Call for help
- **Do up to 5 sharp back blows:**
 - use the heel of your hand in the middle of the back between the shoulder blades
 - if infant - place in a head downwards position ie across your lap
- **If back blows unsuccessful, do up to 5 chest thrusts** - like chest compressions for CPR but sharper and delivered at a slower rate:
 - **infant** - place face up, back across your thigh
 - **child/adult** - sitting or standing position. **Support the patient's back when doing thrusts:**⁴
 - put your other hand on the patient's back OR on the back of the chair (if patient sitting) **OR**
 - get someone to stand behind patient to support the back **OR**
 - stand patient against a firm surface/wall **OR**
 - lie patient down

After each back blow or chest thrust, check to see if obstruction relieved

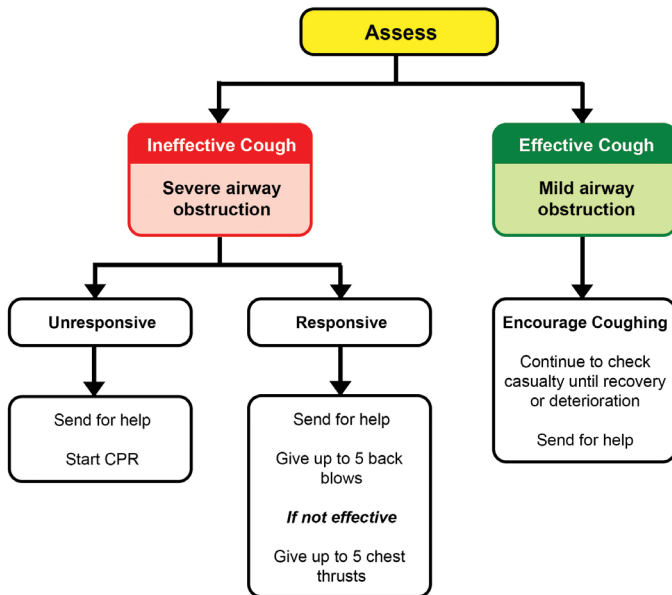
Aim is to relieve the obstruction rather than give all 5 blows/thrusts

- **If obstruction still not relieved and patient remains responsive:**
 - continue alternating 5 back blows with 5 chest thrusts

Unconscious or becomes unresponsive¹

- Call for help
- If solid material is visible in the mouth - remove
- Start CPR. See [BLS, p. 46](#)
- Urgently contact MO/NP

Foreign Body Airway Obstruction (Choking)



January 2016



NEW ZEALAND
Resuscitation Council
WHAKAHAUORA AOTEAROA

3. Clinical assessment¹

- Get rapid history as able:
 - circumstances leading to choking eg eating, drinking, other
- Do vital signs
- Inspect chest for expansion, drawing in of spaces between ribs and clavicles
- Listen to the chest for air entry and added sounds (crackles or wheeze)

4. Management^{1,3}

- In cases of near (severe) choking or unseen positional foreign object:
 - consult MO/NP urgently
 - give O₂ to maintain SpO₂ ≥ 94%
 - prepare for evacuation
 - chest x-ray if indicated - on MO/NP orders
 - monitor vital signs
- If the choking episode is minor and the foreign body has been dislodged and removed:
 - if asymptomatic and chest findings normal, the patient can go home after a period of

- observation
 - if any concerns, contact MO/NP
- If choking as a result of a button battery, see [Button battery, p. 80](#)

5. Follow up

- If discharged, advise to be reviewed the next day:
 - consult MO/NP if the patient has any symptoms eg ↑ HR, ↑ T or any chest finding

6. Referral/consultation

- Consult MO/NP on all occasions of severe choking

Button battery ingestion/insertion - adult/child

Recommend^{1,2}

- A suspected or proven battery ingestion is a **time critical emergency - urgent x-ray needed**
- Suspect button battery ingestion in all children < 5 years of age with non-specific symptoms
- Promote button battery awareness eg <https://kidsafeqld.com.au/button-batteries/>

Background^{1,2}

- Button (disc) batteries cause burns resulting in life-threatening injuries
- **Failure to remove from the oesophagus within 2 hours can lead to perforation of the oesophagus, fistula (eg oesophageal-aortal/tracheal) and catastrophic haemorrhage**
- Oral honey may slow the development of a chemical burn for a swallowed button battery³

1. May present with^{1,2,4}

- Battery missing
- Seen to have been playing with battery
- Self reported by child (older)
- Gagging, gulp, cough or choking episode:
 - may be overheard when child swallows battery rather than directly observed
- Child may deny ingestion
- Very non-specific symptoms:
 - unexplained partial food refusal - may still take soft food/fluids
 - drooling or regurgitation
 - croup like cough
 - chest pain
 - upper GI bleeding (melaena/black stools; haematemesis - may mimic epistaxis):
 - may be small bleed initially, then catastrophic bleed
 - fever/vomiting/signs of infection without a clear focus
 - pain/grunting
- Bloody discharge from ear, nose, vagina, rectum - may have inserted battery

2. Immediate management

- If inhaled, see [Choking, p. 78](#)
- If haematemesis or melaena:
 - insert IVC x 2
 - get rapid history
 - urgently consult MO/NP
- Do vital signs

If ingestion (swallowed) suspected

- Contact the Poisons Information Centre (PIC) ☎ 13 11 26 (24 hours) urgently for advice
- Urgently contact MO/NP:
 - **urgent ‘neck to bottom’ x-ray required - even if asymptomatic¹**
 - if no x-ray facilities, will need urgent evacuation for x-ray
- If the x-ray shows battery is located in the hypopharynx (bottom of throat) or oesophagus:⁵
 - URGENT evacuation for removal via endoscopy required
- Give **oral honey** if ingestion suspected < 12 hours and:^{3,6}
 - child ≥ 12 months old
 - able to swallow
 - give 10 mL (2 teaspoons) every 10 minutes, up to 6 doses (or as guided by MO/NP)
- Keep nil by mouth otherwise
- If the battery is in the stomach or beyond:²
 - management will depend on factors such as age of child, symptoms, size of battery, time of suspected ingestion
 - MO/NP will advise
- Monitor vital signs

3. Clinical assessment

- Ask about - if known:
 - timing of ingestion
 - size of battery (if ≥ 2 cm, more likely to lodge in oesophagus)
 - was ingestion witnessed
 - what treatment (if any) has been tried at home
 - colour of stools, any blood in vomit, or any other signs/symptoms

4. Management

- Continue management of suspected swallowed battery in collaboration with MO/NP
- **If insertion suspected** eg into vagina, ear, rectum, nose:
 - consult MO/NP regarding urgent removal
 - x-ray may be required if unexplained nasal/ear/vaginal discharge and unable to visualise cause¹

5. Follow up

- As advised by MO/NP. **Note:** even after removal of a button battery, ongoing damage can occur⁷

6. Referral/consultation

- Always consult MO/NP

HMP Anaphylaxis - adult/child

Recommend¹

- Adrenaline (epinephrine) is first line treatment. Give without delay
- Anaphylaxis is potentially life-threatening and must be treated as a medical emergency
- Check for medic alert jewellery and accessories in emergency situations.² May look like normal jewellery or other accessory eg key ring, USB stick, shoe tag, anklet, watch or tattoo
- Fluid resuscitation is important if severe anaphylaxis with hypotension

Background

- See *ASCIA Guidelines - acute management of anaphylaxis* <https://allergy.org.au/hp/papers/acute-management-of-anaphylaxis-guidelines/>

1. May present with¹

- **ANY ONE of the following** (onset can range from minutes to hours after exposure to a substance):
 - difficult/noisy breathing
 - swelling of tongue
 - swelling/tightness in throat
 - difficulty talking ± hoarse voice
 - wheeze or persistent cough - usually sudden
 - persistent dizziness or collapse
 - pale and floppy (young children)
 - abdominal pain, vomiting - for insect sting or injected drug (medication) allergy
- **CONSIDER anaphylaxis in ANY acute onset:**
 - illness with typical skin features - itchy rash or red/flushing ± angio-oedema (swelling) **PLUS** involvement of respiratory ± cardiovascular ± persistent severe GI symptoms
 - **OR** hypotension or bronchospasm or upper airway obstruction where anaphylaxis is considered possible, even if typical skin features are not present

2. Immediate management¹ *also see flowchart inside back cover*

- **Remove allergen** if still present - **do not delay adrenaline (epinephrine) to do this:**
 - stop infusion of medicine/blood product
 - flick out insect stings; freeze tick with liquid nitrogen or ether containing spray
- **Call for help**
- **Lay patient flat. Do NOT allow to stand or walk** - can result in fatal hypotension
 - if breathing difficult allow to sit - with legs outstretched in front (not in chair):
 - lay flat again if ↓ BP or ↓ LOC or confusion
 - do not hold infants upright
 - if pregnant, put in left lateral position
- **Give IM adrenaline (epinephrine) into OUTER MID-THIGH WITHOUT DELAY**
 - repeat adrenaline (epinephrine) every 5 minutes as needed
 - if known **asthmatic with allergy** give adrenaline (epinephrine) **first**, then asthma reliever if **sudden breathing difficulty** (wheeze, persistent cough or hoarse voice) - even if no skin symptoms
- **Urgently consult MO/NP**

S3	Adrenaline (epinephrine)					Extended authority ATSIHP/IHW
ATSIHP and IHW may proceed with up to 2 doses then must consult MO/NP						
MID, RIPRN and RN may proceed						
Form	Strength	Route	Dose			Duration
Injection	1:1,000 1 mg/mL	IM Use 1 mL syringe with 22–25 G needle, 25 mm length or if very large adult, 38 mm length do NOT use insulin syringe	Adult and Child > 12 years 0.5 mg			stat Deep injection into outer mid-thigh Repeat every 5 minutes as required
			Child ≤ 12 years 0.01 mg/kg (max. 0.5 mg)			
			Doses on approx. age/weight			
			Age (years)	Weight (kg)	Volume 1:1,000	
			< 1	< 7.5	0.1 mL	
			1–2	10		
			2–3	15	0.15 mL	
			4–6	20	0.2 mL	
			7–10	30	0.3 mL	
			10–12	40	0.4 mL	
			> 12–adult	> 50	0.5 mL	
OR if using autoinjector eg Epipen®, Anapen®						
Auto injector	0.15 mg	IM	7.5–20 kg (approx. 1–5 years) 0.15 mg			
	0.3 mg		> 20 kg (approx. > 5 years) 0.3 mg			
	0.5 mg		> 50 kg (approx. > 12 years) 0.3 mg OR 0.5 mg			
Offer CMI: May cause restlessness, anxiety or headache and palpitations in conscious patients						
Note: Instructions for autoinjector on device labels						
Management of associated emergency: Consult MO/NP						

1

When skills and equipment are available¹

- **Do NOT allow patient to walk or stand, even if they appear to have recovered**
- Cardiac monitor, ECG
- Monitor:
 - vital signs
 - for altered LOC and confusion. See [GCS/AVPU, p. 562](#)
- O₂ 6–8 L/minute if:
 - respiratory distress, ↓ LOC, or needs repeat doses of adrenaline (epinephrine)
 - consider O₂ if asthmatic, or chronic respiratory/cardiovascular disease
- Airway support if needed:
 - jaw thrust, oro/nasopharyngeal airway or bag-valve-mask with high flow O₂ will save most patients, even with airway swelling¹
- Insert IVC if adult (14–16 G) or hypotensive child

- If hypotensive:
 - IV sodium chloride 0.9% 20 mL/kg rapidly
 - + insert another IVC

If inadequate response to 2–3 adrenaline (epinephrine) doses OR deterioration

- MO/NP may consider:
 - **adrenaline (epinephrine) infusion** on advice of emergency medicine/critical care specialist
- If adrenaline (epinephrine) infusion NOT available or NOT effective **MO/NP may order for:**
 - **upper airway obstruction:**
 - nebulised adrenaline (epinephrine) 5 mL (5 ampoules of 1:1,000)
 - **persistent hypotension/shock:**
 - sodium chloride 0.9% - max. 50 mL/kg in the first 30 minutes
 - IV glucagon
 - **persistent wheeze:**
 - salbutamol 8–12 puffs (MDI) using a spacer OR 5 mg (NEB) as per [Asthma, p. 95](#)
 - oral prednisolone 1 mg/kg (max. 50 mg) as per [Asthma, p. 95](#) OR
 - IV hydrocortisone 5 mg/kg (max. 200 mg)
- **If airway not able to be maintained and SpO₂ falling consider** (if skills/equipment):
 - intubation - avoid prolonged attempts
 - cricothyrotomy
- **If cardiac arrest:**
 - see [ALS, p. 48](#)
 - do prolonged CPR
 - PLUS aggressive fluid resuscitation AND IV adrenaline (epinephrine) bolus

3. Clinical assessment¹

- Get rapid history - from patient, relatives or friends:
 - food, medicine, sting/bite, herbal medicines, other exposures in the previous 6–8 hours
 - known allergies and reaction
 - any previous episodes, treatments used and effect
 - current medications, use of an autoinjector eg EpiPen®
- Do physical examination:
 - check affected body systems - skin changes, face, throat, breathing, HR, neurological state
- Monitor response to treatment - using simple palpable systolic BP:
 - palpate radial or brachial pulse. Note pressure at which this disappears
 - may be more difficult in children
 - **note:** infants can stay pale after 2–3 doses of adrenaline (epinephrine), which can resolve without further doses. Use BP to guide response
- Monitor for signs of over treatment:
 - hypertension or pulmonary oedema

S ₄	Hydrocortisone			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, MID, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	100 mg	IV Reconstitute with 2 mL water for injections	5 mg/kg (max. 200 mg)	stat - inject over 30 seconds–5 minutes
Management of associated emergency: Consult MO/NP				1,3,4

S3	Adrenaline (epinephrine)			Prescribing guide
MID, RIPRN and RN only. Must be ordered by an MO/NP				
Form	Strength	Route	Dose	Duration
Injection	1:1,000 1 mg/mL	IV INFUSION only in separate IV line	1:1,000 (1 mL) Dilute in 1,000 mL sodium chloride 0.9%	Start infusion at ~ 5 mL/kg/hour (~0.1 microg/kg/minute) using a pump Titrate rate up or down according to response and side effects If pump not available, start at ~ 2 drops/second using standard giving set
Monitor continuously: ECG, SpO ₂ + frequent BP to maximise benefit and minimise risk of adrenaline (epinephrine) toxicity eg nauseous, shaky, vomiting, tachycardia, but with normal BP DO NOT GIVE IV BOLUS of adrenaline (epinephrine) unless in cardiac arrest situation. Do not stop suddenly. Extravasation can cause ischaemia and necrosis				
Management of associated emergency: Consult MO/NP				1,5

4. Management¹

When stable

- Monitor closely for at least 4 hours after last dose of adrenaline (epinephrine):
 - relapse/protracted ± biphasic (two phase) reactions may occur
- BP, RR, HR, LOC - 15 minutely for 2 hours then hourly
- Evacuation/hospitalisation may be required if:
 - severe reaction eg required repeated doses of adrenaline (epinephrine) or IV resuscitation OR
 - severe/protracted anaphylaxis OR
 - has other concomitant illness eg asthma, arrhythmia OR
 - lives alone or remote from medical care OR
 - presents for medical care late in evening
- If not evacuated, continue to manage as per MO/NP instructions
- Document allergy in medical record

Patient advice prior to discharge

- Avoid being re-exposed to the allergic trigger
- If there is a risk of re-exposure (eg stings, food) **OR unknown cause** provide:
 - an autoinjector of adrenaline (epinephrine) on discharge, or script for an autoinjector
 - education of how and when to use the autoinjector
- Give an *ASCIA action plan for anaphylaxis* <https://www.allergy.org.au/hp/anaphylaxis/ascia-action-plan-for-anaphylaxis>
- Refer to Allergy and Anaphylaxis Australia <https://allergyfacts.org.au/allergy-anaphylaxis> for support
- Discuss medical alert jewellery

5. Follow up

- If not evacuated advise to be reviewed the next day, or earlier if concerned
- Advise to see MO/NP at next clinic

6. Referral/consultation

- Ensure referred to clinical immunology/allergy specialist¹
- Report adverse reaction to immunisation or medicine ②:
 - immunisation - in Qld use AEFI form <https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/immunisation/service-providers/adverse-event>. If outside of Qld use local reporting systems
 - medicine - report directly to the TGA <https://www.tga.gov.au/form/blue-card-adverse-reaction-reporting-form>

HMP Fitting - adult/child

Convulsions, seizures

Recommend

- **Status epilepticus** is continuous seizure activity or repeated seizures without full recovery to normal LOC between episodes - **neurological emergency, aim to stop seizure urgently**^{1,2}

Background

- Most fits are brief + end within 1–3 minutes without needing midazolam²
- Febrile convulsions occur with rapid ↑ T in early acute illness in child aged 6 months–6 years¹
- If child, also see *Status epilepticus; Febrile convulsions - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>

1. May present with

- Fitting eg:^{1,3}
 - sudden body stiffening, will fall if standing
 - jerking movements, head arching back
 - shallow breathing or may stop temporarily
 - dribbling, blood stained if tongue bitten
 - ± fever in child
- Pregnant + fitting, see [Preeclampsia, p. 386](#) for magnesium sulphate infusion + ongoing management
- Post seizure - drowsy, confused, incontinent, agitated, noisy breathing if partial airway obstruction³

2. Immediate management

- **Fitting:**^{2,3}
 - protect patient's head + avoid restraining unless essential to avoid injury
 - lay down + turn on the side when practical
 - note the time
 - maintain airway - do not force mouth open or attempt to insert object
 - insert IVC if possible
 - do BGL - if < 4 **adult**, < 3 **child** - treat [Hypoglycaemia, p. 91](#) concurrently
 - contact MO/NP urgently
- **Status epilepticus:**^{1,2}
 - **if fitting > 5 minutes** or repeated seizures without full recovery to normal LOC
 - give midazolam +
 - repeat if seizure continues after 5 minutes - as per MO/NP

- MO/NP will seek urgent advice + may order 2nd agent eg:
 - levetiracetam, phenobarbitone or phenytoin¹
- Do:
 - continuous cardiac monitoring - assess for arrhythmias
 - [GCS, p. 562](#) + vital signs. Check for ↓ BP
 - check for complications eg airway, aspiration, hyperthermia, IV site for extravasation
 - monitor closely until evacuated
- **Post seizure:**
 - insert oropharyngeal airway if needed
 - place in recovery position³
 - give O₂ to maintain SpO₂ ≥ 94%
 - cardiac monitoring²
 - take bloods/i-STAT - VBG, FBC, UE²
 - reassure patient/family/carers - fitting can be extremely distressing¹
- Do vital signs + [GCS, p. 562](#)

Look for causes + manage concurrently^{1,2}

- Screen for [Sepsis, p. 64](#)
- If [Alcohol withdrawal, p. 356](#) cannot be excluded give IV thiamine
- Suspected poisoning or drug overdose - see [Toxicology assessment, p. 212](#)
- Epilepsy - adherence with therapy, recent sleep deprivation²

S4	Midazolam			Extended authority ATSIHP/IHW/RIPRN
ATSIHP, IHW and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Injection	5 mg/5 mL 5 mg/1 mL	IV/IM (ATSIHP + IHW may NOT give IV)	Adult 5–10 mg Child 0.15 mg/kg (max. 10 mg)	stat If IV, give as push
	5 mg/1 mL	Buccal	Adult 5–10 mg Child	Consider repeat dose if no effect after 5–10 minutes on MO/NP order
		Intranasal	0.3 mg/kg (max. 10 mg)	
Administration advice: Buccal: slowly drip into mouth between gums and cheek using a syringe or squeeze directly from the <i>plastic ampoule</i> . Intranasal: use mucosal atomisation device (MAD) or 1–3 drops (<i>plastic ampoule</i>), 1 at a time into alternate nostrils until full dose is given (over 15 seconds)				
Note: Monitor for sedation and respiratory depression				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

2,4

3. Clinical assessment

- **Ask about details leading up to fitting**, including:¹
 - prior events
 - changes in behaviour
 - signs/symptoms of illness, fever

- **Get details of the fitting**, including:¹
 - how it started
 - any movements of eyes + limbs, symmetry of movements
 - focal movements eg rubbing of hands, lip smacking
 - estimated duration + appearance/behaviour after
 - pre-hospital treatment
- **Get past history**:^{1,2}
 - previous fits or family history + previous management
 - medical/surgical eg intracranial infection, hypoglycaemia/electrolyte disturbance, neurological damage/surgery eg placement of ventriculoperitoneal (VP) shunt
- **Do physical examination**, including:⁵
 - if child + fever - look for source eg URTI, pneumonia, AOM, UTI
 - assess neurological status + return to normal level of alertness + activity¹
 - ECG²
 - check for injuries²
 - pregnancy test if female of reproductive age. If +ve consider [Eclampsia, p. 386](#)

4. Management

- Ongoing management as per cause in collaboration with MO/NP
- **If brief seizure < 5 minutes**:^{1,2}
 - observe/monitor for ongoing seizures
 - further investigations as per MO/NP
 - consider discharge if:¹
 - cause of seizure is certain
 - no further seizures for several hours + patient is alert/responding normally
 - observations, including GCS, pupil reaction, BP, HR - within normal ranges
 - family/caregivers are able to safely manage the patient at home
- **If child with febrile convulsion**:⁵
 - MO/NP will advise, based on source of fever. **Note:** if any doubt check clinical features against *Febrile convulsions - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>
 - give ibuprofen ± paracetamol if uncomfortable. See [Acute pain, p. 32](#)
 - consider discharge if:
 - returned to normal age appropriate baseline neurology
 - infection source identified that can be managed in community
 - give *Febrile convulsions* factsheet eg <https://www.childrens.health.qld.gov.au/fact-sheet-febrile-convulsions/>
- Advise family/carers about:^{1,5}
 - first aid/how to manage subsequent seizure eg *First aid management of a seizure* <https://resus.org.au/guidelines/>
 - return promptly if deterioration/another seizure

5. Follow up

- If discharged, advise review the next day or sooner if concerned/recurrent seizure - contact MO/NP urgently. Also see MO/NP at next clinic + advise not to drive until cleared by a specialist

6. Referral/consultation

- MO/NP will advise if specialist referral required

Diabetic ketoacidosis (DKA) - adult/child

Hyperosmolar hyperglycaemic state (HHS)

Recommend

- Can be rapidly fatal. Avoid delays to treatment - IV fluids, potassium replacement + IV insulin^{1,2}
- Be aware - excessive thirst + frequent urination can be a sign of undiagnosed diabetes

Background

- DKA - BGL > 11 + acidosis, sudden onset^{1,3}
- HHS - BGL > 33.3 + profound dehydration without ketosis - gradual onset, commonly caused by acute illness¹
- If child, also see *DKA and HHS - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>
- If adult, also see *Management of diabetic ketoacidosis in adults (age ≥ 16 years and over)* <https://clinicalexcellence.qld.gov.au/resources/diabetes-resources/diabetic-ketoacidosis>

1. May present with⁴

- ↑ BGL
- Rapid breathing (Kussmaul breathing)
- Excessive thirst, dehydration
- Abdominal pain \pm vomiting
- Fruity sweet smelling breath (acetone - similar to paint thinner or nail polish remover)
- Confusion, ↓ LOC or unresponsive
- **Note:** DKA occurs mainly in patients with type 1 diabetes. It is also seen in patients with type 2 diabetes, particularly if taking sodium-glucose co-transporter 2 (SGLT2) inhibitors, when DKA may occur without hyperglycaemia⁵

2. Immediate management^{2,3}

- **DRSABCD**
- Rapidly assess + manage concurrently
- Do vital signs
- Insert IVC x 2 into large veins
- Take bloods/i-STAT - FBC, UE, LFT, glucose, VBG
- Start IV fluids - sodium chloride 0.9%
 - **adult** 1000 mL/hour, repeat if systolic BP < 100
 - **child** only give on MO/NP order
- Finger prick/blood ketones if available³
- **Contact MO/NP urgently**
- Look for signs of acute illness^{1,3} eg *Sepsis, p. 64, ACS, p. 107, Stroke, p. 130*
- Start fluid balance
- Continuous cardiac monitoring
- Do neurological observations - excessive fluids can cause cerebral oedema eg headache, ↓ LOC, agitation/aggression^{2,3}
- If patient is using a continuous subcut insulin pump, disconnect it³

3. Clinical assessment

- Get history, including:¹
 - polyuria + excessive thirst, **note:** may be absent in young child³
 - if toilet trained child - any new bed wetting or 'accidents'³
 - recent weight loss, ↑ appetite^{2,3}
 - vomiting, abdominal pain, non-specific symptoms + malaise³
- If known diabetic, ask about:¹
 - unstable glycaemic control or review continuous glucose monitoring (CGM) device data if available
 - antihyperglycaemics, insulin - total daily dose, adherence to regimen⁵
 - past DKA
 - initiation of new medicines including over-the-counter
- Do physical examination, including:^{2,3}
 - look for signs of infection eg appendicitis, ileus + pancreatitis
 - weight
 - Hydration assessment - adult, p. 200 or child, p. 535
 - ECG
 - urinalysis for ketones - if blood ketones not available
 - MSU for MCS + pregnancy test if female of reproductive age

4. Management

- MO/NP will arrange urgent evacuation + may order:^{2,3}
 - potassium replacement + IV short acting insulin infusion eg Actrapid®, see **Management guide**
 - give patient's usual subcut long acting insulin (if already on it)
- If ↑ BGL + ketones but not acutely unwell, closely monitor + aggressively manage to prevent DKA²

Management guide - use local protocol if available	
≥ 16 years ²	<ul style="list-style-type: none"> • Aggressive IV sodium chloride 0.9% ± potassium • Start IV insulin infusion as per MO/NP - max. starting dose 10 units/hour: <ul style="list-style-type: none"> – ongoing rate titrated to BGL, aim to maintain BGL 9–14 • When BGL < 14 - start glucose 10% at 100 mL/hour • If BGL < 9 - ↑ rate of glucose as per MO/NP
< 16 years ³ Note: do not use adult protocol	<ul style="list-style-type: none"> • Start IV insulin infusion as per MO/NP (1 hour after starting IV fluids) • Rate as per MO/NP - ideal continuous dose 0.1 unit/kg/hour via syringe pump • If BGL falls to ≤ 15 - MO/NP may advise IV sodium chloride 0.9% with glucose 5% + potassium 40 mmol. See fluid recipe for how to prepare https://www.childrens.health.qld.gov.au/qpec-paediatric-resuscitation-tools/#tab-foa925fdb661980a62 • Do not reduce insulin infusion rate unless advised
Monitor closely until evacuated	<ul style="list-style-type: none"> • Continuous cardiac monitoring - assess for T wave changes³ • Do hourly BGL + • Vital signs + neurological observations/signs of cerebral oedema • Strict fluid balance • UE + VBG - 2nd hourly or as per MO/NP
MO/NP may also advise	<ul style="list-style-type: none"> • Nil by mouth/ice to suck • Insert nasogastric tube, IDC • If suspected infection - antibiotics, blood cultures, throat swab²

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

HMP Hypoglycaemia - adult/child

Recommend

- Hypoglycaemia is a medical emergency. If left untreated it can cause convulsions, irreversible brain damage + death¹

Background

- Most common cause in children is ketotic hypoglycaemia (KH), a physiological condition that is a variant of normal + expected in a fasting state. Most outgrow KH by mid - late primary school¹
- For known diabetics, hypoglycaemia may be secondary to insulin use
- If child, also see *Unexplained hypoglycaemia - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>

1. May present with^{2,3}

- BGL < 4 adult, < 3 child
- Sweating, pale skin, shaking, palpitations, feeling anxious
- Hunger, difficulty concentrating, confusion/inappropriate behaviour
- Loss of consciousness, seizures
- Child - drowsy, listless + lethargic¹

2. Immediate management

- Do BGL - rapidly assess + manage concurrently - avoid delays
- If child + BGL < 3 on glucometer:¹
 - **confirm BGL** on i-STAT + finger prick/blood ketones if available

ALERT if hazardous alcohol use or severely malnourished^{3,4}

Give thiamine before glucose in any form

Glucose may deplete thiamine stores causing Wernicke encephalopathy

If severe - unconscious/fitting OR child with confirmed BGL ≤ 2.6 ^{1,3}

- Insert IVC into antecubital vein
- Give IV bolus glucose 10% **OR** IM/subcut glucagon if IV will cause delay
- Contact MO/NP urgently
- **Note:** most fitting is brief - if lasting > 5 minutes, give midazolam as per [Fitting, p. 86](#)
- Monitor closely - patients given IV glucose respond within minutes
- Do vital signs + neurological observations ie:⁵
 - GCS, [p. 562](#)
 - pupil size + reaction to light
 - motor response in limbs
 - fontanelle in infant
- Repeat BGL 10–15 minutes, if < 4 repeat glucose as per MO/NP

- If patient is using a continuous subcut insulin pump, disconnect it¹
- If confusion/loss of consciousness - recovery may take hours, even if normal BGL³
- **If child** - MO/NP may order:¹
 - IV infusion of glucose 10% + sodium chloride 0.9% at maintenance rate
 - **to prepare** use 1 L bag of glucose 5% with sodium chloride 0.9%, withdraw 100 mL + discard. Inject 100 mL of glucose 50% into the bag + mix well
 - urine metabolic screen - get the first urine passed after BGL ≤ 2.6 , regardless of age + time since episode, use urine bag if needed
- Ongoing management as per MO/NP who may advise:
 - urgent evacuation
 - antiemetic + IV fluids if dehydrated¹
 - when able, oral fluids + carbohydrate snack

If conscious/cooperative^{2,3}

- Give oral glucose:
 - **adult** - 15 g tube of glucose gel, or if BGL < 3 give 20 g
 - **child** confirmed BGL > 2.6 - give sugary drink/fruit juice or flavoured ice block - do not give hydralyte ice block
- If glucose gel not available, give alternative eg:²
 - 5–20 jelly beans, 20–25 Skittles®, 5–10 Mentos®
 - sugary drink/fruit juice 200 mL - DO NOT give diet/zero/sugar free
 - OGTT drink, or 3 teaspoons of honey/sugar
- Give a carbohydrate snack eg 1 slice of bread/glass of milk/piece of fruit/2–3 pieces of dried fruit/snack size tub of yoghurt - not diet/sugar free²
- Repeat BGL in 10–15 minutes. If < 4 repeat glucose as per MO/NP³
- If patient is using a continuous subcut insulin pump, ask them to stop it¹
- Consult MO/NP in all cases

Unscheduled		Glucose		
ATSIHP, IHW and IPAP must consult MO/NP				
RIPRN and RN may proceed for adult only. Must consult MO/NP for child				
Form	Strength	Route	Dose	Duration
Injection	10% in 500 mL	IV/ Intraosseous	Child and adolescent 2 mL/kg (max. 100 mL)	Infuse over 20 minutes until BGL > 4
			Adult 150–200 mL	Infuse over 15 minutes
Management of associated emergency: Contact MO/NP. See Anaphylaxis, p. 82				

S3	Glucagon			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Injection	1 mg	IM/Subcut	Adult and child > 25 kg 1 mg	stat
			Child ≤ 25 kg 0.5 mg	Further doses on MO/NP order
Offer CMI: May cause nausea, vomiting or allergic reaction				
Note: Reconstitute before use. Response should occur within 10 minutes				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

3

Unscheduled		Thiamine		
ATSIHP, IHW, IPAP, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Injection	300 mg/3 mL	IV Dilute in 10–20 mL of sodium chloride 0.9% or IM undiluted	Adult 300 mg	stat Inject IV slowly over 10 minutes
Note: Give thiamine before administering glucose for hypoglycaemia. Giving glucose in thiamine deficiency may precipitate Wernicke encephalopathy				
Management of associated emergency: Contact MO/NP. See Anaphylaxis, p. 82				

3

3. Clinical assessment

- **If known diabetic**, ask about:⁶
 - antihyperglycaemics, insulin - type, total daily dose, adherence³
 - recent alcohol³
 - unstable glycaemic control, past hypoglycaemic events or review continuous glucose monitoring (CGM) device data if available
 - do they have a diabetes management plan
- **Look for other causes**, ask about:³
 - severe vomiting, diarrhoea or fasting in last 3 days - most common cause in children:¹
 - if fasted - how long before becoming hypoglycaemic
 - stopping hyperglycaemia-inducing drugs eg glucocorticoids
 - drugs + alcohol misuse/withdrawal
 - vigorous ± prolonged exercise, exposure to heat
 - recent unexplained weight loss/gain
- **If child without clear cause**, ask about:¹
 - difficulty to wake in the morning
 - fasting overnight, if so how long
 - recent protein meal, fruit or honey
 - potential ingestion eg insulin, metformin, beta-blockers, quinine, chloroquine, salicylates + valproate
- **Get past history**, including:³
 - cognitive or kidney impairment
 - liver disease¹
 - coeliac disease, bariatric surgery eg gastric sleeve/bypass
 - hypopituitarism, adrenal cortical failure
- **Do physical examination**, including:¹
 - [Hydration assessment - adult, p. 200](#) or [child, p. 535](#)
 - weight
 - if child - urinalysis for ketones (if blood ketones not available)¹
 - pregnancy test if female of reproductive age
- Take bloods:
 - i-STAT - UE, LFT, VBG, glucose, lactate
 - + as per MO/NP

4. Management

- **Monitor closely until evacuated:**
 - BGL every 15 minutes until normal, then hourly or as per MO/NP^{1,3}
 - hourly - vital signs, neurological observations + IV site for signs of extravasation^{1,3}

If non-severe hypoglycaemia³

- Check BGL 15 minutely until normal, then 1–2 hourly for 4 hours
- If at high risk for thiamine deficiency will need ongoing thiamine - consult MO/NP
- Check diabetes management plan (if in place)
- Consult MO/NP prior to discharge
- Give advice on preventing/recognising hypoglycaemia events eg:³
 - have access to glucagon injection + be trained to give it
 - know diabetes first aid eg *First Aid management of a diabetic emergency* <https://resus.org.au/guidelines/>

5. Follow up

- Advise to be reviewed the next day or sooner if recurrent hypoglycaemia - contact MO/NP

6. Referral/consultation

- Offer referral to diabetes educator for management plans

HMP Acute asthma - adult/child

Recommend¹

- Beware of severe asthma in patient with no wheeze and unable to speak
- Resources <https://www.asthmahandbook.org.au/>

1. May present with¹

- Breathlessness, speaking in short sentences
- Wheeze/cough
- ↑ WOB, ↓ SpO₂
- Symptoms continue despite using puffer
- Cyanosis, exhaustion, drowsy/collapsed, quiet chest, poor respiratory effort

2. Immediate management¹

- **Consider and treat Anaphylaxis, p. 82** if asthma like symptoms **AND**
 - features of anaphylaxis eg itchy rash, angio-oedema (swelling) **OR**
 - history of allergy **OR**
 - if suspected or cannot be excluded
- **If < 12 months of age** contact MO/NP:
 - do not treat as asthma. **Bronchiolitis, p. 503** or small floppy airways likely cause of wheeze

Step 1 - assess severity

Mild/Moderate	Severe	Life-threatening
<ul style="list-style-type: none"> • Can walk, speak whole sentences in 1 breath • Young child - can move around and speak in phrases • SpO₂ > 94% 	ANY of: <ul style="list-style-type: none"> • Unable to speak in sentences • Visibly breathless • Obvious respiratory distress • Use of accessory muscles: <ul style="list-style-type: none"> – neck or intercostal – tracheal tug or subcostal recession • SpO₂ 90–94% 	ANY of: <ul style="list-style-type: none"> • Drowsy, collapsed • Exhaustion • Cyanosis • Poor respiratory effort, soft/absent breath sounds • SpO₂ < 90%

Give salbutamol immediately

See **Step 2**
(next page)

- **If patient unresponsive, cannot inhale bronchodilators OR respiratory arrest imminent**
- Give IM adrenaline (epinephrine) 1:1,000
 - same doses as **Anaphylaxis, p. 82**
 - repeat every 3–5 minutes if needed

Step 2 - give salbutamol ± ipratropium

Mild/Moderate	Severe	Life-threatening
Salbutamol puffer with spacer	Salbutamol puffer + ipratropium puffer with spacer or NEB if unable use puffer	Continuous salbutamol NEB + ADD ipratropium to NEB
Note: NEBs carry high risk of transmitting viral infections - use PPE Aerosol droplets can spread for several metres and stay airborne for > 30 minutes ¹		

Give O₂ if SpO₂ < 92% in adult or < 95% in child¹

Target: adult 93–95%, child ≥ 95%

Do not over-oxygenate

Step 3

Within minutes, reassess severity using table below:

- general appearance
- LOC, speech
- listen to chest, look for use of accessory muscles
- vital signs

If severe or life-threatening at any time

- Call for help
- **Urgently contact MO/NP**
- Urgent evacuation
- Be prepared for rapid deterioration ± cardiorespiratory arrest

Mild/Moderate	Severe	Life-threatening
ALL of: <ul style="list-style-type: none"> • Alert, can walk • Can finish a sentence in 1 breath • For young child: can crawl, talk or vocalise • Respiratory distress not severe • Wheeze or normal lung sounds • RR: <ul style="list-style-type: none"> – adult < 25 – child - normal range* • HR: <ul style="list-style-type: none"> – adult < 110 – child - normal range* • SpO₂ > 94% 	ANY of: <ul style="list-style-type: none"> • Can only speak a few words in 1 breath • Lethargic • Unable to lie flat due to SOB • Sitting hunched forward • Use of accessory muscles: <ul style="list-style-type: none"> – chest sucks in when breathes in, or – neck or intercostal, or – tracheal tug or abdominal breathing (subcostal recession) • RR: <ul style="list-style-type: none"> – ≥ 6 years–adult ≥ 25 – < 6 years - tachypnoea* • HR: <ul style="list-style-type: none"> – adult ≥ 110 – child - tachycardia* • SpO₂ 90–94% 	ANY of: <ul style="list-style-type: none"> • Drowsy or unconscious • Collapsed or exhausted • Severe respiratory distress or poor respiratory effort • Cyanosis • Silent chest or ↓ air entry • Abnormally slow breathing /respiratory exhaustion • Soft/absent breath sounds • Arrhythmia or bradycardia - may occur just before arrest • SpO₂ < 90%
<p>*Child vital signs as per CEWT</p> <p>Reduced wheezing alone is an unreliable indicator of improvement. It may mean deterioration</p>		

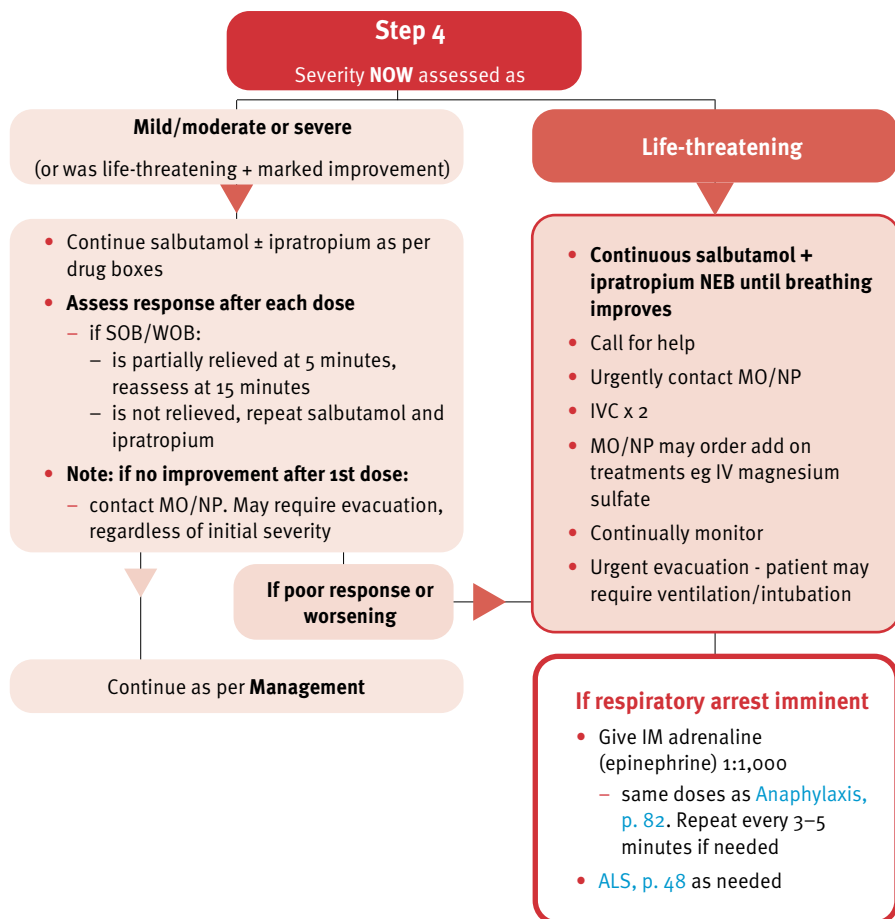
Go to Step 4

S3 MDI S4 NEB	Salbutamol		Extended authority ATSIHP/IHW/RIPRN	
RN may proceed with MDI. NEB - on MO/NP order (or standing order)				
ATSIHP and IHW may proceed with 1 dose then consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
MDI (puffer)	100 microg/ puff	Inhalation Use spacer + <i>mask if young child</i>	Mild/moderate ≥ 6 years–adult 4–12 puffs 1–5 years 2–6 puffs	stat
			Severe ≥ 6 years–adult 12 puffs 1–5 years 6 puffs	Mild/moderate Give every 20–30 minutes for 1st hour if needed
Nebule	2.5 mg/ 2.5 mL	NEB *With air or O ₂ 6–8 L/ minute	Severe ≥ 6 years–adult 5 mg nebule 1–5 years 2.5 mg nebule	Give at least every 20 minutes for 1st hour Give sooner if needed
	5 mg/ 2.5 mL		Life-threatening ≥ 6 years–adult 2 x 5 mg nebules 1–5 years 2 x 2.5 mg nebules	Life-threatening Give continuously Refill as needed
Offer CMI: May cause tremor, palpitations or headache				
Note: *Give NEB with air in adult unless O ₂ needed or life-threatening. Give with O ₂ in child. If spacer not anti-static, prime with 10 puffs of salbutamol. ¹ After each puff, take 4 breaths in and out of the spacer. Remove from mouth and shake prior to next puff				
Management of associated emergency: Observe for salbutamol toxicity eg tachycardia, tachypnoea. Consult MO/NP				

