

CARPA

Standard Treatment Manual

A clinic manual for primary health care practitioners
in remote and Indigenous health services
in central and northern Australia

7th edition

CARPA
Centre Australian Rural Practitioners Association Inc



RPHCM
Remote Primary Health Care Manuals



CRANAplus
improving
remote health

Centre for Remote Health
Alice Springs, 2017

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Preface

The Central Australian Rural Practitioners Association (CARPA) is a multi-professional grass roots group that formed in 1984 out of a shared recognition of the need to support practice in remote and rural communities in Central Australia. This professional support function led to the development of the *CARPA Standard Treatment Manual (CARPA STM)* by a small group of practitioners from Central Australia with 'fire in their bellies'. The ongoing development of the manual has increasingly seen the involvement of practitioners from a broad range of disciplines and regions.

Since its first publication in 1992, as a collection of protocols for the management of common conditions seen in remote (mainly Aboriginal) health practice, the *CARPA STM* has become the flagship of CARPA's activities. It has a strong reputation, among its users and farther afield, as an essential tool to support evidence-based practice in remote and Aboriginal and Torres Strait Islander health services.

Many practitioners arrive in remote Australia without specific training relevant to remote practice. The *CARPA STM* helps them to deal with a range of health, social and work conditions unique to the context.

Remote primary health care continues to evolve, and so too do the demands on those providing health services. There is now an expectation that services will incorporate a public health approach and preventative health care, as well as evidence-based clinical practice. The *CARPA STM* also continues to evolve, partly in response to these changes and partly as a leader and agent of change. We are pleased to bring you the seventh edition of this well-established and well-regarded primary health care clinic manual.

Cover painting

The painting tells the story of some women who are ill due to the loss of their 'souls' (kurrumpa). They are being healed by Ngankaris (traditional healers) who are restoring their souls.

Remote Primary Health Care Manuals logo

The RPHCM logo, developed by Margie Lankin, tells this story:

The people out remote, where they use the manuals, are coming into their health service. They are being seen from one of the manuals ... desert rose, the colours of the petals. The people sitting around are people who use the manuals – men and women. People who are working for Indigenous health... doctors and nurses and health workers. Messages are being sent out to the community from the clinic, from the people, to come in to the clinic to be seen. Messages about better health outcomes. People are walking out with better plans, better health, better health outcomes.

About this manual

The seventh edition of the *CARPA Standard Treatment Manual* has been produced as part of the suite of Remote Primary Health Care Manuals, through a collaboration between the Central Australian Rural Practitioners Association, Central Australian Aboriginal Congress, CRANAplus, and the Centre for Remote Health. The other manuals in the suite are the *Minymaku Kutju Tjukurpa Women's Business Manual (WBM)*, the *Clinical Procedures Manual for remote and rural practice (CPM)*, and the *Medicines Book for Aboriginal and Torres Strait Islander Health Practitioners (Medicines Book)*.

In producing this edition we have maintained the essential and distinctive components of past manuals. The seventh edition of the *CARPA STM* continues to provide:

- One easily portable manual for Aboriginal and Torres Strait Islander health practitioners (ATSIHPs), nurses and doctors
- Simple language, without compromise in the content
- A brief, easy-to-read style
- A focus on what makes a difference to clinical practice and health outcomes
- A manual combining technical expertise with input by remote practitioners for remote practitioners.

The *CARPA STM* does not claim to be comprehensive. It covers conditions that:

- Are common or clinically significant in remote practice
- Have different presentations and management issues to those in 'mainstream' practice
- Are life-threatening and need emergency management
- Are frightening for practitioners
- Have important public health implications
- Need coordinated, standardised care.

The *CARPA STM* does not stand alone. It is designed to be used with:

- Other books in the suite of Remote Primary Health Care Manuals
 - *WBM* — covers women's health issues including obstetrics, gynaecology, well women's screening, menopause, infertility, and contraception
 - *CPM* — explains how to do procedures referred to in the *CARPA STM* and the *WBM*
 - *Medicines Book* — a guide to medicines in the *CARPA STM* and *WBM* in an easy to read format, to assist practitioners and clients with lower English literacy levels
- *Australian Immunisation Handbook*
- *Australian Medicines Handbook*, and *Therapeutic Guidelines*.

In order to avoid unnecessary duplication between the manuals, the *WBM* and *CPM* are cross-referenced throughout the *CARPA STM*.

The style of the manual uses short directives without explanation — 'Check ...', 'Take blood ...' or 'Give ...'. In any health interaction the rights of the patient must be remembered. As a part of health care provision a patient has the right to:

- Determine what medical treatment they choose to accept or not to accept

- Be given easily understandable explanations, in their first language, about their specific health problem, any proposed treatments or procedures, and the results of any tests performed
- Have access to all health information about themselves
- Have their privacy respected, be treated with respect and dignity, and know that all health information is confidential.

Your input

Feedback is an essential component of keeping the manuals ‘by the users for the users’. Please submit your suggestions and comments via either

- Online feedback form at www.remotephcmanuals.com.au
- Email to remotephcmanuals@flinders.edu.au

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Contributors

Thank you to the practitioners, from all over Australia, who volunteered their time and expertise to ensure the manual remains evidence-based, relevant, practical and user-friendly. More information about the review process can be found at www.remotephcmanuals.com.au

This acknowledges those contributors known to us. Due to the large number of volunteers, we have only recorded the highest level of participation.

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- Absolute cardiovascular risk charts — adapted from: Australian Cardiovascular Risk Charts (National Vascular Disease Prevention Alliance, 2011) and New Zealand Cardiovascular Risk Charts (New Zealand Guideline Group, 2009)
- Warfarin starting doses for adults (Table 6.2) — adapted with permission from: Roberts GW, Helboe T, Nielsen CB, Gallus AS, Jensen I, Cosh DG, et al. Assessment of an age-adjusted warfarin initiation protocol. *Ann Pharmacother* 2003;37(6):799–803
- Pain in teeth or gums (Table 6.17) — adapted with permission from: Kingon A. Solving dental problems in general practice. *Aust Fam Physician* 2009;38(4):211–16.

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Using the CARPA Standard Treatment Manual

The *CARPA STM* is intended for use by trained health professionals including ATSIHPs, nurses and doctors. It is not intended to be a layperson's manual. It is designed to be used primarily in remote (largely Aboriginal and Torres Strait Islander) communities, and rural and urban Aboriginal Medical Services.

The *CARPA STM* supports a holistic approach to health care that incorporates collaborative practice, shared care, patient recall and follow-up. Use of the manual also facilitates standardised pharmacy imprest lists and quality assurance.

Use of the *CARPA STM* is not intended to replace clinical judgement, expertise, or appropriate referral. It does not support practitioners to work beyond their level of competence or confidence, or outside their scope of practice or health service policies. Supply of medicines recommended in this manual must occur within the constraints of organisational policies and jurisdictional drugs and poisons legislation. Safe practice requires that practitioners who are not sure what they are dealing with talk with someone more experienced or skilled.

Following protocols in the *CARPA STM* does not remove the need to complete normally accepted practices (even if unstated) such as:

- Observing privacy and confidentiality
- Getting informed consent
- Discussing procedures and treatment options with patients and/or their carers
- Discussing medicines, including side effects and the need to complete the whole course of treatment
- Actively involving parents and/or carers in the care and treatment of children
- Recording history, observations, findings and actions in the file notes.

When options are given they are listed in order of preference. Only move down the list if earlier options are not available, or are not acceptable to the person or their carer.

Practitioners should discuss with the person the impact of a diagnosis on their ability to hold an unconditional driver's license. Reporting requirements vary by jurisdiction. For more information see www.austroads.com.au/drivers-vehicles/assessing-fitness-to-drive

The protocols

Protocols are largely in dot point form. Activities are usually under 4 headings:

- **Ask** — subjective assessment, patient history (eg pain when passing urine)
- **Check** — objective assessment, observations, tests (eg temp, pulse, BP, BGL)
- **Do** — action, treatment, giving medicine (eg wash out eye with normal saline)
- **Follow-up** — plan, referral (eg review 1 week after treatment)

Always begin by reading the whole protocol, and carefully checking points in information boxes.

Information boxes

Black boxes — easy to find information.

Thin red boxes — important information.

Thick red boxes — very important or life-saving information.

Terms

Indigenous

In this manual the term Indigenous is used to mean both Aboriginal and Torres Strait Islander Australians. We mean no disrespect by using this inclusive term for different cultural groups and apologise for any discomfort or sorrow it may cause.

Abbreviations

Abbreviations and acronyms may be used without explanation. There is an abbreviation list, including acronyms, in the reference section.

Medical consult

A medical consult involves seeking advice and/or authorisation for treatment from a doctor, appropriately qualified nurse practitioner, midwife or specialist. It occurs while the patient is present. It may be in person or by telehealth (eg phone, radio, videoconference).

Medical review

A medical review is an assessment of the patient by a doctor, appropriately qualified nurse practitioner, midwife, or specialist. This can be done in person or via case conference. It would usually involve making an appointment for the person to return to the clinic or to visit the practitioner at a future time.

Medicines

Medicines are named for their active ingredients. Where a brand name for a medicine or other product is used it is in italics, and usually in brackets. Mention of specific products does not imply that they are endorsed or recommended in preference to others of a similar nature that are not mentioned.

Online version

The *CARPA Standard Treatment Manual* is available online as part of the Remote Primary Health Care Manuals at: www.remotephmanuals.com.au

Cultural safety tips

To be effective, health care must occur in a culturally safe/secure environment with practitioners who are culturally aware and competent. See *Cultural safety* for more information (CPM p6). Learn all you can about the local culture. Always be respectful, and carefully consider the following.

Cultural beliefs

- Traditional beliefs about health and illness remain intact, embedded and valid in many Indigenous communities
- Use of traditional healers and traditional medicine is common. It is very important to acknowledge and respect this

Loss and grief

- Indigenous communities may follow these practices after a death
 - Deceased person's name should not be spoken
 - Special rituals, such as smoking deceased person's house and work, or the clinic
 - Certain relatives of the deceased may choose not to speak
 - Relatives of the deceased may live outside the community to mourn
 - In some communities 'sorry business' (grieving) involves self-inflicted injury (sorry cuts), family fighting (payback), wailing, silence

Effective communication

- English can be a second or third language for Indigenous Australians
 - Ask if person would like an interpreter to assist
- Don't assume that conversations conducted in English have the same meaning for practitioner and patient
- Hearing problems are common and can make communication difficult
- While efforts to learn the local language are usually appreciated, don't try to use a language learnt in another community
- Be aware of non-verbal body language and gestures — pointing, hand signals, eye contact. Meanings may differ between cultures

How you question patients

- Direct questions can be considered rude
- Only ask one question at a time and allow person time to consider it
 - Person may be thinking in their own language before responding
- Check that you have understood what the person has told you
- Person may bring along a relative or friend
- Avoid double negatives. *Example:* 'You don't do nothing like that, do you'
- Ready agreement can be a sign of misunderstanding, or courtesy
- Silence is often OK, give person plenty of time to answer. But remember that silence can also mean misunderstanding, or that practitioner is on culturally unsafe ground

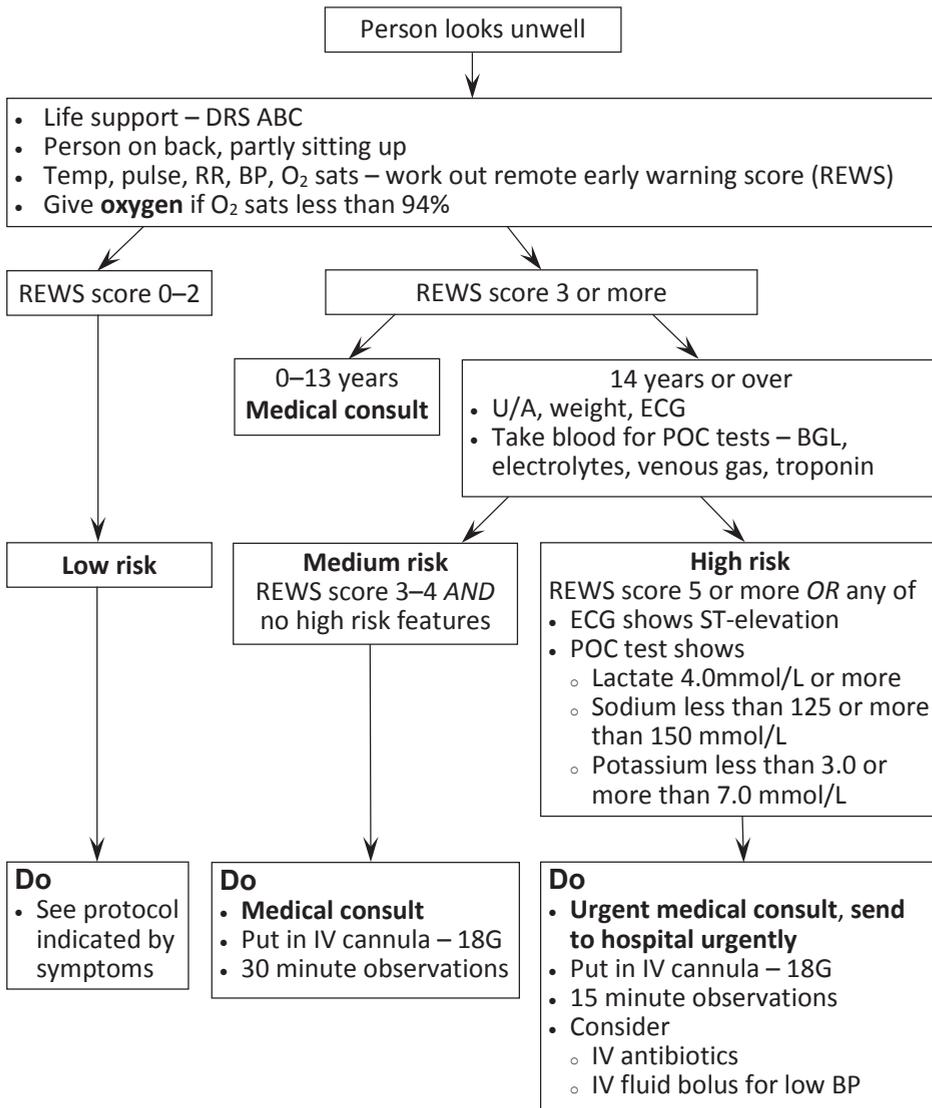
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Early recognition of sick or deteriorating patients