1,2

S4	Ipratropium		Extended authority ATSIHP/IHW/IPAP/RIPRN	
RN must consult MO/NP				
ATSIHP, IHW and IPAP may proceed with first dose then consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
MDI (puffer)	21 microg/puff	Inhalation Use spacer + <i>mask if young child</i>	Severe ≥ 6 years–adult 8 puffs 1–5 years 4 puffs	stat Give every 20 minutes for 1st hour
Nebule	250 microg/mL 500 microg/mL	NEB With air or O ₂ 6–8 L/minute	Severe or life-threatening ≥ 6 years–adult 500 microg 1–5 years 250 microg	Further doses on MO/NP order
Offer CMI: May cause dry mouth, throat irritation, headache, taste disturbance or nausea. If using NEB, patient should close their eyes or wear eye protection. Avoid getting mist into eyes				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,3



Unscheduled		Magnesium sulfate			Prescribing guide
RIPRN and RN only. Must be ordered by an MO/NP					
Use local protocols for administration of magnesium sulfate if available					
Form	Strength	Route	Dose		Duration
Injection	2.5 g/5 mL	IV	Adult 2.5 g Dilute in 100 mL sodium chloride 0.9%		Infuse over 20 minutes
			Child ≥ 2 years 25–50 mg/kg (max. 2 g) Dilute the 5 mL ampoule with at least 7.5 mL of sodium chloride 0.9% to make a concentration of 200 mg/mL or weaker		
Offer CMI: Relaxes bronchial smooth muscle. May cause nausea, vomiting or flushing					
Contraindication: Heart block, hypermagnesaemia					
Management of associated emergency: Hypermagnesaemia unlikely with single dose. Cease infusion. Contact MO/NP					

1,4,5

3. Clinical assessment¹

- Get rapid history:
 - reliever puffer taken for this episode - dose, number of doses, time of last dose
 - current asthma medicine(s)
 - if prescribed preventer puffer, are they using it correctly
 - what triggered this episode, if known eg allergy, hypersensitivity, medicine, URTI
 - heart or lung disease, COPD
 - smoker, exposure to second hand smoke
 - previous ICU/hospital admission(s) for asthma
- **Closely monitor:**
 - vital signs - **in particular** fatigue, LOC, RR, HR, SpO₂
 - in adults avoid SpO₂ > 95% as risk of ↑ CO₂ in blood
 - if COPD aim for SpO₂ 88–92%
 - do spirometry if available, patient able and staff trained

4. Management¹

- Continue to manage severe and life-threatening asthma, or mild asthma that is not responding, in collaboration with MO/NP

Within 1 hour start corticosteroids

- Give for all presentations, even mild
- Adult and child ≥ 6 years:
 - oral prednisolone **OR** IV hydrocortisone if oral route not possible
- Child 1–5 years - only on MO/NP order AND if severe wheezing

1 hour after 1st dose of salbutamol - reassess response to treatment

- Use assessment tool in **Step 3**

If still not improving

- If persisting respiratory distress **OR** ↑ WOB **OR** not able to lie flat without SOB:
 - **urgently contact MO/NP**
 - continue to give salbutamol every 20 minutes
 - MO/NP may consider add on treatments eg IV magnesium sulfate
 - evacuation/hospitalisation

- **MO/NP may consider evacuation/hospitalisation if:**¹
 - hypoxia at presentation
 - respiratory distress, ↑ WOB unresolved or unable to lie flat without SOB 1–2 hours after presentation
 - history of ICU admission for asthma, or hospitalised ≥ 2 in last year
 - frequent presentations for acute asthma
 - high recent use of salbutamol
 - patient cannot be monitored well at home
 - other risk factors eg poor asthma control, chronic lung disease, cardiovascular disease

If mild/moderate episode, no fever and SOB/WOB resolves¹

- Observe for at least 3–4 hours (or as per MO/NP) after breathing difficulty resolves:¹
 - if breathing difficulty persists OR returns, contact MO/NP
 - if no further breathing difficulty patient may return home
- Advise to continue usual asthma medicines, including:
 - salbutamol puffer 4 hourly as needed - supply remainder of MDI
 - preventer puffer (if prescribed)
- Check and coach inhaler technique - give spacer + care instructions (if does not have one)
- Check patient knows how to recognise asthma symptoms and what to do. Give discharge plan eg <https://www.asthmahandbook.org.au/acute-asthma/clinical/post-acute-care>

S4	Prednisolone		Extended authority ATSIHP/IHW/IPAP/RIPRN	
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed for adult and child ≥ 6 only				
Form	Strength	Route	Dose	Duration
Tablet	1 mg, 5 mg, 25 mg	Oral	Adult 50 mg	stat Then repeat each morning for 5–10 days
Oral liquid	5 mg/mL		Child 6–11 years and child 1–5 years with severe wheeze 1 mg/kg (max. 50 mg)	stat Then repeat each morning on days 2 and 3 <i>A longer course may be needed for severe cases eg 5 days - consult MO/NP</i>
Offer CMI: May affect mood and sleep. Take with food to help reduce stomach upset				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,6

1,6

S4	Hydrocortisone			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
		IV	Adult 100 mg	stat
Injection	100 mg	Reconstitute with 2 mL water for injections or sodium chloride 0.9%	Child 6–11 years <i>and child 1–5 years with severe wheeze</i> 4 mg/kg (max. 100 mg)	Inject over 30 seconds to 5 minutes. Further doses as per MO/NP
Offer CMI: May cause ↑ BGL and affect mood and sleep				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1.7.8

1,7,8

5. Follow up¹

- Advise to return the following day for review, or sooner if concerned/needing to use salbutamol more than 4 hourly. If returns earlier consult MO/NP
- On review the next day:
 - if wheeze/other symptoms present consult MO/NP
 - if no wheeze present advise to be reviewed at next MO/NP clinic and again in 2–4 weeks
- Patients, relatives and friends of people with asthma should have an Asthma Action Plan + know asthma first aid <https://www.asthmahandbook.org.au/>

6. Referral/consultation¹

- Consult MO/NP as above

Drowning/submersion - adult/child

Recommend^{1,2}

- Ventilation + oxygenation to reverse hypoxia
- Active rewarming is not routinely recommended. May lead to rapid overshoot of core T

Background

- If child, also see *Drowning - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>

1. May present with

- Immersion ± vomiting, respiratory compromise, apnoea or in cardiac arrest^{1,3}
- Suspect spinal injury if history indicates eg dived into shallow water, found near dumping surf, rocks or after boating accident²

2. Immediate management

- Rapidly assess + manage concurrently¹
- **DRSABCD** + **BLS**, p. 46 as needed. **Note:** if hypothermia do prolonged CPR
- Assess patient on back with head + body at same level:
 - not head down - risk of regurgitation + vomiting²
 - only roll on side if airway obstructed, reassess condition after rolling²
 - **c-spine immobilisation**, p. 147 if spinal injury suspected
- If breathing, place on side + open airway eg head tilt²
- Do:
 - vital signs + **GCS**, p. 562
 - BGL
 - continuous cardiac monitoring
- **Consult MO/NP urgently**
- If SpO₂ < 95% + respiratory compromise eg ↑ WOB:¹
 - give O₂ to maintain SpO₂ ≥ 95% in adults + children
 - if unable to maintain SpO₂ with O₂ + adequate conscious state (GCS 13–15):
 - consider non-invasive ventilation eg **CPAP**, p. 55¹
- Remove wet clothing, dry + keep warm with blankets²

3. Clinical assessment

- Ask about:¹
 - circumstances leading to the drowning, duration of immersion
 - resuscitation, length of CPR + drugs given
 - witnesses
 - fresh or salt water, contaminated eg agricultural, sewage

- If cause of drowning not clear, ask about:¹
 - epilepsy
 - personal + family history of arrhythmias
 - diabetes
 - drug + alcohol use
 - dementia²
- Do physical examination, including:¹
 - listen to chest - any crackles, wheeze, chest x-ray if available
 - ECG
 - if distended stomach do not try to empty by applying external pressure²
 - check for other injuries. Avoid prolonged exposure to prevent heat loss
- Consider non-accidental injury or neglect if child with inconsistent histories, an obvious lapse in supervision, a delay in seeking care or other injuries eg bruises, old fractures.¹ See [Child protection, p. 551](#)

4. Management

- MO/NP may advise:¹
 - IV/[Intraosseous, p. 57](#) sodium chloride 0.9%, if child 20 mL/kg
 - IV antibiotics if grossly contaminated water
 - insert IDC, nasogastric tube
 - bloods/i-STAT ± blood gas
 - evacuation/hospitalisation - **early contact with retrieval service is advised**
- Monitor closely until evacuation:^{1,2}
 - continue O₂ + encourage to cough + take deep breaths
 - keep warm
 - vital signs + strict fluid balance
- If patient initially appears well, they may still deteriorate due to pulmonary oedema:
 - observe for 4–8 hours before considering discharge in collaboration with MO/NP^{1,3}

5. Follow up

- As per MO/NP

6. Referral/consultation

- A person in charge of a hospital is required to notify Qld Health of any immersions of a child < 5 years in a swimming pool.¹ See <https://www.health.qld.gov.au/public-health/notifiable-incidents-conditions/pool-immersion-reporting> or refer to local policy if outside of Qld

Cardiovascular emergencies

Chest pain assessment

Recommend

- Chest pain assessment is time critical¹
- Use cardiac clinical pathways. Ensure they are readily available.^{2,3} In Qld see <https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/cardiac-clinical-pathways>
- ECG Flash is available in some Qld remote facilities <https://qheps.health.qld.gov.au/caru/networks/cardiac/ecg-flash>
- Do not use gastrointestinal (GI) cocktails eg 'pink lady' (oral viscous lidocaine (lignocaine), antacid ± anticholinergic) to assist in ruling out coronary ischemia^{4,5}

1. May present with¹

- Chest pain or discomfort

2. Immediate management¹

- Aim to identify **Acute coronary syndrome**, p. 107 or other life-threatening conditions
- **Do rapid assessment:**
 - general appearance
 - vital signs
 - allergies
 - **ECG** - to be reviewed by MO/NP **within 10 minutes of presentation:**
 - if difficult to interpret, MO/NP may send to cardiologist using **ECG Flash** if available
- **Ask about the pain and symptoms:**^{1,6}
 - **Site** - central chest, left chest, epigastric, shoulder/back, jaw, neck, arm
 - **Onset** - when did it start, sudden or gradual, is it present now
 - **Characteristics** - discomfort, pressure, tightness, heaviness, cramping, band like, burning, ache, sharp, dull, stabbing, fullness, squeezing, tearing, ripping
 - **Radiation** - to neck, jaw, shoulder, one or both arms, into hands and wrists, back
 - **Associated symptoms:**
 - SOB
 - nausea, vomiting, sweating
 - dizziness/light-headedness, fainting
 - fever, cough with purulent or pink frothy sputum or blood
 - **Timing:**
 - constant or intermittent
 - ever had this pain before, how often does it occur, how long did it last
 - **Exacerbating or relieving factors:**
 - what brought on pain eg activity, foods, cold, stress, trauma
 - what makes it better/worse eg rest, medicines (GTN, antacids), eating, position changes, deep inspiration, movement, cough, laugh
 - any analgesia taken, effect
 - **Severity** - scale of 0–10, with 0 being none and 10 being the worst
- **Use flowcharts on next page to help with differential diagnosis** - note, these flowcharts do not include all causes of chest pain

Life-threatening causes of chest pain^{1,6}**Acute coronary syndrome^{1,7}**

If possible cardiac chest pain ± other symptoms of myocardial ischaemia, go immediately to [ACS, p. 107](#)

- Heaviness/pressure/tightness/squeezing/burning pain:
 - central chest - may radiate to arm, neck, jaw
 - duration ≥ 10 minutes
 - ± triggered by exertion, emotional stress, temperature extremes
- **Other symptoms** eg SOB, nausea/vomiting, sweating, unexplained fatigue, syncope/fainting, dizziness, SOB when lying down
- **Atypical symptoms** ie symptoms without pain. More common in elderly, women, renal failure, diabetes, Aboriginal and Torres Strait Islander people

Pulmonary embolism⁶

Contact MO/NP urgently
Go to [PE, p. 125](#)

- Sudden onset
- SOB - most common symptom
- Sharp, pleuritic pain
- Cough, fainting
- Consider if:
 - symptoms of [DVT, p. 124](#) eg calf swelling/pain in 1 leg
 - pregnant/postnatal women, HRT
 - hospitalised within previous 3 months
 - a period of inactivity eg long-distance travel
 - history of cancer - other than skin cancer
 - bone fracture

Aortic dissection (rare)⁶

Contact MO/NP urgently

- Sudden onset of severe chest ± back pain:
 - sharp, ripping, tearing, stabbing
 - can radiate anywhere in chest or abdomen
- Pulse deficits ie ↓ flow to peripheral vessels
- Commonly associated with hypertension or connective tissue disorder
- Fainting, ↓ BP, shock
- sBP may be different on each arm of > 20

Tension pneumothorax⁶

Go to [Chest injuries, p. 140](#)

- History of trauma
- ↑ respiratory distress, ↑ HR, ↓ BP
- Unequal chest movement, ↓ air entry

Pericardial tamponade⁶

Contact MO/NP urgently

- Dizziness, SOB, fatigue, ↓ BP, ↑ HR
- Features of pericarditis:
 - sharp/pleuritic pain - worse when lying down. Improved by sitting up and leaning forward
 - dry cough, fever, muscle/joint pain
 - pericardial friction rub - superficial scratchy or squeaking sound on auscultation
 - new wide spread ST elevation or PR depression
- Cardiogenic [Shock, p. 62](#)

Non-immediate life-threatening causes of chest pain⁶

Spontaneous pneumothorax⁶

- Sudden onset unilateral pleuritic chest pain
- SOB, absent breath sounds, ↑ resonance to percussion
- ↑ HR, hypoxia

Musculoskeletal causes⁶

eg rib fracture(s) from coughing, stress fracture

- Pain/tenderness on palpation
- Pain on inspiration, movement of chest or upper body

Pneumonia⁶

See [Pneumonia - adult, p. 253](#)

- Pleuritic pain, fever, productive or dry cough
- ↑ RR, ↓ breath sounds, crackles, wheeze
- Night sweats, rigors

Acute bronchitis⁸

See [URTI - adult, p. 250](#)

- Cough, worse at night or with exercise
- Low grade fever, wheeze
- Smoking history ± close contact with infected person

Lung cancer⁶

- Chest discomfort, typically on side of tumour
- Persistent cough, coughing up blood
- SOB, hoarseness
- Smoking history, symptoms > 30 days, weight loss

Gastrointestinal causes⁶

See [Abdominal pain, p. 196](#)
See [Gastritis, p. 202](#)

- Heartburn, regurgitation, dysphagia, precipitated by meal, fatty foods, bending down, or lying down
- Retrosternal without radiation
- Epigastric pain, relieved by antacid or food
- GORD may mimic angina

3. Clinical assessment^{1,6}

- Get past history, including prior:
 - presentation/admission to hospital/clinic with chest pain within 28 days³
 - cardiac investigations eg stress test, exercise ECG, coronary CT angiography
 - heart disease, previous myocardial infarction
- Ask about cardiovascular risk factors:³
 - ↑ cholesterol
 - hypertension, diabetes
 - smoking - cigarettes/day, years smoking, quit date
 - obesity - weight, BMI
 - family history
 - chronic kidney disease - stage
- Also ask about:
 - current medicines + aspirin, anticoagulants
 - lung disease
 - cancer
 - alcohol, recreational drug use eg cocaine, amphetamines
 - diet

- recent events eg:
 - pregnancy, trauma, major surgery or medical procedures
 - periods of immobilisation, long-distance travel
 - illness, fever, malaise
 - strenuous physical activity
- Do physical examination, including:
 - BP on both arms - if concern for aortic dissection
 - inspect and auscultate chest ± heart sounds if skilled
 - palpate abdomen. See [Abdominal pain, p. 196](#)
- Chest x-ray may be ordered by MO/NP to assist in differential diagnosis⁶

4. Management

- For all patients with suspected cardiac causes of chest pain see [ACS, p. 107](#)
- Urgently contact MO/NP if severe or life-threatening symptoms
- Consult MO/NP for all other presentations of chest pain

5. Follow up

- Be guided by MO/NP

6. Referral

- Always consult MO/NP

HMP Acute coronary syndrome (ACS) - adult

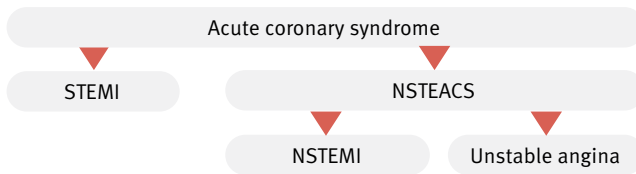
Possible cardiac chest pain, unstable angina, myocardial infarction

Recommend^{1,2}

- Evacuation/treatment of ACS is time critical
- **Use cardiac clinical pathways.** Ensure they are readily available²
 - In Qld <https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/cardiac-clinical-pathways>
 - *Suspected acute coronary syndrome clinical pathway*
 - *Acute coronary syndrome clinical pathway*
 - *Thrombolysis for STEMI clinical pathway*
- Elevated troponin alone (without cardiac symptoms) should not trigger the urgent treatment of ACS. Troponin may be elevated in many conditions, including sepsis³ and PE.¹ Urgently consult MO/NP in all cases

Background¹

- ACS includes myocardial infarction (MI) or unstable angina:
 - MI can be ST elevation (STEMI) or non-ST elevation (NSTEMI)
 - patients without ST elevation are initially described as having NSTEMACS (non-ST elevation acute coronary syndrome) until investigated further
- Reperfusion is restoring the flow of blood to the heart



1. May present with^{1,4}

- **Chest discomfort or pain:**
 - heaviness/discomfort/pressure
 - aching, numbness
 - tightness/fullness
 - squeezing/burning
 - can radiate to shoulder, arm, jaw, back, or upper abdominal area
 - duration ≥ 10 minutes
 - typically triggered eg by exertion, emotional stress, temperature extremes OR can occur at rest
- **Associated symptoms:**
 - SOB or difficulty breathing \pm chest discomfort
 - dizziness, light-headedness, feeling faint or anxious
 - nausea, vomiting, indigestion
 - sweating/cold sweat
 - lethargy/fatigue
- **Consider atypical presentation:**
 - associated symptoms WITHOUT chest pain
 - especially if diabetes, renal failure, female, elderly or Aboriginal and Torres Strait Islander person⁵

2. Immediate management^{1,5}

Use *Suspected acute coronary syndrome clinical pathway*
<https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/cardiac-clinical-pathways>
 or local pathway(s) if outside Qld

- **Get rapid history** of chest pain as per [Chest pain assessment, p. 103](#)
 - site, onset, characteristics, radiation, associated symptoms, timing, exacerbating or relieving factors, severity
 - other [Life-threatening causes of chest pain, p. 104](#) eg aortic dissection, PE, must be considered¹
- **Do ECG + vital signs:**
 - send for **urgent review by MO/NP within 10 minutes** of first patient contact
 - if difficult to interpret, MO/NP may send to cardiologist using [ECG Flash](#) if available. See <https://qheps.health.qld.gov.au/caru/networks/cardiac/ecg-flash>
- **Give aspirin** as soon as possible (if not contraindicated/already given)
- **Give subling glyceryl trinitrate (GTN)** if no contraindications:
 - repeat every 5 minutes for ongoing chest pain or discomfort (aim for no pain)
 - up to 3 doses
- **Insert IVC x 2**
- **Take blood for troponin** - i-STAT
- **If symptoms not relieved with GTN** or for ongoing chest discomfort at any time during initial management:
 - give IV fentanyl or morphine - titrate to pain. See [Acute pain, p. 32](#) for doses
 - **note:** opioids may delay absorption of clopidogrel and ticagrelor⁶
- **Give antiemetic if needed.** See [Nausea and vomiting, p. 40](#)
- **Continuous cardiac monitoring**
- If SpO₂ < 93% or evidence of shock give O₂
 - use with caution if COPD. Aim for SpO₂ 88–92% if known CO₂ retainer
 - titrate O₂ to SpO₂
- **Repeat ECG every 10–15 minutes** until pain free
- MO/NP may order chest x-ray

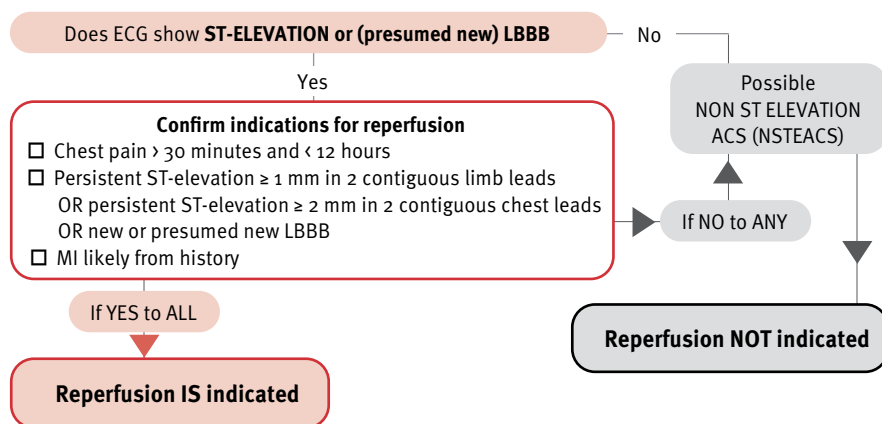
S2	Aspirin			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Dispersible tablet	300 mg	Oral	300 mg Chewed or dissolved in water	stat
Offer CMI: May cause GI irritation or bleeding				
Contraindication: Allergy to aspirin or NSAIDs, aspirin sensitive asthma, active or high risk of internal bleeding, or major bleeding				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				5:7

S3	Glyceryl trinitrate (GTN)		Extended authority ATSIHP/IHW	
ATSIHP, IHW, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Tablet	600 microg	Subling	300–600 microg	stat
Spray	400 microg/spray		400–800 microg	Repeat every 5 minutes up to 3 doses providing sBP ≥ 90
Offer CMI: May cause headache, flushing, palpitations, hypotension, dizziness or fainting. Advise to get up gradually from sitting or lying				
Note: Sit or lie before giving. Do not use tablets from bottles that have been opened > 3 months. If unopened spray, prime by pressing nozzle 5 times into the air, or if > 7 days since used, press once				
Contraindication: Hypotension (sBP < 90), patient has taken phosphodiesterase-5-inhibitors eg sildenafil (eg Viagra®), vardenafil (Levitra®) ≤ 24 hours or tadalafil (eg Cialis®) ≤ 48 hours				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

5,8

3. Clinical assessment⁵

- MO/NP will assess if reperfusion indicated - with cardiologist advice if needed
- Use *Suspected acute coronary syndrome clinical pathway*/local pathway if outside of Qld (summarised below)



4. Management

- If reperfusion IS indicated** - arrange urgent evacuation:
 - OPTION 1, p. 110**
 - if access to a cardiac lab for stent (primary PCI) **IS possible within \leq 90 minutes** of first diagnostic ECG - MO/NP to immediately contact on call interventional cardiologist
 - OPTION 2, p. 110**
 - if primary PCI **is NOT possible within \leq 90 minutes** of first diagnostic ECG - assess for thrombolysis at rural or remote facility
- If reperfusion NOT indicated** - see **OPTION 3, p. 112**

OPTION 1: Urgent evacuation for stent (primary PCI)⁵

- STEMI + reperfusion indicated + **ABLE** to access cardiac lab within 90 minutes

Use *Suspected acute coronary syndrome clinical pathway*

<https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/cardiac-clinical-pathways>
or local pathway(s) if outside Qld

- MO/NP will urgently:
 - contact on call interventional cardiologist
 - arrange urgent evacuation
 - order **antithrombotic therapy**:
 - aspirin 300 mg - if not already given
 - ticagrelor 180 mg oral - or alternative if advised by interventional cardiologist
 - enoxaparin OR unfractionated heparin/heparin sodium - to confirm with interventional cardiologist
- Continuous cardiac monitoring
- Frequently monitor vital signs
- Continue to liaise with MO/NP for further management until evacuation

OPTION 2: Thrombolysis at rural or remote facility⁹

- STEMI + reperfusion indicated + **NOT ABLE** to access cardiac lab within 90 minutes

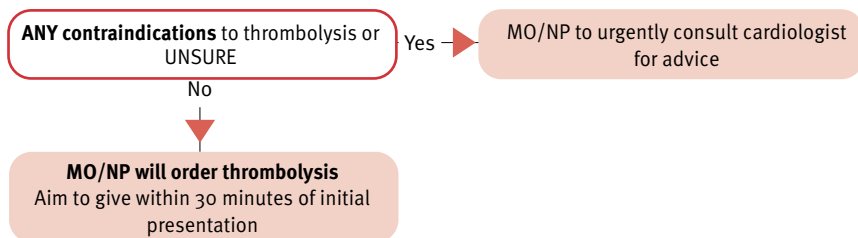
Use *Thrombolysis for STEMI clinical pathway*

<https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/cardiac-clinical-pathways>
or local pathway(s) if outside Qld

MO/NP to assess if suitable for thrombolysis at rural or remote facility

Check for **Contraindications for thrombolysis**

Absolute contraindications		Relative contraindications	
<input type="checkbox"/>	Active bleeding or bleeding tendency (excluding menses)	<input type="checkbox"/>	Current anticoagulants, including novel anticoagulant agents
<input type="checkbox"/>	Suspected aortic dissection	<input type="checkbox"/>	Non-compressible vascular puncture
<input type="checkbox"/>	Significant closed head or facial trauma ≤ 3 months	<input type="checkbox"/>	Recent major surgery (< 3 weeks)
<input type="checkbox"/>	Any prior intracranial haemorrhage	<input type="checkbox"/>	Traumatic or prolonged (> 10 minutes) CPR
<input type="checkbox"/>	Ischaemic stroke ≤ 3 months	<input type="checkbox"/>	Recent internal bleeding - within 4 weeks/active peptic ulcer
<input type="checkbox"/>	Known cerebral vascular lesion	<input type="checkbox"/>	Suspected pericarditis
<input type="checkbox"/>	Known malignant intracranial neoplasm	<input type="checkbox"/>	Advanced liver disease/advanced metastatic cancer
		<input type="checkbox"/>	History of chronic, severe, poorly controlled hypertension
		<input type="checkbox"/>	Severe uncontrolled hypertension on this presentation - systolic BP > 180 or diastolic BP > 110
		<input type="checkbox"/>	Ischaemic stroke > 3 months ago, known intracranial abnormality (not covered in absolute contraindications)/dementia
		<input type="checkbox"/>	Pregnancy or ≤ 1 week postpartum



Pre thrombolysis

- Informed verbal consent required
- Insert IVC x 2 if not in situ
- Record baseline:
 - vital signs + continuous cardiac monitoring
 - circulation observations ie for bleeding
 - neurological observations - [GCS, p. 562](#)
- Weigh patient

Thrombolysis medication

- **Note:** patient should be monitored by staff trained in ALS with access to a defibrillator:
 - significant arrhythmias including VF can occur after reperfusion - have pads on chest
- On MO/NP order ONLY, give:
 - aspirin 300 mg - if not already given
 - clopidogrel 300 mg - orally
 - tenecteplase - IV bolus as per weight adjusted dose guide - consider ½ dose if ≥ 75 years old
 - enoxaparin (if severe renal failure, MO/NP may order unfractionated heparin/heparin sodium):
 - if < 75 years - loading dose 30 mg IV. **Omit loading dose if > 75 years**
 - 15 minutes after loading dose, give 1 mg/kg subcut (max. 100 mg)

S4	Tenecteplase						Prescribing guide
RIPRN and RN only. Must be ordered by an MO/NP							
Form	Strength	Route	Dose				Duration
Injection	40 mg (8,000 units)	IV Reconstitute with diluent provided Reconstituted strength = 5 mg/mL (1,000 units/mL) Swirl to dissolve do not shake	Weight	units	mg	mL	stat
			< 60 kg	6,000	30	6	Inject over 10 seconds
	≥ 60– < 70 kg		7,000	35	7		
	≥ 70– < 80 kg		8,000	40	8	Flush line before and after with sodium chloride 0.9%	
	≥ 80– < 90 kg		9,000	45	9		
	≥ 90 kg		10,000	50	10		
Offer CMI: May cause bleeding at injection sites, intracerebral bleeding, internal bleeding eg GI/genitourinary or transient hypotension							
Note: If ≥ 75 years old, consider ½ dose to ↓ risk of intracranial bleeding							
Contraindication: See Contraindications for thrombolysis, p. 110 . Severe active bleeding disorders or disease states with an increased risk of bleeding. Allergy to gentamicin							
Management of associated emergency: Contact MO/NP. See Shock, p. 62/Anaphylaxis, p. 82 ⁹⁻¹¹							

S4	Enoxaparin (Clexane®)			Prescribing guide
RIPRN and RN only. Must be ordered by an MO/NP				
Form	Strength	Route	Dose	Duration
Prefilled syringe	60 mg/0.6 mL 80 mg/0.8 mL	IV*	Loading dose (< 75 years)[#] 30 mg Expel air bubble and excess enoxaparin before injecting	stat Loading dose Flush line before and after injection with sodium chloride 0.9%
		Subcut	Maintenance dose < 75 years 1 mg/kg (max. 100 mg) ≥ 75 years 0.75 mg/kg (max. 75 mg) Do not expel air bubble	Maintenance dose Give 15 minutes after loading dose
Offer CMI: May cause bleeding, bruising or pain at injection site				
Note: [#] Omit loading dose if ≥ 75 years. [*] Use Microbore® extension set (or similar) to give IV enoxaparin (has a Y-injection port to put needle in). See QAS procedure <i>Priming of a Microbore extension set</i> https://www.ambulance.qld.gov.au/CPPTable.html				
Contraindication: Use with caution if severe hepatic or renal impairment (heparin preferred)				
Management of associated emergency: Contact MO/NP. See Shock, p. 62 / Anaphylaxis, p. 82 ^{9,12-14}				

Post thrombolysis

- Prepare for urgent evacuation to PCI capable hospital:
 - send copies of ECGs with other documentation
 - keep under direct observation of RN until evacuated
- Continuous cardiac monitoring:
 - be alert to arrhythmias including VF
- Monitor frequently:
 - vital signs
 - circulation and neurological observations - to detect bleeding¹
- Repeat ECG at 30 minutes, 60 minutes and 90 minutes - to be reviewed by MO/NP
- Continuously liaise with MO/NP
- **If failed reperfusion:**
 - ie unresolved pain and ST elevation has not reduced > 50% at 60 minutes
 - MO/NP will urgently consult on call interventional cardiologist for further advice

OPTION 3: Reperfusion NOT indicated⁵

- Possible NSTEMI or STEMI + does not meet criteria for reperfusion

Use *Suspected acute coronary syndrome clinical pathway* AND *Acute coronary syndrome pathway* <https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/cardiac-clinical-pathways> or local pathway(s) if outside Qld

- MO/NP will:
 - risk stratify as per the *Suspected acute coronary syndrome clinical pathway*
 - if patient is high risk commence *Acute coronary syndrome pathway*
- Be guided by MO/NP for further management, which may include:⁵
 - urgent evacuation to cardiac interventional facility
 - continuous cardiac monitoring
 - repeat ECGs

- repeat troponin in 3 hours (laboratory) **or** 6–8 hours (i-STAT) after presentation +
 - CHEM20, FBC, coagulation studies, HbA1C, lipid profile
- BGL
- frequent monitoring of:
 - vital signs
 - circulation and neurological observations
 - SpO₂
- **If assessed as low risk**, MO/NP may advise patient can be discharged home if:
 - repeat ECG normal
 - repeat troponin negative at 3 hours (laboratory) or 6–8 hours (i-STAT)
 - no further chest pain

5. Follow up

- As directed by MO/NP

6. Referral/consultation

- Consult MO/NP on all occasions of chest pain
- May require further investigations eg angiography, echo, stress test

HMP Acute pulmonary oedema (cardiac causes) - adult

Recommend¹

- **Acute pulmonary oedema (APO) is a medical emergency.** It is the rapid accumulation of fluid in the alveoli from the pulmonary circulation. Fluid impairs gas exchange and decreases lung compliance leading to difficulty breathing and hypoxia

Background

- Causes can be ACS, valve dysfunction. **Note:** can be non-cardiac causes eg sepsis, drowning

Related topics

[Hypertensive emergency, p. 116](#)
[ACS, p. 107](#)

[Sepsis, p. 64](#)
[Drowning, p. 101](#)

1. May present with^{1,2}

- Sudden onset of extreme breathlessness. May wake patient up at night
- Anxiety/agitation
- Pale/ashen, sweaty
- Lung crackles
- Cough (pink frothy sputum in severe cases)
- Chest pain
- Cyanosis (late sign), exhaustion, altered LOC
- Tripod position (sit/standing leaning forward, supporting upper body with hands on knees/other surface, indicating respiratory distress)
- Oedema of legs/sacrum and an enlarged liver may co-exist as a sign of right heart failure

2. Immediate management^{1,2}

- **DRSABCD.** Be prepared for rapid deterioration ± cardiorespiratory arrest
- Call for help
- **Sit patient as upright as possible** - do not lay them down
- **Consult MO/NP urgently** + urgent evacuation
- Do vital signs +
 - capillary refill time
 - LOC. See [GCS/AVPU, p. 562](#)
 - continuous cardiac monitoring
- Give O₂ if SpO₂ < 94%. Titrate O₂ to SpO₂
 - use with caution if COPD. Aim for SpO₂ 88–92%
- **Insert IVC x 2** eg 16 G
- **Take bloods** - i-STAT (CHEM8+, VBG, troponin) + FBC, TSH
- **Give:**²
 - subling glyceryl trinitrate (GTN) providing sBP > 110. Give 2–5 minutely being guided by clinical response AND
 - IV furosemide (frusemide)
- **Do ECG** - review by MO/NP within 10 minutes

3. Clinical assessment^{1,2}

- **Get rapid history**, including:
 - **Allergies**
 - **Medicines** - are they taken correctly
 - **Past history:**
 - heart problems eg angina, MI, heart failure, palpitations, RHD, arrhythmias
 - hypertension, renal failure, COPD, diabetes
 - alcohol/drug use
 - recent infection
 - currently pregnant²
 - Last ate
 - **Events related:**
 - onset, any chest pain
 - other signs/symptoms
 - recent ↑ weight
- **Do physical examination**, including:
 - general appearance eg ashen/cyanosed, sweaty, WOB
 - skin temperature - compare trunk with limbs; are peripheries cool
 - auscultate chest - crackles, wheeze, air entry
 - weight (if able)
 - oedema - check legs/ankles + if able sacrum (with patient sitting up and forward)
- Chest x-ray if MO/NP requests

4. Management^{1,2}

- MO/NP may order:
 - GTN infusion - titrate to BP and clinical effect:
 - see [Hypertensive emergency, p. 116](#) for drug box
 - **if infusion not practical in the rural/remote area**, GTN transdermal patch(es)³

- + other treatment specific to cause (if known)²
- Monitor closely until evacuation:²
 - airway, LOC, vital signs, SpO₂
 - cardiac monitoring
 - symptoms
 - urine output. IDC not routinely recommended. **Do not lie patient down in APO**

If no improvement/deteriorating, MO/NP may consider:

- **Non invasive ventilation** - CPAP, p. 55 (or BiPAP if CPAP not available):
 - monitor for nausea/vomiting as ↑ risk of aspiration while mask in place due to altered LOC
 - although morphine not routinely recommended for APO, if patient anxious/distressed or not tolerating CPAP, MO/NP may consider:²
 - IV morphine 1–2.5 mg - single dose. Use cautiously as may ↑ need for ventilation²
 - if given, monitor nausea, RR/depth and LOC. See [Sedation score, p. 35](#)
- **Intubation** if still continues to deteriorate + skilled staff eg:
 - exhaustion, ↓ LOC, ↑ confusion/agitation
- **CPR if needed.** See [ALS, p. 48](#)

S3	Glyceryl trinitrate (GTN)			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Tablet	600 microg	Subling	300–600 microg	stat
Spray	400 microg/ spray		1–3 sprays (400–1200 microg)	Repeat every 2–5 minutes provided sBP ≥ 110 If no improvement consult MO/NP - may need higher doses
Offer CMI: May cause headache, flushing, palpitations, hypotension, dizziness or fainting. Advise to get up gradually from sitting or lying				
Note: Sit before giving. Do not use tablets from bottles that have been opened > 3 months. If unopened spray, prime by pressing nozzle 5 times into the air, or if > 7 days since used, press once				
Contraindication: Hypotension (sBP < 90), patient has taken phosphodiesterase-5-inhibitors eg sildenafil (eg Viagra®), vardenafil (Levitra®) ≤ 24 hours or tadalafil (eg Cialis®) ≤ 48 hours				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,2,4

S4	Furosemide (frusemide)			Extended authority ATSIHP/IHW/RIPRN
ATSIHP, IHW and RN must consult MO/NP				
RIPRN must consult MO/NP unless circumstances do not allow, in which case give up to 40 mg and notify the MO/NP as soon as circumstances allow				
Form	Strength	Route	Dose	Duration
Injection	20 mg/ 2 mL	IV	20–40 mg OR if patient already taking oral furosemide, give at least equivalent dose IV*	stat Give undiluted over 2–5 minutes Repeat in 20 minutes if needed on MO/NP order
Offer CMI: May cause dizziness, fainting or dehydration				
Note: Check BP first - check with MO/NP if hypotensive. *If > 80 mg required, give via slow IV infusion to reduce risk of ototoxicity				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				1,2,5,6

S4	Glyceryl trinitrate (GTN)				Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP					
Form	Strength		Route	Dose	Duration
Patch	5 mg/24 hours =	1 x Minitran 5 OR 1 x Transiderm Nitro 25	Transdermal	5–15 mg Apply to clean, dry skin on the chest area or upper arm	stat
	10 mg/24 hours =	1 x Minitran 10 OR 1 x Transiderm Nitro 50			note: remove before defibrillation
Offer CMI: As per subling GTN. Write date and time of patch application on patch itself when placing on patient					
Contraindication: As per subling GTN					
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82					

4

5. Follow up

- As per MO/NP

6. Referral/consultation

- Consult MO/NP as above

HMP Hypertensive emergency - adult

1. May present with^{1,2}

- BP $\geq 180/110 \pm$
 - headache, dizziness, visual disturbances
 - SOB, lung crackles, nausea, vomiting
 - chest pain
 - altered LOC, [Stroke, p. 130](#) (\downarrow sensation, movement)
 - \downarrow urine output

2. Immediate management¹⁻³

- Do pregnancy test if female of reproductive age. If +ve, see [Hypertension in pregnancy, p. 383](#)
- If trauma related, urgently contact MO/NP
- Do vital signs +
 - check BP on both arms (+ a lower limb if [Aortic dissection, p. 104](#) suspected)¹
 - if automated BP machine, check manually
- Get rapid history, including:¹
 - allergies
 - any chest pain, SOB, headache, visual change, neurological symptoms
 - recent drug use eg cocaine, ice/amphetamines
 - medicines - for BP, aspirin, anticoagulants, other (are they taken correctly)
 - past medical history - prior \uparrow BP, heart problems, renal disease, aneurysm
- **Rapidly assess severity** and manage as per table (next page)

Rapidly assess severity^{1,2}

Severely elevated BP ¹	Hypertensive urgency ¹	Hypertensive emergency ¹
<ul style="list-style-type: none"> BP $\geq 180/110$ No symptoms No signs of acute organ damage¹ 	<ul style="list-style-type: none"> BP $\geq 180/110$ Persistently elevated BP Minor symptoms eg headache, dizziness 	<ul style="list-style-type: none"> High BP - often $> 200/120$, but may be lower PLUS symptoms of acute organ damage eg: <ul style="list-style-type: none"> SOB/signs of APO, p. 113 altered LOC/stroke seizures, lethargy, vision changes ↓ urine output chest pain aortic dissection

- Do not usually need immediate treatment
- If patient already on BP medicine and has not taken, give usual dose

Consult MO/NP who may advise¹

- Observe and re-check BP several times over 1–2 hours to see if it settles
- Initiating or ↑ oral anti-hypertensive medication
- Home with follow up over next 2–3 days to see if BP reduces + review at next MO/NP clinic
- Or hospitalisation if risk factors/concerns

- If patient already on BP medicine and has not taken, give usual dose

Urgently consult MO/NP who may advise¹

- If not on BP medicine give oral anti hypertensive eg nifedipine (**slow release**)¹ or amlodipine
- Aim for a slow controlled reduction of BP¹
- Monitor BP and symptoms for at least 2 hours¹
- If sBP reduced (ideally < 160) AND symptoms gone, may consider home with review next day
- Or hospitalisation/evacuation if symptoms ongoing, BP difficult to control, or risk factors/concerns

Life-threatening

Urgently consult MO/NP who may advise¹

- Urgent evacuation
- BP 5 minutely
- ± medicine as per cause
- It may be harmful to ↓ BP too rapidly or too much
- MO/NP may seek specialist advice for target BP
- Insert IVC x 2
- Continue BP 5 minutely until stabilises

Hypertensive emergency - on MO/NP order only¹

BP reduction rate/target¹

Acute pulmonary oedema	<ul style="list-style-type: none"> Subling/IV GTN or patch if IV not available in rural or remote area.⁴ See APO, p. 113 	<ul style="list-style-type: none"> Immediate reduction of BP Aim for sBP < 140
Acute coronary event		
Stroke	<ul style="list-style-type: none"> MO/NP may seek specialist advice 	<ul style="list-style-type: none"> Avoid aggressive BP reduction - can worsen ischaemic stroke¹
Aortic dissection	<ul style="list-style-type: none"> Beta blocker eg esmolol Subling/IV GTN Analgesia¹ 	<ul style="list-style-type: none"> Immediate reduction of BP and HR Aim for sBP < 120 and HR < 60
Hypertensive encephalopathy	<ul style="list-style-type: none"> IV labetalol if available MO/NP may seek specialist advice Aim to ↓ mean arterial pressure by 20–25% 	<ul style="list-style-type: none"> Immediate reduction of BP
Malignant hypertension ie advanced retinopathy		<ul style="list-style-type: none"> Reduce BP over several hours
Adrenergic crisis		eg from stimulant misuse (rare). MO/NP to seek specialist advice ²