- If concerned a person is not improving or is deteriorating despite treatment —
 - Calculate remote early warning score (REWS) using appropriate table
 - Adult – Table 1.1 *OR* if woman more than 20 weeks pregnant – Table 1.2
 - Child (by age) – Tables 1.3 – 1.6 (p8)
 - Score each line individually, then add scores for REWS
 - *THEN* follow Flowchart 1.1

Flowchart 1.1: Management based on risk level



- Person at increased risk of deterioration if
 - Abnormal physical signs
 - Comorbidities (eg RHD, diabetes, kidney disease)
- Better to assume a person is sick and increase care early
 - Do simple investigations early (eg ECG, POC blood tests)
 - **Do not** assume no chest pain means no heart problems
- Consider sepsis in any person with abnormal signs — take blood and urine for culture before giving antibiotics

Sepsis — signs and symptoms can include

- Fast breathing
- Fast pulse
- Low BP or dizziness
- Confusion and/or agitation
- High or low temperature

- After treatment given, re-assess for response
 - If no response or brief/weak response — **medical consult**

Table 1.1: Adult REWS

13 years and over — remote early warning score (REWS)							
REWS score	3	2	1	0	1	2	3
Consciousness AVPU				Alert	Voice		Pain Unresponsive
RR	8 or less			9–20	21–30	31–35	36 or more
O ₂ sats (%)	84 or less	85–89	90–92	93 or more			
Pulse	40 or less		41–50	51–100	101–110	111–130	131 or more
Systolic BP (mmHg)	89 or less	90–99		100–169	170–179	180–199	200 or more
Temperature (°C)	34 or less	34.1–35	35.1–36	36.1–37.9	38–38.5	38.6–39.5	39.6 or more

Table 1.2: Obstetric REWS

Obstetric — remote early warning score (REWS)							
REWS score	3	2	1	0	1	2	3
Consciousness AVPU				Alert	Voice		Pain Unresponsive
RR	9 or less			10–17	18–24	25–29	30 or more
Oxygen needed to keep O ₂ sats 94% or more						2–4L/min	More than 4L/min
Pulse	59 or less			60–110		111–149	150 or more
Systolic BP (mmHg)	79 or less	80–89		90–139	140–149	150–159	160 or more
Diastolic BP (mmHg)				89 or less	90–99	100–109	110 or more
Temperature (°C)	34 or less	34.1–35	35.1–36	36.1–37.9	38–38.5	38.6–39.5	39.6 or more

Table 1.3: Paediatric REWS — 0–3 months

0–3 months — remote early warning score (REWS)							
REWS score	3	2	1	0	1	2	3
Consciousness AVPU				Alert	Voice		Pain Unresponsive
Respiratory distress				Normal	Mild	Moderate	Severe
RR	19 or less	20–24	25–29	30–59	60–69	70–79	80 or more
O ₂ sats (%)	90 or less		91–94	95 or more			
O ₂ needed – nasal prongs*				Less than 2L/min		2L/min or more	
Pulse	59 or less	60–89	90–109	110–159	160–169	170–179	180 or more
Capillary refill				Less than 2 seconds		2 seconds or more	
Temperature (°C)	33.4 or less	33.5–35	35.1–35.5	35.6–38	38.1–38.5	38.6–39	39.1 or more

Table 1.4: Paediatric REWS — 4–11 months

4–11 months — remote early warning score (REWS)							
REWS score	3	2	1	0	1	2	3
Consciousness AVPU				Alert	Voice		Pain Unresponsive
Respiratory distress				Normal	Mild	Moderate	Severe
RR	14 or less	15–19	20–29	30–44	45–49	50–59	60 or more
O ₂ sats (%)	90 or less		91–94	95 or more			
O ₂ needed – nasal prongs*				Less than 2L/min		2L/min or more	
Pulse	59 or less	60–89	90–109	110–159	160–169	170–179	180 or more
Capillary refill				Less than 2 seconds		2 seconds or more	
Temperature (°C)	33.4 or less	33.5–35	35.1–35.5	35.6–38	38.1–38.5	38.6–39	39.1 or more

Table 1.5: Paediatric REWS — 1–4 years

1–4 years — remote early warning score (REWS)							
REWS score	3	2	1	0	1	2	3
Consciousness AVPU				Alert	Voice		Pain Unresponsive
Respiratory distress				Normal	Mild	Moderate	Severe
RR	11 or less	12–16	17–19	20–34	35–39	40–59	60 or more
O ₂ sats (%)	90 or less		91–94	95 or more			
O ₂ needed – nasal prongs*				Less than 2L/min		2L/min or more	
Pulse	59 or less	60–89	90–109	110–139	140–149	150–170	171 or more
Capillary refill				Less than 2 seconds		2 seconds or more	
Temperature (°C)	33.4 or less	33.5–35	35.1–35.5	35.6–38	38.1–38.5	38.6–39	39.1 or more