S3	Glyceryl trinitrate (GTN)			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Tablet	600 microg	Subling	300–600 microg	stat
Spray	400 microg/ spray		1–3 sprays (400–1200 microg)	Repeat every 2–5 minutes until desired BP obtained
Offer CMI: May cause headache, flushing, palpitations, hypotension, dizziness or fainting. Advise to get up gradually from sitting or lying				
Note: Sit before giving. Do not use tablets from bottles that have been opened > 3 months. If unopened spray, prime by pressing nozzle 5 times into the air, or if > 7 days since used, press once				
Contraindication: Hypotension (sBP < 90), patient has taken phosphodiesterase-5-inhibitors eg sildenafil (eg Viagra®), vardenafil (Levitra®) ≤ 24 hours or tadalafil (eg Cialis®) ≤ 48 hours				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,2,5

S4	Glyceryl trinitrate (GTN)			Prescribing guide
RIPRN and RN only. Must be ordered by an MO/NP. Use local protocol if available				
Form	Strength	Route	Dose	Duration
Injection	50 mg/ 10 mL	IV	Start infusion 10 microg/minute	Infusion
		Dilute to 500 mL in sodium chloride 0.9% to make a concentration of 100 microg/mL	Titrate until target BP reached Increase by 5 microg/minute, every 5 minutes (max. 100 microg/minute)	As per MO/NP instruction
Offer CMI: May cause headache, flushing, palpitations, hypotension, dizziness or fainting. Advise to get up gradually from sitting or lying				
Note: GTN is absorbed onto some plastics. Use glass or non-PVC containing bottle or bag eg Braun Ecoflac®. Onset of action: 1–2 minutes. Duration of effect: 3–5 minutes				
Contraindication: Hypovolaemia, hypotension (sBP < 90), raised ICP, patient has taken phosphodiesterase-5-inhibitors eg sildenafil (eg Viagra®), vardenafil (Levitra®) ≤ 24 hours or tadalafil (eg Cialis®) ≤ 48 hours				
Management of associated emergency: Contact MO/NP. See Anaphylaxis, p. 82				1,2,5,6

3. Clinical assessment^{1,2}

- MO/NP may advise (depending on severity):
 - ECG + continuous cardiac monitoring
 - listen to chest for air entry, crackles or wheeze
 - IVC + bloods/i-STAT - CHEM20, VBG, troponin, FBC
 - urinalysis (protein, blood) + urine microscopy
 - chest x-ray

4. Management

- Continue to manage according to clinical condition involved, as guided by MO/NP
- If acute pulmonary oedema, also see [APO, p. 113](#)
- If discharged, support patient to take oral antihypertensive medicine(s) correctly

5. Follow up

- As guided by MO/NP

6. Referral/consultation

- As above

Arrhythmias - adult

Recommend¹

- Anyone who presents with an arrhythmia should be investigated for cause
- Opportunistically screen patients aged ≥ 65 for atrial fibrillation (AF) by pulse palpation and do ECG if irregular
- ECG flash is available in some Qld remote facilities https://qheps.health.qld.gov.au/__data/assets/pdf_file/0024/2435271/ecg-flash-clinical-guideline.pdf

Background

- Sinus tachycardia (↑ HR with normal ECG) can occur secondary to most injuries and illnesses eg anxiety, fever, infection, blood loss/shock, dehydration

1. May present with²

- Fast, slow or irregular pulse
- \pm symptoms eg:
 - palpitations, sensation of 'missed beats'
 - SOB, fatigue, dizziness, light-headedness, syncope/fainting, non-accidental falls
 - chest pain/discomfort, hypotension/shock

2. Immediate management²

- **DRSABCD**
- If needed see [BLS, p. 46](#) and [ALS, p. 48](#)
- If chest pain go to [Chest pain assessment, p. 103](#) and [ACS, p. 107](#)
- Vital signs
- ECG³ - **to be reviewed by MO/NP promptly - within 10 minutes if symptomatic**
 - if difficult to interpret, MO/NP may send to cardiologist using [ECG Flash](#) if available. See <https://qheps.health.qld.gov.au/car/networks/cardiac/ecg-flash>
- Attach cardiac monitor
- Give O₂ if needed to maintain SpO₂ $\geq 94\%$
- Insert IVC x 2
- Take bloods:
 - i-STAT - FBC, UE, troponin, TSH \pm VBG³
 - ASOT in Aboriginal and Torres Strait Islander people/other groups at high risk of [ARF, p. 515](#)

If unstable/deteriorating urgently consult MO/NP² for urgent evacuation +

- Look for reversible causes eg ACS, AF, hypothermia, hypovolaemic shock, electrolyte abnormalities, hypoxaemia, infection, acidosis, hypothyroidism
- **If tachyarrhythmia** - MO/NP will advise management

- **If bradyarrhythmia** - MO/NP will advise. May include:³
 - check if taking beta blockers, calcium channel blocker (diltiazem or verapamil) or digoxin (drug toxicity)³
 - medication (depending on cause) eg:³
 - atropine (for vasovagal bradycardia), or
 - isoprenaline (if available), or
 - other medication(s) if drug toxicity
 - external cardiac pacing if deteriorates/haemodynamically unstable - as per local policy

3. Clinical assessment^{2,3}

- Get rapid history, including:³
 - onset, associated symptoms
 - frequency, timing, duration, severity, longevity, circumstances, triggers, alleviating factors
 - relationship of symptoms to - medications, meals, emotional distress, exertion, positional changes, triggers (eg urination, defecation, cough, prolonged standing, shaving, tight collar, head turning)
 - previous episode(s)
 - medications
 - recent drug/alcohol use
 - cardiovascular disease, renal disease
 - risk factors for cardiovascular disease eg hypertension, diabetes, hyperlipidaemia, smoking, family history
- Listen to the chest for air entry + added sounds - crackles or wheeze
- Any oedema - check legs/ankles + if able sacrum (with patient sitting up and forward)

4. Management

- Consult MO/NP for all arrhythmias, who may advise:
 - further investigation and management of any underlying cause
 - referral to cardiologist
 - evacuation/hospitalisation if required

5. Follow up

- If patient not evacuated/hospitalised advise to be reviewed at next MO/NP clinic, or sooner if indicated

6. Referral/consultation

- Consult MO/NP as above

HMP Electrocution/electric shock - adult/child

1. May present with¹

- Electrical exposure
- Lightning strike
- Trauma, burns
- Cardiac arrest
- Conducted energy weapons eg Taser® - negligible risk of injury in healthy person

2. Immediate management¹

- **Call 000 immediately** and provide Situation Report if patient unconscious or still in contact with electrical source

Do NOT approach patient until SAFE

High voltage from powerlines, train lines, industrial generators - HIGH DANGER

- Voltage from several 1,000 V to 200,000 V possible
- High danger for rescuers to get electrocuted - without perceiving they are close to the source
- **Stay away at a safe distance** - at least 1 m per 10,000 V or as directed by emergency services:
 - high voltage can cause instant death if a flash/arcing occurs
 - electricity can travel through wet ground or air for many metres
- Call the electricity provider/railway company. If unknown call 000 to get support
- **Do not get closer until disconnection of power is confirmed** and the line is grounded on both sides (high voltage electrician, fire and rescue or SES can provide this, **not healthcare providers**)



Household electricity

- Electrical source **must be turned off and protected against it being switched on again**:
 - ensure person or lock is at the fuse box where electricity has been switched off OR power plug pulled and loose end taken with the rescuer
- If not possible, ask for support to remove electrical cables from the patient using dry timber or rubber (non conducting). This task is risky and **should ideally be performed by an electrician, fire and rescue person or SES - not healthcare providers**
- **DRSCABCD** as per [Traumatic injuries, p. 134](#)
- **If in cardiac arrest** see [BLS, p. 46](#). Do prolonged CPR - high likelihood of recovery
- **Do:**
 - vital signs + continuous cardiac monitoring
 - ECG
 - insert IVC
- **If hypotensive** - suspect internal injury:
 - give fluid bolus of sodium chloride 0.9% or Hartmann's 10–20 mL/kg
 - repeat as advised by MO/NP
- **Urgently consult MO/NP for all electrocutions**

3. Clinical assessment¹

- **Ask patient/witness:**
 - type of electrical exposure + voltage if known
 - other circumstances of injury eg fall, in water
 - loss of consciousness or seizures
- **Head to toe assessment** as per **EFGHIJ** in [Traumatic injuries, p. 134](#)
- Look for entry and exit wound
- Urinalysis - check for blood

4. Management¹

- MO/NP will guide management
- Evacuation if:
 - high voltage exposure
 - loss of consciousness, seizures or any other symptoms
 - entry and exit wound present - **suspect serious deep tissue injury** even if looks minor
 - severe pain/tenderness over limb - monitor closely for [Compartment syndrome, p. 160](#)
 - numbness or palsy - indicates critical injury
 - visual disturbance - indicates eye injury
 - trauma/injury/burns
- Treat injuries or [Burns, p. 177](#) as needed
- Offer analgesia. See [Acute pain, p. 32](#)
- If patient has pacemaker or implantable defibrillator, will need function checking:
 - continuous cardiac monitoring required - as soon as available
- MO/NP may allow home after observation if:
 - low voltage exposure
 - asymptomatic
 - no loss of consciousness, seizures or cardiac arrhythmia
 - ECG, urinalysis normal

5. Follow up

- If not evacuated advise to see MO/NP at next clinic

6. Referral/consultation

- Consult MO/NP on all occasions
- Ophthalmology referral as risk of delayed ocular complications¹

HMP Acute lower leg ischaemia - adult

Background^{1,2}

- Caused by a sudden blockage of blood supply to limb needing urgent evaluation + management

Related topics

[Compartment syndrome, p. 160](#)

[DVT, p. 124](#)

1. May present with^{1,2}

- Sudden onset intense pain in 1 leg ±
 - limb is pale, no pulse, pins and needles/paralysis, cold

2. Immediate management¹

- Contact MO/NP urgently + urgent evacuation** - a longer transfer time = higher risk of limb loss
- Get rapid history, including:
 - leg + any other symptoms
 - past medical history - allergies, current medicines, including recent anticoagulants, antiplatelets or thrombolytic agents eg warfarin, aspirin, clopidogrel³
 - prior thromboembolic events, active bleeding, ↑ risk of bleeding/bleeding disorders eg haemophilia³
- Do vital signs + ECG² + weight
- Offer analgesia. See [Acute pain, p. 32](#)
- Assess limb - neurovascular observations⁴ - compare to other leg:
 - pain, sensation, movement, pulses, capillary refill, warmth, colour, swelling
- Insert IVC + take bloods for baseline APTT (not on i-STAT), FBC

3. Clinical assessment

- As above

4. Management

- MO/NP will consult vascular surgeon for advice, which may include IV heparin bolus ± infusion
- Note:** heparin is a **high risk medicine** and APTT has to be monitored (baseline + 4–6 hourly):
 - if APTT not able to be done on-site DO NOT give infusion or only start immediately prior to evacuation⁵
 - if evacuation likely to be > 6 hours, a stat dose of enoxaparin (Clexane®) (1 mg/kg) may be considered in lieu of IV heparin⁶
 - use local heparin protocol/heparin order form for doses eg for Qld Health³ <https://qheps.health.qld.gov.au/medicines/medication-safety/forms-charts> (Qld Health intranet only)
- Monitor vital signs + neurovascular observations until evacuated
- Protect limb. Use cage and heel pad if available - **do not elevate**¹

5. Follow up

- As advised by MO/NP

6. Referral/consultation

- As above

HMP Deep vein thrombosis (DVT) - adult

Background¹

- DVT is a blood clot in the deep vein of the leg or pelvis. If not detected and treated can lead to a life-threatening pulmonary embolism

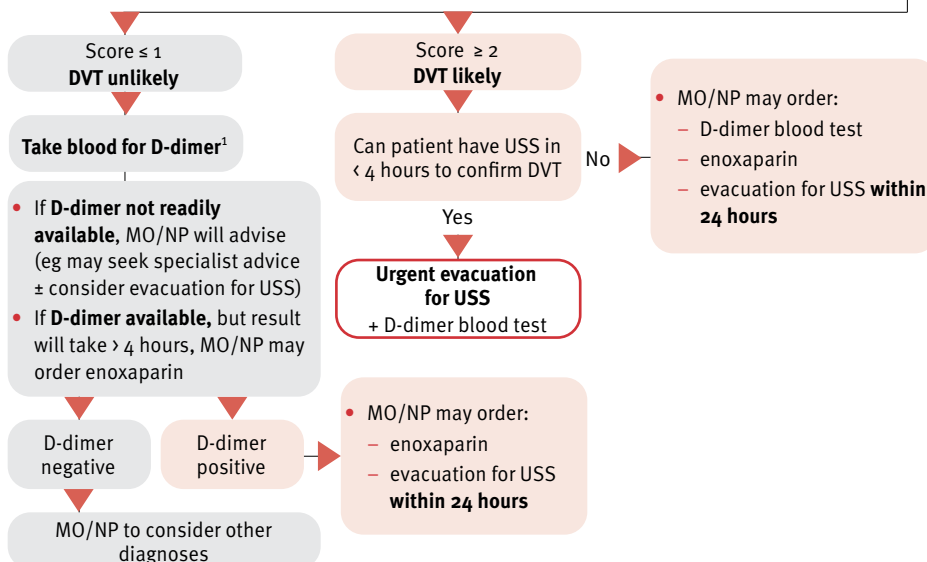
1. May present with¹

- Calf swelling
- Pain/tenderness in one leg
- Distension of surface veins over foot and leg

2. Immediate management¹

- If **DVT suspected** contact MO/NP urgently +
 - in collaboration with MO/NP assess using **Wells score if DVT suspected** below

Wells score if DVT suspected ¹			
Active cancer - treated within ≤ 6 months, or palliative	1	Calf swollen ≥ 3 cm more than the other leg	1
Paralysis, muscle weakness or recent plaster to immobilise lower leg	1	Pitting oedema of the leg	1
Recently bed ridden for ≥ 3 days, or major surgery within 3 months	1	Superficial veins in same leg standing out (not varicose veins)	1
Entire leg swollen	1	Previous DVT	1
Tenderness along distribution of deep venous system	1	Could patient have an alternative diagnosis at least as likely as DVT	- 2
			Score



Note: D-dimer not currently available on point of care testing in Qld. Specimen needs freezing if not processed within 4 hours

3. Clinical assessment

- Ask about leg symptoms + past history:¹
 - onset of pain, severity, associated symptoms eg fever
 - pregnant or postpartum, oestrogen therapy
- Do physical examination including:
 - vital signs
 - pregnancy test if female of reproductive age²

4. Management¹

- MO/NP may advise:
 - enoxaparin
 - take blood first - FBC, coagulation studies, CHEM20^{1,3}
 - urgent evacuation as needed
- Offer analgesia. See [Acute pain, p. 32](#)

S4	Enoxaparin (Clexane®)			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, MID, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Prefilled syringe	Various as available	Subcut Do not expel air bubble	1–1.5 mg/kg	stat
Offer CMI: May cause bleeding, bruising and pain at injection site				
Note: Inject into abdomen while patient lying down. Do not rub injection site				
Contraindication: Use with caution if severe hepatic or renal impairment (heparin preferred). Active bleeding, bleeding disorders				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				1,4,5

5. Follow up

- As advised by MO/NP

6. Referral/consultation

- As above

HMP Pulmonary embolism (PE) - adult

Background¹

- PE is a life-threatening blood clot in the lung

1. May present with²

- Acute onset SOB
- Hypotension, ↑ HR, ↑ RR, ↓ SpO₂
- Chest pain - sharp/pleuritic, usually one sided ±
 - signs of [DVT, p. 124](#)
 - coughing up blood
 - shock, collapse (massive PE)

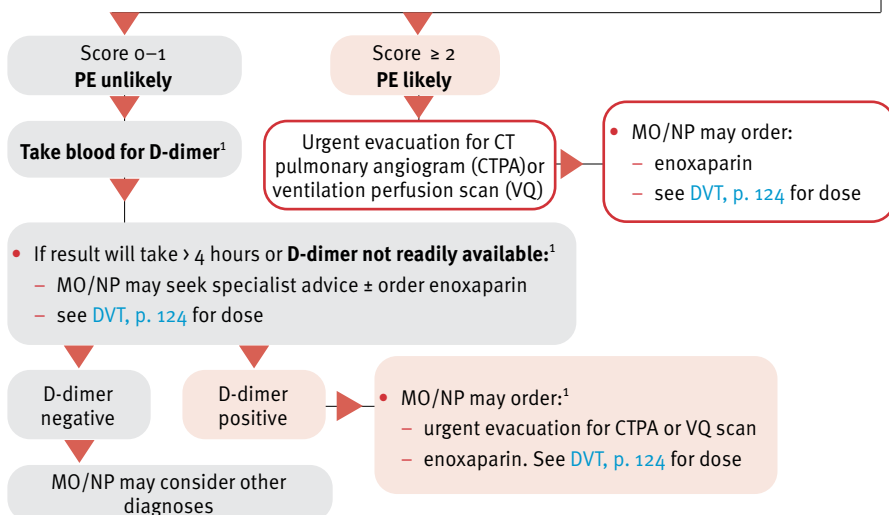
2. Immediate management

- **May have massive PE** if sBP < 90, tachy/bradycardia, RR > 20, SpO₂ < 94% (< 88 if COPD)³
 - send for help
 - **contact MO/NP urgently + urgent evacuation**
 - insert IVC x 2
 - MO/NP may seek specialist advice ± order IV bolus tenecteplase.³ See drug box in [ACS, p. 107](#) for doses
 - CPR as needed. See [BLS, p. 46](#)

3. Clinical assessment¹

- Do [Chest pain assessment, p. 103](#)
- Ask about risk factors:
 - cancer, recent surgery or hospitalisation, current/prior DVT, pregnant, 6 weeks postpartum, recent immobilisation, oestrogen use eg contraceptive pill
- Do vital signs:
 - give O₂ if SpO₂ < 94% or 88% if COPD
- Pregnancy test if female of reproductive age²
- ECG within 10 minutes + continuous cardiac monitoring
- **Contact MO/NP urgently**
- If NO signs of massive PE:
 - in collaboration with MO/NP assess likelihood of PE using **Wells score for PE** below

Wells score for PE ¹			
Signs/symptoms of DVT, p. 124	1	Coughing up blood	1
Immobility or surgery in prior 4 weeks	1	Alternative diagnosis less likely than PE	1
Previous DVT or PE	1	Cancer	1
HR > 100	1	Score	



4. Management

- Continue management as per MO/NP
- If enoxaparin ordered:
 - take blood first - FBC, coagulation studies, CHEM20¹⁻³
- Offer analgesia. See [Acute pain, p. 32](#)
- Closely monitor vital signs until evacuated

5. Follow up

- As advised by MO/NP

6. Referral/consultation

- As above

Neurological emergencies

HMP Headache - adult/child

Recommend¹

- Aim to identify red flags of serious causes of headaches
- Also see *Headache - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>

Related topics

[Meningitis, p. 72](#)

[Fitting, p. 86](#)

1. May present with¹

- Headache

2. Immediate management¹

- Consult MO/NP urgently if any of:
 - **sudden onset severe headache** - ‘thunderclap headache’ or ‘worst headache of life’:
 - suspect subarachnoid haemorrhage
 - **confusion, drowsiness or neurological changes**
 - **severe ↑ BP**. Also see [Hypertensive emergency, p. 116](#)
- MO/NP may advise:
 - urgent evacuation
 - insert IVC
 - analgesia
 - closely monitor:
 - vital signs
 - conscious level. See [GCS/AVPU, p. 562](#)
 - neurological observations

3. Clinical assessment^{1,3}

- Get history of headache:
 - pain - nature, intensity, impact on normal activities
 - is this a 'typical' headache
 - onset - when, sudden/slow
 - provoking factors eg exercise, cough, sneeze, sexual activity
 - exacerbating factors eg erect position, exertion/valsalva, worse in mornings, food eg caffeine
 - other symptoms:
 - fever, vomiting
 - aura, visual symptoms, photophobia
 - neck pain, facial pain/tenderness
 - recent:
 - head trauma
 - travel
 - infection in neck or head area
 - sun/heat exposure
 - pregnant or recently postnatal
 - drug/alcohol use
- Past medical history:
 - recent medication change
 - immunocompromised, cancer
 - hypertension
- Do physical examination, including:
 - vital signs
 - [GCS, p. 562](#)
 - check for [Neck stiffness, p. 74](#)
 - [Hydration assessment - adult, p. 200](#) or [child, p. 535](#)
 - pregnancy test if female of reproductive age
- Assess for ANY red flags

Red flags^{2,3}

- Sudden onset reaching maximum intensity within 5 minutes
- Worsening headache with fever
- Rash, neck stiffness or other signs of systemic illness
- New onset neurological signs or personality change
- Confusion or drowsiness/altered LOC
- Head trauma in previous 3 months
- Frequency/severity increases over weeks to months
- HIV, cancer or is immunocompromised
- Triggered by - cough, exercise, valsalva, sneeze or posture change eg lying down
- Vomiting without obvious cause
- > 50 years
- Headache causing night waking, or early morning headache ± vomiting

4. Management^{1,3}

- Consult MO/NP promptly if:
 - any red flags
 - headache is atypical or not 'usual' for patient
 - persistent headache, despite treatment with oral analgesia
- If pregnant assess for [Preeclampsia, p. 386](#)

Migraine^{2,4}

- If child consult MO/NP
- If adult says headache is typical of a migraine (that they have previously had) offer:
 - ibuprofen with paracetamol (avoid opioids). See [Acute pain, p. 32](#)
 - AND metoclopramide - even if not nauseous as improves absorption of analgesia. See [Nausea and vomiting, p. 40](#)
- Consider:
 - cold packs over forehead and back of skull
 - hot packs to neck and shoulders
 - neck stretches
 - rest in a dark room
 - **Lifestyle habits**

Tension type headache^{2,5}

- Usually bilateral, feels like pressure or tightness in head, mild to moderate intensity (not severe enough to prevent walking or climbing stairs), ± photophobia, sensitivity to noise, not usually nauseous:
 - offer ibuprofen ± paracetamol. See [Acute pain, p. 32](#)
 - consider advice on **Lifestyle habits**

Lifestyle habits - to help prevent migraines and tension type headaches^{4,5}

- Regular sleep schedule
- Minimise variations in BGL eg eat regular meals, avoid excess sugary food/drinks
- Stay hydrated eg drink 1.5–2 L of water/day
- Limit caffeinated drinks to 1–2 cups/day
- Regular exercise
- Use relaxation techniques to manage stress eg mindfulness, yoga, breathing techniques
- Avoid known triggers for patient eg alcohol, citrus fruit, chocolate, preserved meats, perfume
- If posture problems or neck muscle tightness, refer to a physiotherapist

5. Follow up

- If not evacuated, advise to return if headache does not improve or if concerned

6. Referral/consultation

- Consult MO/NP as above

Transient ischaemic attack (TIA) and stroke - adult/child

Recommend

- TIA + stroke are medical emergencies. Urgent evacuation + timing of treatment is critical¹
- Advise community about FAST stroke recognition message:²
 - Facial weakness, Arm ± leg weakness, Speech difficulty, Time to act fast

Background

- A stroke occurs when the arteries to the brain become blocked (ischaemic stroke/cerebral infarction) or rupture (haemorrhagic stroke), disrupting blood supply leading to brain damage¹
- TIA - transient episode of neurological dysfunction, most are brief eg < 1 hour + resolve in 24 hours with no brain infarction^{1,3}
- See *Transient ischaemic attack (TIA)/stroke clinical pathway* <https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/tia-stroke-clinical-pathways> (Qld)

1. May present with^{1,3}

- Suspect stroke if abrupt onset of ≥ 1 of:
 - asymmetric:
 - face weakness
 - arm weakness
 - leg weakness
 - speech disturbance eg slurred speech
 - visual field defect/vision loss
- **Note:** any abrupt change in neurological function could represent stroke

2. Immediate management

- **DRSABCD**
- Do BGL - if < 3.5 contact MO/NP urgently + treat as per MO/NP^{1,3}
- **If persistent symptoms for < 9 hours - patient may be thrombolysis candidate - avoid delays²**
- Get rapid history, including:³
 - symptoms + time of onset. If unknown, the last time the patient was seen to be well
 - are symptoms resolving or persisting
 - current medicines eg anticoagulant/antiplatelet medications
 - any seizures, loss of consciousness or syncope
- Suspect TIA if symptoms have resolved. Ask about duration:¹
 - < 10 minutes, 10 minutes–1 hour or > 1 hour
- **Contact MO/NP urgently in all cases of suspected stroke/TIA + urgent evacuation**
- Do vital signs + GCS, p. 562
- **Only give O₂ if SpO₂ < 92%^{1,4}**
- ECG only if does not cause delay. If new atrial fibrillation, send copy of ECG with patient
- Continuous cardiac monitoring
- Insert IVC x 2
- Take bloods - FBC, UE, LFT, coagulation studies, group and hold for x-match

3. Clinical assessment

- Get past history + any TIA/stroke or similar symptoms³
- Do physical examination + weight (if possible)³

4. Management

- **Ongoing management as per MO/NP**
- Brain imaging eg CT scan/MRI required to determine cause^{1,3}
- Check ability to swallow before giving oral medications:
 - if difficulty swallowing - keep nil by mouth
- Give paracetamol if fever
- **If ischaemic stroke:**¹
 - cautious ↓↓ BP if markedly raised eg > 220/110. **Note:** most instances resolve spontaneously
 - do not give aspirin until brain imaging excludes intracranial haemorrhage
 - monitor BGL - avoid aggressive management/IV fluids with glucose
- **If haemorrhagic stroke:**¹
 - urgent reduction of BP may be necessary to ↓↓ haematoma expansion
- **If TIA** - management is similar to ischaemic stroke¹
- Monitor closely until evacuation:
 - vital signs + GCS

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

HMP Delirium - adult

Recommend¹

- Consider delirium where a patient has one or more of the following risks:
 - age ≥ 45 years for Aboriginal and Torres Strait Islander people
 - age ≥ 65 years
 - history of cognitive impairment or dementia
 - severe medical illness
 - current hip fracture
 - cognitive concerns raised by others

Background¹

- Delirium may be confused with dementia
- Medicine toxicity is a major cause of delirium

1. May present with^{2,3}

- Acute change in mental status
- Difficulty focusing or keeping track, easily distracted

- Behaviour fluctuates in severity over 24 hour period:
 - hyperactive:
 - disorganised or incoherent thinking, rambling or illogical flow of conversation
 - hyperalert, startles easily
 - restlessness, picking at clothes, tapping fingers or making frequent sudden changes of position
 - hypoactive:
 - lethargic, drowsy
 - difficult or unable to rouse
 - disoriented, unsure of where they are or what time it is
 - inability to recall events or instructions
 - sluggishness, staring into space, staying in one position for a long time or moving very slowly
 - disturbance of sleep-wake cycle, excessive daytime sleepiness and insomnia at night
- Hallucinations, illusions or misinterpretations
- Withdrawal states eg tremors, sweating, visual hallucinations
- Fever

2. Immediate management

- If patient is highly agitated, threatening, aggressive or violent, see [Mental health emergency, p. 336](#)
- Screen for [Sepsis, p. 64](#)
- Do not leave patient alone

3. Clinical assessment^{2,4}

- Assess and manage patient in quiet environment
- Ask family or carer about recent behavioural change eg:
 - confusion
 - concentration
 - agitation, restlessness
 - sleepiness, levels of consciousness
 - communication or response levels
 - difficulty meeting requests
 - alterations in mood
- Do full head to toe physical examination
- Identify underlying acute medical causes:^{2,4}
 - infections eg meningitis, encephalitis, neurosyphilis, UTI, pneumonia
 - CNS conditions eg brain lesions or tumours, subdural haematoma, TIA, stroke
 - sodium, potassium and calcium abnormalities. Consider renal or liver disease
 - [Hypoglycaemia, p. 91](#) or hyperglycaemia
 - respiratory disorders leading to hypoxia or pulmonary embolism
 - myocardial infarction, arrhythmias, heart failure
 - seizures, epilepsy and postictal states
 - pain or discomfort eg urinary retention, constipation, hip fracture, dental
 - withdrawal eg alcohol, benzodiazepines
- Urgently identify possible medicines toxicity:^{2,4}
 - consider polypharmacy, particularly drugs with anticholinergic effects, given at high or prolonged doses:

- **anticholinergics**
 - sedating antihistamines eg promethazine, doxylamine
 - drugs for bladder overactivity eg oxybutynin
 - **psychotropics**
 - antipsychotics eg clozapine, olanzapine
 - lithium
 - hypnotics eg benzodiazepines
 - tricyclic antidepressants eg amitriptyline
 - **drugs for parkinsonism**
 - anticholinergics eg benztropine
 - dopamine agonists eg levodopa
 - **cardiac medications**
 - betablockers eg sotalol and propranolol
 - digoxin
 - **analgesics**
 - opioids
 - tramadol
 - nonsteroidal anti-inflammatory drugs (NSAIDs)
 - **antiemetics**
 - prochlorperazine
 - hyoscine hydrobromide
 - **corticosteroids (high dose)**
 - **alcohol and illicit drugs** eg cannabis, methamphetamine
- Do vital signs +
 - SpO₂ and BGL to exclude hypoxia or hypoglycaemia as a cause
 - Do:
 - bloods/i-STAT - BGL, FBC, UE, LFT
 - urinalysis and MSU for MCS
 - ECG
 - drug screen:
 - therapeutic drug monitoring if taking digoxin, lithium, quinidine
 - illicit drugs
 - chest x-ray

4. Management^{2,4}

- **Manage and treat underlying medical cause as above in consultation with MO/NP**
- For suspected medicines or other substance use, see [Poisoning and overdose, p. 211](#)
- Contact pharmacist for medication review
- Offer analgesia. See [Acute pain, p. 32](#)
- Address hydration, nutrition, ventilation, temperature control, skin care, bladder and bowel care
- Provide familiar environmental cues ie clocks, calendars, with involvement from family
- Commence regular observations. Observe at all times

5. Follow up

- As per MO/NP or specialist instructions
- According to identified cause of delirium

6. Referral/consultation

- Consult MO/NP and specialist

Traumatic injuries

HMP Traumatic injuries - adult/child

Recommend¹

- **Early notification for transfer.** See [Criteria for early notification of trauma for interfacility transfer \(inside front cover\)](#), or if outside Qld, follow local policy
- Assume possible spinal injury in all blunt trauma or multiple injuries. Use caution when moving¹
- Systematic evaluation of all trauma patients (minor and major)²

Background

- Common causes of preventable death in trauma: airway obstruction, tension pneumothorax and haemorrhage
- Hard/semi-rigid cervical collars are not recommended^{3,4}

1. May present with

- Trauma

2. Immediate management. Primary survey and resuscitation DRSCABCD^{1,6-9}

Danger - eg body fluids, toxins, traffic, perpetrators of crime, < 10 m from fallen [powerlines](#), [p. 121](#)

- If there is immediate threat to a person's life and rapid movement is needed, make all efforts to limit spinal movement without delaying treatment.¹⁰ If you are by yourself and patient needs moving out of danger, you may need to drag them via ankle or arm/shoulder³

Response

Send for help - ideally 1 or more assistants are needed

Catastrophic haemorrhage - control before checking airway^{1,2,7,8}

- Do not remove any penetrating/impaled objects eg knife¹⁰
- Use **direct firm pressure** - with hands + combine pads and crepe bandages. If not working, check pad(s) is over bleeding point/using firmer pressure with 1 or 2 pads over smaller area
- If unable to control:
 - use **haemostatic dressing** - hold against bleeding point, then bandage¹⁰
 - or **arterial tourniquet** (if limb):^{6,10}
 - apply firmly 5 cm above the injury/amputation (not over a joint/wound)
 - tighten until bleeding stops - if not stopping, try 2nd tourniquet above the 1st¹¹
 - record application time + tell retrieval team. Do not cover with bandage/clothing

Airway and cervical spine (c-spine)^{1,3,4,7,9}

- Look - signs of airway obstruction eg use of accessory muscles¹
- Listen - upper airway noises + breath sounds - absent, diminished, noisy (snoring, gurgling, stridor)
- Open airway - chin lift/jaw thrust ±
 - airway adjuncts eg oro/nasopharyngeal (not if base of skull fracture), [LMA](#), [p. 56](#)
 - suction/remove loose foreign bodies eg blood, vomit, oedema, loose teeth/foreign objects
- **Maintain c-spine stabilisation:**^{3,4,9}
 - support head in a neutral position in line with torso - avoid twisting/angular movements
 - consider soft collar ± sand bags to support neck

- If needed, roll a 'face-down' non-responsive person onto their back to assess airway⁵
 - if excessive bleeding into the airway that suction cannot remove, roll onto side¹
- Check for wounds/injury
- If motorbike helmet⁵ - remove while assistant restricts movement of c-spine⁷

Breathing^{1,6-9}

- Fully expose chest. Assess:
 - RR, effort, open wounds, bruising, deformity
 - circumferential or airway burn ie singed facial hair, soot in mouth/nose
 - use of accessory muscles, symmetrical/paradoxical chest movements
 - auscultate for breath sounds/air entry (listen in axilla area)¹
- If tension pneumothorax - do immediate [Needle decompression, p. 141](#) with 14 G needle^{7,9}

Signs of tension pneumothorax - life-threatening

- Decreased/absent breath sounds
- Hyper-resonance on percussion
- ↑ HR, ↓ BP, ↑ SOB
- Distended neck veins
- If open/sucking chest wound - apply occlusive [3 sided dressing, p. 141](#)/vented chest seal
- If any abnormalities, see [Chest injuries, p. 140](#) for possible causes + immediate management
- Give O₂ to maintain SpO₂ ≥ 94%
- Start bag-valve mask ventilation if indicated

Circulation + haemorrhage control⁷⁻⁹

- Control external haemorrhage by direct pressure/bandaging ± elevate + reassess tourniquet application
- HR, central capillary refill time
- Insert IVC x 2 large bore OR [Intraosseous, p. 57](#)
- **If shock** (cool, ↑ HR, capillary refill > 2 seconds):^{7,10}
 - IV fluid bolus (warmed if possible) - sodium chloride 0.9% or Hartmann's:
 - **adult** 1 L (250 mL increments, aim to maintain sBP at 90). **Child** 10–20 mL/kg
 - try to find source of haemorrhage eg chest, abdomen, pelvis, long bones

Disability - basic neurological evaluation^{1,6-9}

- **Alert, Voice, Pain, Unresponsive**
- BGL
- Pupils - size, equal + reacting

3. Clinical assessment. Secondary survey - EFGHIJ

- Start only after lifesaving interventions/management have been initiated
- If ongoing bleeding/life-threatening injury - consult MO/NP urgently

Exposure, Environment, Early transfer notification^{1,7,9}

- Assess using [Criteria for early notification of trauma for interfacility transfer, \(inside front cover\)](#)
- Remove all clothing
- Keep warm/prevent hypothermia - cover with blanket/space blanket

Full vital signs, eFAST, Family

- Vital signs + neurological observations - [GCS, p. 562](#), motor response in limbs, fontanelle in infant
- Consider eFAST if trained/available^{1,6,7,9}
- Communicate with/support family/friends

Give pain relief. Get resuscitation adjuncts⁵

- Lab/bloods - FBC, UE, lactate, troponin, BGL, LFT, group and hold, coagulation studies, blood gases ± blood alcohol/toxin screen^{1,9}
- Monitor vital signs at least 15 minutely. Attach cardiac monitor + ECG
- Naso/orogastric tube (consider) - not NG if suspect base of skull fracture^{1,9}
- Oxygen/capnography as indicated¹²
- Pain - assess + analgesia eg morphine or fentanyl.^{7,9} See [Acute pain, p. 32](#)
 - if head injury suspected, do not give opioid until discussion with MO/NP

History from patient/witnesses^{1,7,9}

- Allergies + check for medic alert eg jewellery, key ring, USB stick, shoe tag, anklet, watch, tattoo
- Medications + anticoagulation/antiplatelet therapy
- Past medical history + bleeding disorder, [Tetanus immunisation, p. 557](#)
 - last menstrual period, possible pregnancy
- Last meal
- Events related to injury:⁵
 - mechanism:
 - **blunt** - speed of patient/objects, seatbelt use, air bag deployment, direction of impact, damage to car/bike, distance ejected from vehicle, height of fall/body part landed on
 - **penetrating** - type of firearm/distance from, number of shots, type/length of blade
 - any loss of consciousness + duration
 - amnesia
 - alcohol/drug use
 - social issues eg domestic and family violence

Head to toe assessment - search everywhere for injuries as per table below^{1,5,7,9}

CHECK for - pain, deformities, bruising, swelling, lacerations, abrasions, burns, impaled object(s) eg knife (do NOT remove impaled objects)

General appearance	<ul style="list-style-type: none"> • Position found, posture, guarding/self-protection movements • Odours - alcohol, petrol, chemicals, vomit, urine, faeces
Head and face^{1,7}	<ul style="list-style-type: none"> • Inspect face and scalp for lacerations/bruising/penetrating injury + check: <ul style="list-style-type: none"> – eyes - size, equal + reacting, foreign body/contact lenses, subconjunctival haemorrhage, hyphaema, irregular iris, penetrating injury – movements - ask to follow your moving finger in all directions – also see Eye injury, p. 286 – nose - deformity, CSF leak, bleeding, look in nose - any asymmetry of septum ± bluish/reddish swelling (may be septal haematoma). Also see epistaxis, p. 190 – mouth - lacerations to gums, lips, tongue, palate. Check if any missing/loose/broken teeth.¹ Bite malocclusion - may be Fractured jaw, p. 157 – ears - bleeding, blood behind eardrum, CSF leak - do NOT pack to stop drainage • Bruising behind ears ('Battle sign') or periorbital (raccoon's eyes) = base of skull fracture • Palpate - skull, orbit, nose and jaw, noting: <ul style="list-style-type: none"> – depression(s) in skull, boggy swelling of scalp, bony tenderness, subcutaneous emphysema[#], fontanelle in baby⁹ • If ANY trauma to head, see Head injuries, p. 143 • Scalp lacerations can result in major blood loss⁷ - close with staples or sutures prior to transfer if able (or tie hair to close) as per Acute wounds, p. 162

Neck ^{1,6,7}	<ul style="list-style-type: none"> • Palpate neck while maintaining in-line immobilisation of the c-spine eg head and neck immobilised with 2 hands by assistant. Check if: <ul style="list-style-type: none"> – pain, deformity – bony/laryngeal tenderness or crepitus/step, subcutaneous emphysema[#] – veins - distended/flattened¹² • Assume c-spine injury until excluded. See NEXUS tool in Spinal injuries, p. 147
Chest ⁶⁻⁹	<ul style="list-style-type: none"> • Inspect + palpate entire chest wall - including clavicles, sternum, ribs, axilla (do NOT spring rib cage). Check: <ul style="list-style-type: none"> – expansion, paradoxical movement, accessory muscle use – tenderness, crepitus – subcutaneous emphysema[#] • Auscultate + percuss: <ul style="list-style-type: none"> – breath sounds/lack of, wheeze, crackles (listen in axilla area) – heart sounds - murmurs, friction rubs, muffled sounds – hyper-resonance/dullness • If significant chest injury suspected - auscultate BP in both arms and note if difference > 10–15 may indicate aortic injury • If any abnormalities, see Chest injuries, p. 140 • Haemothorax can result in major blood loss
Abdomen and flanks ^{1,6-9}	<ul style="list-style-type: none"> • Inspect for lacerations, seat-belt bruising/red marks • Auscultate bowel sounds - present/absent (before palpating) • Palpate - tenderness, guarding, rigidity, rebound tenderness, masses: <ul style="list-style-type: none"> – especially over liver, spleen, kidneys and bladder¹ • Assess repeatedly - injury may not be obvious. See Abdominal injuries, p. 150
Pelvis ^{1,7}	<ul style="list-style-type: none"> • Gently palpate for tenderness. Do NOT spring pelvis • If fracture suspected apply pelvic binder, p. 156 NOW - even if low suspicion - do not log roll. Once binder in place, only log roll if essential • Fractured pelvis, p. 156 can result in major blood loss⁷
Perineum, genitalia ¹	<ul style="list-style-type: none"> • Inspect for bruising/bleeding • If bleeding from urethral opening/scrotal haematoma - suspect pelvic fracture⁷ • Note priapism (persistent erection) - symptom of spinal injury
Limbs ^{1,7}	<ul style="list-style-type: none"> • Inspect and palpate entire length of limbs: <ul style="list-style-type: none"> – tenderness, deformity, swelling, open fractures – movement of joints and strength/range of motion (passive and active) – colour, distal pulses, warmth, movement, sensation, capillary refill • Apply splint(s) as per Simple fracture of limbs, p. 152 and do neurovascular observations as needed • If discrepancy in leg length or rotational deformity in leg without obvious fracture, suspect Fractured pelvis, p. 156 • Fractured femur and any open long bone fractures can result in major blood loss⁷
Inspect back ¹	<ul style="list-style-type: none"> • log roll, p. 148 if assistance available (may be best achieved at time of transfer) - do not roll onto side with injury • Ask patient to squeeze buttocks if awake • Inspect and palpate - back/chest, flanks, buttocks, perineum and posterior thighs: <ul style="list-style-type: none"> – deformity, bruising, swelling, tenderness/deformity/step (along spine) – subcutaneous emphysema[#] • Auscultate for air entry, abnormal sounds

[#]subcutaneous emphysema - air trapped under the skin (skin crackles when palpating)

Put it down

- Ensure clear, accurate, concise documentation^{1,7}

4. Management¹

- Continually reassess primary survey + monitor for signs of airway compromise
- Continue c-spine precautions + spinal immobilisation until evacuated:
 - for guidance on **moving trauma patient** see [Spinal injuries, p. 147](#)
- Treat wounds - remove gross contamination/irrigate + cover
- If impaled object eg knife, VERY CAREFULLY pack around with gauze soaked in sodium chloride 0.9% and secure¹⁰
- Splint fractures¹
- MO/NP will advise ongoing management, which may include:^{1,7,9}
 - IV fluids
 - tranexamic acid (within 3 hours) if haemorrhage
 - antibiotics eg if open fracture,⁷ penetrating trauma¹
 - monitor vital signs + neurological observations
 - keep warm/prevent heat loss
 - nil by mouth
 - IDC + urinalysis, monitor urine output hourly
 - x-ray(s)
- Give [Tetanus immunisation, p. 557](#) if indicated
- Also consider [Electrocution, p. 121](#), [Compartment syndrome, p. 160](#), [Burns, p. 177](#)
- If not evacuated but affected by drugs/alcohol:
 - encourage to stay under observation until nonaffected, or if discharged, into the care of a responsible nonaffected adult
- Consider non-accidental injury (if injury/presentation inconsistent with history) eg self inflicted injury, elder abuse, [Domestic and family violence, p. 241](#), + consider [Child protection, p. 551](#)

Pregnant woman with trauma^{7,13}

- Can lose a significant amount of blood before ↑ HR, ↓ BP, signs of shock evident¹³
- If > 20 weeks pregnant (uterus at level of umbilicus):
 - lie on left side, or if spinal precautions/lying on back, tilt the right side 15–30° by placing a wedge under her hip/spinal board
 - **note:** baby can compress the vena cava causing hypotension if lying flat
- Have high index of suspicion for [Abdominal injuries, p. 150](#) even with minor trauma
- Also see Qld Clinical Guideline *Trauma in pregnancy* <https://www.health.qld.gov.au/qcg/publications#maternity>

Amputated body part⁷

- Thoroughly wash with sodium chloride 0.9%, then wrap in moist sterile dressing (eg combine)
- Further wrap in moistened sterile towel
- Place in plastic bag and transport with patient in cooler box eg Esky® with crushed ice
- Do not freeze

S4	Tranexamic acid			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	1000 mg/ 10 mL	IV	Adult 1000 mg Dilute in 100 mL sodium chloride 0.9%	stat Infuse over 10 minutes
			Child 15 mg/kg Dilute 10 mL (1000 mg) to 100 mL to give concentration of 10 mg/mL	
Offer CMI: May cause hypotension, dizziness (particularly after rapid administration), thrombosis or visual disturbances				
Contraindication: Active intravascular clotting. Use with caution if subarachnoid haemorrhage or if predisposition to thrombosis. Reduce dose if renal impairment				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

14-16

5. Follow up

- Be guided by MO/NP

6. Referral/consultation

- Consult MO/NP as above

HMP Chest injuries - adult/child

Background¹⁻³

- **Life-threatening emergencies** include tension pneumothorax, massive haemothorax, open pneumothorax, flail chest, pulmonary contusions, great vessel injury, diaphragm rupture

1. May present with

- Chest trauma

2. Immediate management¹⁻⁶

- Do primary survey **DRSCABCD** as per [Traumatic injuries, p. 134](#) + initiate any lifesaving measures
- Assess against [Criteria for early notification of trauma for interfacility transfer \(inside front cover\)](#)
- Use tables below for possible chest injuries and for immediate management

Blunt trauma to chest eg fall from height, motor vehicle accident ¹⁻⁴		
Signs and symptoms	Consider	
<ul style="list-style-type: none"> • Increasing SOB, ↑ HR, ↓ BP • Agitation, hypoxia • ↓ air entry + hyper-resonance on percussion on affected side • ↓ chest movement • Trachea deviation (late sign) 	Tension pneumothorax	<ul style="list-style-type: none"> • Immediate needle decompression (next page)
<ul style="list-style-type: none"> • ↓ air entry/dull percussion on affected side • Hypotension/shock • Hypoxia 	Haemothorax can be massive	<ul style="list-style-type: none"> • Treat hypovolaemia - IV sodium chloride 0.9% or Hartmann's 1 L (20 mL/kg for child) • If respiratory distress develops, treat as tension pneumothorax
<ul style="list-style-type: none"> • Paradoxical movement - segment of chest wall moves in when the patient breathes in and out when patient breathes out 	Flail chest	<ul style="list-style-type: none"> • Ventilation support as needed • MO/NP may intubate prior to evacuation
<ul style="list-style-type: none"> • Coughing up blood, crackles • ↑ HR, hypoxia, ↑ WOB • ↓ air entry and ↑ percussion on affected side • ± unequal chest movement 	Pulmonary contusion	<ul style="list-style-type: none"> • O₂ + ventilation support
	Simple pneumothorax	<ul style="list-style-type: none"> • Be alert to ↑ SOB - may be tension pneumothorax
<ul style="list-style-type: none"> • Tender sternum 	May have underlying lung or cardiac injury	<ul style="list-style-type: none"> • ECG • MO/NP will advise further
<ul style="list-style-type: none"> • Chest wall tenderness/swelling • Pain worse on inspiration/cough 	Broken rib(s)	<ul style="list-style-type: none"> • MO/NP may advise review next day if minor/no other injury/concerns
<ul style="list-style-type: none"> • ↓ BP, asymmetric, diminished or absent peripheral pulses • Paraplegia 	Great vessel injury³	<ul style="list-style-type: none"> • Urgent MO/NP advice

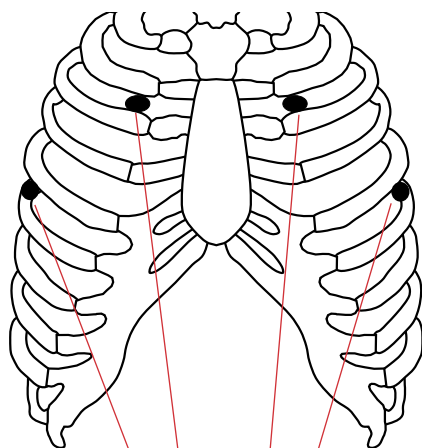
Penetrating trauma to chest eg gunshot or stab wound^{1,4,5}

Signs and symptoms	Consider	
<ul style="list-style-type: none"> Wound to the chest ± object sticking out 	Possible haemothorax or pneumothorax	<ul style="list-style-type: none"> Do NOT remove any object sticking out of wound eg knife. VERY CAREFULLY pack around with gauze soaked in sodium chloride 0.9% and secure Cover open chest wound with: <ul style="list-style-type: none"> vented chest seal OR sterile occlusive dressing large enough to overlap the wound edges, taped securely on 3 sides (opening at bottom) to provide a flutter-type valve effect - air can move out but not in
<ul style="list-style-type: none"> Chest wall opening Air sucking in 	Open/ sucking chest wound/ open pneumothorax	

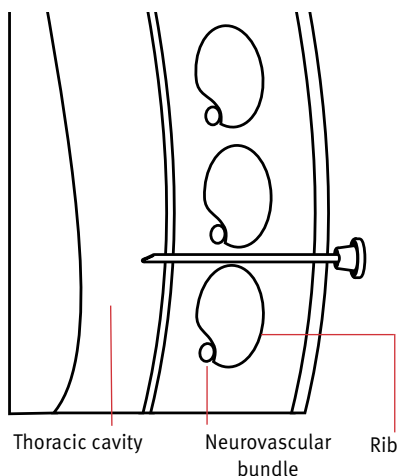
Other life-threatening complications: cardiac tamponade (can be detected with eFAST), aortic/tracheo-bronchial/oesophageal injury, diaphragm injury, blunt cardiac injury^{2,3}

Needle decompression for tension pneumothorax^{5,6}

- Insert 14 G needle/cannula (use longer needle) at **2nd intercostal space, mid-clavicular line**
 - air should escape with a rush + respiratory distress should decrease
- If not working:
 - insert needle at **5th intercostal space, mid axillary line**
 - check IVC has not kinked or tension pneumothorax has recurred/another on the other side
- Note:** will require definitive treatment ie chest drain to be inserted



Needle decompression sites



3. Clinical assessment⁶

- Do secondary survey **EFGHIJ** as per [Traumatic injuries, p. 134](#) including **examination of chest**
- Do eFAST if trained/available
- Be aware of risk factors for potential deterioration:²
 - past history - smoker, COPD, asthma, obesity
 - age > 55 years, uncontrolled pain

- respiratory compromise: \uparrow WOB, \uparrow RR, \downarrow SpO₂
- ≥ 3 fractured ribs
- shallow breathing, unable to cough

4. Management^{1,2,6}

- Give O₂ to maintain SpO₂ \geq 94%
- Ensure **adequate analgesia**.² See [Acute pain, p. 32](#)
- Consult MO/NP in all cases, who may advise:
 - urgent evacuation
 - close monitoring of vital signs + WOB
 - chest x-ray
 - ECG
 - nil by mouth
 - bloods - FBC, group and hold
- **Note:** if critical, MO/NP may advise finger thoracostomy (if skilled). Usually only done if patient ventilated
- MO/NP may insert chest tube prior to evacuation. Attach to Heimlich Valve® or similar ambulatory chest drainage system for evacuation

5. Follow up

- MO/NP will advise ongoing management

6. Referral/consultation

- As above

HMP Head injuries - adult/child

Recommend¹

- Consider the possibility of non-accidental head trauma in all children presenting with mild to moderate head injury
- Do not do x-ray or USS in lieu of CT scan if skull fracture suspected in child

Background

- If child, also see *Head injury - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines>
- Head injury clinical pathways (Qld) <https://clinicalexcellence.qld.gov.au/resources/clinical-pathways/head-injury>

1. May present with

- Trauma to head

2. Immediate management¹⁻⁴

- Do primary survey **DRSCABCD** as per *Traumatic injuries*, p. 134 + initiate any lifesaving measures
- Consider need for **c-spine immobilisation**, p. 147
- Assess against **Criteria for early notification of trauma for interfacility transfer (inside front cover)**
- Do **GCS**, p. 562 + neurological observations:⁵
 - pupil size + reaction to light
 - motor response in limbs
 - fontanelle in infant
- Do vital signs + BGL if altered LOC
- **Consult MO/NP urgently if:**^{2,4,6}
 - GCS < 15
 - seizure(s)
 - penetrating injury or suspected skull fracture (depressed/open)
 - basal skull fracture suspected - black eye with no damage around eyes, bleeding from ear(s), clear fluid (CSF) from ear(s) or nose, bruising behind ear(s)^{1,3}
 - focal neurological deficit eg loss of sensation, paraesthesia
 - **signs of ↑ intra cranial pressure (ICP):**²
 - GCS decreasing
 - abnormal posture (decorticate/decerebrate)
 - abnormal pupil responses, pupil dilation (1 or both), upward gaze
 - ↑ BP + ↓ HR + breathing abnormalities - 'Cushing's triad' (late sign)
 - **may be just** headache, vomiting, irritability, altered LOC ± Cushing's triad

3. Clinical assessment^{2,4}

- Do secondary survey **EFGHIJ** as per *Traumatic injuries*, p. 134, including **examination of head**
- Get history, including:¹⁻³
 - time/date of injury, witnessed or not
 - mechanism of injury/how it happened
 - use of alcohol/drugs
 - bleeding disorder/taking anticoagulants^{1,4}

- Ask about symptoms. Any:¹⁻⁴
 - loss of consciousness - when, how long for. If < 2 years old, was it for ≥ 5 seconds²
 - vomiting (amount), headache (severity)¹
 - seizure(s) or amnesia post injury - when/duration
 - double vision, ataxia, clumsiness, gait abnormality
 - abnormal behaviour (child/infant) eg drowsiness, agitation, restlessness, not interested in things around them, not themselves (as reported by parent)²
 - weakness/tingling in arms or legs
- Assess for **Head injury risk factors** as per tables below

Head injury risk factors - child ²		
Low risk ALL of the following	Intermediate risk No high risk features + ≥ 1 of the following MAY need urgent CT scan	High risk ≥ 1 of the following Urgent CT scan
<ul style="list-style-type: none"> • Well appearing child • GCS 15 • No intermediate or high risk features present 	<ul style="list-style-type: none"> • Severe headache • Vomiting • Amnesia • Post-traumatic seizure • Altered mental status (drowsiness, agitation, repetitive questioning, slow verbal response) • Significant mechanism of injury, including: <ul style="list-style-type: none"> – fall from significant height (≥ 1 m if aged < 2, or > 1.5 m if ≥ 2 years)¹ – following vehicle accident - high speed, ejected from vehicle or with others significantly injured in crash – pedestrian/cyclist impacted by car – impact from high speed object eg golf ball, ceiling fan 	<ul style="list-style-type: none"> • GCS < 14 • Focal neurological deficit • Clinical suspicion of: <ul style="list-style-type: none"> – basal skull fracture (raccoon eyes, blood behind eardrum, Battle's sign, clear fluid leaking from ear or nose (CSF)) – depressed skull fracture (boggy haematoma, palpable depressions) – penetrating injury – open skull fracture – large haematoma, laceration or bulging fontanelle in young child – non-accidental injury – extensive other injuries

Head injury risk factors - adult ⁶	
'High risk' any of the following	
<ul style="list-style-type: none"> • Age > 65 years • On anticoagulant/antiplatelet therapy • Known coagulopathy eg liver disease, factor deficiency • Known neurosurgery and/or neurological impairment 	<ul style="list-style-type: none"> • Multi-system trauma • Delayed presentation or re-presentation • Persistent abnormal level of alertness, behaviour and/or cognition • Multiple comorbidities or combination of worrying factors
<ul style="list-style-type: none"> • Dangerous mechanism of injury • Clinical suspicion of skull fracture • Unwitnessed head injury • Loss of consciousness > 5 minutes • Intoxicated (alcohol \pm other drugs) • Persistent vomiting/more than 1 episode³ • Persistent severe headache 	Urgent CT scan if below⁶ <ul style="list-style-type: none"> • Deterioration in GCS • Focal neurological deficit • Post traumatic seizure • Anterograde or retrograde amnesia > 30 minutes • Persistent GCS < 15 at 2 hours post injury • Skull fracture suspected or other clinical concern

4. Management

- If drug or alcohol intoxicated at presentation, treat as if the neurological findings are due to the head injury until proven otherwise^{1,3,4}
- If scalp laceration, control bleeding - **can result in major blood loss:**⁴
 - easily controlled by closing with staples/sutures/tying hair. See [Acute wounds, p. 162](#)
 - ± combine + pressure bandage

If symptoms/unstable, assessed as high/intermediate risk or fractured skull suspected

- **Urgently consult MO/NP who may advise:**^{2,4,6}
 - urgent evacuation for CT scan
 - monitor closely:
 - GCS + neurological observations
 - vital signs
 - pain and sedation score as needed
 - IVC x 2 or [Intraosseous, p. 57](#)
 - O₂ to maintain SpO₂ ≥ 95% (+ capnography if available)
 - BGL
 - analgesia ± antiemetic - only on MO/NP orders
 - if 🧠 ICP:
 - elevate head of bed 20–30°
 - support airway/ventilation
 - keep warm/avoid hypothermia
 - if seizures, manage as per [Fitting, p. 86](#)
 - MO/NP may consider:
 - IV fluid bolus 10–20 mL/kg sodium chloride 0.9% to avoid hypovolaemia
 - sodium chloride 3% or mannitol^{2,4}
- If GCS ≤ 8, patient is in a coma/has severe injury + will need intubation by MO/NP prior to evacuation.⁴ Consider [LMA, p. 56](#) until intubation possible

If asymptomatic, fully awake and alert, have no neurological abnormalities + assessed as low risk

- If baby < 6 months, consult MO/NP promptly¹
- If child **very low risk** no need to monitor ie:^{1,2}
 - trivial injury (ground level fall, walking/running into stationary objects), no loss of consciousness, GCS 15 AND no signs or symptoms of head trauma other than an abrasion. Discharge with **Head injury advice**
- Otherwise, in collaboration with MO/NP, monitor neurological observations for 4–6 hours:^{2,6}
 - 1/2 hourly for 1st 2 hours post injury, then hourly for 2–6 hours/until discharged
 - if GCS falls ≥ 1 point for 30 minutes,³ symptoms develop/persist, or any abnormal observations, **urgently consult MO/NP**
- Consider discharge ≥ 4–6 hours if:^{1,2,6}
 - GCS remains at 15
 - neurological observations remain normal + no symptoms develop
 - no concerns of non-accidental injury in child
 - no concerns of alternative/concurrent illness
 - patient has responsible adult to observe them for 24 hours + can return promptly if needed
 - not under the influence of drugs or alcohol¹
 - have been given **Head injury advice** + know when to return to clinic^{1,2,4,6}
- Consider a longer period of observation if antiemetics have been given³

Head injury advice - give verbal and written advice⁷⁻⁹

- Adults and children should be observed by someone responsible for next 24 hours
- Give fact sheets eg:
 - **adult** - *Concussion/minor head injury without concussion* <https://clinicalexcellence.qld.gov.au/resources/emergency-department-patient-information-sheets>
 - **child** - *Head injury care after discharge* <https://www.childrens.health.qld.gov.au/chq/information-for-families/fact-sheets/>

General advice

- Rest quietly for next 48 hours
- Eat a healthy diet, drink lots of fluids
- Avoid activities that make symptoms worse
- Use ice packs on swollen or painful areas
- Use paracetamol for headache (not ibuprofen)
- Do not take sedatives/other medicines unless instructed
- Do not drive for at least 24 hours and only once you can concentrate properly
- Return to exercise after a few days rest

Concussion

- Symptoms may include:
 - mild headaches, which settle with rest/paracetamol
 - mild dizziness, feeling tired, difficulty paying attention or remembering things
 - feeling emotional or moody
- Symptoms usually settle over time. Return to clinic if you are worried

Return to the clinic immediately if

- Severe headache, especially if getting worse
- Dizziness or unsteady walking
- Nausea, vomiting or poor feeding (child) or frequent vomiting (adult)
- Unexpected drowsiness or weakness
- Disorientation or confusion
- Restlessness (adult), irritability, continued crying or unusual agitation (child)
- Slurred speech or double/blurred vision
- Seizure (fit) or spasms of face or limbs
- Difficult to wake up
- If you are worried for any reason

5. Follow up

- If not evacuated advise to be reviewed the next day and at the next MO/NP clinic (1–2 weeks)¹
- If on anticoagulants/has bleeding disorder, advise follow up within 72 hours due to increased risk of intracranial haemorrhage⁶

6. Referral/consultation

- Consult MO/NP as above

HMP Spinal injuries - adult/child

Recommend¹

- Focus on minimal handling, maintaining immobilisation and preventing further damage

Background

- Hard/semi-rigid cervical collars are not recommended^{1,2}
- Cervical spine injury is relatively rare in children.^{2,3} Also see *Cervical spine injury - emergency management in children* <https://www.childrens.health.qld.gov.au/qpec-statewide-guidelines/>

1. May present with¹

- History of trauma, in particular:
 - motor vehicle or motor bike accident - occupant, rider or pedestrian
 - industrial accident ie workplace
 - dive or jump into shallow water or being 'dumped' in the surf
 - sporting accident eg rugby, falling from a horse, trampoline²
 - fall from greater than standing height eg ladder, roof
 - fall in the elderly
 - significant blow to head
 - severe penetrating wound eg gunshot

2. Immediate management

- Do primary survey **DRSCABCD** as per [Traumatic injuries, p. 134](#) + initiate any lifesaving measures
- **Maintain cervical spine (c-spine) in-line immobilisation:**¹

Cervical spine (c-spine) in-line immobilisation

- Support head in a neutral position in line with torso - avoid twisting/angular movements
- Use soft collar (as prompt to restrict movement) + sand bags to support neck if unconscious^{1,2}
- Padding may help - **adult**: 2 cm under head **child < 8**: use thoracic elevation device (TED)¹⁻³
- If conscious, ask them to stay still¹
- Restrict spinal movement until patient can undergo appropriate examination ± imaging⁴
- Lay flat on firm supportive surface

- Do vital signs + BGL
- Assess against [Criteria for early notification of trauma for interfacility transfer \(inside front cover\)](#)

3. Clinical assessment^{1,4}

- Do secondary survey **EFGHIJ** as per [Traumatic injuries, p. 134](#)
 - note mechanism of injury + check for symptoms of spinal injury eg:¹
 - tingling, numbness in the limbs - where⁶
 - weakness or inability to move the limbs (paralysis)
 - altered/absent sensation - where
 - nausea, headache or dizziness
 - head or neck in abnormal position
 - signs of head injury, altered LOC, shock
 - breathing difficulties - c-spine or thoracic injury can cause respiratory failure
 - change in muscle tone (flaccid/stiff)
 - loss of bladder or bowel control
 - priapism (persistent erection in males)

Use NEXUS criteria to assess risk of c-spine injury

NEXUS Criteria to assess risk of c-spine injury^{4,5}

- | | |
|----------|---|
| 1 | Midline cervical tenderness <ul style="list-style-type: none"> • Neck pain on palpation of the posterior midline neck area, from nuchal ridge to the 3rd thoracic prominence, or palpation of any cervical spinous process |
| 2 | Altered mental status <ul style="list-style-type: none"> • GCS < 15 • Disorientation to time, place, person or event • Inability to remember 3 objects at 5 minutes • Delayed or inappropriate response to external stimuli |
| 3 | Focal neurologic deficit <ul style="list-style-type: none"> • eg motor weakness, numbness/loss of sensation, paraesthesia, other eg priapism⁴ |
| 4 | Intoxicated - any of <ul style="list-style-type: none"> • Patient or observer reports recent history of intoxication/consumption of intoxicating substances • Odour of alcohol, slurred speech, ataxia, lack of coordination, or other cerebellar findings • Behaviour consistent with intoxication • Tests of bodily secretions are positive for drugs or alcohol affecting mental alertness |
| 5 | Painful distracting injury <ul style="list-style-type: none"> • Any non spinal related condition causing sufficient pain to distract patient from a possible cervical spine injury eg: <ul style="list-style-type: none"> – long bone fracture, significant visceral injury – large laceration, crush or degloving injury, large burns – other injury that could impair the patient's ability to appreciate cervical spine pain |

Patient is very unlikely to have c-spine injury if NONE of the above 5 criteria are present AND

- NO neck pain, bruising or deformity of neck + has full range of active neck movement (45° rotation left and right)^{2,4} **AND**
- NO other high risk factors ie:^{2,6}
 - age > 65 (higher incidence of degenerative disease)^{4,6}
 - fall + landing head first from a height eg diving, trampolining⁵
 - forced neck hyperflexion (low speed, high force eg rugby scrum collapse)²
 - high risk motor vehicle/bicycle accident eg head on collision, rollover, ejection from vehicle, death in same crash, speed > 88 km/hour^{2,4}
 - substantial torso injury (clavicles, abdomen, flanks, back, spine, pelvis), or thoracic/lumbar spine or face

How to log roll^{1,4} Min. of 3, preferably 5, people needed

- 1 person takes the lead. They are positioned at the patient's head to provide manual in-line stabilisation (with 2 hands) to the head and neck. This person gives instructions to the rest of the team
- 3 people (if available) perform the roll:
 - position along the patient's body opposite to the direction that the patient's head is facing
 - 1 at shoulders/chest; 1 at hips; and 1 in control of the legs
 - roll slowly maintaining spinal alignment, avoiding flexion, rotation, lateral bending, sagging of chest or abdomen. Keeping the patient's nose in line with the umbilicus at all times
- 5th person examines back, inserts/removes spinal board etc

4. Management

- If ANY NEXUS criteria, urgently consult MO/NP - requires evacuation ± CT scan^{4,5}
- **Consult MO/NP for clearance before stopping c-spine precautions, regardless of NEXUS criteria**
 - generally, if patient is alert, without neurological deficit, sober, does not have additional painful injuries, and has no pain along spine or neck, it is unlikely they have a spinal injury⁴
- Offer analgesia ± antiemetic. See [Acute pain, p. 32](#), [Nausea and vomiting, p. 40](#)
- If breathing difficulties - monitor SpO₂, capnography (if able) + VBG
- Continue to manage in collaboration with MO/NP until evacuation, which may include:
 - vital signs + neurological observations
 - monitoring respiration
 - nil by mouth
 - keep warm
 - IDC ± oro/nasogastric tube⁵
- If hypotensive consider neurogenic shock if hypovolaemia ruled out. **Note:** haemorrhage is most common cause of shock in trauma⁵
- If paraplegia or a level of sensory loss on the chest or abdomen, presume spinal instability:⁴
 - do not try to reduce an obvious deformity⁶

Moving patient with suspected spinal injury^{1,3}

- Provide in-line immobilisation of the c-spine during transfer and movement of the patient (manually support)
- Use scoop stretcher or log roll onto spinal board/vacuum mattress
- Do NOT leave on rigid spinal board - high risk of pressure ulcers/necrosis
- Use head blocks/sandbags to maintain cervical alignment⁶ - DO NOT strap as significant aspiration risk
- If extended immobilisation, straighten bedding and remove debris from under patient

5. Follow up

- As advised by MO/NP

6. Referral/consultation

- As above

HMP Abdominal injuries - adult/child

Background

- Missed abdominal injuries are a major cause of avoidable death in trauma patients¹
- The absence of abdominal pain does not rule out the presence of significant abdominal injury²

1. May present with

- Abdominal trauma
- General trauma

2. Immediate management

- Do primary survey **DRSCABCD** as per [Traumatic injuries, p. 134](#) + initiate any lifesaving measures
- Assess against [Criteria for early notification of trauma for interfacility transfer \(inside front cover\)](#)

3. Clinical assessment^{1,3}

- Do secondary survey **EFGHIJ** as per [Traumatic injuries, p. 134](#) including **examination of abdomen**
- Do eFAST if trained/available:
 - significant blood loss can occur without change to size of abdomen
 - **note:** –ve eFAST is not accurate in haemodynamically stable patient
- Urinalysis + pregnancy test if female of reproductive age²
- Repeated abdominal assessment needed, as life-threatening injury may not be obvious on initial assessment
- Consider concurrent [Fractured pelvis, p. 156](#)

4. Management^{1,3}

- Offer analgesia eg morphine or fentanyl. See [Acute pain, p. 32](#)
- Nil by mouth
- Keep warm
- Urgently consult MO/NP who may advise:
 - urgent evacuation
 - airway/ventilation support as needed + O₂
 - IV fluids - if haemodynamically compromised, to maintain sBP of 90
 - NG tube if no signs of facial/base of skull injury - on free drainage/aspirate periodically

Blunt injury eg fall from height, steering wheel, being forcefully struck, bicycle related, sports injury

- Can cause:¹⁻³
 - haemorrhage; solid organ injury eg liver/spleen, or hollow viscus injuries eg bladder/bowel
 - contamination by visceral contents + peritonitis
 - pelvic injuries
- Suspect serious injury if:¹
 - rebound tenderness, distension or guarding
 - seatbelt injury or concomitant femur fracture
 - signs of shock (cool, ↑ HR)

Penetrating injury eg gunshot, stab wounds

- May cause injury to liver, spleen, bowel, diaphragm, vessels²
- Do NOT remove impaled object(s) eg knife - removal can cause catastrophic haemorrhage¹
 - VERY CAREFULLY pack around object with gauze soaked in sodium chloride 0.9% and secure (packing/securing can result in further injury)
- If open wound, pack with soaked sodium chloride 0.9% pack
- Exposed bowel should be replaced if able to be done gently, otherwise cover with generously soaked sodium chloride 0.9% packs⁴
- If not evacuated, MO/NP may advise discharge after a period of observation:
 - advise to return immediately if symptoms worsen eg ↑ pain, ↑ HR, ↑ T or swelling of abdomen

Pregnant woman with abdominal trauma^{2,5}

- If > 20 weeks pregnant (uterus at level of umbilicus) - baby can compress the vena cava causing hypotension if lying flat:
 - lie on left side, or if spinal precautions/lying on back, elevate the right side 15–30° by placing a rolled towel/wedge under hip
- Can lose a significant amount of blood before ↑ HR, hypotension/signs of shock occur
- Blunt trauma (even minor) can cause placental abruption. See [APH, p. 390](#)
- Seek obstetric advice⁵ +
 - check for vaginal loss/bleeding
 - fetal heart rate (if skilled) + ask about baby's movements (normal or decreased)
 - monitor for contractions
 - if Rh D –ve blood group, see [Rh D immunoglobulin, p. 369](#)
- If ≥ 23 weeks pregnant, CTG (if available) for at least 4 hours
- Also see Qld Clinical Guideline *Trauma in pregnancy* <https://www.health.qld.gov.au/qcg/publications#maternity>

5. Follow up

- If not evacuated, advise to be reviewed the next day, or sooner if concerned:
 - consult MO/NP if ↑ pain, ↑ HR, ↑ T or any abdominal finding

6. Referral/consultation

- Consult MO/NP with any findings as above or if at high risk of serious injury because of circumstances

Fractures, dislocations and sprains

HMP Simple fracture of limbs - adult/child

Recommend

- Always consider non-accidental injury if presentation is inconsistent with history/explanation, is unexpected or you suspect abuse¹

Background

- Long bone fractures can result in major blood loss²

Related topics

[Dislocations, p. 158](#)

[Sprains/soft tissue injury, p. 159](#)

1. May present with²

- Injury + pain
- ± swelling, bruising, deformity, ↓ range of motion (ROM)

2. Immediate management

- Do primary + secondary survey as per [Traumatic injuries, p. 134](#)
- Assess against [Criteria for early notification of trauma for interfacility transfer \(inside front cover\)](#)
- **Immobilise/apply splint:**²
 - in neutral position if possible. If significant deformity get advice from MO/NP
 - immobilise joints above + below suspected fracture
 - if femur use traction splint eg femoral splint **or** adjacent leg as a splint¹
 - vacuum splint for all others¹
 - arm fractures use removable splint/sling
- Check neurovascular status before + after doing anything to the injured limb
- Offer analgesia. See [Acute pain, p. 32](#)
- **Note:** if pain out of proportion to what would be expected ± not responding to analgesia, suspect [Compartment syndrome, p. 160](#)
- **Consult MO/NP urgently if:**
 - if neurovascular compromise + skin over fracture site is blistering, white or stretched - ↑ risk of becoming open fracture, requires urgent reduction²
 - signs of neurovascular compromise distal to the site eg:
 - weakness or numbness
 - ↓ or absent pulses, delayed capillary refill
 - changes in colour
- If broken bone with wound ± visible bone, see [Open fractures, p. 154](#)

3. Clinical assessment

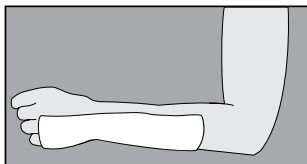
- **Ask about mechanism of injury +**
 - timing + events surrounding the injury
 - any witnesses, any first aid¹
 - if lower limb - could they weight bear immediately after injury - if not, may indicate fracture³
- **Get past history,** including:
 - previous fractures, when, treatment

- orthopaedic surgery
- comorbidities eg osteoporosis, arthritis, diabetes
- risk factors for complications eg immunocompromised, PVD, alcohol misuse, anticoagulants³
- **Check limb** + compare with other side for:
 - deformity, swelling, wounds
 - bruising, expanding haematoma¹
 - range of motion - painful or limited
 - inability to weight bear if lower limb^{4,5}
- Examine joints above + below for associated injuries eg elbow if fall onto outstretched hand⁵
- If elderly + fall - check for other injuries

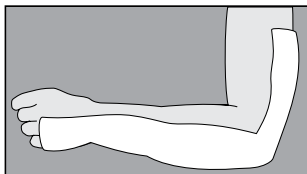
4. Management

- Consult MO/NP for all suspected fractures who may advise:
 - x-ray + backslab
 - nil by mouth
 - evacuation
- **Note:** after a fall on outstretched hand a scaphoid fracture may not be seen on x-ray. If tenderness, immobilise until follow up x-ray in consultation with MO/NP
- Keep warm + closely monitor until evacuation:⁶
 - vital signs + neurovascular observations + signs of [Compartment syndrome, p. 160](#)
- If not evacuated, ongoing management as per MO/NP

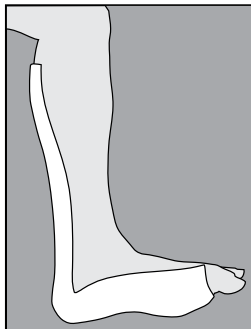
Plaster backslab ^{2,4}	
Positioning of slab	<ul style="list-style-type: none"> • Discuss with MO/NP + see Backslabs for guidance
What you need	<ul style="list-style-type: none"> • Plaster bandages eg 7.5/10 cm - short arms/wrists, 15/20 cm - long arm • Undercast padding • Bowl of cold water + trauma scissors • Crepe bandages ± sling
How to do	<ul style="list-style-type: none"> • Remove all rings, bracelets, watches, restrictive clothing, shoes² • Apply 2–3 layers of padding + 50% overlap beyond margins of plaster • Measure a length of plaster 1 cm shorter than the padding/stockinette at each end. Fold the roll in about ten layers to the same length • Submerge in water until bubbling stops, remove + squeeze out excess • Lightly mould to the contours of the limb in a neutral position • Plaster must not fully encircle the limb • Turn back padding over ends of plaster + apply crepe bandage firmly over slab • Elevate limb on pillows or sling for arm • Advise patient it may take 4–6 weeks to heal + Plaster care ± crutches if not evacuated
Plaster care advice⁴	<ul style="list-style-type: none"> • Elevate limb above level of heart when possible using a sling/pillows, will ↓ pain + swelling • Exercise fingers/toes + other joints that aren't covered by the plaster by bending/stretching/wiggling them • Avoid applying pressure + heat to the cast • Use plastic bag to protect plaster while in shower + do not scratch under the cast with a sharp object, if damaged return to clinic

Backslabs

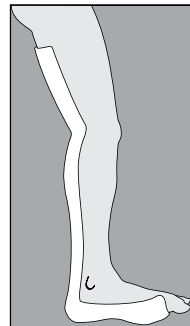
Short arm plaster backslab



Long arm plaster backslab



Short leg plaster backslab



Long leg plaster backslab

5. Follow up

- If not evacuated advise patient to be reviewed next day or sooner if needed:
 - if ↑ pain or swelling, numbness, tingling or skin colour changes to blue or white⁶ - urgently contact MO/NP

6. Referral/consultation

- Physiotherapist where possible

HMP Open (compound) fractures - adult/child**Recommend**

- Urgent surgical review. Keep nil by mouth + give antibiotics, ideally within 3 hours of injury¹

1. May present with

- Open wound on same limb segment as an associated fracture²
- Bone has broken the skin or mucous membrane ± visible bone¹
- Wound may be small eg puncture³

2. Immediate management

- Do primary + secondary survey as per [Traumatic injuries, p. 134](#)
- Assess against [Criteria for early notification of trauma for interfacility transfer \(inside front cover\)](#)
- Stop any bleeding by putting pressure on wound, not on exposed bone¹
- If signs of neurovascular compromise contact MO/NP urgently +
 - thoroughly irrigate with sodium chloride 0.9%
 - give antibiotics + requires urgent reduction
- Immobilise/apply splint as per [Simple fracture of limbs, p. 152](#):
 - irrigate with sodium chloride 0.9% if severely contaminated wound.³ **Do not probe²**
 - **do not irrigate open fractures of the long bones or foot⁴**
 - apply a saline-soaked dressing covered with an occlusive layer^{3,4}

- Insert IVC
- Give analgesia. See [Acute pain, p. 32](#)

3. Clinical assessment^{1,3}

- Assess as per [Simple fracture of limbs, p. 152](#) +
 - ask if contaminated environment eg agricultural, sewage, fresh or salt water¹
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)

4. Management

- Urgently consult MO/NP who may advise:
 - IV cefazolin ± IV metronidazole¹
 - x-ray, backslab, evacuation
 - neurovascular observations
 - nil by mouth

S4	Cefazolin			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	1 g	IV	Adult 2 g	stat
			Child 50 mg/kg (max. 2 g)	Inject slowly over at least 5 minutes
Offer CMI: May cause diarrhoea, nausea, vomiting, rash, headache or dizziness				
Contraindication: Allergy to cephalosporins or if severe or immediate allergic reaction to a penicillin. Be aware of cross-reactivity between penicillins, cephalosporins and carbapenems				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				1,5

S4	Metronidazole			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN must consult MO/NP				
Form	Strength	Route	Dose	Duration
Injection	500 mg/100 mL	IV	Adult 500 mg	stat
			Child 12.5 mg/kg (max. 500 mg)	Infuse over 20 minutes
Offer CMI: May cause nausea, anorexia, abdominal pain, vomiting, diarrhoea, metallic taste, dizziness, headache or thrombophlebitis				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,6

5. Follow up

- As per MO/NP advice

6. Referral/consultation

- All open fractures require consultation with local orthopaedic services

HMP Fractured pelvis - adult/child

1. May present with

- Suspected pelvic fracture post trauma eg:¹
 - tenderness of pelvic area
 - abnormal rotation of affected leg ± shock
- Major haemorrhage¹ + likely to have other injuries

2. Immediate management

- Do primary survey **DRSCABCD** as per [Traumatic injuries, p. 134](#) + initiate any life saving measures
- **Consult MO/NP/RSQ urgently - suspected fractured pelvis requires Early notification of trauma for interfacility transfer (inside front cover)**
- Do not spring the pelvis to check for stability - may dislodge clots + cause catastrophic haemorrhage²
- **Apply pelvic binder urgently** to ↓ risk of haemorrhage, even if low suspicion of fracture:³⁻⁵
 - slide under the legs + then buttocks⁶
 - apply over the greater trochanters + symphysis pubis region, **do not apply above iliac crests**¹
 - secure firmly, should be able to insert 2 fingers between patient + binder⁷
 - use sheet if binder not available
- Insert IVC x 2
- Give IV morphine or fentanyl. See [Acute pain, p. 32](#)
- Only log roll to clear airway if suction is ineffective/not available - may cause haemodynamic instability^{5,8}

3. Clinical assessment

- Do secondary survey **EFGHIJ** as per [Traumatic injuries, p. 134](#)
- Also check:¹
 - lower leg - pulses, power, sensation - any ↓
 - for blood at urethral opening + scrotal bruising - in males
 - urinalysis - for blood if possible, or take from IDC if inserted
- May also have genitourinary + [Abdominal injuries, p. 150](#)

4. Management

- MO/NP will advise further management eg x-ray is important if available
- Gently insert IDC if delay to evacuation
- Transport on scoop where possible⁵
- Keep warm + closely monitor until evacuation:
 - vital signs + signs of hypovolaemic shock
 - lower leg - pulses, power, sensation + pain

5. Follow up

- As per MO/NP/RSQ advice

6. Referral/consultation

- As above

HMP Fractured jaw - adult/child

Recommend

- Be alert to airway obstruction from bleeding or swelling

1. May present with

- Trauma to face + pain, swelling, bleeding, deformity, drooling^{1,2}

2. Immediate management

- Do primary survey **DRSCABCD** as per [Traumatic injuries, p. 134](#)
- Assess against [Criteria for early notification of trauma for interfacility transfer \(inside front cover\)](#)
- Consider need for [c-spine immobilisation, p. 147](#)

3. Clinical assessment

- **Ask about mechanism of injury +**
 - timing + events surrounding the injury
 - any witnesses, any first aid
- Do vital signs + secondary survey **EFGHIJ** as per [Traumatic injuries, p. 134](#)
- Assess as per [Head injuries, p. 143](#)
- Do full facial examination, including:
 - **check for signs of fractured jaw:**
 - clenched teeth not 'fitting together' as usual/misaligned
 - limited or painful mouth opening¹
 - unable to maintain bite on tongue depressor while twisted²
 - flattening, swelling of cheeks
 - difficulty swallowing²
 - **any other injuries eg:**²
 - mouth + tongue - lacerations, swelling
 - broken teeth - keep knocked out teeth for possible replacement. See [Trauma to teeth, p. 257](#)
 - orbit - palpate for step defect, numbness - may indicate fracture

4. Management

- Consult MO/NP who may consider:
 - IV antibiotics, x-ray, nil by mouth
 - evacuation/hospitalisation for surgical review
- Offer analgesia. See [Acute pain, p. 32](#):
 - consider ice packs + soft collar for comfort¹
- Check tetanus vaccination status and give booster if indicated.¹ See [Tetanus immunisation, p. 557](#)
- Consider [Domestic and family violence, p. 241](#)
- Closely monitor until evacuation + frequent airway checks

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

HMP Dislocations - adult/child

Background

- Pulling or pushing of a bone out of its normal position in the joint¹

1. May present with

- Injury + severe pain that is worse on movement + very apprehensive to move joint²
- ± deformity, associated fractures
- Reports of popping or joint rolling out of place - mainly shoulder dislocations¹

2. Immediate management

- Offer analgesia. See [Acute pain, p. 32](#)
- Support limb using pillows as needed + apply ice packs as tolerated
- If simple dislocation eg patella, digit + skilled - quickly reduce to alleviate pain
- Contact MO/NP if signs of neurovascular compromise distal to the site eg:
 - weakness or numbness
 - ↓ or absent pulses, delayed capillary refill
 - changes in colour

3. Clinical assessment

- Ask about mechanism of injury +
 - timing + events surrounding the injury. Any witnesses, any first aid
- Get past history:
 - previous dislocations, when, was it reduced, if so how/which manoeuvre¹
 - any orthopaedic surgery or underlying conditions eg osteoporosis²
- Do physical examination, including:^{1,2}
 - vital signs
 - check range of motion - painful or limited + palpate joints above and below injury - any tenderness, swelling

4. Management

- Consult MO/NP who may advise:
 - x-ray to check for fracture + if can be reduced locally, or
 - evacuation/hospitalisation
- Collaborate with MO/NP on reduction manoeuvres - if skilled + appropriate. Consider:
 - nil by mouth
 - IV analgesia/sedation or methoxyflurane or nitrous oxide + O₂ (Entonox®)¹
 - monitor neurovascular status before + after reduction:
 - if shoulder - check sensation over deltoid muscle, nerve can be damaged during reduction
 - after care eg x-ray + immobilise joint/limb²

5. Follow up

- As per MO/NP

6. Referral/consultation

- Refer to physiotherapist if available

HMP Sprains/soft tissue injury - adult/child

Recommend

- Be alert to associated injuries eg fractures + dislocations¹
- In children consider fibula fracture, often misdiagnosed as a sprain

Background

- Sprain is over stretching to incomplete or complete tear of the ligament²

1. May present with

- Injury + swelling, bruising + pain on movement²
- No fracture seen on x-ray

2. Immediate management

- Contact MO/NP if signs of neurovascular compromise distal to the site eg:
 - weakness or numbness
 - ↓↓ or absent pulses, delayed capillary refill
 - changes in colour + T
- Offer analgesia. See [Acute pain, p. 32](#)
- Support limb using pillows as needed + apply ice packs