Table 1.6: Paediatric REWS — 5–12 years

5–12 years — remote early warning score (REWS)							
REWS score	3	2	1	0	1	2	3
Consciousness AVPU				Alert	Voice		Pain Unresponsive
Respiratory distress				Normal	Mild	Moderate	Severe
RR	9 or less	10–14	15–19	20–29	30–34	35–49	50 or more
O ₂ sats (%)	90 or less		91–94	95 or more			
O ₂ needed – nasal prongs*				Less than 2L/min		2L/min or more	
Pulse	59 or less	60–69	70–79	80–120	121–129	130–150	151 or more
Capillary refill				Less than 2 seconds		2 seconds or more	
Temperature (°C)	33.4 or less	33.5–35	35.1–35.5	35.6–38	38.1–38.5	38.6–39	39.1 or more

* If using mask — 4L/min

- To calculate level of respiratory distress for child see Table 1.7
 - Assess each category individually
 - Use the highest grade in any category when calculating REWS

Table 1.7: Assessing respiratory distress — child 0–12 years

	Mild	Moderate	Severe
Airway	• Stridor on exertion/crying	• Some stridor at rest	• Stridor at rest
Behaviour and feeding	• Normal • Talks in full sentences	• Some irritability • Difficulty talking/crying • Difficulty feeding or eating	• Increased irritable and/or lethargic • Looks exhausted • Unable to talk or cry • Unable to feed or eat
Accessory muscle use	• Mild intercostal recession and mild tracheal tug	• Moderate intercostal recession and moderate tracheal tug • Nasal flaring in infants	• Marked intercostal and sternal recession and marked tracheal tug • Head bobbing in infants
Other		• May have brief apnoeas (stops breathing)	• Gasping, grunting • Very pale or blue (cyanosis) • Increasingly frequent or prolonged apnoeas

Life support — DRS ABC

- If newborn — see *Newborn resuscitation* ([WBM p70](#))
- If immediately unsure of pulse — don't delay compressions
- Person with narcotic overdose may at first have a pulse but not be breathing — they need respiratory support

This protocol is for people collapsed and unresponsive, or drowned.

- If no signs of life — not responding, not moving, gasps/not breathing, pulseless or pulse not clearly felt in 10 seconds — DRS ABC (*below*)
- If unresponsive and breathing normally — assess for causes and manage as **coma** ([p113](#))
- If deterioration or clinical change during assessment — return to start of this protocol
- If more than one of you — declare who is boss
- Decision to stop CPR is very difficult — made by senior member of team **after medical consult**

D – Danger

- Make sure that you, person, and place are safe
 - If outside — put on protective clothing (eg fluoro vest, sun protection)
 - Use protection against blood/saliva-borne infections
 - Check for hazards — toxic gases, chemicals, electrical sources, being trapped or burned
 - Check surface person is lying on
 - If very hot — can cause burns ([p38](#))
 - If very cold — can cause hypothermia ([p62](#))

R – Response

- Does person respond to voice or gentle shake
 - Unresponsive — coma ([p113](#)) or cardiac arrest

S – Send for help

- Helper can
 - Collect needed equipment
 - Call for more help, call ambulance if access to hospital
 - Help with CPR

If no signs of life — not responding, not moving, gasps/not breathing, pulseless/pulse not clearly felt in 10 seconds — DRS ABC

Immediate defibrillation

- If collapse is witnessed and defibrillator immediately available/attached (eg in clinic) defibrillate if indicated — see *Defibrillation* ([p12](#))

A – Airway

- Establish clear airway
 - If person starts breathing — support airway and assess circulation
 - If person doesn't breathe — start CPR (30 compressions first) and give breaths with patient lying on back (supine)
 - Roll on to side if needed to clear vomit
- Adult or child
 - Use chin lift. Grip chin and gently lift it up — F 1.1
 - *OR* jaw thrust. Hold jaw at point under ears, push upward and forward until chin juts out and airway opens — F 1.2
- Infant (under 1 year)
 - Put folded towel or nappy under shoulders and back — F 1.3
- **Clear** airway
 - If visible foreign body — 2 'hooked' fingers in downward sweeping motion
 - If liquid (blood, vomit, water) — use suction if available
 - *OR* use gravity — roll on to side, open mouth, turn face downward
- **Keep** airway open — put in oropharyngeal (*CPM p45*) or nasopharyngeal (*CPM p46*) airway if needed



1.1



1.2



1.3

B – Breathing

- If 1 responder — for all ages except newborns give 2 breaths per 30 compressions
 - If newborn — see *Newborn resuscitation (WBM p70)*
- If 2 responders — give
 - 2 breaths per 15 compressions — child
 - 2 breaths per 30 compressions — adult
- 2 breaths, delivered over 1 second each with bag-valve-mask using **oxygen** if available, or mouth-to-mouth with droplet barrier/filter
- Compressions paused for breaths, no longer than 10 seconds
- Watch chest rise and fall. Don't overinflate
- If recovers and breathing normally —
 - Give **oxygen** to target O₂ sats 94–98%
 - *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Now put in recovery position — F 1.4 — unless head or spinal injury possible



1.4

C – Compressions

- Start CPR on firm surface
- Centre of chest, depth of 4–6cm
 - Infants and prepubertal children $\frac{1}{3}$ depth of chest
 - Allow chest recoil, minimise interruptions
- **If 1 responder — 30 compressions then 2 breaths for adult and for child**
 - 5 cycles in 2 minutes
- **If 2 responders**
 - **30 compressions then 2 breaths for adult** — 5 cycles in 2 minutes
 - **15 compressions then 2 breaths for child** — 5 cycles in 1 minute
- Compressions at rate of 100/min
- Pause compressions to allow for breaths — max pause 10 seconds
- 2 breaths delivered over 1 second each. Don't overinflate

Defibrillation

- As early as possible — if immediately available and adult, defibrillation before compressions
 - Manual defibrillator — continue compressions until charged
 - AED — once attached, pause compressions for rhythm analysis
- Resume CPR immediately after shock delivered. Recheck rhythm after 2 minutes or return of responsiveness

Indications

- VF
- Pulseless VT

Children

- Infant or child less than 10kg
 - Use manual defibrillator if available
 - If no manual defibrillator — use AED