3. Clinical assessment

- If child, infections of joints often present with a history of injury. See [Swollen/painful joint, p. 550](#)
- **Ask about mechanism of injury +**
 - timing + events surrounding the injury
 - any witnesses, any first aid
 - if ankle - could they weight bear immediately after injury - if not may indicate fracture²
- Get past history:
 - similar injury, when, treatment - ankle sprains are often recurrent²
- Do physical examination, including:¹
 - vital signs
 - check for signs of **severe sprain**:
 - severe pain, extensive bruising + swelling
 - complete inability to weight bear
 - loss of motion + stability + abnormal joint movement
 - palpate joints above + below injury - any tenderness, swelling

4. Management

- **If severe** contact MO/NP, who may advise:
 - x-ray ± cast for 10–14 days + non-weight bearing activity/crutches
- **If mild or moderate sprain:**
 - Rest + limit activity until pain free use is possible:²
 - may need crutches for 2–3 days until standing is no longer painful^{1,3}
 - Ice for 48 hours - apply for 20 minutes on/20 minutes off as needed for pain/swelling²
 - Compression for 1st few days - bandage is better for ↓↓ swelling than rigid splint²
 - Elevate above level of heart to ↓↓ pain + swelling²
 - Refer to physiotherapist if available

- Reassure patient pain should ↓ gradually + most sprains heal well^{1,2}

5. Follow up

- Advise patient to be reviewed if:^{2,3}
 - changes to limb/joint - T, pallor, numbness, pins + needles or swelling
 - pain continues, increases or is not relieved by analgesia
 - contact MO/NP + consider fracture, compartment syndrome

6. Referral/consultation

- As above

HMP Compartment syndrome - adult/child

Recommend

- Limb threatening emergency - urgent evacuation for surgical management^{1,2}
- Be alert in all limb injuries eg closed leg + forearm fractures, crush injuries or treatment causing compression/constriction eg casts/splints, circumferential bandaging²

Background

- Hypoxia of muscle + nerves caused by bleeding + swelling in closed muscle cavity, leading to necrosis + amputation¹

1. May present with

- Limb injury + pain out of proportion to what would be expected ± not responding to analgesia¹
- If child - anxiety, agitation, unable to rest comfortably³

2. Immediate management

- Remove any bandaging, casts/splints to relieve pressure:³
 - leave a portion of cast/splint to stabilise fracture as needed
- Rapidly assess:²
 - pain - severity, is it responding to analgesia
 - passively extend fingers/toes distal to injury, does this cause pain
 - any ↓ sensation, numbness, pins + needles + absent pulses - compare to opposite limb^{1,4}
- Contact MO/NP urgently, even if low suspicion of compartment syndrome²
- Offer analgesia. See [Acute pain, p. 32](#)
- Rest, apply ice packs + elevate the limb to heart level with pillows^{1,4}
- Insert IVC

3. Clinical assessment

- Ask about:
 - mechanism of injury, when, treatment so far
 - underlying bleeding disorders, anticoagulants²
- Do physical examination, including:
 - vital signs
 - check entire limb for swelling³
 - palpate muscles - firm, tight, tenderness³

4. Management^{1,4}

- Consult MO/NP who will:
 - order x-ray to exclude displaced fracture
 - arrange urgent evacuation
 - advise further management eg splinting of limb to prevent further ↑ pressure
- Nil by mouth
- Closely monitor until evacuation:²
 - vital signs + neurovascular observations at least hourly
 - pain

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

Acute wounds

HMP Acute wounds - adult/child Wound repair

1. May present with

- Acute traumatic wound eg laceration, abrasion, tear, scrape
- Blood under nail with pain

2. Immediate management

- Apply direct pressure for 10–15 minutes to control bleeding:¹
 - if bleeding persists, consider suturing/stapling (or using hair as a tie for scalp)²
 - see [Traumatic injuries](#), p. 134 as relevant
- Do not remove any penetrating foreign body eg knife, unless advised by MO/NP to do so³
- If shock **from blood loss** (cool, HR > 100, capillary refill > 2 seconds):³
 - insert IVC x 2
 - IV fluid bolus (warmed if possible) - sodium chloride 0.9% or Hartmann's:
 - **adult** 1 L (250 mL increments, aim to maintain SBP at 90). **Child** 10–20 mL/kg
- If **bat bite** or scratch, see [Bat bite/scratch](#), p. 176 - **requires urgent treatment**
- Offer analgesia. See [Acute pain](#), p. 32 ± consider local anaesthetic

3. Clinical assessment^{1,4}

- Get history including:
 - mechanism of injury/how it happened
 - time/date of injury
 - where did it occur eg dirt, oil, water, mud, other contaminated area
- Get past history, including:
 - diabetes, smoking, peripheral vascular disease
 - steroid medicines
 - bleeding disorder/anticoagulants
- Do vital signs
- **Assess wound:**
 - site:
 - if chest or abdomen, be wary of penetration through the body wall - consult MO/NP as needed
 - size - length + depth
 - skin or tissue loss
 - direction of entry. This will help track the wound
 - bony tenderness - suggests an underlying fracture. See [Open fractures](#), p. 154
 - swelling - suggests bleeding into the tissues
 - any bones, joints, vessels, nerves, muscles damaged²
 - if stab wound, evaluate for depth/underlying damage - consult MO/NP¹
- **Could there be a foreign body (FB).** Suspect if:¹
 - stepping on anything eg glass, wood/sticks, metal, fish barbs, bones
 - projectiles thrown by machinery
 - assault eg knives, bottles, glass, spears, arrows
 - limb going through glass

- **Check:**¹
 - colour, warmth and pulses distal to the wound
 - sensation around and below the wound (before putting in anaesthetic)
 - movement of joints above and below the wound
- **If arm or hand injury:**⁵
 - assess tendons of the hand through range of motion:
 - extensors - straighten the fingers against resistance
 - flexors - make a fist
 - thumb - raise it to the ceiling (palm up) + make an 'O' with the little finger, both against resistance
- **X-ray or USS may be indicated if:**¹
 - underlying fracture suspected
 - foreign body suspected but cannot be identified visually:²
 - **note:** no foreign body on x-ray does not exclude a FB in the wound, unless you are sure it would be radio-opaque
- If wound looks infected, take swab for MCS.⁶ See [How to take a wound swab, p. 324](#)

4. Management²

- If [tetanus prone wound, p. 557](#) check vaccination status and give booster if indicated
- If wound over a fracture or penetrating wound into joint, see [Open fractures, p. 154](#)
- Consult MO/NP if:¹
 - damaged tendons, nerves, vessels or fracture suspected
 - systemic infection eg fever, malaise **OR** localised infection involving deeper tissues (eg bones, joints or tendons) **OR** penetrating wound through footwear⁶
- Remove rings, watches etc from the affected limb
- **Clean wound thoroughly** - important to prevent infection:¹
 - may need to use local anaesthetic prior to cleaning
 - use sodium chloride 0.9% or tap (drinking) water:⁷
 - ensure dirt, grass, other contamination is removed
 - **deeper wounds** need irrigation to get dirt out:¹
 - running tap water, or use 18 G cannula, without the stylet + 20–50 mL syringe
 - repeat a number of times - may need 500 mL or more
 - **gravel rash** - if bitumen and dirt ground into skin with abrasion, after anaesthetic, scrub with a brush to remove ground in dirt⁸
- **If foreign body possible:**
 - explore wound - use small probe or forceps. Can often feel foreign body before seeing it
 - do not explore deep wounds with spurting blood or near large vessels eg neck, groin, armpits
 - if glass - may be fragments remaining - consult MO/NP¹

Antibiotics⁶

- Not usually needed for recent clean wounds, especially if cleaned properly
- **May be needed if:**
 - sustained in water eg coral cuts, stingray barb, fish hook. See [Water related wounds, p. 170](#)
 - bite - [Human and animal bites, p. 173](#)
 - over a fracture. See [Open fractures, p. 154](#)
 - significantly contaminated eg through footwear, stab wound, or requiring surgical management:
 - consult MO/NP
 - localised infection eg redness, pus. Give antibiotics as per mild [Cellulitis, p. 306](#)⁶ **OR** [Water related wounds, p. 170](#) **OR** [Bites, p. 173](#) if indicated. Also consider retained FB

Wound management options.^{1,8} Also see **Special sites/considerations** (next page)

- Leave open to the air eg grazes and superficial cuts in clean dry areas of the body
- Simple dressings eg for grazes and small cuts, not gaping
- Wound closure/repair
- Healing by secondary intention (no formal closure) eg if a deep stab/puncture wound, infection, contaminated or > 24 hours old

Wound closure/repair

- Primary closure - if clean wound < 12–18 hours old (or up to 24 hours if head wound):^{1,2}
 - **do not close if:**⁴
 - dirty, contaminated, infected or at high risk of infection eg deep puncture wounds, [Bites](#), p. 173 or [Water related wounds](#), p. 170
- Delayed primary closure - delay repair for 3–5 days to allow for proper cleaning:
 - eg for dirty or complex wounds. Usually needs debridement before closure. Consult MO/NP

Primary closure options

Goal is to stop bleeding and achieve optimal cosmetic results without increasing risk of infection²

Option	Indications
Adhesive strips ⁸ eg Steri-Strip®	<ul style="list-style-type: none"> • Simple lacerations with slightly separated wound edges • Not suitable if movement or tension across the wound or oozing blood • Skin tears in the elderly/wounds over the shin, even large ones • Skin barrier wipe eg 3M Cavilon®, on the skin helps them stick
Tissue (skin) adhesive ^{2,8}	<ul style="list-style-type: none"> • Wounds < 3 cm, with clean edges that are easily held together • DO NOT use around eyes or on mucosal surfaces, or if actively oozing blood
Sutures ⁴	<ul style="list-style-type: none"> • Larger wounds, areas with high skin tension, over joints/moving areas • Do not suture if a lot of tension needed to bring it together eg tissue loss
Staples ⁹	<ul style="list-style-type: none"> • Useful for linear wounds on scalp, trunk, arms, legs • DO NOT use on face, neck, hands or feet • Align wound edges, staple across wound, about 0.5–1 cm apart • Need staple remover on hand
Hair apposition technique ² If hair ≥ 3 cm long	<ul style="list-style-type: none"> • Cost effective, fast, less painful approach to scalp laceration repair < 10 cm • Twist together 3–7 strands of hair on 1 side of wound. Do the same on the other side. Interlock by twisting together 360°. No need to tie a knot • Secure intertwined hair bundles with a few drops of skin adhesive

Preparation for wound repair¹

- **Local anaesthetic options:**²
 - lidocaine (lignocaine) 1% - use for most wounds. Inject via the wound and under the skin (don't go through the normal skin, it hurts more)
 - lidocaine (lignocaine) 1% with adrenaline (epinephrine) 1:100,000 for longer lasting anaesthetic + reduction of bleeding
 - topical lidocaine (lignocaine) + tetracaine (amethocaine) + adrenaline (epinephrine) gel eg Laceraine® (eg in children)
 - **Digital nerve block** for fingers/toes
- **Debride as needed** - remove dead/dying tissue from in/around wound. Use scalpel or scissors
- Do not remove hair unless it interferes with wound closure or knot formation:
 - do not shave; do not remove eyebrows¹

S4	Lidocaine (lignocaine)			Extended authority ATSIHP/IHW/RIPRN
ATSIHP, IHW and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Injection	1% 50 mg/5 mL	Subcut	up to 3 mg/kg (max. 200 mg)	stat
Offer CMI: It will hurt as it goes in. Report any drowsiness, dizziness, blurred vision, vomiting or tremors				
Note: Use the lowest dose that results in effective anaesthesia				
Management of associated emergency: Ensure resuscitation equipment readily available. Consult MO/NP. See Anaphylaxis, p. 82				

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S4	Lidocaine (lignocaine) + adrenaline (epinephrine)			Extended authority ATSIHP/IHW/IPAP/RIPRN
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Injection	Lidocaine (lignocaine) 1% (50 mg) + adrenaline (epinephrine) 1:100,000/5 mL	Subcut	Adult and child > 12 years up to 7 mg/kg (max. 500 mg) <i>Dose as per lidocaine component</i>	stat
Offer CMI: It will hurt as it goes in. Report any drowsiness, dizziness, blurred vision, vomiting, tremors or anxiety. May cause pallor, tachycardia, hypertension, sweating or arrhythmias				
Note: Use the lowest dose that results in effective anaesthesia. Use with caution in fingers, toes and ears				
Contraindication: Avoid in Raynaud's phenomenon or if peripheral vascular disease. Do not use on penis or tip of nose				
Management of associated emergency: Ensure resuscitation equipment readily available. Consult MO/NP. See Anaphylaxis, p. 82				

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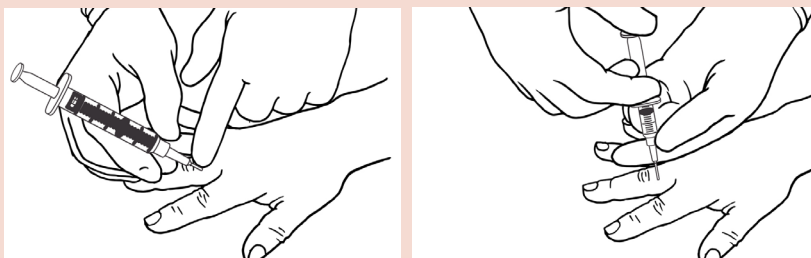
S3	Lidocaine (lignocaine) + tetracaine (amethocaine) + adrenaline (epinephrine) eg Laceraine®			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Gel	Lidocaine 4.2% + tetracaine 0.5% + adrenaline (epinephrine) 0.2%/4 mL	Topical	0.1 mL/kg (1–3 years: max. 2 mL) (> 3 years: max. 3 mL)	stat
Offer CMI: Stinging can occur initially. Anaesthesia lasts for 40–60 minutes				
Note: Apply to wound directly or with a cotton tipped applicator, then cover with occlusive dressing. Leave for 20–30 minutes (max. 60 minutes) - blanching of the area should occur. Then remove dressing and gel				
Contraindication: Do not apply to extremities eg fingers, toes, ears, nose due to risk of ischaemia. Do not apply to mucous membranes				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

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Digital nerve block¹

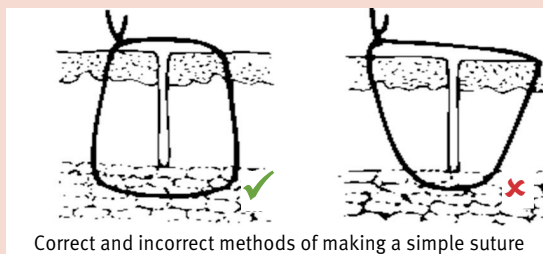
- Infiltrate lidocaine (lignocaine) 1% near the digital nerve on each side of the dorsum of the finger, avoiding the joint. Keep infiltration as close to the bone as possible
- Use approximately 1–2 mL of lidocaine (lignocaine) on each side
- Draw back regularly to avoid injecting into a blood vessel
- Wait at least 5 minutes for the anaesthetic to take effect

**Suturing^{2,4}**

- For skin use polypropylene eg Prolene® or nylon eg Ethilon®²

Area	Size (approx.)	Removal ^{2,4}
Face, neck	5/0	3–5 days
Scalp	3/0	7–10 days
Digits, palm, sole	4/0, 5/0	10–14 days
Legs, trunk	3/0, 4/0	7–10 days
Arms		

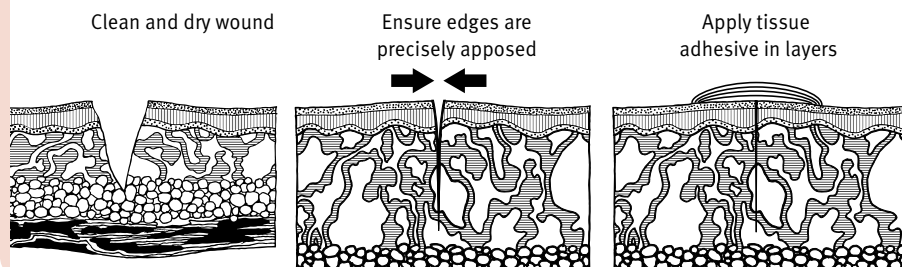
- Use smallest suture that will give sufficient strength to bring edges together and support the wound
- **Placing suture(s):**
 - aim to evert skin edges, like puckered lips
 - enter skin at 90° angle, about 5 mm from the wound edge. Go straight down, across, then straight up and exit the skin about 5 mm from the other edge
 - place first suture halfway along the wound and continue to divide the wound in half. The first suture may lose tension when the others are completed. If so, take it out and re-insert new suture
 - when suturing a 'V' or 'Y' shaped wound, align the point of the 'V' first
 - if the wound crosses wrinkles or skin creases, line up as well as possible
- Take sutures out if they are in the wrong place and re-insert
- **If you are not happy repairing any wound, don't do it. Consult MO/NP**
- **Note:** sutures can cause a pink foreign body inflammation around the wound



Correct and incorrect methods of making a simple suture

Tissue adhesive^{2,8} eg Dermabond®

- Do NOT allow adhesive to get into the wound - will act like a foreign body
- Bring wound edges together and apply very small amount of adhesive to surface
- Hold edges together for 30 seconds
- Repeat with layers of adhesive (at least 3), allowing time for drying between each application
- **Note:**
 - avoid contact around eyes - if applying to forehead pad the eye to avoid adhesive dripping into eye
 - do not use over bleeding wounds
 - avoid gluing yourself (eg gloves or equipment) to the patient
- Does not require removal - comes off in 1–2 weeks

**Special sites/considerations**⁴

Face ²	<ul style="list-style-type: none"> • Only repair if confident of getting a good cosmetic result • Limit debridement - increased blood supply to face helps healing + could cause ↑ scarring • Be aware that there may be damage to facial nerves
Nose or ears ²	<ul style="list-style-type: none"> • Consult MO/NP. Cartilage has poor circulation and prone to infection + necrosis
Lips ^{2,8}	<ul style="list-style-type: none"> • Lips swell +++ when wounded • Lacerations to inner lips will usually heal without intervention • If the wound crosses the edge of the lip onto normal skin (vermillion border), ensure it is realigned exactly. Place 1st suture at this border + mark border prior to anaesthetic, as may blur border
Inside mouth and tongue ⁸	<ul style="list-style-type: none"> • Sutures not usually needed unless large laceration - consult MO/NP • Will look grey and sloughy after a few days - advise mouth rinses after each meal
Eyelid and Eyebrow ^{2,8}	<ul style="list-style-type: none"> • If eyelid, consult MO/NP - may need ophthalmology referral. Also see Eye injury, p. 286 • Do not use tissue adhesive near eyes • Use edges of eyebrow as landmarks. Put single suture at each margin first to ensure good alignment²
Hand and forearm ²	<ul style="list-style-type: none"> • If suspected tendon, nerve, muscle, vessel, bone or nail bed injury, consult MO/NP - may need specialist review² • Take rings off - fingers swell after injury • Keep sutures to fingers a minimum, as they will pull out of the tissue as the finger enlarges. Most finger lacerations can be treated without sutures. Use Steri-Strips® carefully to keep wound edges approximated: <ul style="list-style-type: none"> – circumferential or tightly tensioned Steri-Strips® can cause vascular occlusion – apply a nonadherent dressing + bandage the whole finger so that it stays in a functional position of minimal flexion

Special sites/considerations (continued)

Small laceration to finger tip

- Skin flap not lost:
 - reapply the flap over the wound and secure it loosely with Steri-Strips®
 - cover with a nonadherent dressing and bandage the finger to keep it straight
 - review in 2–3 days. Hopefully the flap will ‘take’ and act as a graft onto the wound. More often the flap will die off, but at least it covers the wound well until it heals
- Skin loss:⁸
 - if ≤ 1 cm square treat with dressings, usually heal well
 - if > 1 cm consult MO/NP

Crush injury or partial amputation of finger eg in hinge of door, hammer^{8,13}

- **Consult MO/NP**
- If nail lacerated/lifted - where/how much. MO/NP will advise if nail should be removed or replaced. If removed, keep nail as possible splint
- Assess integrity of nail bed - if damaged needs meticulous repair - poor technique results in a permanently split or deformed nail
- Consider x-ray to look for an underlying fracture
- Clean and apply sodium chloride 0.9% dressing to keep moist
- If needed, put amputated part in a clean plastic bag and seal it. Put bag in a mix of crushed ice and water for transport. Do not get it wet/frozen - send with patient when evacuated

Painful subungual haematoma (blood under nail)¹⁴

- If significant pain drain blood from under the nail. Otherwise treat with ice and analgesia⁸
- Use needle or hot cautery method to put hole through nail
- **Needle method:**
 - twirl 18–21 G needle with slow downward pressure until loss of resistance and drainage is seen (avoiding nail bed injury). Multiple holes may be needed for adequate drainage
- **Hot cautery method:**
 - straighten the end of a paper clip and heat with a flame
 - place the hot end on the nail over the centre of the haematoma
- Gently squeeze tip of finger to facilitate drainage
- Irrigate wound with sodium chloride 0.9%

5. Follow up

- Advise:⁴
 - if Steri-Strips® keep dry for 72 hours⁸
 - if wound repaired, leave dressing in place for 24 hours, then leave open to air⁴
 - if wound at higher risk of infection or patient has diabetes/immunocompromised:
 - review in 2–3 days
 - elevate as needed to lessen pain/swelling
 - to return if signs of infection eg redness, pus, swelling, fever
 - when to return for sutures/staple removal. Tissue adhesive (including if used for hair), will come off by itself²

6. Referral/consultation

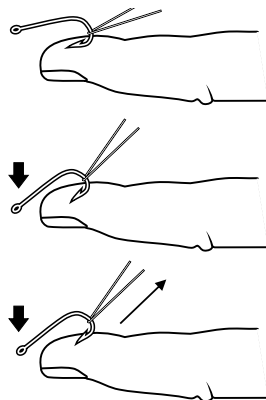
- Consult MO/NP as above

Removal of small fish hook

- If involves eye consult MO/NP immediately
- Large hooks may require surgical intervention. Consult MO/NP
- Clean area with Betadine® or chlorhexidine ± sodium chloride 0.9% irrigation prior to removal¹
- May need antibiotics. See [Water related wounds, p. 170](#)
- Wear protective eye wear if pulling or cutting hook

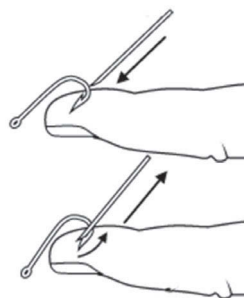
Method 1 String yank¹

- Do not use on body part that is not fixed eg earlobe
- Loop a length of string/fishing line around the bend in the hook
- Apply downward pressure to the shank of the hook, to disengage the barb, thereby moving it into the original path of the barb
- Maintaining downward pressure, use a quick, firm tug on the string to remove the hook
- In most cases local anaesthesia is not needed



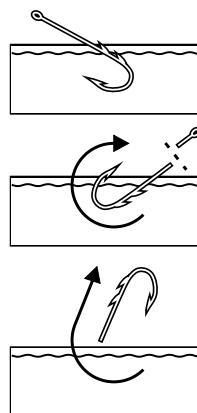
Method 2 Needle cover¹

- Insert an 18 G needle along the barbed side of the hook, with the bevelled part pointing towards the inside of the hook's curve
- Pull gently on the shank to disengage the barb inside of the hook's curve
- Then push the needle gently downwards until its hole locks over the barb
- Rotate the hook shank slightly downward and the hook curve upwards until the needle and hook are removed through the original wound



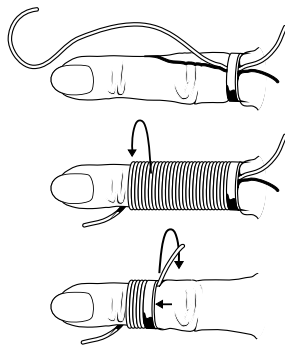
Method 3 Push through and cut off^{1,2}

- Always have forceps (needle holding) gripping at least one end of the hook, so as not to lose the hook
- Grip the hook with forceps, advancing the hook through the tissue until the barb end of the hook penetrates through the skin at a separate location
- Cut the eye off the hook with a pair of wire cutters
- Grip the barbed end of the hook with forceps and guide the hook out



Removal of tight ring¹

- Use thread eg 3/0 nylon suture material, string, dental floss or thin elastic
- Feed one end of thread under ring (a paper clip makes a good hook)
- Tightly wrap the finger with the thread - from proximal to distal end, while keeping tension on the thread
- Pull the proximal end of the thread towards the tip of the finger - the thread will start to unwind as you pull it and push the ring towards the tip
- Gradually the ring will slide over the compressed finger
- Several repetitions of the process may be required
- If unsuccessful use ring cutter



HMP Water related wounds - adult/child

Recommend¹

- Close monitoring of wound infections related to water immersion. Can progress rapidly

Background¹

- Immersion in water includes:
 - fresh or brackish water/mud eg creeks, estuaries, mangrove swamps
 - salt water, swimming pools, fish tanks, ponds

1. May present with¹

- Wound sustained with water immersion or mud eg boat propeller, prawn/crayfish shells, fish spines, coral cut, aquarium objects, surfing, fish hook
- Marine animal bite eg shark, crocodile
- ± signs of infection eg redness, pus, fever

2. Immediate management¹

- Initial management as per [Acute wounds, p. 162](#)
- Do vital signs
- Screen for [Sepsis, p. 64](#)

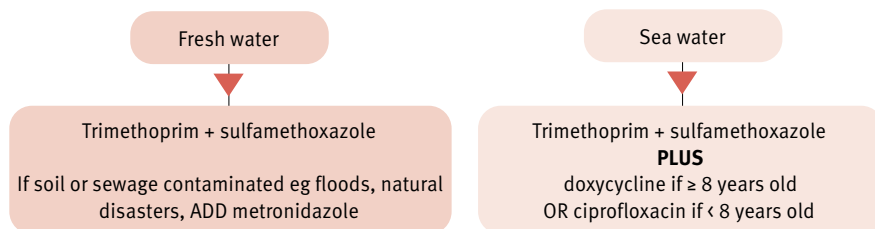
3. Clinical assessment¹

- Get history and examine wound as per [Acute wounds, p. 162](#), including:
 - when/how the wound occurred
 - type of water immersion eg fresh water/brackish/mud or sea water
 - look for signs of infection eg fever, redness, swelling, pus, [Cellulitis, p. 306](#)
- Get past history including:
 - diabetes, liver disease, immunocompromised, iron overload, malignancy
- If wound infected, take swab for MCS. See [How to take a wound swab, p. 324](#)

4. Management¹

- Offer analgesia. See [Acute pain, p. 32](#)
- Manage as per [Acute wounds, p. 162](#) +
 - irrigate/clean well and debride as needed - **important to prevent infection**
 - do not suture - allow to heal by secondary intention. Consult MO/NP as needed for advice
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)
- **Consult MO/NP promptly** (may order IV/oral antibiotics ± evacuation) - **if any of:**
 - systemically unwell eg malaise, fever, chills (insert IVC + blood cultures)
 - deeper tissues, tendons or joints involved (or unsure)
 - diabetes, liver disease, immunocompromised, iron overload, malignancy
- **Otherwise, give oral antibiotics if:**¹
 - mild/localised wound infection **OR**
 - traumatic wound and significantly contaminated or needs surgical management **OR**
 - marine bite, especially if:
 - on hand, feet, face or puncture wound **OR**
 - > 8 hours delay to medical care

Oral antibiotics if indicated¹



S4	Trimethoprim + sulfamethoxazole			Extended authority ATSIHP/IHW/IPAP/RIPRN
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Tablet	80 + 400 mg 160 + 800 mg	Oral	Adult 320 + 1600 mg bd Child ≥ 1 month 8 mg/kg (max. 320 mg) bd <i>Dose as per trimethoprim component</i>	5 days
Oral liquid	40 + 200 mg /5 mL			
Offer CMI: Take with food to reduce stomach upset. May cause fever, nausea, vomiting, diarrhoea, itch, rash or sore mouth. Avoid sun exposure. Report straight away if sore throat, fever, rash, cough, breathing difficulties, joint pain, dark urine or pale stools				
Note: If renal impairment, taking ACE inhibitor or potassium, HIV or SLE seek MO/NP advice				
Pregnancy: Do not use in the 1st trimester or in late pregnancy				
Contraindication: Severe or immediate allergic reaction to sulfonamides, megaloblastic anaemia, severe hepatic impairment, elderly				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,2

S4	Metronidazole			Extended authority ATSIHP/IHW/IPAP/RIPRN	
ATSIHP, IHW, IPAP and RN must consult MO/NP					
RIPRN may proceed					
Form	Strength	Route	Dose	Duration	
Tablet	200 mg, 400 mg	Oral	Adult 400 mg bd	5 days	
Oral liquid	200 mg/5 mL		Child 10 mg/kg (max. 400 mg) bd		
Offer CMI: Avoid alcohol while taking and for 24 hours after finishing the course. Take tablet with food to reduce stomach upset. Take oral liquid 1 hour before food for better absorption. May cause nausea, anorexia, abdominal pain, vomiting, diarrhoea, metallic taste, dizziness or headache					
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82					1,8

S4	Doxycycline				Extended authority ATSIHP/IHW/IPAP/RIPRN	
ATSIHP, IHW, IPAP and RN must consult MO/NP						
RIPRN may proceed						
Form	Strength	Route	Dose			Duration
Tablet	50 mg 100 mg	Oral	Adult 100 mg bd			5 days
			Child ≥ 8 years			
			< 26 kg	50 mg	bd	
			26–35 kg	75 mg		
			> 35 kg	100 mg		
Offer CMI: Take with food or milk to reduce stomach upset. May cause nausea, vomiting, diarrhoea, epigastric burning, tooth discolouration or photosensitivity. Take with a large glass of water. Do not lie down for an hour after taking. Do not take iron, calcium, zinc or antacids within 2 hours. Avoid sun exposure						
Pregnancy: Safe in the first 18 weeks						
Contraindication: Serious allergy to tetracyclines. Taking oral retinoids. After 18 weeks of pregnancy						
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82						

1,3

S4	Ciprofloxacin			Extended authority ATSIHP/IHW/IPAP/RIPRN
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Tablet	250 mg 500 mg	Oral	Child < 8 years 12.5 mg/kg (max. 500 mg) bd	5 days
Offer CMI: Take 1 hour before, or 2 hours after meals. Drink plenty of fluids. Do not have dairy products, zinc, iron or calcium within 2 hours of taking as reduces absorption. Avoid sun exposure. May cause dizziness or faintness, rash, itch, nausea, vomiting, abdominal pain or indigestion. Stop taking if any tenderness, inflammation or develop numbness or tingling in toes. Can cause severe diarrhoea (colitis) due to <i>C. difficile</i>				
Note: If renal impairment, epilepsy seek MO/NP advice. There is no liquid for children. Disperse one 250 mg tablet in 5 mL water to make approximate concentration of 50 mg/mL. As it has a bitter taste, follow dose with flavoured drink eg juice				
Contraindication: Serious allergy to quinolones, peripheral neuropathy				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				1,6,7

5. Follow up

- Follow up results of MCS if taken. If needed, modify antibiotics in consultation with MO/NP
- Advise return for review in 1–2 days +
 - monitor wound closely for signs of infection eg redness, swelling, increased pain. Infection can spread rapidly
 - immediately return if:
 - any signs of localised infection - start antibiotics if not already. Consult MO/NP if worsening
 - systemic features eg fever, malaise - **urgently consult MO/NP**

6. Referral/consultation

- Consult MO/NP as above

HMP Human (tooth-knuckle) and animal bites - adult/child

Recommend¹

- Bites often become infected. Ensure thorough cleaning, irrigation, debridement, elevation and immobilisation

1. May present with¹

- Tooth-knuckle injury - hand is lacerated by another persons teeth eg a punch in the mouth
- Human or animal bite

2. Immediate management

- Initial management as per [Acute wounds, p. 162](#)
- If bite from a bat, see [Bat bite/scratch, p. 176](#) + contact MO/NP urgently

3. Clinical assessment¹

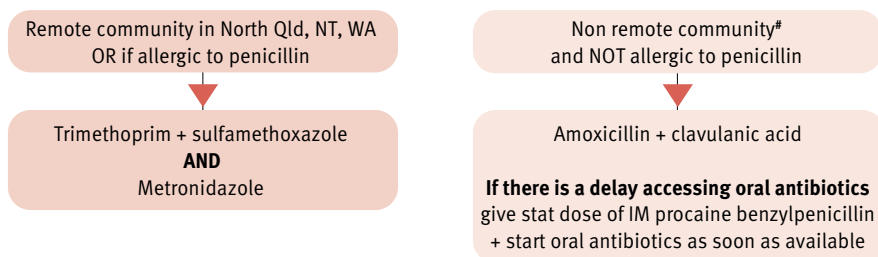
- Get history and examine wound as per [Acute wounds, p. 162](#) +
 - how/when the bite happened. If animal, what type
 - carefully examine for:
 - deeper injuries, dead tissue, retained foreign bodies eg small teeth from animal
 - signs of infection eg fever, redness, swelling, pus, [Cellulitis, p. 306](#)
 - if human, was there any blood exposure - prophylaxis for hep B ± HIV, [p. 476](#) may be indicated
- Get past history including:
 - diabetes, alcoholic liver disease, immunocompromised
- If wound infected, take swab for MCS. See [How to take a wound swab, p. 324](#)

4. Management¹

- Offer analgesia. See [Acute pain, p. 32](#)
- Manage as per [Acute wounds, p. 162](#) +
 - irrigate/clean well and debride as needed - **important to prevent infection**
 - do not suture. Allow to heal by secondary intention. Consult MO/NP as needed for advice
 - elevate and immobilise affected limb
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)
- If human bite(s) consider [Domestic and family violence, p. 241](#)

- **Consult MO/NP promptly** (may order IV/oral antibiotics ± evacuation/surgical drainage) - **if any of:**
 - systemically unwell eg malaise, fever, chills, ↓ range of motion, pus (insert IVC + blood cultures)
 - deeper tissues, tendons or joints involved (or unsure)
 - **Open fractures**, p. 154 present/suspected
- **Otherwise, give oral antibiotics if:**
 - mild/localised wound infection **OR**
 - risk of wound infection high (**'presumptive'** treatment) ie:
 - > 8 hours delay to medical care
 - puncture wound that cannot be debrided adequately
 - is on hands, feet or face
 - diabetes, alcoholic liver disease or immunocompromised
 - cat bite

Oral antibiotics if indicated¹



#If prior MRSA infection or MRSA suspected treat as per Remote community in North Qld, NT, WA

S4	Trimethoprim + sulfamethoxazole			Extended authority ATSIHP/IHW/IPAP/RIPRN
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Tablet	80 + 400 mg 160 + 800 mg	Oral	Adult 160 + 800 mg bd Child ≥ 1 month 4 mg/kg (max. 160 mg) bd <i>Dose as per trimethoprim component</i>	Presumptive 3 days Localised infection 5 days
Oral liquid	40 + 200 mg /5 mL			
Offer CMI: Take with food to reduce stomach upset. May cause fever, nausea, vomiting, diarrhoea, itch, rash or sore mouth. Avoid sun exposure. Report straight away if sore throat, fever, rash, cough, breathing difficulties, joint pain, dark urine or pale stools				
Note: If renal impairment, taking ACE inhibitor or potassium, HIV or SLE seek MO/NP advice				
Pregnancy: Do not use in the 1st trimester or in late pregnancy				
Contraindication: Severe or immediate allergic reaction to sulfonamides, megaloblastic anaemia, severe hepatic impairment, elderly				
Management of associated emergency: Consult MO/NP. See Anaphylaxis , p. 82				

1,2

1,2

S ₄	Metronidazole		Extended authority ATSIHP/IHW/IPAP/RIPRN		
ATSIHP, IHW, IPAP and RN must consult MO/NP					
RIPRN may proceed					
Form	Strength	Route	Dose	Duration	
Tablet	200 mg, 400 mg	Oral	Adult 400 mg bd	Presumptive 3 days	
Oral liquid	200 mg/5 mL		Child 10 mg/kg (max. 400 mg) bd	Localised infection 5 days	
Offer CMI: Avoid alcohol while taking and for 24 hours after finishing the course. Take tablet with food to reduce stomach upset. Take oral liquid 1 hour before food for better absorption. May cause nausea, anorexia, abdominal pain, vomiting, diarrhoea, metallic taste, dizziness or headache					
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82					1,3

S ₄	Amoxicillin + clavulanic acid		Extended authority ATSIHP/IHW/IPAP/RIPRN	
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Tablet	875 mg + 125 mg	Oral	Adult 875 + 125 mg bd Child ≥ 2 months 22.5 mg/kg (max. 875 mg) bd <i>Dose as per amoxicillin component</i>	Presumptive 3 days Localised infection 5 days
Oral liquid	400 mg + 57 mg/5 mL			
Offer CMI: Take with food. May cause rash, diarrhoea, nausea or thrush. Can cause severe diarrhoea (colitis) due to <i>C. difficile</i>				
Contraindication: Severe or immediate allergic reaction to a penicillin. Be aware of cross-reactivity between penicillins, cephalosporins and carbapenems				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,4

S ₄	Procaine benzylpenicillin (procaine penicillin)			Extended authority ATSIHP/IHW/IPAP/RIPRN
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Prefilled syringe	1.5 g/3.4 mL	IM	Adult 1.5 g Child 50 mg/kg (max. 1.5 g)	stat
Offer CMI: May cause diarrhoea, nausea and pain at injection site				
Contraindication: Severe or immediate allergic reaction to a penicillin. Be aware of cross-reactivity between penicillins, cephalosporins and carbapenems				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

5. Follow up

- Follow up results of MCS if taken. If needed, modify antibiotics in consultation with MO/NP
- If antibiotics given, advise to be reviewed daily, especially tooth-knuckle injuries. If swollen, decreased range of motion, pus or not improving consult MO/NP - may need evacuation

6. Referral/consultation

- Consider referral to physiotherapist for hand therapy after tooth-knuckle injury

HMP Bat bite/scratch - adult/child

Australian Bat Lyssavirus (ABLV), rabies

Recommend¹

- **Urgent Post-Exposure Prophylaxis (PEP)** - rabies vaccine ± human rabies immunoglobulin
- Assume all Australian bats have lyssavirus which causes rabies
- Advise to not handle bats + avoid land animals in rabies enzootic countries, including Bali, Indonesia eg dogs, cats + monkeys around temples

Background¹

- If rabies develops, it is almost always fatal

1. May present with¹

- Scratch, bite, nibble or lick from:
 - bat in Australia or overseas (alive or dead < 4 hours)²
 - land dwelling mammal in rabies enzootic country eg monkey, dog, cat

2. Immediate management¹

- Immediately + thoroughly wash bite wounds + scratches with soap and water **for at least 5 minutes**
- Apply antiseptic with anti-virus action eg Betadine®.² **Do not suture**

2. Clinical assessment^{1,2}

- Get history, including:
 - type of animal, date, time, place of exposure
 - prior rabies vaccine(s), when
 - immunocompromised
 - was the bat/animal displaying unusual behaviour; did it look sick/become sick
 - type of exposure eg:
 - minor scratch or abrasion - with or without bleeding
 - nibbling of uncovered skin
 - transdermal bites or scratches
 - contamination of mucous membrane (eg eye, nose, mouth) with saliva from licks
 - licks on broken skin

4. Management^{1,2}

- **Get URGENT advice from Public Health Unit ± MO/NP in ALL CASES who will advise + arrange PEP:**
 - see rabies vaccine/immunoglobulin indications + doses and administration advice in the *Australian immunisation handbook* <https://immunisationhandbook.health.gov.au/vaccine-preventable-diseases/rabies-and-other-lyssaviruses>
- If possible (and safe), the bat should be tested for rabies - Public Health Unit will advise²
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation](#), p. 557
- Consider antibiotics if indicated, as per [Bites](#), p. 173

5. Follow up

- As per MO/NP/Public Health Unit

6. Referral/consultation

- Clinical exposure + laboratory confirmed lyssavirus and rabies is notifiable ①

Burns

HMP Burns - adult/child

1. May present with

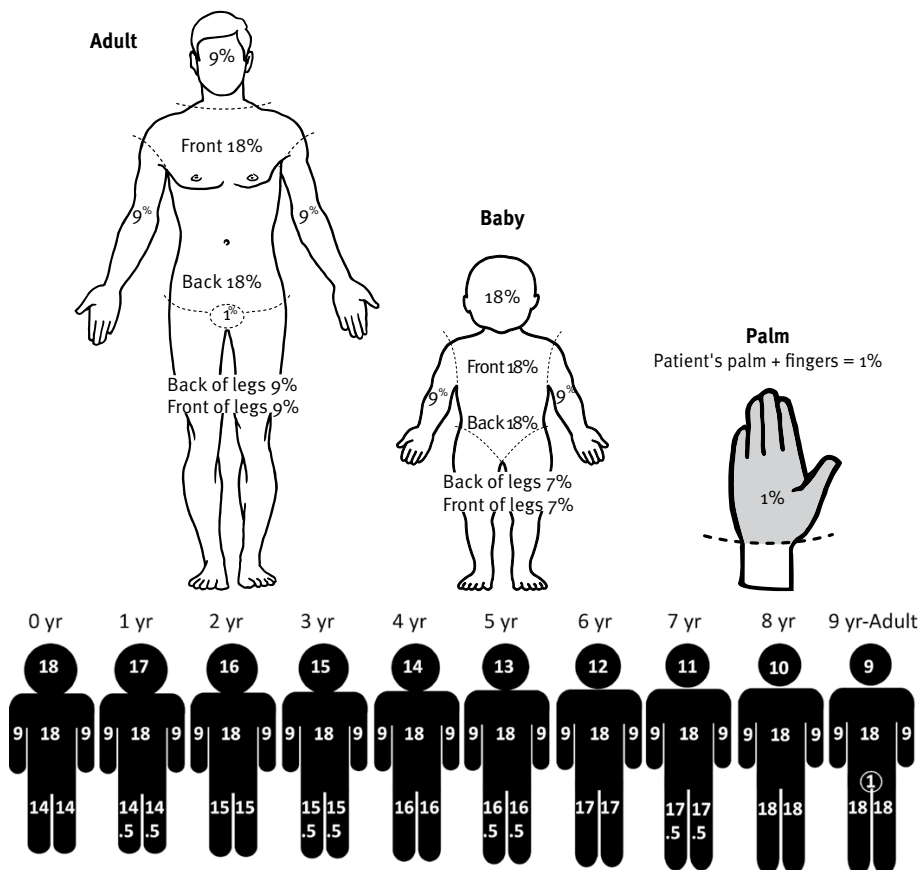
- Burn eg boiling water, fire, chemical, electrical, lightning

2. Immediate management¹⁻³

- **DRSCABCD** as per [Traumatic injuries, p. 134](#)
- If safe, stop burning process. Remove from source of injury eg hot water or charred clothing:
 - if chemical burn use PPE if necessary
- Specific to burns, also check:
 - **Airway:**
 - foreign material
 - respiratory distress - stridor, hoarse voice, harsh cough, SOB, wheeze
 - soot, sputum, facial burns, black carbon around nostrils
 - if compromised insert oropharyngeal airway, [LMA, p. 56](#) or early intubation
 - maintain spinal precautions especially with explosion or electrical burns
 - **Breathing:**
 - expose chest and ensure expansion is adequate and bilateral
 - circumferential chest burns may require escharotomy. Get urgent MO/NP or Burns Unit advice
 - O₂ to maintain SpO₂ > 95% if needed
 - **Circulation:**
 - colour, HR, BP, capillary refill time (normal ≤ 2 seconds)
- **Cool burn with cool running tap water for ≥ 20 minutes** - effective up to 3 hours after injury:
 - reduce duration if burn is large or multiple trauma. May cause rapid heat loss
 - brush away any chemical first
 - if no running water, use 2 moistened towels or pads. Alternate at 15 second intervals
 - stop cooling if T < 35
 - keep remaining areas dry and warm to avoid hypothermia eg space blanket
 - if [Chemical contact burns, p. 182](#) copious amounts of water needed for at least 60 minutes, consider shower. **Note:** avoid washing chemical over unaffected skin/eyes
- **Remove jewellery and clothing as soon as possible eg rings, belts, watches:**
 - to visualise burn and to prevent ischaemic necrosis of digits
- **Get rapid history:**
 - how, when and with what were they burnt
 - any first aid, what and for how long
- **Assess** (according to tables/graphics on following pages):
 - **pain + offer analgesia.** See [Acute pain, p. 32](#). Consider IV morphine if severe pain
 - **total body surface area % (TBSA) of burn.** Use 'Rule of nines' or the NSW Trauma App https://aci.health.nsw.gov.au/networks/itim/about_itim/trauma-app
 - **burn depth**
 - **criteria to contact Burns Unit** for early advice ± transfer. **Send photos**
 - weight (if possible)

3. Clinical assessment

Rule of Nines to assess total body surface area % (TBSA)¹⁻⁴



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Assess burn depth¹

Depth	Epidermal	Superficial mid-dermal	Mid-dermal	Deep-dermal	Full thickness
Colour	<ul style="list-style-type: none"> Red Warm to touch 	<ul style="list-style-type: none"> Pink 	<ul style="list-style-type: none"> Dark pink 	<ul style="list-style-type: none"> Pale pink Blotchy red 	<ul style="list-style-type: none"> White Charred
Capillary refill time	<ul style="list-style-type: none"> < 2 seconds 	<ul style="list-style-type: none"> Slower 	<ul style="list-style-type: none"> Sluggish > 2 seconds 	<ul style="list-style-type: none"> Sluggish to absent 	<ul style="list-style-type: none"> None
Sensation	<ul style="list-style-type: none"> Painful 	<ul style="list-style-type: none"> Very painful Raw, sensitive 	<ul style="list-style-type: none"> Painful 	<ul style="list-style-type: none"> Decreased sensation 	<ul style="list-style-type: none"> Nil
Blisters	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> Present 	<ul style="list-style-type: none"> Large, rupture within hours 	<ul style="list-style-type: none"> No blistering

Criteria to contact Burns Unit¹⁻⁴

- | | |
|---|---|
| <ul style="list-style-type: none"> • > 10% TBSA adults • > 5% TBSA in children • Full thickness > 5% TBSA • Pre-existing illness • Associated major trauma • Non-accidental burn | <ul style="list-style-type: none"> • Inhalation burn injury • Electrical burns • Chemical burns • Pregnant • Young children or elderly • Burns to face, hands, feet, genitalia, perineum, major joints or circumferential limb or chest |
|---|---|
- **Qld Adult Burns Centre RBWH** and page Burns Registrar on 07 3646 8111
 - **Qld Children's Hospital Brisbane** contact **CATCH** on 13 22824
 - **Townsville University Hospital** for all North Qld children with < 50% TBSA and page Paediatric Surgeon on 07 4433 1111
 - Contact local Burns Unit if outside of Qld

4. Management¹⁻³

- Treat as **severe burn** if:
 - **child < 18 months** with > 10% TBSA burns
 - **child > 18 months** with > 15% TBSA burns
 - **adult** with > 20% TBSA burn
 - inhalation injury or compromised breathing
 - high voltage electrical injury
- Otherwise go to [Minor burns, p. 181](#) for ongoing management
- For additional management of a **minor burn** caused by a chemical, see [Chemical contact burns, p. 182](#)

Severe burn

- Contact MO/NP or RSQ for urgent evacuation
- **Circumferential burns:**
 - escharotomy may be required if distal to burn:
 - capillary refill is sluggish or absent
 - pulse is weak or absent
 - skin is cool to touch
 - consult Burns Unit
- **Monitor vital signs:**
 - be alert to respirations < 10 or > 20
- **Insert IVC x 2 or Intraosseous, p. 57**
 - burns are wet and slippery. Consider suturing IVC in situ or secure with bandage
 - insert through burn if necessary. Remove within 24 hours
- **Take bloods:¹**
 - FBC, UE, CK, LFT, BGL, group and hold, coagulation studies
 - lipase, carboxyhaemoglobin
 - consider drug and alcohol screen

- **Start fluid resuscitation:**
 - fluid resuscitation of inhalation burns may cause swelling of the airway - contact Burns Unit first
 - for adult and child - IV Hartmann's using Parkland's formula:
 - **3–4 mL IV fluid x %TBSA x kg/24 hours¹⁻³**
 - 1/2 in the first 8 hours post injury then
 - 1/2 over next 16 hours
 - additional **maintenance fluids** are required if < 16 years. Discuss with MO/NP or Burns Unit
- **Insert IDC and measure output hourly:¹⁻³**
 - urine output should be:
 - **adult 0.5 mL/kg/hour**
 - **child 1 mL/kg/hour**
 - if output:
 - < 0.5 mL/kg/hour - increase IV fluids by 1/3 of current IV fluid amount
 - > 1 mL/hour for adult or > 2 mL/kg/hour for child - decrease IV fluids by 1/3 of current IV fluid
- **Insert nasogastric tube if child receiving fluid resuscitation**
- **Wound care prior to evacuation:**
 - clean with sodium chloride 0.9% or chlorhexidine 0.1%
 - remove small loose skin/blisters
 - use cling wrap to cover burns:
 - lay longways over burns
 - this is a sufficient dressing for < 8 hours
 - use paraffin based dressings for face
- **Assess for and manage other injuries.** See secondary survey in [Traumatic injuries, p. 134](#)
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)

5. Follow up

- As per MO/NP and Burns Unit
- Consider non-accidental injury (if injury/presentation inconsistent with history) eg self inflicted injury, elder abuse, [Domestic and family violence, p. 241](#), + consider [Child protection, p. 551](#):
 - + contact police

6. Referral/consultation

- Consult MO/NP as above

HMP Minor burns - adult/child

1. May present with^{1,3}

- An epidermal or superficial dermal burn:
 - < 10% TBSA in adult
 - < 5% TBSA in child
- Blistered, painful, pale pink/red, raw, brisk capillary return
- From scald, minor flame or other heat contact

2. Immediate management

- Cool with running water for at least 20 minutes within the first 3 hours of injury

3. Clinical assessment

- Assess as per [Burns, p. 177](#)

4. Management^{1,3}

- Offer analgesia. See [Acute pain, p. 32](#)
- Clean with sodium chloride 0.9% or clean water and mild soap
- Remove all foreign matter, loose and non viable skin and tissue
- Debride blisters if > 2.5 cm or over joints
- Dress according to **Minor burn dressing** table below:
 - unless concerned about infection, dress wounds **as infrequently as possible** to allow healing
 - expect exudate in the first 72 hours. Use absorbent gauze or foam
 - switch to a low adhesive paraffin dressing once risk of infection is low
 - ensure dressing is secure and non-constrictive
 - elevate affected area as appropriate

Minor burn dressing ^{1,2,5}		
	Epidermal burn	Superficial mid-dermal burn
Character	<ul style="list-style-type: none"> • Painful • Epidermis damaged/intact • Red 	<ul style="list-style-type: none"> • Blistered • Painful, raw • Pale pink, red • Brisk capillary return within burn margin
Dressing	<ul style="list-style-type: none"> • Soothing moisturisers • Vaseline • Paraffin gauze 	<ul style="list-style-type: none"> • Absorbent dressings • Foams • Alginates • Silicone dressings <p>If contaminated:</p> <ul style="list-style-type: none"> • Silver products • Silver sulfadiazine cream dressing where adherence to regimen is a concern

S4	Silver sulfadiazine			Extended authority ATSIHP/IHW/IPAP/RIPRN
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Cream	1%	Topical	Adult and child > 2 months Apply a 3–5 mm thick layer	3 days max. after burn
Offer CMI: May cause burning, itch or rash. Avoid contact with eyes				
Note: Discard tube 7 days after opening. 1 tube per person				
Contraindication: Premature infants, infants < 2 months, or in last month of pregnancy				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				
4				

5. Follow up

- Review daily initially or sooner if:
 - fever
 - increased pain, redness, swelling or purulent exudate
- Consult MO/NP if wound(s):
 - become infected
 - are unhealed or poorly granulating > 14 days

6. Referral/consultation

- Consult MO/NP as above

HMP **Chemical contact burns** - adult/child

Hydrofluoric acid, cement, phosphorus, bitumen, petrol, other acids + alkalis

Recommend

- Contact Poisons Information Centre (PIC) ☎ 13 11 26 (24 hours) or local Burns Unit. See [Burns, p. 177](#)

Background

- Can be a fluid, powder or gas
- **Alkalis** causing burns:
 - drain cleaners, oven cleaners, denture cleaners, household bleach, detergents and cleaners
 - cement, pool chlorine
- **Acids** causing burns:
 - stain removers and cleaners, battery and rust proofing fluids
 - fertilisers, swimming pool and laboratory chemicals
 - electroplating, glass etching and light bulbs chemicals

1. May present with¹

- History of exposure to chemical agent
- Visible burn or excoriation that may appear superficial
- Pain due to tissue destruction and toxicity
- Hypotension/shock

2. Immediate management^{1,2}

- Strict use of PPE
- Remove contaminated clothing
- First brush away all dry chemical powders eg cement, lime, phosphorous
- Then prolonged irrigation with water \geq 20 minutes. Consider shower
- Offer analgesia. See [Acute pain, p. 32](#)

3. Clinical assessment

- Assess as per [Burns, p. 177](#)
- Do vital signs
- Get history, including:
 - how, when and with what were they burnt
 - any first aid, what and for how long
 - identify **active ingredients** if possible
 - if hydrofluoric acid determine:
 - concentration %
 - onset of symptoms:
 - within an hour for $> 40\%$ concentration
 - within 24 hours $< 10\%$ concentration
 - if bitumen determine:
 - if any circumferential hardened bitumen is causing constriction of limb

4. Management

- If a **severe burn** continue to manage as per [Burns, p. 177](#)
- Consult MO/NP
- Additional chemical burn management information below

Hydrofluoric acid¹⁻³

- Extremely toxic
- Maintain PPE standards
- **To neutralise the acid** consult MO/NP or PIC who may order:
 - **calcium gluconate:**
 - IV for systemic toxicity
 - topically for dermal exposures applied liberally to site using:
 - 2.5% gel **OR**
 - 1 ampoule 2.2 mmol/10 mL **mixed with** 30 g water soluble gel (eg KY Jelly®)
 - nebulised in O₂ or air for inhalational exposures using:
 - 1 ampoule 2.2 mmol/10 mL - **dilute** 1 mL with 3 mL of sodium chloride 0.9%
- If i-STAT available, check potassium, calcium and magnesium
- Consult MO/NP for evacuation/hospitalisation
- Observe for 6 hours after exposure
- Asymptomatic patients with a normal serum calcium concentration can be discharged
- Also see [Poisoning and overdose, p. 211](#)

Bitumen burns^{4,5}

- For severe bitumen burns refer to the Burns Unit. See [Burns, p. 177](#)
- Do not remove large bitumen areas. Cooled bitumen will form a waterproof, sterile layer which

- prevents the burn from drying out
- In consultation with the Burns Unit:
 - if hardened circumferential bitumen is causing constriction, use a hydrophobic solvent to soften and split the bitumen eg orange oil (De-Solv-It®) or petroleum jelly
 - small bitumen areas can be gently removed with the same solvent
 - any remaining bitumen will naturally fall off in time due to re-epithelialisation
- Do not** remove bitumen from the eye. Evacuate for specialist assessment and management
- If not evacuated, see [Minor burns, p. 181](#) for dressing options

Cement, phosphorous, petrol¹

- Remove visible particles
- If dressing is required see [Minor burns, p. 181](#)
- Consider evacuation if symptomatic

Unscheduled	Calcium gluconate			Prescribing guide
RIPRN and RN only. Must be ordered by an MO				
Form	Strength	Route	Dose	Duration
Injection	2.2 mmol/10 mL	IV	Adult 30 mL Child 0.6 mL/kg (max. 30 mL)	stat Inject slowly over 5–10 minutes in a large peripheral vein
Offer CMI: To neutralise effects of hydrofluoric acid				
Note: High risk medicine and is rapidly fatal in overdose. Extravasation can cause tissue necrosis				
Contraindication: Subcut and IM route				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				3,6

5. Follow up

- Review daily
- According to MO/NP or Burns Unit recommendations

6. Referral/consultation

- As above

Environmental emergencies

HMP Decompression illness (DCI/bends) - adult/child

Recommend

- All divers who become unwell should be discussed with a diving medicine physician urgently¹
- If transport by air is required, movement at lowest possible safe altitude or in pressurised cabin is recommended

Background

- DCI/bends is nitrogen bubble formation in the blood/tissues due to the changes in pressure while diving²
- 90% of illness after diving are dive related³
- Also see *Assessing potential diving related illness* https://qheps.health.qld.gov.au/__data/assets/pdf_file/0026/335294/sw210.pdf. If outside of Qld, see local protocol

1. May present with

- Consider in anyone feeling unwell after diving¹

2. Immediate management⁴

- **DRSABCD**
- Do vital signs + give 100% O₂ via non-rebreather mask at 15 L/minute **regardless of SpO₂**
- If early-onset DCI is suspected ie ≤ 30 minutes of surfacing:
 - lay the patient flat if possible
 - if conscious + difficulty breathing when flat, place in a comfortable position
- Urgently contact MO/NP for all unwell divers regardless of time since last dive¹

3. Clinical assessment

- **Ask about symptoms:**⁴
 - joint/muscle pain in limbs or torso - most common symptom³
 - numbness/tingling
 - extreme fatigue
 - dizziness/vertigo
 - muscle weakness in arm(s) ± legs
 - headache, nausea, vomiting, passing urine normally³
- **Get dive(s) details, including:**⁴
 - time of surfacing + onset of symptoms
 - any first aid + response⁴
 - number of recent dives + duration, bottom time, depth, decompression stops, speed of ascent, surface interval
- Ask about any alcohol in last 24 hours + other causes of dehydration
- Relevant past history eg hole in the heart^{2,3}
- Do physical examination, including:
 - **GCS, p. 562** + neurological observations. Any confusion
 - check joints - any ↓ range of motion³
 - balance + coordination

- skin - mottled/blotchy rash⁴
- Also check for associated barotrauma eg pneumothorax, ruptured eardrum:²
 - listen to chest - equal breath sounds + chest wall movement
 - eardrums - any redness, bulging, retraction or blood

4. Management

- MO/NP will advise further management eg IDC, rehydrate with oral or IV fluids⁴
 - **note:** IV glucose containing solutions **should NOT be given**¹
- Monitor closely until evacuation +
 - keep flat + during evacuation if possible¹
 - continue 100% O₂ ± air breaks as per MO/NP
 - keep warm, not hot - avoid sun exposure, unnecessary activity + excess clothing^{2,4}
- Offer ibuprofen. See [Acute pain, p. 32](#)

5. Follow up

- As per MO/NP/specialist

6. Referral/consultation

- Hyperbaric Medicine Unit:
 - Townsville University Hospital ☎ 07 4433 1111
 - Royal Brisbane + Women's Hospital ☎ 07 3646 8111
- Divers Emergency Service ☎ 1800 088 200, to speak directly to hyperbaric doctor

Hypothermia - adult/child

Recommend^{1,2}

- Prolonged CPR until normothermic or until MO/NP advise to stop - complete recovery is possible
- Do not rewarm in bath

Background^{1,2}

- Hypothermia is when a body's core T falls below 35

1. May present with^{1,2}

- Following exposure to cold ±
 - shivering, ↑ muscle tone
 - pale, cool skin
 - impaired coordination, slurred speech
 - apathy/confusion/loss of consciousness
 - slow RR

2. Immediate management¹

- DRSABCD
- **Handle GENTLY to prevent arrhythmias:**¹
 - the hypothermic heart is very sensitive to movement. Rough handling may precipitate arrhythmias including VF or asystole
 - **note:** most arrhythmias resolve spontaneously with rewarming
- Remove wet clothing + dry patient, place in warm, wind free environment + allow to shiver

- Do vital signs + BGL
- Start continuous cardiac monitoring
- Start rewarming eg warm blankets, heating pads + warming devices if available
- Contact MO/NP, **urgently if T < 32, slow irregular HR, ↓ BP or ↓ LOC**
- Give warm sweetened drinks (not alcohol) if fully conscious^{1,2}

3. Clinical assessment¹

- Ask about:
 - length of exposure, time since
 - any first aid + witnesses
- If not exposure related, look for other causes eg:
 - drug intoxication/stimulants
 - recent neurological events, illnesses, infections
 - underlying endocrine disorders eg diabetes
- Do physical examination while limiting exposure to prevent further heat loss, including:
 - ECG
 - look for other injuries + any muscle stiffness
 - check extremities for exposure injuries - any numbness, pain, do they look pale + waxy
 - i-STAT - UE

4. Management¹

- Consult MO/NP who may advise:
 - IV glucose 10% - start rate at: **adult** 100 mL/hour, **child** 3–5 mL/kg/hour:
 - then ↑ rate until BGL 5.5–11
 - warmed sodium chloride 0.9% if fluid resuscitation required - give cautiously as per MO/NP
 - take bloods - coagulation studies
 - evacuation/hospitalisation
- Monitor closely until evacuation:
 - vitals signs + continuous cardiac monitoring
 - keep warm
- If mild hypothermia T 32–35 + patient spontaneously rewarms once removed from the cold:¹
 - discuss discharge with MO/NP

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

HMP Hyperthermia - adult/child

Heat exhaustion, heat stroke

Recommend

- Paracetamol, aspirin + ibuprofen are ineffective + should not be used to actively cool¹

Background¹

- Heat stroke is life-threatening. Core T > 40 + can result in organ failure
- Heat exhaustion is usually mild. Associated with exercise + dehydration. May be difficult to distinguish from heat stroke

1. May present with²

- Hot, sweaty + breathless ±
 - dizziness, faintness
 - nausea, vomiting or diarrhoea
 - signs of shock eg ↓ LOC, pale skin
 - dry skin - lack of sweating is a serious sign

2. Immediate management²

- DRSABCD**
- Lie the patient in a cool place or in the shade + loosen/remove excess clothing
- Rapidly assess + do vital signs
- Start cooling + contact MO/NP, urgently if T ≥ 40** - may indicate heat stroke¹
- If > 5 years** immerse whole body from neck down in cold as possible water eg bath for 15 minutes
 - if no bath, do combination of:
 - wet with cold/cool water, under shower/hose
 - apply ice packs to groin, armpits, cheeks, palms + soles
 - repeatedly moisten the skin with a moist cloth + fan continuously
- If < 5 years** cool in lukewarm bath or repeatedly moisten the skin with a moist cloth + fan continuously
- Give cool/cold water to drink if fully conscious²
- If shivering - risk of heat gain:¹
 - insert IVC + give IV midazolam, **note:** small dose of only 0.5–1 mg for an adult

S4	Midazolam			Extended authority RIPRN
RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Injection	5 mg/5 mL	IV	Adult and child 0.01 mg/kg	stat MO/NP may order further doses at 5 minutely intervals until shivering is suppressed
Offer CMI: May cause drowsiness or respiratory depression				
Note: Caution calculating and measuring low dose. Monitor for sedation + respiratory depression				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1

3. Clinical assessment

- Ask about:^{1,2}
 - any signs of infection, recent illnesses - consider [Sepsis, p. 64](#)
 - recent activity/exercise in hot conditions
 - if child have they been left in a car¹
 - inadequate fluid intake
 - illicit drugs or medications which affect heat regulation - consider drug associated hyperthermia eg anticholinergics, stimulants, SSRIs/MAOIs, antipsychotics¹
 - any muscle pain
- Do physical examination, including:¹
 - BGL
 - ECG + continuous cardiac monitoring
 - listen to chest - any crackles, wheeze
 - look for petechial haemorrhages, bruising
 - palpate muscles - any tenderness
 - urinalysis for leucocytes, nitrites, blood + note colour of urine
 - i-STAT - UE¹

4. Management

- **If $T < 40$ + symptoms resolve ≤ 30 minutes, likely heat exhaustion:¹**
 - discuss discharge with MO/NP +
 - advise on prevention eg keep cool, wear light coloured, loose-fitting clothing, drink plenty of fluids on hot days² + delay return to activity/sports ≥ 48 hours¹
- **If likely heat stroke, MO/NP may further advise:**
 - IV fluids, give cautiously based on clinical parameters eg urine output + BP
 - bloods - LFT, coagulation studies¹
 - stop cooling if T about 38 to avoid overcooling¹
 - insert IDC
 - evacuation/hospitalisation
- If drug associated hyperthermia - MO/NP may order:³
 - cold IV fluids at maintenance rate, rarely > 20 mL/kg is required
 - **note:** IV fluid stored in a standard refrigerator is approx. 4°C
- Monitor closely until evacuation - vital signs, airway + urine output

5. Follow up

- As per MO/NP

6. Referral/consultation

- Consider child safety reporting for children being left in a car. See [Child protection, p. 551](#)

Ears, nose and throat (ENT) emergencies

HMP Nose bleed/epistaxis - adult/child

Background¹

- 95% of nose bleeds are anterior and are usually managed by simple compression of nose

1. May present with

- Nose bleed

2. Immediate management^{1,2}

ALERT suspect [Button battery](#), [p. 80](#) insertion or ingestion in child with blood around nostrils. If lodged in the oesophagus, it can burn a hole through to the aorta causing catastrophic haemorrhage

- **DRSABCD**
- **If active bleeding + SHOCKED²** (major obvious epistaxis in process) (cool, ↑ HR, CRT > 2 seconds):
 - urgently consult MO/NP + urgent evacuation
 - insert [Anterior nasal pack](#), [p. 191](#) eg Rapid Rhino®
 - IVC x 2
 - take bloods - FBC, group and hold, coagulation studies²
 - start IV sodium chloride 0.9% 10–20 mL/kg
 - MO/NP may order IV tranexamic acid.¹ See drug box in [Traumatic injuries](#), [p. 134](#)
 - **If not controlled**, MO/NP may advise:
 - [Posterior nasal pack](#), [p. 192](#) (take out anterior pack first)
 - ± remove pack and trying other nostril
 - ± Rapid Rhino® to both nostrils
- **If active bleeding + NOT shocked²**
 - apply continuous pressure on the lower third of nose with thumb and forefinger for 5–10 minutes¹
 - sit upright, lean forward
 - breathe through mouth + spit blood out rather than swallowing
 - **if not stopped after 10–15 minutes^{1,2}**
 - reapply pressure and reassess (incorrect pressure most common cause of continued bleeding)
 - spray lidocaine (lignocaine) + phenylephrine into nostrils
 - insert absorbable pack eg Kaltostat®
 - continue applying pressure
 - **if still bleeding:**
 - remove Kaltostat® and insert [Anterior nasal pack](#), [p. 191](#) eg Rapid Rhino®
 - urgently consult MO/NP
 - continue to manage as per 'if active bleeding + shocked' above

3. Clinical assessment^{1,2}

- Do vital signs
- Get history, including:
 - onset, duration and severity of bleeding
 - prior nose bleeds - when, how often, severity, treatment
 - **red flags** for tumour eg nasal blockage, facial pain/swelling, headaches, deep toothache, teenage male¹

- **risk factors** for nose bleed:
 - nose or facial trauma, nose picking, CPAP use
 - prior nasal surgery
 - intranasal medicine or drug use
 - bleeding disorders (or family history of), easy bruising
 - kidney/liver disease, hypertension
 - taking anticoagulants/antiplatelets eg NSAIDs

4. Management

- If bleeding stops with compression alone, patient can go home with first aid advice:
 - return if bleeding re-starts and unable to control at home with compression
 - if risk factors/red flags present or recurrent bleed(s), advise to see MO/NP at next clinic
- If anterior nasal pack inserted, MO/NP may advise:^{1,2}
 - evacuation/hospitalisation OR home with pack in situ + give **Nasal pack discharge advice** (remove in 24–72 hours)
 - ± antibiotics

Anterior nasal pack insertion - only to 1 nostril

Rapid Rhino® - easiest and least painful + most comfortable for patient^{1,3}

- Use size 4.5 cm (< 8 years), 5.5 cm (all ages) or larger size for posterior pack
- PPE + get good light source + sit patient up if possible
- Soak in sterile water for a FULL 30 seconds
- Spray lidocaine (lignocaine) + phenylephrine on the Rapid Rhino®⁴
- Insert in straight direction along floor of nasal cavity, until blue indicator is past the nares
- Use a 20 mL syringe to inflate device with AIR. Stop inflation when the pilot cuff becomes rounded and feels firm when squeezed
- Reassess after 15–20 minutes. Re-inflate as needed to ensure proper pressure
- Tape to patient's cheek
- **See instructions + video** at <https://rapidrhino.com/rapid-rhino-product-usage-instructions/>

Other nasal pack eg Merocel®⁵

- Coat with water soluble gel + grasp string with fingers
- Gently and quickly insert along the floor of the nasal cavity until the string reaches the nose
- If packing has not expanded in 30 seconds, irrigate with 10 mL sodium chloride 0.9%
- Tape the string to the nose and trim ends
- Moisten with saline prior to removal

Nasal pack discharge advice¹

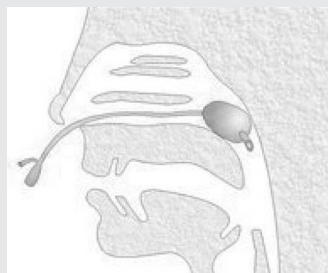
- May have symptoms of a cold while in place eg blocked nose, ↓ smell, facial pressure, headaches, nasal drainage, tearing from eyes
- Try not to blow nose. Sneeze with open mouth
- To avoid ↑ blood flow to the nose and risk of further bleeding - avoid straining, lifting > 5 kg, strenuous exercise, bending over + sleep with head slightly elevated
- Avoid aspirin and ibuprofen (may ↑ bleeding). Take paracetamol if needed for pain
- Keep pack moist by spraying with sodium chloride 0.9%
- Return immediately if bleeding starts (nose or mouth), fever, ↑ pain, vision changes, SOB, loss of colour of skin around nose, swelling of face, skin rash

Posterior nasal pack insertion - only to 1 nostril

- MO/NP may advise if anterior packing does not work, or catastrophic haemorrhage
- **Use Rapid Rhino®** in larger size than normal - in attempt to control posterior and anterior bleeding (follow instructions as per anterior nasal packing)
- OR, use Foley® urine catheter - **get further advice if trauma/suspected base of skull fracture**^{1,2}

Foley® catheter² - note Rapid Rhino® preferred

- PPE + get good light source + sit patient up if possible
- Have suction available + assistant to apply as you insert catheter
- Spray nasal passage with lidocaine (lignocaine) + phenylephrine - it will be painful
- Lubricate tip of catheter (sterile lubricant)
- Measure half way point between nasal septum and tragus of ear
- Insert in straight direction along floor of nasal cavity towards ear lobe - to half way point
- Keep mouth open
- You **MUST be able to see the TIP** of catheter in back of throat **BEFORE inflating balloon**:
 - inflate with 3 mL air and pull catheter forward until it 'catches' in the back of the nose
 - then inflate with up to 10 mL air, stopping when it gets too uncomfortable
- Get assistant to maintain firm traction while you pack anterior nostril eg with a Rapid Rhino®
- Secure catheter at nostril to prevent it slipping backwards eg with tubing clamp/clip
- Place wad of gauze between clamp and patients nose to prevent pressure necrosis
- Secure catheter to patients face with tape



- If posterior pack inserted, will need urgent evacuation + close observation + antibiotics:
 - at risk of airway obstruction if Foley® dislodges or placed inappropriately

S2	Lidocaine (lignocaine) + phenylephrine			Extended authority ATSIHP/IHW/IPAP
ATSIHP, IHW, IPAP, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Spray	Lidocaine (lignocaine) 5% + Phenylephrine 0.5%	Intranasal	Adult and child ≥ 12 years up to 5 sprays Child ≥ 2 years 2–4 years 1 spray 4–8 years 2 sprays 8–12 years 3 sprays	stat
Offer CMI: May cause transient burning and stinging. Numbness of tongue or mouth; risk of trauma from hot drinks or biting. Do not eat or drink for two hours after. Bitter taste for 1–2 minutes				
Contraindication: Pregnancy and child < 2 years				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

6

6

5. Follow up

- If nasal pack in situ and not evacuated, review next day or sooner if any concerns:
 - remove pack as advised by MO/NP

6. Referral/consultation

- MO/NP may consider ENT referral as appropriate

Traumatic rupture of eardrum - adult/child

1. May present with^{1,2}

- Hearing loss, tinnitus (ringing in ears), earache
- + history of:
 - blow to ear eg slap, fall from water skis, diving
 - rapid change in ear pressure eg air travel, scuba diving, blast/explosion
 - object poked in ear eg cotton tipped applicator

2. Immediate management Not applicable

3. Clinical assessment¹

- Ask about:
 - circumstances + mechanism of injury eg any water exposure
 - date/time of injury + when first noticed symptoms
 - vertigo/dizziness, hearing loss, tinnitus, light-headedness, other symptoms/injuries
 - prior history of ear infections/problems
- If blow to head, assess for [Head injuries](#), p. 143 including base of skull fracture
- Do vital signs
- Do otoscopy - note location + size of perforation, any discharge/pus:
 - do NOT syringe ears with water or remove any blood in canal - can delay healing
- Check hearing using audiometry (if possible)
- If hearing loss, use tuning fork test to determine type (if able):^{1,3}
 - activate fork by striking firmly on your bent elbow. Place vibrating fork firmly on the midpoint of the patient's skull, or central forehead. Is sound heard better in normal ear (sensorineural hearing loss), or ear with ruptured eardrum (conductive hearing loss)

4. Management

- If vertigo/dizziness **seek urgent medical advice ± evacuation**
- Consult MO/NP who may advise:
 - ciprofloxacin ear drops if 'dirty' injury (eg in water) or discharge/infection¹ ± ENT and audiology referral
- Advise to keep ear dry until healed.¹ Use Blu Tack® or cotton wool in ear with Vaseline® over top while showering. Avoid swimming
- Most perforations will heal without treatment¹ within 2 months⁴
- If related to assault/[Domestic and family violence](#), p. 241, offer support/referral as per local policies. Also consider [Child protection](#), p. 551

5. Follow up

- Advise to be reviewed in 2–3 days, see MO/NP at next clinic + review 2 weekly until healed if asymptomatic, or sooner if concerned eg infection

6. Referral/consultation

- MO/NP may refer to ENT specialist if not healed after 3 months^{1,5,6}

Foreign body in ear or nose - adult/child

1. May present with^{1,2}

- Foreign body (FB) in ear or nose eg insect, bead, pebble, plastic toy, food

Symptoms suggesting possible FB in ear/nose of child

Ear	Nose
<ul style="list-style-type: none"> – ear pain, hearing loss, discharge (pus or blood) – ear fullness, hiccups or cough that won't stop – tinnitus (ringing in ear) 	<ul style="list-style-type: none"> – nasal occlusion or bleeding nose – malodorous, pus or blood stained discharge – facial swelling or pain

2. Immediate management^{1,2}

- Urgently consult MO/NP for ENT referral if:
 - suspected [Button battery](#), p. 80 or paired magnets (in nose) - **time critical emergency**:
– **urgent removal needed**. If suspected, but not visualised, x-ray needed to rule out. If no on-site x-ray arrange urgent evacuation
 - bleeding or airway issues if FB to nose²

ALERT button batteries require urgent removal to prevent necrosis of surrounding tissue

3. Clinical assessment^{1,2}

- Get history and examine ears/nose
- Identify exact location, shape and composition of FB
- If possible, get assistant to help, especially if child (in addition to caregiver)

4. Management^{1,2}

- **Do NOT attempt to remove if any of below:**
 - FB not easily seen **OR** is deep in the ear/nose
 - large **OR** impacted FB
 - child moving/noncompliant - risk of trauma, pushing FB further in, or aspiration
 - paired magnets or magnet and metallic object across septum of nose ie in each nostril
 - penetrating or hooked FB
 - if any of above, consult MO/NP for evacuation/referral to ENT
- **Otherwise, attempt to remove FB from ear or nose ONCE** - regardless of method:
 - if unsuccessful or not comfortable attempting, consult MO/NP

Removing FB from NOSE²

Small, smooth or spherical objects	<ul style="list-style-type: none"> • Self blow/exhale - if child old enough to cooperate eg > 3 years, encourage to blow nose while occluding the nostril opposite to the FB • Parents' kiss - ask parent/caregiver to seal the child's mouth with their mouth, while occluding the unaffected nostril. Then give a short sharp puff of air • Suction - only try if FB visible and not 'lodged'. Use micro suction tube. Form a solid seal between tube and object. Be careful not to push FB up nose • Magnet device - (if available) for metal object - insert gently until clicks onto object. Be careful not to push FB up nose
Soft, irregular, small object	<ul style="list-style-type: none"> • Forceps - only use if FB visible and looks easy to grasp. Avoid repeated grasping attempts as may push FB in further
Other objects	<ul style="list-style-type: none"> • Consult MO/NP

Removing FB from EAR ¹	
Soft, irregular, small object	<ul style="list-style-type: none"> • Forceps - only use if FB visible and looks easy to grasp. Avoid repeated grasping attempts as may push FB in further
Insect or small inorganic object	<ul style="list-style-type: none"> • Gentle irrigation - if insect, put 2–3 drops of cooking oil into ear to kill first. Irrigate with warm water using a cut 14/16 G cannula (needle removed) with a 30 or 60 mL syringe. Direct stream along upper back area of canal. Repeat as needed • Do NOT irrigate if suspected perforated eardrum, grommets, button battery, vegetable matter or expandable FB
Smooth/spherical mobile objects	<ul style="list-style-type: none"> • Gentle suction - only try if FB visible and not 'lodged.' Use micro suction tube to form a solid seal between tube and object • Magnet device - (if available) for metal object - insert gently until clicks onto object
Other objects	<ul style="list-style-type: none"> • Consult MO/NP

- **Post removal:**
 - look for other FBs patient may have inserted + for any trauma/infection:^{1,2}
 - if significant trauma to ear canal consult MO/NP who may order dexamethasone + framycetin + gramicidin (eg Otodex®, Sofradex®) or ciprofloxacin ear drops ± ENT referral¹
 - treat concurrent **Otitis externa**, p. 532 if present¹
- Give education around safe storage of small objects eg button batteries, marbles, coins, balloons. Ensure toys for play are appropriate for age^{1,2}

5. Follow up

- **Ear FB removed** - advise to be reviewed:¹
 - if any symptoms arise ie hearing loss, discharge, marked pain, facial nerve paralysis or dizziness/feeling off balance. Consult MO/NP ± ENT referral
 - if ear drops given, in 2–3 days
- **Nose FB removed** - advise to be reviewed:²
 - if any symptoms arise ie fever, purulent discharge, nose bleed, facial pain or swelling. Consult MO/NP ± ENT referral

6. Referral/consultation

- As above

Gastrointestinal emergencies

HMP Acute abdominal pain - adult/child

Recommend

- **Always consider:**

- [Ectopic pregnancy, p. 371](#) in all females of reproductive age with abdominal pain ± bleeding
- [PID, p. 462](#) in sexually active females, particularly if < 25 years, with new onset of pelvic pain
- [Testicular torsion, p. 209](#) and check testes in males with abdominal pain + male infants with inconsolable crying

1. May present with

- Abdominal pain

2. Immediate management

- Do vital signs
- If signs of shock - ↑HR, ↑RR, ↓BP, ↓LOC:
 - contact MO/NP urgently
 - start treatment for [Shock, p. 62](#)
- Screen for [Sepsis, p. 64](#)
- If severe pain:
 - insert IVC x 2, do rapid assessment
- Offer analgesia ± antiemetic. See [Acute pain, p. 32](#), [Nausea and vomiting, p. 40](#):
 - **note:** analgesia does not mask physical signs/hinder diagnosis^{1,2}

3. Clinical assessment³

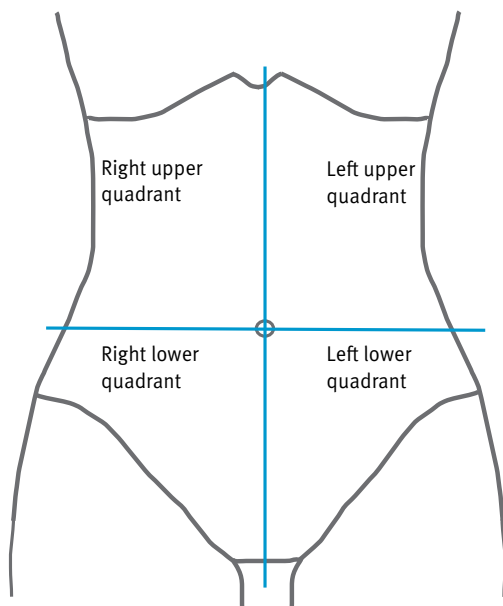
- It is not necessary to make a definitive diagnosis. It is more important to recognise cases which are significant
- Ask about the pain:
 - **Site** - where is it
 - **Onset:**
 - gradual, rapid or sudden
 - continuous or intermittent
 - what were they doing when it started
 - **Character** - sharp, dull, burning, stabbing, cramp like, crushing, tingling
 - **Radiate** - anywhere eg shoulder tip, back
 - **Alleviating factors** - eg sitting up, medicine, relief by moving about eg renal colic, or from lying very still eg peritonitis
 - **Timing:**
 - when did it first begin, duration
 - have they had it before, when, what happened
 - any increase in severity
 - **Exacerbating factors** - does anything make it worse eg movement
 - **Severity:**
 - does it interfere with sleep or normal activities
 - mild, moderate or severe (scale 1–10)

- Also ask about:^{1,4}
 - **associated symptoms** - eg fever, SOB, recent weight loss, changes in appetite, nausea, vomiting - any blood, bile or green vomit
 - **bowels** - any diarrhoea, constipation, blood, black stools/melaena, time of last motion, passing wind¹
 - **urine** - dysuria, frequency, urgency, haematuria
 - **vaginal** - bleeding, discharge. **Note:** abnormal discharge may indicate [PID, p. 462](#)
- **Get past history**, including:¹
 - recent trauma
 - medical + surgical history
 - smoking, alcohol + other drugs
 - medications + family history
 - menstrual history in females - last period, was it normal, are periods regular, any contraception³
- **Do physical examination**, including:^{1,2}
 - urinalysis
 - pregnancy test if female of reproductive age - **if +ve go to Ectopic pregnancy, p. 371**
 - ECG¹ + BGL
 - bloods/i-STAT including lactate
 - listen to chest - any wheeze, crackles:
 - **note:** pneumonia and [ACS, p. 107](#) can present with abdominal pain
 - [Hydration assessment - adult, p. 200](#) or [child, p. 535](#)
 - check for:
 - pallor, jaundice
 - enlarged lymph nodes
 - **Red flags**

Red flags - if any contact MO/NP urgently

- Pain radiating to the back + palpable pulsatile mass⁵
 - Localised tenderness, distension
 - Guarding - ↑ muscle tightness in response to palpation³ or board like rigidity
 - Rebound tenderness - pain when pressure is applied + then released suddenly³
- **Do abdominal examination:**¹
 - **look for:**
 - symmetry, shape eg distended or sunken
 - surgical scars, bruises, distended veins, hernias
 - signs of non-accidental injury⁶
 - **listen** for bowel sounds - absent, decreased or hyperactive
 - normal are low pitched + gurgling 2–5/minute.² Hyperactive/high pitched suggests [Bowel obstruction, p. 205](#)
 - **palpate** - start lightly, away from site of pain + move through the 9 areas. Follow with deep palpation:^{1,2}
 - also palpate kidneys - with one hand underneath + one hand above (below rib line), gently push down
 - check testes in males
 - **percuss (tap)** all four quadrants to check for dullness
 - Rectal examination - may be indicated if suspected [Upper GI bleeding, p. 203](#)

Abdominal quadrants



4. Management

- Consult MO/NP in all cases of moderate to severe pain, or if cause not known
- MO/NP may order:
 - chest + abdominal x-ray
 - urgent evacuation/hospitalisation
 - antibiotics, IDC, nasogastric tube
 - nil by mouth

5. Follow up

- If not evacuated, advise patient to be reviewed next day, or sooner if:¹
 - pain persists > 24 hours, worsens or changes from generalised to localised, or
 - worsening symptoms or new symptoms develop eg vomiting, fever
 - if any of the above, contact MO/NP