1.5

Pad/paddles

- If using adhesive pads — press on firmly for best shock and to avoid burns
- Do not place pad/paddle over ECG dots, leads or pacemakers
- Adult — F 1.5
 - One pad/paddle on right parasternal area over 2nd intercostal space
 - One pad/paddle on left midaxillary line over 6th intercostal space
- Child — use largest pad/paddles that allow at least 3cm pad separation
 - Over 10kg — usually 8–10cm adult pads
 - 10kg or under — dose-attenuated paediatric pads (deliver 50J) *OR* adult pads placed front and back — F 1.6



1.6

Defibrillator energy levels

- | | |
|---|--|
| <ul style="list-style-type: none"> • Monophasic <ul style="list-style-type: none"> ◦ Adult — 360J ◦ Child — 4J/kg (doses = biphasic p16) | <ul style="list-style-type: none"> • Biphasic <ul style="list-style-type: none"> ◦ Adult — 200J ◦ Child — 4J/kg (doses p16) |
|---|--|

Drugs (medicines)**Adrenaline (epinephrine)**

- Give if no heart beat (asystole), pulseless VT, VF, pulseless electrical activity (PEA/EMD)
- Adrenaline dose
 - **Adrenaline (epinephrine)** IV/IO – adult 1mg, child 0.01mg/kg/dose up to 1mg (doses [p17](#))
 - Every 4 minutes during CPR
 - **Do not** give if person already responding (breathing and moving)

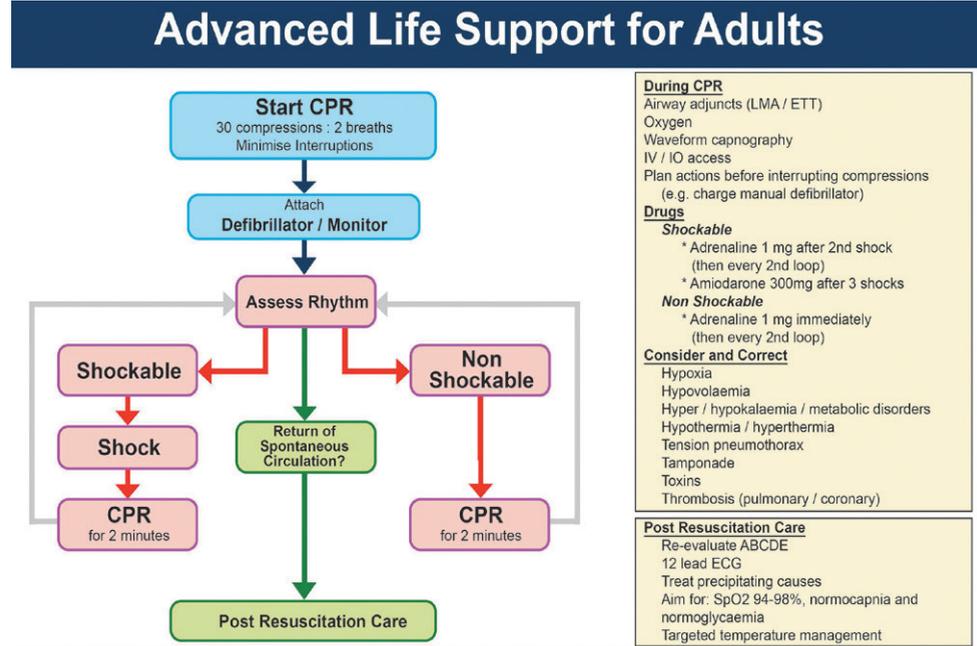
Amiodarone

- If persistent VT or VF after 3 failed shocks — give **amiodarone** IV/IO push as bolus – adult 300mg, child 5mg/kg up to 300mg (doses [p17](#))
- If still persistent VT or VF — shock again
- If still persistent VT or VF after fourth shock — **medical consult** about
 - Second **amiodarone** IV/IO bolus – adult 150mg, child 2.5mg/kg up to 150mg
 - *OR* **lidocaine (lignocaine)** IV/IO bolus – 1mg/kg
- If normal rhythm restored — start **amiodarone** infusion 15mg/kg over 24 hours (usual adult dose 900mg). Dilute in **glucose 5%**
 - **Do not** dilute **amiodarone** in **normal saline**
 - Diluting — need concentration of more than 0.6mg/mL for stable solution
 - Less than 225mg — use 100mL bag **glucose 5%**
 - 225–449mg — use 250mL bag **glucose 5%**
 - 450mg or more — use 500mL bag **glucose 5%**
 - Use volumetric pump
- Repeat 12 lead ECG — look for evidence of ischaemia/infarct

Atropine

- For very slow heart rate (severe bradycardia), some poisons
- **Do not** give if no heart beat (asystole)
- Dose
 - Adult — IV 1mg boluses (up to 3mg in total)
 - Child — IV/IO 0.02mg/kg (doses [p17](#)) *OR* ETT 0.03mg/kg

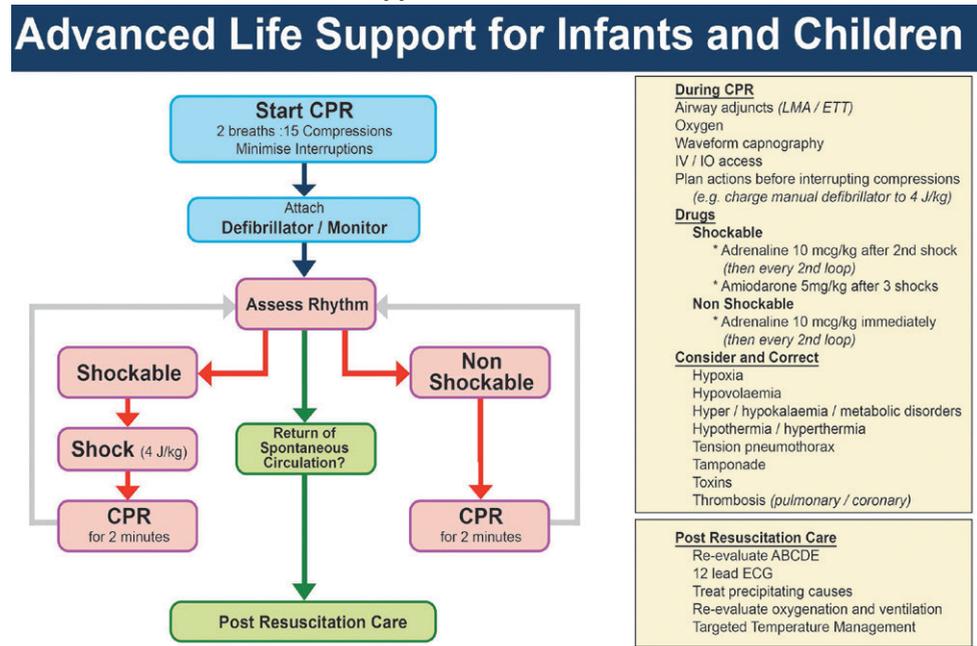
Flowchart 1.2: Advanced life support for adults



January 2016



Flowchart 1.3: Advanced life support for infants and children



January 2016



If unresponsive with signs of life — breathing slowly, or not breathing but pulse easily felt — ABC

A – Airway

- Establish clear airway and give breaths with patient lying on back (supine)
 - Roll on to side if needed to clear vomit

B – Breathing

- Support breathing with bag-valve-mask using oxygen if available, or mouth-to-mouth with droplet barrier/filter
 - 15 breaths/min child, 10 breaths/min adult
- If breathing becomes normal but person remains unconscious — put in recovery position — F 1.4
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult *OR* mask 5–10L/min
- If carbon monoxide poisoning (eg house fire victim) — give **oxygen**
 - Always use non-rebreather mask 10–15L/min

C – Circulation

- Assess circulation
 - Check pulse and BP
 - Correct low BP (hypotension) — IV bolus normal saline – adult 500mL, child 20mL/kg up to 500mL. Assess response, **medical consult**
 - Cardiac monitoring
 - 12 lead ECG — **send ECG for medical consult**
- Assess/manage causes of coma ([p113](#))

If unresponsive and breathing normally

- Assess and manage as coma — see *Unconscious person* ([p113](#))

Resuscitation reference table

This table must be used with an appropriate protocol and **medical consult**. It is intended as a guide only.

Age	Weight (kg)	Airways			Defibrillator	Bolus IV fluid Normal saline	Maintenance IV fluid Normal saline with 5% glucose	Oxygen
		LMA	ET tube					
		Size (cuff volume)	ID size (mm) = (Age [years] ÷ 4) + 4 OR width of person's fifth fingernail	Depth of insertion at lip (cm)				
Under 3 months	2	1 (up to 4mL)	2.5 uncuffed	8.5	Medical consult	20mL	8mL/hr	5L/min
	3.3	1 (up to 4mL)	3 uncuffed	9	Medical consult	33mL	13mL/hr	5L/min
3 months	6.2	1.5 (up to 7mL)	3.5 uncuffed	10	Medical consult	124mL	25mL/hr	5–8L/min
6 months	7.6	1.5 (up to 7mL)	4 uncuffed	10.5	Medical consult	152mL	31mL/hr	8L/min
1 year	9	2 (up to 10mL)	4 uncuffed	11	36J	180mL	36mL/hr	8L/min
2 years	12	2 (up to 10mL)	4.5 uncuffed	12	48J	240mL	44mL/hr	10L/min
3 years	14	2 (up to 10mL)	4.5 uncuffed	13	56J	280mL	48mL/hr	10L/min
4 years	16	2 (up to 10mL)	5 uncuffed	14	64J	320mL	52mL/hr	10L/min
6 years	20	2.5 (up to 14mL)	5.5 uncuffed	15	80J	400mL	60mL/hr	10L/min
8 years	25	2.5 (up to 14mL)	6 uncuffed	16	100J	500mL	65mL/hr	10L/min
10 years	32	2.5 (up to 14mL)	6.5 uncuffed	17	128J	640mL	72mL/hr	10L/min
12 years	40	3 (up to 20mL)	6.5 cuffed	18	160J	800mL	80mL/hr	10L/min
14 years	50	3 (up to 20mL)	7 cuffed	19	200J	1L	90mL/hr	10L/min
Adult	65+	4 (up to 30mL)	7 cuffed	20	200J	1L	105mL/hr	15L/min
	71+	4 (up to 30mL)	7 cuffed	21	200J	1L	110mL/hr	15L/min
	90+	5 (up to 40mL)	8 cuffed	21	200J	1L	110mL/hr	15L/min

Age	Weight (kg)	Medicines							
		Adrenaline IV/IO (epinephrine) 1:10,000 1mg/10mL	Adrenaline IM (epinephrine) 1:1000 1mg/1mL	Amiodarone IV/IO 50mg/1mL 150mg/3mL	Atropine IV/IO 0.6mg/mL	Glucose IV 10%, 50%	Midazolam IV/IO 5mg/mL	Morphine IV 10mg/mL	
		Pulseless VT, VF, asytle	Anaphylaxis, sudden severe asthma	Pulseless VT, VF	Symptomatic slow heart rate (bradyarrhythmia)	Low blood glucose	Fits	Pain management	
		0.01mg/kg/dose up to 10mL		5mg/kg/dose up to 300mg	0.02mg/kg/dose Adult – 1mg (1.7mL) boluses (up to 3mg total)	10% – 5mL/kg/dose	0.15mg/kg/dose up to 5mL	0.1mg/kg/dose up to 10mL	
	Undiluted If not shockable — give immediately. If shockable — give after 2nd shock <i>THEN</i> every 2nd loop.	Undiluted Give in upper outer thigh (anterolateral). Give every 5 min until improves — use different injection sites.	Undiluted Give after 3rd shock Slow IV/IO push (2 min) <i>THEN</i> 20mL 5% glucose flush.	Undiluted Give every 5 min until desired heart rate or maximum dose.	Undiluted Repeat if needed.	Mix to give 1mg/mL — 5mg (1mL) + 4mL normal saline. Inject slowly over 2 min. Titrate to clinical response.	Mix to give 1mg/mL — 10mg (1mL) + 9mL normal saline. Give every 3–5 min. Titrate to clinical response.		
				10%	50%				
Under 3 months	2	0.2mL	N/A	0.2mL	0.07mL	10mL	–	0.3mL	0.2mL
	3.3	0.33mL	0.05mL	0.33mL	0.1mL	16.5mL	–	0.5mL	0.33mL
3 months	6.2	0.62mL	0.05mL	0.62mL	0.2mL	31mL	–	1mL	0.62mL
6 months	7.6	0.76mL	0.05mL	0.76mL	0.25mL	38mL	–	1.2mL	0.8mL
1 year	9	0.9mL	0.1mL	0.9mL	0.3mL	45mL	–	1.4mL	0.9mL
2 years	12	1.2mL	0.15mL	1.2mL	0.4mL	60mL	–	1.8mL	1.2mL
3 years	14	1.4mL	0.15mL	1.4mL	0.5mL	70mL	–	2.2mL	1.4mL
4 years	16	1.6mL	0.2mL	1.6mL	0.5mL	80mL	–	2.4mL	1.6mL
6 years	20	2mL	0.2mL	2mL	0.7mL	100mL	–	3mL	2mL
8 years	25	2.5mL	0.3mL	2.5mL	0.9mL	125mL	–	3.8mL	2.5mL
10 years	32	3.2mL	0.3mL	3.2mL	1.1mL	–	50mL	4.8mL	3.2mL
12 years	40	4mL	0.4mL	4mL	1.4mL	–	50mL	5mL	4mL
14 years	50	5mL	0.5mL	5mL	1.7mL	–	50mL	5mL	5mL
Adult	65+	10mL	0.5mL	6mL	1.7mL	–	50mL	5mL	up to 10mL