6. Referral/consultation

- As above

Abdominal pain causes

Right hypochondriac

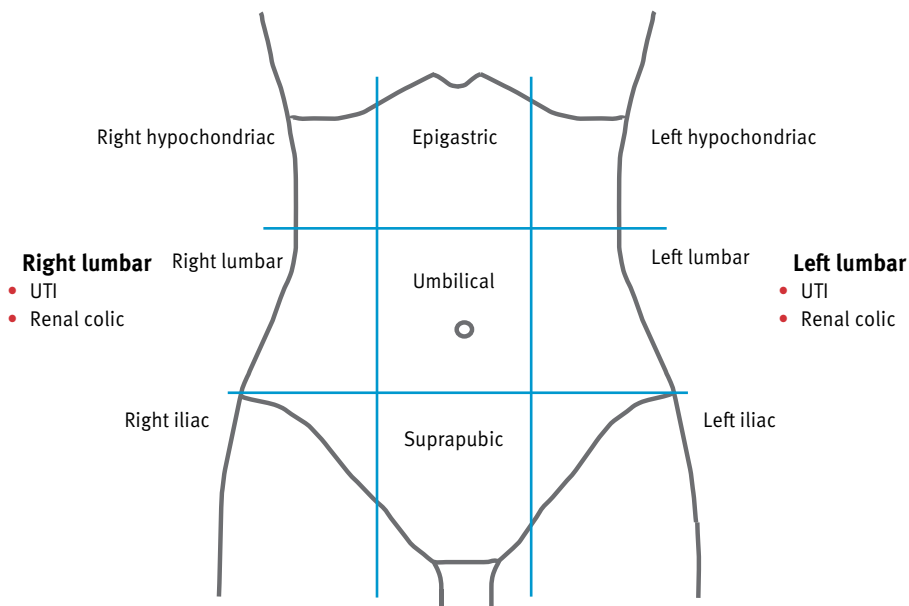
- Gall bladder - biliary colic or cholecystitis⁷
- Hepatitis
- Pneumonia
- Liver abscess/tumour - rare

Epigastric

- Myocardial infarction
- Gastritis or gastric/duodenal ulcer⁷
- Pancreatitis⁷
- Ruptured aortic aneurysm

Left hypochondriac

- Pneumonia
- Pancreatitis
- Ruptured spleen



Right iliac

- Appendicitis⁶
- Ectopic pregnancy (unilateral)⁴
- Ovarian cyst⁴
- PID (bilateral)⁴
- Strangulated hernia (usually men)
- Testicular torsion

Umbilical

- Strangulated umbilical hernia
- Ruptured aortic aneurysm⁵
- Gastroenteritis
- Small bowel obstruction
- Inflammatory bowel disease
- Early appendicitis (then moves to right iliac)⁷

Left iliac

- Diverticulitis
- Ectopic pregnancy (unilateral)⁷
- Ovarian cyst⁷
- PID (bilateral)⁴
- Strangulated hernia (usually men)
- Testicular torsion

Suprapubic

- Ectopic pregnancy⁴
- Testicular torsion
- Miscarriage⁴
- UTI
- Large bowel obstruction
- Acute retention of urine
- Uterine fibroid complication
- PID⁴

Gastroenteritis/dehydration - adult

Diarrhoea ± vomiting

Recommend¹

- Rehydration is the most important aspect of management ie with oral rehydration solution (ORS)

Background¹

- Most acute diarrhoea is viral, self-limiting and resolves without specific treatment
- Antibiotics are of no benefit in most cases and may exacerbate diarrhoea¹

Related topics

[Giardiasis, p. 538](#)

[Gastroenteritis - child, p. 535](#)

[Nausea and vomiting, p. 40](#)

[DKA, p. 89](#)

1. May present with¹

- Sudden onset of diarrhoea ± vomiting, fever or abdominal pain
- Lethargy, dehydration

2. Immediate management

- Do vital signs + **Hydration assessment¹**
- If severe dehydration:**
 - contact MO/NP urgently
 - continue to manage as per [Shock, p. 62](#)

Hydration assessment ¹			
	Mild	Moderate	Severe
Level of consciousness	alert	slightly lethargic	altered
Thirst	mild	moderate	intense
Oral mucous membranes	slightly dry	dry	parched, with wrinkled tongue
Sternal skin turgor		↓	marked ↓
Eyes		normal	sunken
RR	normal	normal or ↑	normal or ↑
HR		↑	
BP		mild ↓ or postural ↓	severe ↓ with cold extremities
Urine output	normal or ↓	↓	significant ↓ or no output

3. Clinical assessment

- Get history, including:¹
 - gastrointestinal symptoms:
 - date/time of onset, frequency, is there blood ± mucous in stools, bile stained or green vomit, location and severity of abdominal pain
 - fever, rash, headache
 - known illness in contacts
 - recent overseas travel¹
- Do physical examination, including:²
 - BGL - if ↑ consider [DKA, p. 89](#)
 - i-STAT - UE, lactate

- urinalysis - ketones
- [abdominal examination, p. 197](#)
- Do stool MCS if:¹
 - diarrhoea > 7 days
 - severe symptoms eg blood in stools, high fever, ↑ HR, abdominal tenderness or severe pain^{1,2}
 - immunocompromised (stool MCS + parasites + viral pathogens)
 - recent overseas travel

4. Management

- Consult MO/NP if:
 - vomiting and unable to tolerate oral fluids² - IV fluids may be required
 - severe symptoms
 - immunocompromised or elderly¹
- If mild to moderate dehydration:¹
 - give ORS, even if intermittent vomiting
 - **note:** if ORS is not available, use 1/2 level teaspoon of salt + 6 level teaspoons of sugar in 1 L of clean drinking water
 - aim for 2–3 L over 24 hours. Frequent small volumes may be better tolerated eg 50 mL every 15–30 minutes
 - avoid fatty or sugary foods and excessive intake of soft drinks, sports/energy drinks, cordials and fruit juice. If used they should be diluted
- Offer antiemetic if needed. See [Nausea and vomiting, p. 40](#)
- Once tolerating/responding to ORS, advise patient to return to normal diet¹
- If patient prepares or serves food - advise to avoid handling food until they have not had any diarrhoea or vomiting for 48 hours

5. Follow up¹

- Advise patient to return if symptoms worsen or develop severe vomiting, abdominal cramps or blood in stools:
 - contact MO/NP
- Review stool MCS results

6. Referral/consultation³

- Notify Public Health Unit if ≥ 2 cases of diarrhoea ± vomiting in the same location or single case in a food handler ①

HMP Gastritis - adult

Background

- Inflammation of the gastric mucosa commonly caused from *Helicobacter pylori* infection, use of NSAID, or alcohol¹

1. May present with

- Epigastric pain or discomfort ± nausea, vomiting, heartburn²

2. Immediate management

- Do vital signs
- If signs of shock - ↑HR, ↑RR, ↓BP, ↓LOC:
 - contact MO/NP urgently + see [Shock, p. 62](#)
- Assess as per [Chest pain assessment, p. 103](#) + see [ACS, p. 107](#)
- Offer analgesia ± antiemetic. See [Acute pain, p. 32](#), [Nausea and vomiting, p. 40](#)

3. Clinical assessment

- Do not jump to conclusions as to the cause of the epigastric pain in a person who drinks alcohol²
- Do NOT use medication cocktail eg pink lady, Shaw's cocktail, to assist in ruling out a cardiac cause³
- Also ask about:
 - pain - onset + duration
 - is it accompanied by nausea, vomiting and heartburn²
 - any blood in vomit² ± melaena, go to [Upper GI bleeding, p. 203](#)
 - recent heavy alcohol intake¹
 - are they taking NSAID, aspirin^{1,2}
 - previous episodes - when, any treatment
 - recent weight loss, difficulty or painful swallowing²
- Get past history of heart disease, GORD, peptic ulcer disease, abdominal surgery¹
- Do physical examination, including [abdominal examination, p. 197](#) +
 - ECG + BGL⁴
 - bloods/i-STAT - lactate

4. Management

- **Contact MO/NP urgently** if intense boring pain that radiates to the back⁵
- Consult MO/NP, who may advise:
 - IV pantoprazole ± IV thiamine if alcohol related^{1,5}
 - bloods for *Helicobacter pylori*²
 - evacuation/hospitalisation ± referral for endoscopy⁶

5. Follow up

- Advise to return if symptoms ↑ or new symptoms eg blood in vomit - contact MO/NP urgently. Otherwise advise to see MO/NP at next clinic

6. Referral/consultation

- As above

HMP Upper gastrointestinal bleeding - adult/child

Vomiting blood

Background

- Usually caused secondary to peptic ulcer disease, erosions, oesophagitis or oesophageal varices¹

1. May present with

- Vomiting blood or dark vomit with 'coffee grounds' ± melaena, pain¹

2. Immediate management

- Do vital signs
- Insert IVC x 2
- If signs of shock - ↑HR, ↑RR, ↓BP, ↓LOC or large active bleed:
 - contact MO/NP urgently + see [Shock, p. 62](#)

ALERT suspect [Button battery, p. 80](#) in all children with upper GI bleed. A button battery lodged in the oesophagus can burn a hole through to the aorta

3. Clinical assessment

- Get rapid history, including:
 - is blood dark, bright or coffee grounds, amount + duration
 - melaena or any fresh blood in stools
 - repeated retching/vomiting prior to bleeding - may indicate oesophageal tear¹
 - previous episodes²
 - history of liver failure, ischaemic heart disease, renal failure, peptic ulcer, oesophageal varices^{1,2}
 - alcohol misuse²
 - ask if taking - aspirin, NSAID, anticoagulants, corticosteroids, iron supplements²
- Do physical examination, including [abdominal examination, p. 197](#) +
 - ECG²
 - i-STAT - lactate, baseline Hb (HemoCue if available)
 - bloods - FBC, UE, INR, LFT, cross match

4. Management

- Consult MO/NP urgently, who may advise:
 - IV fluids
 - IV pantoprazole ± IV thiamine if alcohol misuse^{2,3}
 - evacuation/hospitalisation for urgent endoscopy/surgery³
- Monitor vital signs closely until evacuation, keep nil by mouth

5. Follow up

- As advised by MO/NP

6. Referral/consultation

- As above

HMP Rectal bleeding - adult/child

1. May present with

- Blood mixed in/with stool or blood leaking from the rectum¹

2. Immediate management

- Do vital signs
- If signs of shock - ↑HR, ↑RR, ↓BP, ↓LOC or blood loss is heavy or continuing:
 - contact MO/NP urgently + see [Shock, p. 62](#)

ALERT suspect [Button battery, p. 80](#) in all children with melaena or bloody discharge from rectum

3. Clinical assessment

- Do not attribute rectal bleeding to haemorrhoids unless more serious causes have been excluded
- Get history, including:
 - onset and duration of bleeding +
 - colour of blood - bright or dark
 - does it coat the stool or is it mixed with the stool¹
 - associated with straining or passing hard stool²
 - past history of haemorrhoids
 - any change in bowel habits eg constipation, diarrhoea, black or maroon stools^{1,3}
 - abdominal pain, rectal pain or itch, recent weight loss
 - bowel disease eg diverticular, Crohn's disease, colon/rectal cancer^{1,4}
 - recent removal of polyps¹
 - recent trauma to rectum, including sexual trauma
 - are they taking aspirin, NSAID¹
- Do physical examination, including [abdominal examination, p. 197](#) +
 - check perianal area for - haemorrhoids (not always visible), skin tags, anal fissures, haematoma^{1,3}
- Consider vaginal bleeding as source, especially in older patient¹

4. Management

- Consult MO/NP who may advise:
 - rectal examination, bloods, investigations for serious causes eg cancer
 - topical medication²
 - evacuation/hospitalisation
- If haemorrhoids, advise patient to:²
 - avoid straining and constipation
 - adequate intake of fibre and fluids
 - respond to the urge to open bowels (rather than holding in). Do not try to initiate a bowel action without the urge

5. Follow up

- If not evacuated, advise to be reviewed at next MO/NP clinic. Earlier if concerned/bleeding returns

6. Referral/consultation

- As above

HMP Bowel obstruction - adult/child

Recommend

- Metoclopramide is contraindicated¹

1. May present with²⁻⁴

- Abdominal pain ± bloating, nausea, vomiting, fever

2. Immediate management²

- Do vital signs
- Screen for [Sepsis, p. 64](#)
- Offer analgesia (not oral). See [Acute pain, p. 32](#)
- Insert IVC + start IV sodium chloride 0.9% - then as ordered by MO/NP

3. Clinical assessment

- See [Abdominal pain, p. 196](#) to guide assessment
- Suspect bowel obstruction if:
 - pain:
 - intermittent, colicky, continuous²
 - any distension, is it getting worse
 - nausea, vomiting, inability to pass wind or stool²
 - changes to bowel habits, recent weight loss²
 - rectal bleeding, crampy rectal pain²
 - ask about possibility of foreign body ingestion as cause of obstruction²⁻⁴
- Get past history:
 - abdominal or pelvic surgery, bowel obstruction, hernias²⁻⁴
 - recent abdominal trauma^{3,4}
 - inflammatory bowel disease eg Crohn's disease, diverticulitis^{3,4}
 - are they taking - opioids, NSAIDs, corticosteroids, chemotherapy^{3,4}
- Do physical examination, including:²
 - ECG
 - BGL
 - bloods/i-STAT - UE, lactate, FBC, LFT, lipase²
 - [abdominal examination, p. 197](#) check for:
 - tenderness, guarding, rigidity, masses
 - hyperactive/high pitched bowel sounds

4. Management

- If infant consider [Intussusception, p. 545](#)
- Consult MO/NP urgently, who may advise:
 - urgent evacuation for CT scan/surgery
 - IV antibiotics
 - x-ray
 - IDC
 - nasogastric tube²
- Keep nil by mouth

- Monitor closely until evacuation:
 - vital signs
 - urine output

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

Genitourinary emergencies

HMP Renal colic - adult

Background

- Pain can be caused by kidney stone passage or an obstruction in the urinary tract¹

1. May present with

- Severe one sided flank pain radiating to the groin:^{2,3}
 - usually episodic, typically lasting 20–60 minutes + may not completely resolve before next wave³
 - very distressed and unable to find a comfortable position³
- Nausea + vomiting, sweating, looks unwell²
- ± haematuria²

2. Immediate management

- Do vital signs
- Give oral ibuprofen or IM ketorolac ± antiemetic. See [Acute pain, p. 32](#), [Nausea and vomiting, p. 40](#)
- If severe pain, consider giving a single dose of IV morphine¹ until NSAID works^{2,4}

3. Clinical assessment

- See [Abdominal pain, p. 196](#) to guide assessment
- Get history, including:⁴
 - nausea and vomiting, fever
 - urinary symptoms eg dysuria, frequency, urgency
 - past history of kidney stones, previous episodes, renal impairment
- Do physical examination, including:
 - [Hydration assessment - adult, p. 200](#)
 - urinalysis to confirm haematuria + MSU for MCS if nitrites or leucocytes⁴
 - pregnancy test if female of reproductive age⁴

4. Management

- **Contact MO/NP urgently if:**
 - a pulsatile abdominal mass and ↓BP - a ruptured AAA can mimic renal colic⁴
 - fever, pyuria (eg cloudy urine) or significant tenderness - suggests infected obstructed kidney⁴
- Main aim of treatment is analgesia + IV fluids if significantly dehydrated.⁴ **Note:** most stones pass spontaneously < 1 month⁵
- Consult MO/NP, who may advise:⁴
 - eFAST USS (if skilled/available) or evacuation for CT scan/IVP
 - IV fluids
 - or consider sending home if able to tolerate oral fluids and adequate pain relief with oral NSAID⁴ with follow up at next MO/NP clinic

S4	Ketorolac			Extended authority ATSIHP/IHW/RIPRN
ATSIHP, IHW and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Injection	10 mg/mL	IM	10 mg	stat Inject slowly into a large muscle. Apply pressure for 15–30 seconds after injecting to minimise local reactions Do not give repeat doses (potential serious adverse effects)
Offer CMI: May cause pain at injection site, itching, sweating or purpura				
Note: Use with caution in the elderly, asthma, hypertension, coagulation disorders or other NSAID use				
Pregnancy: May increase rate of miscarriage. Seek specialist advice for use in the 2nd half of pregnancy; do not use during the last few days before expected birth				
Contraindication: Dehydration, hypovolaemia, probenecid use, GI bleeding, renal or hepatic impairment, heart failure. Allergic to aspirin or NSAIDs				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

1,6,7

5. Follow up

- If not evacuated, advise to:
 - be reviewed if develops fever, vomiting or pain returns - contact MO/NP
 - see MO/NP at next clinic ± urology referral

6. Referral/consultation

- As above

HMP Acute retention of urine - adult

Background

- Predominantly affects men. The most common causes are obstruction eg enlarged prostate. Can also be caused from infection, constipation, inflammation or injury¹

1. May present with

- Inability to urinate or empty bladder effectively + suprapubic pain, bloating, urgency, distress^{1,2}

2. Immediate management^{2,3}

- Do vital signs
- Screen for [Sepsis, p. 64](#)
- Offer analgesia. See [Acute pain, p. 32](#)

3. Clinical assessment

- See [Abdominal pain, p. 196](#) to guide assessment
- Also ask about:
 - worsening urinary symptoms eg nocturia, frequency, urgency, weak stream, dribbling^{1,3}
 - systemic symptoms eg T ≥ 38, chills, sweats³
 - previous episodes
 - prostate or bladder problems¹
 - prolapse of the bladder, rectum, or uterus - in females¹
 - recent pelvic trauma, STI, IDC²
 - nausea, vomiting, constipation²
 - medications eg anticholinergic, antidepressants^{1,2}
- Do physical examination, including:
 - abdomen for distension and palpable bladder²
 - urinalysis if possible + MSU for MCS² or collect from IDC if advised to insert
 - bladder scan if available

4. Management

- Contact MO/NP, who may advise:
 - insert IDC:¹
 - if likely difficult catheterisation, urgent evacuation for urological review/suprapubic catheter¹
 - DO NOT use force to push IDC through the obstructed urethra
 - bloods ± cultures, antibiotics³
- Monitor urine output. MO/NP may advise IDC be removed or left in situ

5. Follow up

- If not evacuated, advise to be reviewed next day and consult MO/NP
- Advise to see next MO/NP clinic

6. Referral/consultation

- As above

HMP Testicular/scrotal pain - adult/child

Testicular torsion

Recommend

- Testicular torsion is an emergency. Surgery is required ≤ 6 hours to avoid permanent harm, even if the pain has been present > 6 hours¹

1. May present with

- Pain in the testes/scrotum \pm swelling, abdominal pain^{1,2}
- **Note:** if recent testicular injury assume testicular torsion until proven otherwise

2. Immediate management

- **Rapidly assess** against table below:¹
 - the presence or absence of a single sign cannot exclude testicular torsion +
 - keep in mind boys may be reluctant to volunteer symptoms due to embarrassment and reluctance to be examined
- **Contact MO/NP urgently in all cases of testicular/scrotal pain**
- Offer analgesia \pm antiemetic. See [Acute pain, p. 32](#), [Nausea and vomiting, p. 40](#)
- Do vital signs

Assessment of testicular pain^{1,2}

	Testicular torsion	Epididymo-orchitis (EDO)
Onset and location	<ul style="list-style-type: none"> • Sudden onset of severe unilateral scrotal pain • May be gradual, mainly in the iliac fossa \pm history of minor trauma • Intermittent testicular pain - can result from intermittent torsion/spontaneous detorsion 	<ul style="list-style-type: none"> • Gradual onset of pain and swelling over a few days² • Usually one side
Other symptoms	<ul style="list-style-type: none"> • Nausea, vomiting, tachycardia¹ • \pm fever 	<ul style="list-style-type: none"> • Dysuria, frequency, smelly urine¹
Examination Note: to check cremasteric reflex - pinch or stroke the skin of the upper thigh. The testis on the same side should elevate via contraction of the muscle	<ul style="list-style-type: none"> • Testis - abnormal position, horizontal lie on standing and high riding¹ • Scrotal skin changes - red or darkening^{1,2} • Tender to palpate • Thickened spermatic cord¹ • Absent cremasteric reflex¹ 	<ul style="list-style-type: none"> • Red, hot, swollen testis in normal position • Tender epididymis (tubular structure found at back of testes, running in a sagittal plane) • Intact cremasteric reflex^{1,2}
Also check	<ul style="list-style-type: none"> • Urinalysis - leucocytes does not exclude testicular torsion¹ • Lump in groin of child with acute abdominal or inguinal pain can be torsion of undescended testis but may be mistaken for swollen lymph node or abscess¹ 	<ul style="list-style-type: none"> • Urinalysis - NAD does not exclude EDO¹ • Risk factors eg recent urethral surgery, history of viral infection eg mumps, sexually active³

3. Clinical assessment

- See **Immediate management**

4. Management

- Contact MO/NP urgently in all cases who will arrange urgent evacuation + referral to surgical team:
 - even if the pain has been present > 6 hours
- Monitor vital signs closely and re-examine scrotum if patient deteriorates⁴
- Keep nil by mouth¹
- USS and bloods should not delay surgical review¹

5. Follow up

- As per MO/NP/surgical team

6. Referral/consultation

- As above

Poisoning and overdose

HMP Poisoning and overdose - adult/child Toxicology assessment

Recommend¹

- **Always contact the Poisons Information Centre (PIC) for any poisoning or overdose ☎ 13 11 26 (24 hours) or, for satellite phone use only (07) 4763 7617**
- Provide the following information:
 - name and spelling of the toxin or drug(s), and if able, the active ingredients and send photo
 - patient age, weight, sex, comorbidities, medical history, medication history
 - unintentional or deliberate intent of poisoning
 - time since exposure, route, dose eg amount swallowed, licked container lid
 - actions taken by the patient, parents or carers
 - clinical effects since exposure
 - vital signs
 - results from any investigations

1. May present with¹⁻⁴

- Confusion, drowsiness, loss of consciousness, fitting
- Respiratory failure
- Hyperthermia, hypothermia
- Nausea, vomiting, diarrhoea
- Hypotension, hypertension, bradycardia, tachycardia, arrhythmias
- Conscious and fully orientated
- A history suggestive of deliberate or accidental poisoning or drug taking

2. Immediate management¹⁻⁴

- **DRSABCD.** Resuscitation if required. See [BLS, p. 46](#)
- Contact MO/NP urgently
- Insert IVC x 2 if required
- If contamination suspected, remove all clothes and shower with soap and water. Use PPE
- If patient is confused or withdrawn, strange, aggressive or displaying acutely disturbed behaviour ensure safety of self and others. See [Mental health emergency, p. 336](#)
- **Note:** do not undertake any gastrointestinal decontamination (eg activated charcoal) until a full [Toxicology assessment, p. 212](#) has been completed

3. Clinical assessment¹⁻⁴

- Do a [Toxicology assessment, p. 212](#)
- Do vital signs +
 - SpO₂
 - BGL
 - i-STAT/bloods
 - [GCS/AVPU, p. 562](#)
 - ECG and continuous cardiac monitoring
 - temperature. **Note:** hyperthermia can be life-threatening

- Take the following bloods for every patient and send during evacuation:
 - serum electrolyte (bicarbonate and potassium) concentrations
 - renal function, LFT, FBC
 - venous blood gases
 - serum paracetamol concentration

Toxicology assessment ¹	
Agent	<ul style="list-style-type: none"> • Name of product(s), its active ingredients, manufacturer • Look for container if possible • Ask relatives or witnesses • Ask if alcohol was taken concurrently. This can affect the toxicity of other exposures • Ask if paracetamol or other over-the-counter products were taken
Route of exposure	<ul style="list-style-type: none"> • Oral, topical, eye, inhaled, injected
Dose	<ul style="list-style-type: none"> • How much was taken ie estimate maximal dose on number of remaining tablets/liquid subtracted from total packet/bottle • Always consider the worst-case scenario • Was substance diluted eg insecticides • For a frequent substance user: <ul style="list-style-type: none"> – frequency – duration and pattern of use – time and amount of last use – average daily consumption
Time of exposure	<ul style="list-style-type: none"> • Exact time
Intent of exposure	<ul style="list-style-type: none"> • Accidental or deliberate • If deliberate also see Mental health emergency, p. 336
Action since exposure	<ul style="list-style-type: none"> • Skin washed, eyes irrigated, self induced vomiting, drank milk etc
Patient factors	<ul style="list-style-type: none"> • Age, weight, gender, comorbidities - including mental health issues
Clinical course	<ul style="list-style-type: none"> • What symptoms have occurred since exposure to poison/medicine
Clinical status	<ul style="list-style-type: none"> • BP, HR, RR, T, SpO₂, BGL, conscious state

4. Management¹⁻⁴

- Consult MO/NP urgently
- Following stabilisation of the patient, good supportive care and monitoring is sufficient most of the time

For significant proven or suspected poisoning or overdose the patient will likely require:

- Intubation and ventilation
- IV fluids to maintain blood pressure ± inotropes on advice of MO/NP or PIC
- Unless contraindicated, activated charcoal typically within 2 hours of ingestion. See table below
- Evacuation
- ± extra **Toxin specific management considerations**. See table below

Activated charcoal

- Given on MO/NP or PIC advice only
- Only give if the patient can self-administer without assistance
- Patients at risk of becoming drowsy, unconscious or fitting require intubation prior to nasogastric or orogastric administration
- Rarely indicated in children

ECG monitoring

- Regular monitoring of ECG for:
 - QRS widening:
 - QRS > 120 msecs (0.12 seconds) is considered pathological
 - associated with ingestions of eg tricyclic antidepressants, antihistamines, antiarrhythmics
 - QT prolongation:
 - can be associated with torsades de pointes (abnormal heart rhythm that can be fatal)
 - associated with ingestions of eg antiarrhythmics, antidepressants, antihistamines, antibiotics and antipsychotics
- Send rhythm strips to MO/NP or toxicologist and be guided by their recommendations

Toxin specific management considerations	
Poison or toxic agent	Extra management considerations after: <ul style="list-style-type: none"> – contact with Poisons Information Centre (PIC) 13 11 26 – MO/NP consultation – Toxicology assessment
Alcohol (ethanol) Beer, wine, spirits (also see Toxic alcohol)	<ul style="list-style-type: none"> • Death is usually due to inhalation of vomit or respiratory depression • Activated charcoal is not indicated • Symptomatic treatment and supportive care
Angiotensin Converting Enzyme Inhibitor (ACEI) Captopril, enalapril, fosinopril, lisinopril, perindopril, quinapril, ramipril and trandolapril	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care
Angiotensin II Receptor Blocker (ARB) Candesartan, eprosartan, irbesartan, losartan, olmesartan, telmisartan and valsartan	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care
Anticonvulsants (benzodiazepines) Alprazolam, bromazepam, clobazam, clonazepam, diazepam, flunitrazepam, nitrazepam, oxazepam, temazepam, midazolam and lorazepam	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care • Can cause CNS depression, rarely coma

Toxin specific management considerations	
Poison or toxic agent	Extra management considerations after: <ul style="list-style-type: none"> – contact with Poisons Information Centre (PIC) 13 11 26 – MO/NP consultation – Toxicology assessment
Anticonvulsants (others) Carbamazepine, lamotrigine, levetiracetam, oxcarbazepine, phenobarbital (phenobarbitone), pentobarbital, primidone, pregabalin, gabapentin, phenytoin, sodium valporate, thiopental, tiagabine and topiramate	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care • Can cause CNS depression, rarely coma • Consider midazolam for persistent seizures. See Fitting, p. 86
Antihistamines (sedating) Alimemazine, chlorpheniramine, cyclizine, brompheniramine, cyproheptadine, diphenhydramine, dexchlorpheniramine, doxylamine, pheniramine and promethazine	<ul style="list-style-type: none"> • Regular observations • Diazepam for sedation of agitated patient. See Mental health emergency, p. 336 • IDC for urinary retention
Antipsychotics Amisulpride, aripiprazole, brexpiprazole, chlorpromazine, clozapine, haloperidol, lurasidone, olanzapine, paliperidone, pericyazine, quetiapine, risperidone and ziprasidone	<ul style="list-style-type: none"> • May require noradrenaline. Avoid adrenaline (epinephrine) • IV benzatropine to manage abnormal involuntary movements • Cardiac monitoring for QT prolongation
Arsenic Arsenic gas, inorganic arsenic oxides and salts, organic arsenic	<ul style="list-style-type: none"> • Evacuate for urgent assessment, decontamination and chelation therapy
Aspirin and other salicylates Oil of wintergreen, teething gels	<ul style="list-style-type: none"> • Consider sodium bicarbonate to increase the urinary elimination of salicylates • Consider glucose for coma or seizures, not anticonvulsants
Baclofen	<ul style="list-style-type: none"> • Consider midazolam for persistent seizures or delirium. See Fitting, p. 86
Barbiturates Phenobarbitone, primidone, pentobarbitone and thiopental	<ul style="list-style-type: none"> • CNS depression is common in large ingestion • Symptomatic treatment and supportive care
Benzodiazepines	<ul style="list-style-type: none"> • See Anticonvulsants (benzodiazepines)
Beta-blockers Propranolol, sotalol, atenolol, bisoprolol, carvedilol, labetalol, metoprolol, nebivolol and oxprenolol	<ul style="list-style-type: none"> • Propranolol and sotalol are the most toxic beta blockers • Consider atropine for bradycardia (on MO/NP or PIC instruction) • Symptomatic treatment and supportive care

Toxin specific management considerations	
Poison or toxic agent	Extra management considerations after: <ul style="list-style-type: none"> – contact with Poisons Information Centre (PIC) 13 11 26 – MO/NP consultation – Toxicology assessment
Button battery	<ul style="list-style-type: none"> • See Button battery, p. 80
Caffeine	<ul style="list-style-type: none"> • See Theophylline and caffeine
Calcium channel blockers Verapamil or diltiazem	<ul style="list-style-type: none"> • Consider activated charcoal for ingestions within 12 hours • Consider calcium gluconate or calcium chloride for persistent hypotension and bradycardia • For ingestions > 10 tablets PIC will discuss other decontamination options
Calcium channel blockers Amlodipine, felodipine, lercanidipine, nifedipine and nimodipine	<ul style="list-style-type: none"> • Consider activated charcoal for ingestions within last 4 hours
Carbon monoxide inhalation	<ul style="list-style-type: none"> • 15 L/minute O₂ non-rebreather mask for 6 hours • Keep at rest to minimise oxygen needs
Caustic and corrosive substances Domestic and industrial cleaning agents, oven cleaners, dishwasher detergents, acids and drain cleaners	<ul style="list-style-type: none"> • Wipe out the mouth with a cloth, then rinse with water • Nil by mouth • Offer analgesia. See Acute pain, p. 32
Chloroquine, hydroxychloroquine or quinine	<ul style="list-style-type: none"> • Consider midazolam for persistent seizures. See Fitting, p. 86
Clonidine	<ul style="list-style-type: none"> • Most ingestions result in prolonged drowsiness • Continue to monitor and provide symptomatic treatment and supportive care
Colchicine	<ul style="list-style-type: none"> • Give activated charcoal for all ingestions
Cyanide Inhalation in domestic or industrial fires, ingestion of cyanide-containing products	<ul style="list-style-type: none"> • Strict PPE precautions
Digoxin	<ul style="list-style-type: none"> • Atropine to treat bradycardia associated with hypotension • Consider digoxin immune Fab to bind and remove digoxin and treat hyperkalaemia (may be brought with retrieval team)
Essential oils Eucalyptus oil, tea tree oil and aromatherapy oils	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care
Flecainide	<ul style="list-style-type: none"> • Consider sodium bicarbonate to treat ventricular arrhythmias associated with QRS widening

Toxin specific management considerations	
Poison or toxic agent	Extra management considerations after: <ul style="list-style-type: none"> – contact with Poisons Information Centre (PIC) 13 11 26 – MO/NP consultation – Toxicology assessment
Gamma-hydroxybutyrate (GHB) A drug of abuse	<ul style="list-style-type: none"> • Alternating coma and agitation is a common presentation • Symptomatic treatment and supportive care • Consider midazolam for persistent seizures. See Fitting, p. 86
Hallucinogens LSD	<ul style="list-style-type: none"> • Consider benzodiazepines for agitation and acute behavioural disturbances. See Mental health emergency, p. 336
Herbicide Chlorophenoxy	<ul style="list-style-type: none"> • Rapid cooling techniques for hyperthermia • Consider sodium bicarbonate for urinary alkalinisation • Consider potassium chloride for hypokalaemia
Herbicide Glyphosate	<ul style="list-style-type: none"> • Consider sodium bicarbonate for metabolic acidosis
Herbicide Paraquat	<ul style="list-style-type: none"> • Strict PPE precautions • Do not routinely administer O₂ • For decontamination consider: <ul style="list-style-type: none"> – activated charcoal – soil (mix with water) or – Fuller's earth (calcium montmorillonite)
Hydrocarbons Petrol, fuels and other oils eg sniffing (eg petrol, glues, marker pens, paint thinners) or chroming (eg aerosol sprays including paints)	<ul style="list-style-type: none"> • PPE precautions • Consider salbutamol MDI/NEB for bronchospasm. See Asthma, p. 95
Hydrofluoric acid Also see: <ul style="list-style-type: none"> – Chemical contact burns, p. 182 – Chemical burn to eye, p. 285 	<ul style="list-style-type: none"> • Extremely toxic. Treatment guided by PIC • For dermal exposures, remove all clothes and shower with soap and water • Analgesia for pain • Consider calcium gluconate: <ul style="list-style-type: none"> – topically for dermal exposures – IV for any metabolic, cardiovascular or CNS effects • Consider midazolam for persistent seizures. See Fitting, p. 86
Insecticides	<ul style="list-style-type: none"> • See Pesticides
Iron Ferrous fumarate, gluconate or sulfate	<ul style="list-style-type: none"> • Activated charcoal is not indicated • Desferrioxamine is indicated in patients with severe systemic toxicity

Toxin specific management considerations	
Poison or toxic agent	Extra management considerations after: <ul style="list-style-type: none"> – contact with Poisons Information Centre (PIC) 13 11 26 – MO/NP consultation – Toxicology assessment
Lead Inhaled or swallowed from mining, manufacturing, paint, piping, fishing sinkers, petrol sniffing	<ul style="list-style-type: none"> • Evacuate for urgent assessment, decontamination and chelation therapy
Lithium Usually from chronic usage	<ul style="list-style-type: none"> • Activated charcoal is not indicated • Symptomatic treatment and supportive care • Consider midazolam for persistent seizures. See Fitting, p. 86
Local anaesthetics Articaine, benzocaine, bupivacaine, cinchocaine, cocaine, levobupivacaine, lidocaine (lignocaine), mepivacaine, oxybuprocaine, prilocaine, proxymetacaine, ropivacaine and tetracaine (amethocaine)	<ul style="list-style-type: none"> • QRS widening signals progression of toxicity • Treat seizures and ventricular arrhythmias associated with QRS widening with IV sodium bicarbonate • Hyperventilate by invasive or non-invasive ventilation
Metformin	<ul style="list-style-type: none"> • Causes lactic acidosis not hypoglycaemia • Consider IV sodium bicarbonate for metabolic acidosis
Methotrexate	<ul style="list-style-type: none"> • Consider calcium folinate as antidotal therapy • Brought with retrieval team
Mirtazapine	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care
Monoamine oxidase inhibitors (MAOIs) Phenelzine and tranylcypromine	<ul style="list-style-type: none"> • Treat hypertension with benzodiazepines as first-line and GTN if hypertension persists • Cooling techniques for Hyperthermia, p. 188 • Consider midazolam for persistent seizures. See Fitting, p. 86
Nicotine Children who chew on cigarettes, nicotine gum, patches or drink nicotine liquid from e-cigarettes Adults on nicotine replacement therapy who continue to smoke	<ul style="list-style-type: none"> • Consider atropine for excessive secretions, bradycardia and bronchoconstriction • Consider midazolam for persistent seizures. See Fitting, p. 86
Non-steroidal anti-inflammatory drugs (NSAID) Celecoxib, diclofenac, etoricoxib, ibuprofen, indomethacin, ketoprofen, ketorolac, mefenamic acid, meloxicam, naproxen, parecoxib, piroxicam, sulindac and tiaprofenic acid	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care • Consider midazolam for persistent seizures. See Fitting, p. 86

Toxin specific management considerations	
Poison or toxic agent	Extra management considerations after: <ul style="list-style-type: none"> – contact with Poisons Information Centre (PIC) 13 11 26 – MO/NP consultation – Toxicology assessment
Opioids Alfentanil, buprenorphine, codeine, dextropropoxyphene, fentanyl, hydromorphone, methadone, morphine, oxycodone, pethidine, remifentanyl, sufentanil and tramadol	<ul style="list-style-type: none"> • Potential for significant toxicity, especially in opioid naive patients and exposures to long acting preparations • Give naloxone as antidotal therapy • Check for and remove opioid transdermal patches
Pesticides or insecticides (organophosphates) Chlorpyrifos, diazinon, dimethoate, fenthion and malathion	<ul style="list-style-type: none"> • Strict PPE precautions • For dermal exposures, remove all clothing and shower with soap and water • Stat doses or infusion of IV atropine to treat bradycardia • Consider midazolam for persistent seizures. See Fitting, p. 86
Paracetamol	<ul style="list-style-type: none"> • Give IV acetylcysteine. Brought with retrieval team
Potassium	<ul style="list-style-type: none"> • Activated charcoal is not indicated • Consider calcium gluconate for cardiac arrhythmias • To decrease serum potassium give: <ul style="list-style-type: none"> – IV insulin + glucose and – sodium bicarbonate and – nebulised salbutamol
Selective serotonin reuptake inhibitor (SSRI) Citalopram, dapoxetine, escitalopram, fluoxetine, fluvoxamine, paroxetine and sertraline	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care
Serotonin and noradrenaline reuptake inhibitors (SNRIs) Atomoxetine, desvenlafaxine, duloxetine, reboxetine and venlafaxine	<ul style="list-style-type: none"> • Symptomatic treatment and supportive care • Consider midazolam for persistent seizures. See Fitting, p. 86 • Consider benzodiazepines for agitation. See Mental health emergency, p. 336
Stimulant drugs Amphetamines, cocaine, dexamphetamine, MDMA (ecstasy), methylphenidate, piperazines and lisdexamfetamine	<ul style="list-style-type: none"> • Active rapid cooling for Hyperthermia, p. 188 • Consider benzodiazepines for stimulant induced hypertension or tachycardia • Consider benzodiazepines for agitation. See Mental health emergency, p. 336 • Consider midazolam for persistent seizures. See Fitting, p. 86 • Consider hypertonic saline for severe hyponatraemia

Toxin specific management considerations	
Poison or toxic agent	Extra management considerations after: <ul style="list-style-type: none"> – contact with Poisons Information Centre (PIC) 13 11 26 – MO/NP consultation – Toxicology assessment
Sulfonylurea Glibenclamide, gliclazide, glimepiride and glipizide	<ul style="list-style-type: none"> • Treat hypoglycaemia with glucose. See Hypoglycaemia, p. 91
Super warfarins (rat and mouse poison) Brodifacoum, bromadiolone, coumatetralyl, difenacoum difethialone, diphacinone, flocoumafen and pindone	<ul style="list-style-type: none"> • Consider antidotal vitamin K (phytomenadione)
Theophylline and caffeine	<ul style="list-style-type: none"> • Consider metaraminol or noradrenaline for hypotension unresponsive to IV fluids • Consider midazolam for persistent seizures. See Fitting, p. 86 • Consider benzodiazepines for agitation. See Mental health emergency, p. 336 • Consider potassium chloride to treat hypokalaemia • Give antiemetic for Nausea and vomiting, p. 40
Toxic alcohol Methanol (model aeroplane fuel, rocket fuel, racing car fuel and poorly distilled alcohol) Ethylene glycol (coolants, antifreeze, brake fluids and some solvents)	<ul style="list-style-type: none"> • Treat with fomepizole (very expensive/may not be available) or ethanol • Activated charcoal is not indicated • If ethanol 10% is not available, then white spirits (eg vodka), or sweet alcoholic formulations for children, can be administered orally or via a nasogastric tube
Tricyclic antidepressants (TCAs) Amitriptyline, clomipramine, dothiepin, doxepin, imipramine and nortriptyline	<ul style="list-style-type: none"> • Potential for significant toxicity, symptoms develop early within first few hours • IV sodium bicarbonate for QRS widening • Consider midazolam for persistent seizures. See Fitting, p. 86
Warfarin (also see Super warfarins)	<ul style="list-style-type: none"> • Consider antidotal vitamin K (phytomenadione)

Unscheduled	Activated charcoal			Prescribing guide
Only give on advice of MO/NP or PIC				
Form	Strength	Route	Dose	Duration
Oral liquid	50 g/250 mL	Oral Nasogastric Orogastric	Adult 50 g Child 1 g/kg (max. 50 g)	stat Repeat doses on MO/NP or PIC advice
Offer CMI: May cause colicky abdominal pain, nausea, vomiting or constipation				
Note: Never administer to unconscious, sleepy or dizzy patient unless intubated. Rarely indicated in children unless risk suggests poor outcome. Improve palatability by chilling, serve in a covered container with a straw, drink with eyes shut etc				
Contraindication: Children < 6 years of age with accidental liquid paracetamol ingestion. Strong acids or alkalis, iron sulfate or iron salts, cyanides, sulfonyleureas, malathion, lithium, ethanol, methanol, ethylene glycol, hydrocarbons. Bowel obstruction				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				2,3

S4	Acetylcysteine			Prescribing guide
RIPRN and RN only. Must be ordered by an MO/NP				
Form	Strength	Route	Dose	Duration
Injection	200 mg/mL	IV	Adult Loading dose 200 mg/kg (max. 22 g) *Dilute in 500 mL glucose 5% infuse over 4 hours Maintenance dose 100 mg/kg (max. 11 g) *Dilute in 1000 mL glucose 5% infuse over 16 hours	Total dose 300 mg/kg over 20 hours
			Child Loading dose 200 mg/kg *Dilute in 7 mL/kg glucose 5% (up to 500 mL) infuse over 4 hours Maintenance dose 100 mg/kg *Dilute in 14 mL/kg glucose 5% (up to 1000 mL) infuse over 16 hours	
Offer CMI: May cause flushing, urticaria and itch. Anaphylaxis is common (1%)				
Note: Calculation errors may lead to potentially fatal dosing errors. Calculate dose using actual body weight (rounded up to the nearest 10 kg) to a max. body weight of 110 kg. *Can also be diluted with sodium chloride 0.9%				
Management of associated emergency: If anaphylaxis, stop infusion. See Anaphylaxis, p. 82 Contact MO/NP				