Abdominal pain

- **Always consider heart pain (p47) and pneumonia (p309)** — these can be felt in upper abdomen
- **In females** always consider PID (*WBM p260*), ectopic pregnancy (*WBM p16*), miscarriage (*WBM p17*)
 - Always ask about contraception, last menstrual period
 - Do urine pregnancy test (*WBM p279*). **Be aware:** If negative — could still be early ectopic pregnancy or miscarriage

Abdominal assessment

See F 1.7 to help you visualise abdominal contents and quadrants.

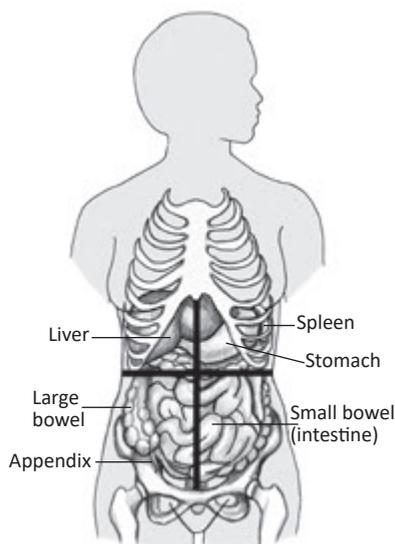
Do first

Remember — Life support — DRS ABC (*p10*).

- Give **pain relief (p377)** early if BP adequate. Person will be more relaxed, assessment more accurate

Ask

- About pain
 - When did pain start, did it come on slowly or fast
 - Where did pain start, where is it now
 - Does pain go anywhere else (eg back, shoulders, chin)
 - What is pain like
 - There all the time, comes and goes
 - Gets stronger and weaker (crampy/colicky)
 - Sharp, aching, burning
 - Had this pain before
 - What makes it better or worse — medicines, foods, position, coughing, movement
- Nausea and/or vomiting
 - Is vomit green (bile indicates obstruction)
 - Is there blood
- Appetite, eating and drinking as usual
- Changed faeces habits — diarrhoea, blood, black (melaena), constipation
- Urine — pain or burning (dysuria), going more often (frequency)
- Women — vaginal discharge or bleeding, last menstrual period, contraception, deep pain with sex (dyspareunia)
- Feeling hot and/or cold (fever and/or chills)
- Anything else wrong — cough, chest pain, shoulder tip pain



1.7



- History of trauma
- Medical history including abdominal operations, pancreatitis, ectopic pregnancy, heart problems, high BP, kidney stones, gallstones, peptic ulcer
- Pain killers especially NSAIDs
- Have they taken any other medicines, drugs, other substances
- Alcohol (grog) use and smoking

Look

- Is pain causing person to lie still or roll around
- Pallor — pale lips, tongue, inner eyelids
- Jaundice — yellow eyes or skin
- Lumps (masses)
- Rash — consider shingles
- Abdomen swollen (distended) — see *Assessing ascites* (CPM p202)
- Abdomen rigid or moving with breathing
- Bruising, other signs of injury
- Blood, black faeces (melaena) on clothing/underwear, at anus
- Discharge from penis or vagina

Listen

- With stethoscope — centre of abdomen for bowel sounds (CPM p199)
 - May be more than usual, less than usual, none
 - Are they loud, splashing, tinkling like water in cave (obstruction)
- With stethoscope — chest for crackles, wheezing, bronchial (harsh) breath sounds (CPM p189). Consider pneumonia

Feel

Start as far from painful area as possible. Get more information if you palpate and percuss most painful area last. Gently feel all areas of abdomen, including sides and behind kidneys for tenderness, hardness, organ enlargement, masses. Watch person's face. See *Percuss* (CPM p199) and *Palpate* (CPM p200)

- Abdomen soft or hard like wood (rigid, guarding)*
- Abdomen very tender anywhere
- Does it hurt more in one part of abdomen
- Does feeling or tapping in one part cause pain in another part of abdomen*
- Check for tenderness or sharp pain* when you tap your finger (percuss) over painful area (percussion tenderness)
- Check for rebound tenderness* — tell person what you are going to do
 - Press gently on sore area for 15 seconds, take hand away suddenly
 - Watch person's face for pain when you take hand away
- Check groin for swellings (hernias). Are they hard or soft, tender
 - Hard, tender hernias are strangulated, need urgent surgery

* See *Do* (p20)

- Check private parts (genitals) for
 - Swollen ball bag (scrotum) — hernia, hydrocele, cancer
 - Tenderness — infected testes or cord (orchitis, epididymitis), twisted testicle (torsion)

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Ask person to cough. Does it cause strong point of pain*
- U/A for blood, nitrites, leucocytes, bilirubin, protein, ketones
- BGL
- If upper abdominal pain, right upper quadrant, or chest pain — do ECG
- Re-examine after 30–60 minutes to see if pattern changes

Serious signs

- Pulse more than 100 beats/min, less than 60 beats/min, irregular
- Systolic BP less than 100mmHg
- Temp (on more than 1 reading) — more than 38°C or less than 36°C
- Severe pain with tenderness or guarding
- Pain goes through to back
- Faeces — blood, black (melaena), greasy, very smelly
- More than a tiny bit of blood (blood streak) in vomit
- See or feel lump (mass), especially throbbing (pulsating) mass

Do

- If any **serious signs** — **medical consult** straight away
- If any signs marked (*) present — see *Generalised peritonitis* ([p27](#))
- Any patient over 55 years with any abdominal pain — see *Ruptured abdominal aortic aneurysm* ([p27](#))
- For other conditions — see area of pain (*below*)

Upper abdominal or epigastric pain

First do abdominal assessment ([p18](#)).