4-7

S3	Naloxone		Extended authority ATSIHP/IHW	
ATSIHP, IHW, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Injection	400 microg/ mL	IM	Adult and child 400–800 microg*	stat Can repeat after 2–3 minutes/as per MO/NP order
Nasal spray	1.8 mg/ actuation	Intranasal	Adult and child 1.8 mg (1 spray into 1 nostril)	stat Can give 2nd dose (using new device) into other nostril after 2–3 minutes
Note: *In adults, 800 microg is most appropriate to achieve adequate respiration, reverse coma and avoid the need for repeated doses. Be guided by pupil size and clinical response. Patient should improve in 1 minute. Failure to respond to 2 mg may indicate another cause of unconsciousness. The duration of naloxone is short (15–30 minutes) compared to opioids. Continue observation + monitor RR. May cause an acute withdrawal syndrome in those with opioid dependence ie anxiety, agitation, tachycardia, confusion, seizures, pulmonary oedema or arrhythmias				
Pregnancy: Can be lifesaving in acute overdose. Monitor closely in pregnancy, lactation and neonates of opioid dependent mothers				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				8-10

5. Follow up

- As advised by MO/NP or PIC

6. Referral/consultation

- Consult MO/NP and PIC for all occasions if substance known or suspected to be toxic
- Always consider referral to [Child protection, p. 551](#) for a:
 - child presentation
 - child whose carer has overdosed

Bites and stings (toxinology)

HMP Snake bite - adult/child Including sea snake

Recommend¹⁻⁴

- Snake bites are a potential medical emergency and should receive high priority assessment, even if the patient appears well
- Patients must be managed in a hospital with a monitored resuscitation area, access to 24 hour formal pathology laboratory and available antivenom, by staff able to manage the complications of anaphylaxis and envenomation
- Antivenom is not indicated without signs of systemic envenomation
- MO/NP is advised to seek early expert advice. The Poisons Information Centre (PIC) 13 11 26 (24 hours) can assist

Background¹⁻⁴

- Snake bite is relatively common in regional and remote areas. Envenomation is rare
- Many Australian snakes have potentially lethal bites

1. May present with²⁻⁴

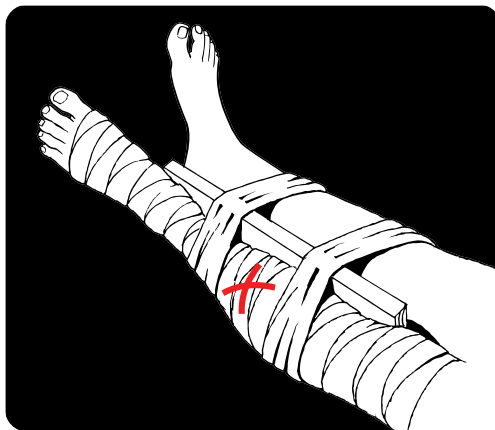
- A history of a snake bite ± bite mark or scratch
- Bite site with pain, redness and local tissue swelling
- If symptoms, may include:
 - sudden collapse or altered LOC
 - hypotension, cardiac arrest or seizure
 - nausea, vomiting, abdominal pain, headache, sweating and diarrhoea
 - bleeding gums, coughing, spitting or vomiting blood, bleeding from bite site
 - droopy eyelids, blurred or double vision
 - difficulty swallowing, breathing or speaking or respiratory arrest
 - fatigue, weakness, gait disturbances or poor coordination
- May have no symptoms

2. Immediate management^{2,4}

- **DRSABCD**. As needed, see [BLS, p. 46](#)
- Consult MO/NP immediately
- If patient has no bandage in situ:
 - quickly note features and location of bite
 - then apply **Pressure bandage with immobilisation**
- If patient has bandage in situ:
 - apply further bandages as necessary without removing the first bandage
- Insert IVC x 2

Pressure bandage with immobilisation^{3,4,6}

- Apply a broad elastic bandage (15 cm) firmly over the bite site
- Should be unable to easily slide a finger between the bandage and skin
- Apply a further bandage from the lower portion of the affected limb, upwards to cover as much of the limb as possible (see diagram), over the top of the clothes if necessary
- If the bite is on the trunk, apply direct pressure on the bite site using multiple combines and a bandage. Do not restrict breathing or chest movement or apply firm pressure to the neck or head
- Immobilise the joints either side of the bite site using a splint and bandage to restrict movement
- **Keep patient and affected limb immobilised, calm and still. Provide reassurance**
- Indicate on bandage the location of the snakebite



3. Clinical assessment

- Do vital signs:^{1,2,6}
 - urinalysis for blood
 - bloods - FBC, UE, CK, coagulation studies, INR, APTT, D-dimer
 - **Do not use** point-of-care/i-STAT devices for INR or D-dimer. False negative results are common
 - send pathology with evacuation team
- Get history:
 - geographic location where bite occurred ie land or water
 - location and features of bite(s) on body
 - time of bite
 - appearance of snake if seen
 - number of strikes
 - first aid measures used
 - time of bandage application
- Palpate the lymph nodes draining the bite site limb for signs of tenderness
- Check for evidence of paralysis:
 - muscles of eyes and face affected first; droopy eyelids, uncoordinated eye movements, double vision, loss of full range of eye movements
 - impaired respiratory effort or peripheral weakness

- Check for abnormal bleeding of gums, urine, bite site and IV site
- Check for muscle tenderness and weakness

4. Management^{4,7}

- **Do not remove bandage. Keep patient immobilised**
- Monitor vital signs and urine output. Insert IDC
- If hypotensive or in shock see [Shock, p. 62](#)
- Nil by mouth
- MO/NP will arrange evacuation

Antivenom administration^{1,3,5,7}

- Unless life-threatening, all cases where antivenom is considered should be discussed with tertiary facility or PIC
- Given if laboratory or clinical evidence of envenoming
- The recommended dose is 1 vial. Additional doses may be given as needed in consultation with MO/NP or PIC
- Give:
 - polyvalent snake antivenom **OR** if snake species known, then monovalent snake antivenom may be recommended by MO/NP or PIC
- Check vital signs every 5 minutes while antivenom is being administered
- Remove bandage once antivenom administered and patient is stable
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)

S4	Polyvalent snake antivenom		Extended authority ATSIHP/IHW/IPAP/RIPRN	
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN must consult MO/NP unless circumstances do not allow, in which case notify MO/NP as soon as circumstances do allow				
Form	Strength	Route	Dose	Duration
Injection	40,000 units/ 50 mL	IV	Adult and child 1 vial (40,000 units)	stat
	Contains 5 monovalents Brown snake Tiger snake Death adder Taipan Black snake		Dilute to 500 mL sodium chloride 0.9% or Hartmann's OR if young child or at risk of fluid overload dilute to 250 mL	Begin infusion slowly, watching for adverse effects*. If no adverse reaction, increase rate and infuse over 15–20 minutes If signs of allergic reaction pause infusion, treat accordingly, then recommence at a slower rate Additional doses on MO/NP order
Offer CMI: May cause anaphylaxis, rash, urticaria and serum sickness				
Note: *eg erythema, urticaria, hypotension and bronchospasm. Continue to monitor for adverse effects post administration				
Contraindication: No absolute contraindications. Benefits outweigh risks				
Management of associated emergency: Ensure adrenaline (epinephrine) is drawn up and resuscitation equipment readily available. If patient develops a significant allergic reaction/anaphylaxis stop the infusion immediately and give IM adrenaline (epinephrine). See Anaphylaxis, p. 82 for doses. Consult MO/NP				

1-4

1-4

5. Follow up

- If antivenom is used, complete and send off the questionnaire that comes with each ampoule
- Patients treated with antivenom may develop serum sickness within 14 days after administration:²
 - flu-like illness with fever
 - joint and muscle pain
 - general malaise
 - treat with antihistamines or oral corticosteroids and reassure

6. Referral/consultation

- Consult MO/NP or PIC on all occasions of snake bite

HMP Funnel-web (big black) spider bite - adult/child

Recommend

- For suspected funnel-web spider bites contact the Poisons Information Centre (PIC) ☎ 13 11 26 (24 hours)

Background^{1,2}

- Severe systematic envenomation can develop within 30 minutes and almost always < 2 hours

1. May present with¹

- History of painful bite by big black spider with large fangs ± signs of envenomation:
 - severe pain and bleeding at bite site
 - minimal local reaction - no swelling or redness
 - tongue and other muscle twitching, tingling of the lips
 - watery eyes, goosebumps, sweating, excessive drooling
 - abdominal pain, nausea, vomiting, headache
 - hypertension, bradycardia or tachycardia
 - breathlessness
 - anxiety
 - in young children, inconsolable crying, drooling, vomiting or collapse¹

2. Immediate management^{1,2}

- **DRSABCD.** As needed, see [BLS, p. 46](#)
- Notify MO/NP
- **Apply pressure bandage with immobilisation.** See [Snake bite, p. 222](#) for technique
- Insert IVC

3. Clinical assessment²

- Get history:
 - description of spider (if seen)
 - time of bite
 - location and features of bite site
 - geographical location where bite occurred
 - first aid measures used

- Do:
 - vital signs
 - ECG and continue to monitor HR + rhythm
 - physical examination, noting signs of envenomation above

4. Management

- Nil by mouth
- Consult MO/NP who may arrange:
 - evacuation/hospitalisation
 - administration of antivenom
- If patient shows signs of envenomation, administer funnel web spider antivenom:^{1,4,5}
 - 2 vials initially
 - further doses on advice from MO/NP or PIC
- Remove the pressure bandage with immobilisation in a facility where antivenom is available:⁶
 - after antivenom has been administered or
 - the patient is asymptomatic
- **Monitor closely**
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)

S4	Funnel web spider antivenom			Extended authority ATSIHP/IHW/IPAP/RIPRN
ATSIHP, IHW, IPAP and RN must consult MO/NP				
RIPRN must consult MO/NP unless circumstances do not allow, in which case notify the MO/NP as soon as circumstances do allow				
Form	Strength	Route	Dose	Duration
Injection	125 units Reconstitute each vial with 10 mL water for injections (gently swirl - may take up to 10 minutes to dissolve)	IV	Adult and child 2 vials Dilute in 100 mL sodium chloride 0.9% OR if young child or at risk of fluid overload dilute dilute in 50 mL	stat Begin infusion slowly, watching for adverse effects*. If no adverse reaction, increase rate and infuse over 15–20 minutes If signs of allergic reaction pause infusion, treat accordingly, then recommence at a slower rate May be repeated in 15 minutes on MO/NP order
Offer CMI: May cause anaphylaxis, rash, urticaria and serum sickness				
Note: Can be given undiluted over 2–5 minutes. *eg erythema, urticaria, hypotension and bronchospasm. Continue to monitor for adverse effects post administration				
Pregnancy: Limited data available. Benefits to mother and fetus may outweigh potential risks				
Management of associated emergency: Ensure adrenaline (epinephrine) is drawn up and resuscitation equipment readily available. If patient develops a significant allergic reaction/anaphylaxis stop the infusion immediately and give IM adrenaline (epinephrine). See Anaphylaxis, p. 82 for doses. Consult MO/NP				

1,3-5

1,3-5

5. Follow up

- If not evacuated/hospitalised advise to be reviewed the next day
- Patients treated with antivenom may develop serum sickness within 14 days after administration:¹
 - flu-like illness with fever
 - joint and muscle pain
 - general malaise
 - treat with antihistamines or oral corticosteroids and reassure

6. Referral/consultation

- Consult MO/NP on all occasions of suspected funnel-web spider bite

HMP Red-back spider bite - adult/child

Background¹

- Not considered life-threatening
- Management focuses on adequate analgesia

1. May present with²

- A history of being bitten by a spider ± bite marks
- Bite is not painful at first, becomes very painful 10–40 minutes later
- The pain radiates from the site and becomes regional
- Localised, patchy sweating and goosebumps within an hour around the bite site
- Red, hot or swollen bite site
- Headache, nausea, vomiting, abdominal pain
- Mild to severe hypertension and tachycardia

2. Immediate management

- **Do not** apply pressure bandage with immobilisation. Not required

3. Clinical assessment

- Get history:
 - description of spider (if seen)
 - time of bite
 - location and features of bite site
 - geographical location where bite occurred
 - first aid measures
- Do:
 - vital signs
 - physical examination, noting signs of envenomation above

4. Management^{1,3}

- Reassure the patient
- Apply ice pack to bite site
- Offer analgesia. See [Acute pain, p. 32](#)
- Clean the wound with soap and water to prevent secondary infection

- Consult MO/NP if:
 - child OR
 - not responding to simple analgesia OR
 - displaying clinical features of systemic envenomation
- If patient shows severe signs of envenomation MO/NP may order red-back spider antivenom if available
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)

5. Follow up

- Advise daily wound care and review as required

6. Referral/consultation

- Consult MO/NP if severe or persistent local or systemic symptoms

HMP Spider bites (other) - adult/child

1. May present with¹

- A history of being bitten by a spider ± bite marks or bleeding
- Site red, swelling, hot or painful
- Generalised spreading pain may suggest [Red-back bite, p. 227](#)
- Nausea, vomiting, headache
- Lethargy

2. Immediate management Not applicable

3. Clinical assessment

- Get history:
 - description of spider (if seen)
 - time of bite
 - location and features of bite site
 - geographical location where bite occurred
 - first aid measures
- Do vital signs
- Do physical examination

4. Management¹

- Reassure the patient
- Apply ice pack to bite site
- Offer analgesia. See [Acute pain, p. 32](#)
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)

5. Follow up

- Advise daily wound care and review as required
- Refer to MO/NP if non-healing wound

6. Referral/consultation

- Consult MO/NP if severe or persistent local or systemic symptoms

HMP **Scorpion stings and centipede bites** - adult/child

Background¹

- Australian scorpion and centipede species do not cause systemic envenomation

1. May present with¹

- History of sting/bite
- Observed scorpion or centipede
- Red, tender, swelling, numbness, itchiness and tingling at site
- Local pain > 15 minutes
- Rarely nausea, headache and malaise

2. Immediate management Not applicable

3. Clinical assessment

- Get history:
 - description of creature (if seen)
 - time of sting/bite
 - site location and features of the site
 - geographical location where sting/bite occurred
 - first aid measures
- Do vital signs
- Do physical examination including site and features of sting/bite

4. Management¹

- Reassure patient
- For pain consider:
 - applying an ice pack to sting/bite site, or
 - apply hot pack or immersing affected area in hot water (for centipede). First check water temperature with unaffected limb to avoid scald
 - offer analgesia. See [Acute pain, p. 32](#)
 - consult MO/NP if patient not responding to simple analgesia
- Clean the wound with soap and water to help prevent secondary infection
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)

5. Follow up

- Severe infection to sting/bite site occasionally occurs
- Advise daily wound care and review if required

6. Referral/consultation

- Consult MO/NP as above or if systemic symptoms persist

Tick bites - adult/child

Paralysis tick, typhus tick

1. May present with

- Tick
- Localised swelling, itching or irritation^{1,2}
- Allergic reaction or anaphylaxis
- Late presentations may show signs of tick paralysis

2. Immediate management²

- If signs of allergy, see [Anaphylaxis, p. 82](#)

3. Clinical assessment

- Get history:
 - allergies
 - geographical location where tick bite occurred
 - how long patient has had the tick
 - first aid measures
- Do vital signs
- Do physical examination:
 - ticks are difficult to find. Don't stop if one is found as there may be more
 - look in hair, between buttocks, groin, labia, ear canals and skin folds
 - inspect for lumps and swelling
- Identify signs of tick paralysis:^{1,2}
 - muscle weakness, difficulty walking, poor balance or coordination
 - numbness, tingling or weakness in limbs, hands, feet or face

4. Management

- If signs of tick paralysis consult MO/NP. Arrange evacuation/hospitalisation
- **Kill the tick** using a rapid freezing ether-containing product eg dimethyl ether spray (Medi Freeze Tick Off®) or permethrin cream to small ticks:^{1,2}
 - allow tick to drop off (may take many hours), then
 - clean the area with soap and water to prevent secondary infection¹
- **To prevent allergic reactions do NOT:**^{1,2}
 - touch or forcibly remove a tick with forceps or tick removal device
 - apply heat, kerosene, methylated spirits
- If patient has removed the tick but mouth-parts remain:^{3,4}
 - attempt to remove with tweezers or if unable, leave it alone and let the skin heal
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)
- Advise patient:
 - apply a cold compress to reduce pain and swelling^{1,2}
 - check bite site daily ± wound care
 - site may remain swollen or inflamed or worsen up to 48 hours after tick removal. Return if concerned
 - return if you experience chills, fever, headache, muscle pain or rash
 - continue to watch for symptoms for 4 weeks³

5. Follow up

- Advise to be reviewed if concerned, feeling unwell or symptoms worsen

6. Referral/consultation

- Consult MO/NP if signs of allergic reaction or paralysis

HMP Box jellyfish stings - adult/child

Background¹

- Life-threatening emergency
- Consider box jellyfish if sting occurred from Bundaberg (Qld) northwards, across the northern coastline and down to Geraldton (WA)

1. May present with^{1,2}

- Cardiac arrest
- Severe pain
- Wide (up to 1 cm) whip-like sting marks, with a characteristic frosted ladder pattern
- Attached jellyfish tentacles

2. Immediate management^{1,2}

- DRSABCD
- **If cardiovascular collapse** eg hypotension, cardiac arrest, unconsciousness, seizures:
 - start CPR if cardiac arrest. May need to be prolonged (> 1 hour). See [BLS, p. 46](#)
 - give box jellyfish antivenom
 - continue to monitor for adverse effects post administration^{3,4}
- Pick off all visible tentacles
- Inactivate stinging cells by dousing the sting sites with vinegar for 30 seconds
- Insert IVC/intraosseous
- Give analgesia:
 - ice packs to affected areas
 - IV opioid may be necessary. See [Acute pain, p. 32](#)
- Consult MO/NP immediately

3. Clinical assessment

- Ask about:
 - geographical location where sting occurred
 - time of sting
 - first aid measures
- Do vital signs + ECG
- Do physical examination, including site, size and features of sting

4. Management

- Manage in a resuscitation room (if possible) in case of sudden cardiorespiratory complications
- Reassure and keep patient at rest

- Give box jellyfish antivenom for systemic envenomation
- Monitor vital signs
- Continuous cardiac monitoring for arrhythmias
- MO/NP may consider contacting Poisons Information Centre (PIC) ☎ 13 11 26 or clinical toxicologist for ongoing advice
- All patients with envenomation from box jellyfish will need evacuation/hospitalisation

S4	Box jellyfish antivenom		Extended authority ATSIHP/IHW/RIPRN	
RN must consult MO/NP				
ATSIHP, IHW and RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Injection	20,000 units/vial	IV	Adult and child ≥ 5 years 1 vial diluted 1:10 with sodium chloride 0.9% or Hartmann's	stat Begin infusion slowly, watching for adverse effects*. If no adverse reaction, increase rate and infuse over 5–10 minutes
			Child < 5 years 1 vial diluted 1:5 with sodium chloride 0.9% or Hartmann's	If signs of allergic reaction pause infusion, treat accordingly, then recommence at a slower rate Further doses on MO/NP order
Offer CMI: May cause anaphylaxis, rash, urticaria and serum sickness				
Note: *eg erythema, urticaria, hypotension and bronchospasm. Continue to monitor for adverse effects post administration				
Management of associated emergency: Ensure adrenaline (epinephrine) is drawn up and resuscitation equipment readily available. If patient develops a significant allergic reaction/anaphylaxis stop the infusion immediately and give IM adrenaline (epinephrine). See Anaphylaxis, p. 82 for doses. Consult MO/NP				

2,3,5

2,3,5

5. Follow up

- Advise patient they may develop a rash over the sting site after 7–14 days²
- Patients treated with antivenom may develop serum sickness within 14 days after administration:²
 - flu-like illness with fever
 - joint and muscle pain
 - general malaise
 - treat with antihistamines or oral corticosteroids and reassure

6. Referral/consultation

- As above

Background¹

- Can result in life-threatening symptoms, with some patients developing cardiac failure
- Jellyfish occur near or far offshore in tropical waters of Australia

1. May present with^{1,2}

- Stings may go unnoticed, but within 20 minutes may develop Irukandji syndrome:
 - severe generalised pain
 - sense of impending doom
 - nausea and vomiting
 - difficulty breathing, shortness of breath
 - restlessness
 - sweating

2. Immediate management

- **DRSABCD**. If needed, [BLS, p. 46](#)
- Reassure and keep patient at rest^{1,2}
- Offer analgesia. See [Acute pain, p. 32](#)
- Insert IVC
- Nil by mouth
- Consult MO/NP

3. Clinical assessment²

- Ask about - time of sting + any first aid measures
- Do vital signs +
 - monitor RR:
 - for respiratory distress
 - listen to chest sounds for pulmonary oedema eg crackles or wheeze
 - monitor BP - severe hypertension may occur
 - ECG + continuous cardiac monitoring - observe for arrhythmias until evacuation
- Check - site, size and features of sting

4. Management^{2,3}

- Give O₂ to maintain SpO₂ ≥ 94%
- Continuous monitoring of BP, HR, SpO₂, RR
- Give subling glyceryl trinitrate (GTN) if hypertensive
- Arrange evacuation
- MO/NP may advise:
 - commence IV GTN infusion. See [Hypertensive emergency, p. 116](#)
 - further management of pulmonary oedema
- MO/NP may contact Poisons Information Centre (PIC) ☎ 13 11 26 or clinical toxicologist
- Continue to monitor pain. See [Acute pain, p. 32](#)

S ₃	Glyceryl trinitrate (GTN)			Extended authority ATSIHP/IHW
ATSIHP, IHW, RIPRN and RN may proceed				
Form	Strength	Route	Dose	Duration
Tablet	600 microg	Subling	300–600 microg	stat Repeat every 5 minutes up to 3 doses provided sBP ≥ 90
Spray	400 microg/spray		400 microg	
Offer CMI: May cause headache, flushing, palpitations, hypotension, dizziness or fainting. Advise to get up gradually from sitting or lying				
Note: Sit before giving. Do not use tablets from bottles that have been opened > 3 months. If unopened spray, prime by pressing nozzle 5 times into the air, or if > 7 days since used, press once				
Contraindication: Hypotension (sBP < 90), patient has taken phosphodiesterase-5-inhibitors eg sildenafil (eg Viagra®), vardenafil (Levitra®) ≤ 24 hours or tadalafil (eg Cialis®) ≤ 48 hours				
Management of associated emergency: Consult MO/NP. See Anaphylaxis, p. 82				

2,4

5. Follow up

- All patients to be evacuated/hospitalised

6. Referral/consultation

- As above

HMP Bluebottle and other jellyfish stings - adult/child

Recommend¹

- Do not use vinegar as may increase pain

1. May present with^{1,2}

- Immediate burning pain (lasts up to 2 hours)
- Linear or spindle (elliptical) red welts
- Systemic effects (nausea, headache or malaise) are uncommon

2. Immediate management Not applicable

3. Clinical assessment¹⁻³

- Ask about:
 - time of sting
 - first aid measures
- Do vital signs
- Check - site, size and features of sting

4. Management¹⁻³

- Gently pick off any remaining tentacles with forceps or gloved fingers
- For pain consider:
 - applying a hot pack or immersing affected area in hot water for 20 minutes. First check water temperature with unaffected limb to avoid scald
 - offer analgesia. See [Acute pain, p. 32](#)

- Monitor for allergic reactions
- Consult MO/NP if:
 - pain not controlled by oral analgesia
 - systemic effects, or doubt over cause of sting
- Transport to hospital or further medical intervention is rarely required

5. Follow up

- If patient concerned

6. Referral/consultation

- As above

HMP Blue-ringed octopus and cone shell envenomation - adult/child

Background^{1,2}

- Venom from these creatures can cause paralysis and death from respiratory failure within 30 minutes
- Blue-ringed octopus inhabit all coastal areas throughout Australia
- Many species of cone shell are found in tropical North Australia

1. May present with

Blue-ringed octopus^{1,2}

- Often painless bite ± mark
- Collapse on or near the beach shortly after a minor sting
- Numbness of mouth, lips and tongue
- Drooping upper eyelid, blurred or double vision
- Difficulty swallowing
- Flaccid paralysis - occurs within minutes of sting
- Respiratory/cardiac arrest

Cone shell²

- Local pain, swelling and numbness
- Can progress to muscle incoordination and weakness, disturbance of speech, vision and hearing loss
- Swallowing/breathing difficulties and respiratory paralysis if severe envenomation

2. Immediate management^{1,2}

- **DRSABCD.** If needed, [BLS](#), p. 46. May require prolonged mechanical ventilation
- **Apply a pressure bandage with immobilisation.** See [Snake bite](#), p. 222 for technique
- Urgently consult MO/NP + evacuation

3. Clinical assessment

- Do vital signs + neurological assessment

- Ask about:
 - time of bite (if possible)
 - first aid measures
 - time when (if) paralysis started
- Check for:
 - site, size and features of bite
 - signs of paralysis

4. Management^{1,2}

- **Do not remove pressure bandage** with immobilisation if systemic signs of envenomation. Leave in situ until evacuated
- Offer analgesia. See [Acute pain, p. 32](#)
- Reassure and keep patient at rest
- Likely to require mechanical ventilation until respiratory paralysis resolves (2–5 days)
- Discharge patient if they remain asymptomatic for at least 6 hours

5. Follow up

- If patient concerned

6. Referral/consultation

- As above

HMP Penetrating marine injuries - adult/child

Stingray, stonefish, bullrout, catfish, scorpionfish, lionfish, rabbitfish, other spiny fish, sea urchins

Recommend

- Do not apply pressure bandage with immobilisation

Background

- Any stingray wounds to the trunk can be life-threatening¹⁻³
- Severe systemic envenomation is rare¹
- Wounds from these injuries can become infected

1. May present with¹

- Barb puncture mark or open wound usually on hands or feet ± barb or spine in situ usually on:
 - lower legs for stingrays
 - soles of feet for sea urchins
 - hands for spiny fish due to handling
- Local trauma and intense pain
- Swelling and bruising

In severe cases

- Nausea, vomiting, headache, dizziness, SOB, diarrhoea, sweating, syncope
- Cardiovascular collapse
- Infected or necrotic wound if delayed presentation

2. Immediate management

- **Do not remove embedded barbs from chest or abdomen:**
 - VERY CAREFULLY place padding around barb and apply pressure to control bleeding³
 - see [Chest injuries, p. 140](#) or [Abdominal injuries, p. 150](#)
- To relieve pain apply a hot pack or immerse affected area in hot water up to 90 minutes. First check water temperature with unaffected limb to avoid scald^{1,2}
- If hot water is ineffective offer analgesia. See [Acute pain, p. 32](#)

3. Clinical assessment

- Ask about:
 - time and circumstances of injury
 - first aid measures
- Do vital signs +
 - x-ray or USS if available to exclude retained barb/spine²
- Check - site and nature of injury

4. Management

- Consult MO/NP for:
 - any penetrating wounds to chest, abdomen or joints
 - ineffective pain relief
 - delayed presentation of injury
 - wounds with retained barbs/spines
 - large or deep wounds likely to require antibiotic prophylaxis
 - evacuation/hospitalisation
- If experienced to do so, clean and irrigate wound thoroughly:
 - infiltrate lidocaine (lignocaine) 1% prior to wound care
 - remove any spines/barbs carefully as they break easily
 - incision may be necessary
 - do not suture wound
 - antibiotics may be necessary.^{1,2} See [Water related wounds, p. 170](#)
- Check tetanus vaccination status and give booster if indicated. See [Tetanus immunisation, p. 557](#)
- Discharge home if no systemic symptoms after 2 hours of observation

S4	Lidocaine (lignocaine)			Extended authority ATSIHP/IHW/RIPRN
ATSIHP, IHW and RN must consult MO/NP				
RIPRN may proceed				
Form	Strength	Route	Dose	Duration
Injection	1% 50 mg/5 mL	Subcut	up to 3 mg/kg (max. 200 mg)	stat
Offer CMI: It will hurt as it goes in. Report any drowsiness, dizziness, blurred vision, vomiting or tremors				
Note: Use the lowest dose that results in effective anaesthesia				
Management of associated emergency: Ensure resuscitation equipment readily available. Consult MO/NP. See Anaphylaxis, p. 82				

1,4

1,4

5. Follow up

- Advise patient to return daily to ensure all retained spines are removed
- Monitor wound for delayed healing or infection

6. Referral/consultation

- As above

HMP Sponges - adult/child

Background^{1,2}

- Venomous sponges found in all coastal waters of Australia can cause contact dermatitis
- Sponge related injuries are rare

1. May present with^{1,2}

- Mild local itching and stinging
- Redness, swelling and joint stiffness
- Fire sponges can cause peeling of the skin 2–3 weeks after contact

2. Immediate management Not applicable

3. Clinical assessment

- Ask about:
 - time and circumstances of contact
 - first aid measures
- Do vital signs
- Check - site and nature of injury

4. Management¹

- Wash the site
- Reassure patient, treatment usually not required
- Offer analgesia. See [Acute pain, p. 32](#)
- If needed, antihistamines/other for contact dermatitis^{1,2}

5. Follow up

- Review if any ongoing symptoms

6. Referral/consultation

- Usually not required

HMP **Ciguatera poisoning** - adult/child

Coral trout, mackerel, red emperor, groper, cod, snapper, bass, trevally, kingfish, other large predatory saltwater fish

Background^{1,2}

- Caused by the ingestion of ciguatoxins that accumulate in some tropical fish

1. May present with^{1,2}

- History of eating a saltwater fish within last 48 hours
- Vomiting, diarrhoea and abdominal cramps
- Tingling and numbness to fingers, around mouth, lips, tongue and throat
- Burning sensation or pain on contact with cold water
- Joint and muscle pain, weakness, cramps
- Headache, fatigue, fainting
- Extreme itchiness
- Difficulty breathing in severe cases

2. Immediate management

- Do vital signs
- If hypotensive, see [Shock](#), p. 62

3. Clinical assessment

- Ask about:
 - type and amount of fish ingested
 - when ingested
 - how often fish is eaten as small doses can accumulate over time
 - if other individuals who ate the fish are feeling unwell
 - gastrointestinal symptoms prior to presentation
- Do:
 - ECG
 - bloods - UE
- Check:
 - [Hydration assessment](#) - adult, p. 200 or [child](#), p. 535
 - if breastfeeding mother has consumed the fish, infant should be assessed for ciguatera poisoning

4. Management²

- Consult MO/NP
- Supportive care and reassurance
- Manage dehydration and per [Gastroenteritis](#) - adult, p. 200 or [Gastroenteritis](#) - child, p. 535
- Offer antiemetic. See [Nausea and vomiting](#), p. 40
- Advise patient:²
 - symptoms may take weeks to months to resolve
 - stay hydrated. Dehydration is associated with symptom recurrence²

- avoid eating the following foods for 3–6 months (associated with symptom recurrence):²
 - any type of fish, nuts, alcohol, caffeine, pork, chicken

5. Follow up

- If not evacuated/hospitalised advise to be reviewed the next day
- Consult MO/NP if there are unresolved symptoms

6. Referral/consultation

- Ciguatera is a notifiable condition in Qld ①. Alert Public Health Unit + see <http://disease-control.health.qld.gov.au/Condition/731/ciguatera-poisoning>

HMP Stinging tree - adult/child

Background

- Common tree in Qld rainforests with stinging hairs on leaves/twigs. Hairs contain poorly characterised toxic compounds that cause severe pain¹
- There is no high quality evidence to guide management of this condition, below are common remedies which are used in areas where the tree is endemic

1. May present with

- Severe pain or intense sharp tingling sensation after contact with tree¹⁻³
- Injured area covered with small red spots joining together to form a red, swollen mass¹

2. Immediate management

- Advise patient not to scratch or rub the area - can cause hairs to break + penetrate deeper, making them difficult to remove⁴
- Give analgesia - IV morphine or fentanyl. See [Acute pain, p. 32](#)
 - **note:** initial pain can last hours³

3. Clinical assessment

- Do vital signs

4. Management

- Hospitalisation not usually needed
- MO/NP may advise:⁵
 - diluted hydrochloric acid 10% (HCl) gauze application
 - **note: HCl is a hazardous chemical - ONLY use if local policies around use, safety + dilution/application are available.** Incorrect preparation can cause an explosion
- Use hair removal wax strip to remove finer hairs (unless a minor sting). Do not smear wax on skin, as will cause more pain:^{2,5}
 - removing finer hairs helps to prevent further release of the toxin (hairs can continue to release toxin for up to a year)
- Apply topical anaesthetic gel after wax removal⁵
- Can also try:¹
 - applying sticking plaster + pulling it off
 - remove visible hairs with tweezers

- **Note:** sometimes the skin will close over the hairs + they can't be removed
- Advise patient:^{1,2}
 - pain/tingling and sensitivity to cold weather/water can last days or months
 - affected area can remain intermittently sensitive for a long period of time

5. Follow up

- As per MO/NP

6. Referral/consultation

- As above

Assault

Domestic and family violence - adult

Recommend¹

- If outside of Qld refer to local policy + consider mandatory reporting requirements
- Domestic and family violence (DFV) has immediate and long-term impacts on children. Always consider [Child protection](#), p. 551

Background¹

- DFV is when one person in a relationship uses their power to control the other person in any way, including physical, emotional, verbal, sexual, financial, social, cultural and spiritual abuse
- Also see *Understanding domestic and family violence* https://www.health.qld.gov.au/__data/assets/pdf_file/0025/952072/1_Understanding-DFV-Booklet.pdf

1. May present with

- Experiencing DFV ± injuries
- Patient may not act any differently or show any outward signs, but consider:¹
 - **indicators** eg depression/anxiety symptoms, emotional lability, delay in seeking treatment, inconsistent explanation of injuries, frequent presentations, bruises in various stages of healing, chronic pain^{1,2}
 - **risk factors** eg pregnancy/new birth, isolation, court orders/proceedings, financial difficulties, perpetrators mental health status and alcohol and other drugs¹

2. Immediate management

- Assess and treat any injuries
- Consider immediate safety of yourself, the patient ± children/unborn child:
 - if concerns call police on triple zero (000)

3. Clinical assessment

- Talk to the patient alone and in private. Ask questions like:^{1,2}
 - has your partner ever threatened to hurt you or your children
 - do you have any worries about your safety or someone else's at home
 - are you afraid of your partner, do you feel safe in your relationship
 - are you safe to go home

- would you like assistance with this
- It takes courage to talk about DFV. It is important to respond sensitively:¹
 - communicate belief and validate the experience eg that must have been frightening for you, it must be difficult for you to talk about
 - affirm that violence is unacceptable
 - **never ask** why don't you leave, why did he/she hit you or what could you have done to avoid this situation
- **Patient's experiencing any of the following are at high risk of being killed or almost killed.**³ Ask about:
 - strangulation/choking/suffocation - how many times
 - escalation in severity or frequency of violence
 - recent or pending separation
 - stalking, including cyber stalking
 - access or use of weapons
 - perpetrator threatens/attempts suicide
 - threats to harm/kill children and pets
 - perpetrator unemployment
 - sexual assault
- If pregnant or new birth, check medical record for DFV screening tool ie SAFE Start Psychosocial form - this may help guide Management

4. Management

- **If patient declines to answer questions or discuss further:**¹
 - offer contact details of DFV services, see **Referral/consultation**
 - advise that he/she has right to protection and safety from DFV
 - document your conversation
- **If patient chooses to talk/asks for assistance:**¹
 - help them to call a DFV service, with consent offer to speak on their behalf and then support them until the call is complete, see **Referral/consultation** for contact details
 - contact social worker if available
 - if patient requests, contact police to assist with:
 - removing perpetrator from home
 - retrieving belongings
 - applying for a Domestic Violence Order, even if they chose to stay in the relationship
- Ensure patient has somewhere safe to go, offer to arrange refuge accommodation. If chooses to go home consider safety plan, including:^{1,4}
 - in an emergency call police on triple zero (000)
 - an escape plan - identify safe places and how to get there
- Do not engage with perpetrator in ways that might ↑ risk of DFV:¹
 - do not confront in an accusatory manner or in a way that will shame or anger them
 - never share anything the patient or children have told you
 - do not collude with their attempts to minimise, excuse or justify their violent behaviour
- **If you are not confident responding to DFV:**⁴
 - contact MO/NP/mental health clinician
 - discuss with local clinic management
 - call DVConnect for advice

5. Follow up

- Offer referral to mental health clinician, DFV specialist workers, legal services

6. Referral/consultation

- DVConnect 24 hour ☎ 1800 811 811, including assistance with refuge accommodation
- DVConnect Mensline 9 am - midnight ☎ 1800 600 636
- 1800 RESPECT, 24 hour sexual assault and domestic violence support ☎ 1800 737 732
- For **non-urgent** matters Police Link ☎ 131 444. Alternatively, online and SMS contact <https://www.police.qld.gov.au/domestic-violence>
- Find local support, including in remote areas <https://www.qld.gov.au/community/getting-support-health-social-issue/support-victims-abuse/domestic-family-violence/find-local-support>

Sexual assault - adult/child

Recommend

- If outside of Qld refer to local policy and procedures

Background

- Sexual assault is a crime and includes:¹
 - any unwanted or forced sexual act which a person does not consent eg digital rape, oral sex, groping, inappropriate touching of a sexual nature
 - sexual abuse of children
- A forensic examination is where a Sexual Assault Investigation Kit (SAIK) is used to collect DNA evidence² and may include the collection of the patient's clothes. Check local protocol, patient may require evacuation if unable to be done locally
- Also see (Qld Health intranet only):
 - *Forensic and scientific services: caring for people disclosing sexual assault* <https://qheps.health.qld.gov.au/hsq/forensics/response-to-sexual-assault>
 - *Clinical risk factors and indicators of abuse and neglect in children* <https://qheps.health.qld.gov.au/csu/factsheets>

1. May present with

- Disclosing sexual assault, rape ± injuries¹⁻³
- Trauma to genital area, anus⁴
- Child/adolescent pregnancy, STI⁴
- Accompanied by police requesting forensic examination¹

2. Immediate management

- Assess and treat any injuries:²
 - clinical interventions take priority over forensic examination
- Contact MO/NP if:
 - traumatic injuries eg head, chest, abdominal injuries
 - < 14 years of age:
 - medical and forensic examinations should be performed by MO with child protection ± sexual assault examination training/skills²
 - ongoing management as per MO/NP/paediatrician

3. Clinical assessment

- It is important that the patient feels a sense of control. **Offer:**²
 - to arrange a support person who is not a potential witness
 - move to private room
 - clinician gender preference where possible
 - reassurance that consent is needed for all parts of treatment/examination and can be withdrawn anytime
- **Ask about:**²
 - details of assault:
 - even if the details sound strange or unlikely, offer a kind response and do not ask questions like - why did you go there, how drunk were you
 - investigating the assault is a police matter, do not try to work out what did/didn't happen
 - contraception. If oral contraceptive - any missed doses in last menstrual cycle
 - tetanus and hep B vaccination status
- **Offer** a physical examination, including:
 - assessment and documentation of all injuries, use diagrams if required
 - **note:** do not perform any forensic examination unless trained to do so
- Do vital signs

4. Management

- **If < 18 years of age:**
 - sexual abuse is a crime and must be reported to police **AND**
 - as per mandatory reporting responsibilities to Child Safety.² See [Child protection, p. 551](#)
 - contact MO/NP who will refer to paediatrician for ongoing management
 - if not evacuated, before sending home consider is:
 - the home environment safe
 - there a protective parent/carer
- **If > 18 years of age:**
 - collaborate with MO/NP, Sexual Health Service or Forensic Nurse Examiner/Sexual Assault Nurse Examiner at nearest district/regional facility:
 - **note:** where there is no trained clinician to do forensic examination, evacuation may be required. Check local protocol
- Encourage patient to talk to the police. The sooner the police are aware the more chance of a conviction¹
- Timing and type of forensic examination is also dependent on:¹
 - time since the assault
 - physical and emotional state of the patient
 - their account of the assault
- **If patient wants to make a complaint to the police:**²
 - call the local police or Policelink ☎ 131 444
 - police will talk with the patient ± request forensic examination (SAIK)
 - **note:** police will supply SAIK, be physically present for the collection of evidence and take completed kit
- **If patient does not want to make a complaint or wants to defer the decision, discuss:**²
 - *Just In Case* (JIC) forensic examination - swabs are collected and stored for 12 months in case patient later chooses to make a complaint. Must be collected by trained clinician
 - reassure the patient they can talk to the police, this does not mean they have to make a complaint now

- JIC SAIK can be obtained from Pathology Qld (PQ). If no PQ, police will supply SAIK² but have no further involvement
- **note:** SAIK does not contain JIC forms eg consent, pathology. These need to be printed,² see <https://qheps.health.qld.gov.au/hsq/forensics/response-to-sexual-assault> (access via Qld Health intranet only)
- refrigerate sealed kit and send to pathology²
- **If patient does not want to report:**²
 - they can contact police later, or
 - log the details of the assault anonymously through the Alternative Reporting Option, see <https://www.police.qld.gov.au/reporting>
- Offer STI screen if indicated or patient concerned.³ See [STI/BBV tests, p. 448](#)
 - **note:** if done now patient still needs screening at 2 week follow up even if antibiotic prophylaxis is given³
- Also consider:³
 - pregnancy test for pre-existing pregnancy
 - [Emergency contraception, p. 443](#)
 - [Tetanus immunisation, p. 557](#)
 - hep B vaccine and immunoglobulin (IG) (should be given within 14 days of the assault if non-immune or incomplete vaccination)⁴
 - if mental health concerns eg self-harm, see [Mental health emergency, p. 336](#)
- Contact MO/NP who may advise:³
 - ceftriaxone, azithromycin for STI prophylaxis
 - HIV [Post-Exposure Prophylaxis, p. 477](#)
- Offer analgesia. See [Acute pain, p. 32](#)

5. Follow up

- Advise patient as indicated:
 - STI screening is recommended 2 weeks after the assault³
 - pregnancy test if next period late or different from normal³
 - hep B vaccine at 1 and 6 months after first dose⁵
 - see MO/NP at next clinic as appropriate

6. Referral/consultation

- Consult MO/NP for all sexual assaults
- Offer referral to sexual assault support service or social work³
- Other resources include:³
 - Clinical Forensic Medicine Unit ☎ 3722 1300 (after hours calls redirected to Police Comms, ask for on call forensic physician)
 - Qld Sexual Assault Helpline ☎ 1800 010 120 (7:30 am–11:30 pm, 7 days)
 - 1800 Respect, 24 hour sexual assault and domestic violence support ☎ 1800 737 732
 - Child Safety Regional Intake Service or Child Safety After Hours Service Centre ☎ 1300 681 513 or 1800 811 810
 - True Relationships & Reproductive Health www.true.org.au ☎ 3250 0240
 - Victims Assist Qld <https://www.qld.gov.au/law/crime-and-police/victim-assist-queensland>

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