- Usually caused by irritation of stomach or oesophagus — gastritis ([p21](#)), reflux ([p21](#)), indigestion ([p21](#))
- Can be gastric/peptic ulcer (*below*), pancreatitis (*below*), gall bladder disease ([p22](#)), pneumonia ([p309](#)), heart disease
- Common presentation of heart attack — do ECG, see *Chest pain* ([p47](#))
- Can be diabetic ketoacidosis. If high BGL — check ketones, do POC test for venous gas



Bleeding ulcer or pancreatitis

Signs of severity — pulse more than 100 beats/min, RR more than 20 breaths/min, systolic BP less than 100mmHg, O₂ sats below 90%.



Pancreatitis

- May be history of pancreatitis
- Severe upper abdominal pain may go through to back, tenderness below breastbone (epigastric)

Bleeding/perforated ulcer

- Upper abdominal pain may radiate to back or shoulder tip, tender
- Vomiting blood or passing black faeces (melaena)

Check

- Collect and measure urine output
- Do POC test for venous gas, Hb and electrolytes
- If signs of sepsis — take blood for cultures before giving antibiotics

Note: Other blood tests will be done in hospital.

Do not

- **Do not** let person eat or drink anything — may need operation

Do

- Put in IV cannula (*CPM p84*)
 - Give **normal saline** bolus – adult 1L — assess response
- Give **antiemetic** to stop nausea or vomiting (*p105*)
- **Medical consult, send to hospital urgently**

Gastritis, reflux, indigestion

- No serious signs (*p20*), normal ECG
- Abdomen soft with mild tenderness
- Temp, pulse, RR, BP, O₂ sats usually normal
- Loss of appetite
- Pain linked to hunger or eating certain foods

Do

- Give **antacids** (aluminium and magnesium salts) *OR* **omeprazole** oral – adult 20mg
- Advise person not to drink alcohol (grog)
- If pain continues for more than a few days with this treatment — **medical consult**/review about treatment and tests. Could be gastric/peptic ulcer

Right upper quadrant pain

First do abdominal assessment (*p18*).

- Usually caused by gall bladder disease — but may be heart attack (*p47*), pneumonia (*p309*) or hepatitis (liver disease) (*p363*)



Gall bladder disease

Uncomplicated gall stone/s

- Pain
 - May be in waves (colicky), background pain between spasms common
 - Mild to severe — may have had same sort of pain before
 - Right-sided or central, may go through to back, base of right shoulder blade, or shoulder
 - Often starts ½–2 hours after eating fatty food
 - Settles with pain relief
- Not unwell — no infection, no jaundice, no fever
- May be loss of appetite with or without nausea, vomiting

Complicated gall bladder disease — infected and/or obstructed

- Pain — moderate or severe, usually constant
- Suspect if very tender under right ribs
- If infected bile duct (ascending cholangitis) — fever, pulse more than 100 beats/min, systolic BP less than 100mmHg, O₂ sats less than 90%, yellow skin or eyes (jaundice), bilirubin on U/A

Do not

- **Do not** let person eat or drink anything — may need operation

Do

- **Medical consult**
- Give **pain relief** — usually morphine ([p381](#))
- Give **antiemetic** to stop vomiting ([p105](#))

Do also — if complicated gall bladder disease

- **Medical consult, send to hospital**
- Put in IV cannula ([CPM p84](#))
 - Run **normal saline** — 1–2L
- Take blood for blood cultures ([CPM p375](#)) — send with person
- Give **amoxi/ampicillin** IV single dose — adult 2g, child 50mg/kg/dose up to 2g (doses [p425](#))
 - If allergic to penicillin — give **ceftriaxone** IV single dose — adult 1g, child 50mg/kg/dose up to 1g (doses [p429](#))
 - If anaphylaxis to penicillin — **medical consult**
- **AND gentamicin** IV single dose (doses [p433](#))
- **AND metronidazole** IV single dose — adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p434](#))



Lower abdominal pain



First do abdominal assessment ([p18](#)).

- Many possible causes — can be hard to tell apart

Must check for

- Appendicitis (*below*)
- Strangulated or stuck (incarcerated) hernia ([p24](#))

Men

- Twisted testicle ([p384](#))
- Infected testes ([p384](#))

Women

- PID ([WBM p260](#)) — common serious cause of lower abdominal pain in non-pregnant women aged 15–35 years, often missed, can cause serious problems
- Ectopic pregnancy ([WBM p16](#))

Could also be

- UTI (adult [p411](#), child [p184](#))
- Constipation ([p26](#))
- Diverticulitis

Appendicitis

- Right lower area pain — may start as central pain
- Usually nausea, vomiting, loss of appetite
 - May be absent, especially if elderly
- May have percussion tenderness, guarding, rebound tenderness
- Usually mild fever (37.8–38°C), fast pulse ([p422](#))

Check

- Do POC test for venous gas
- If signs of sepsis ([p6](#)) — take blood for blood cultures ([CPM p375](#))

Do not

- **Do not** let person eat or drink anything — may need operation

Do

- **Medical consult** — may need antibiotics and/or to be sent to hospital
- Put in IV cannula ([CPM p84](#))
 - Run **normal saline** – 500mL
- Give **pain relief** ([p377](#))

Bladder infection

- Lower central pain, usually tender
- Usually burning when passing urine (dysuria), passing urine often (frequency)
- Usually no fever

Do

- For woman — always consider PID (*WBM p260*), presentation can be similar
- For **adult** and older child — see *Urine problems — over 12 years (p411)*
- For younger **child** — see *Urine problems — 2 months to 12 years (p184)*

Strangulated or stuck (incarcerated) hernia

- Usually in one side of groin, may push into scrotum
- Occasionally in or just beside umbilicus
- Tender, painful swelling

Do not

- **Do not** let person eat or drink anything — may need operation

Do

- Put in IV cannula (*CPM p84*)
- Give **morphine** (*p381*)
- Give **antiemetic** to stop nausea and vomiting (*p105*)
- When pain controlled — try to push hernia back. With 1 or 2 finger tips apply constant moderate pressure over rounded dome of swelling
- **Medical consult**
- If hernia can't be reduced —
 - Run **normal saline**
 - **Medical consult**, send to hospital

Lower abdominal pain — men

See *Twisted testicle (p384)* or *Infected testes (p384)*.

Lower abdominal pain — women

Always consider PID (*WBM p260*) — common serious cause of lower abdominal pain in non-pregnant women aged 15–35 years, often missed, can cause serious problems.

Check file notes

- Dates and results of last STI check, cervical screening
- History of UTIs, STIs, PID, ectopic pregnancy
- Childbirth, miscarriage, termination of pregnancy in last 6 weeks
- IUD

Ask

- Deep pain on having sex
- Vaginal loss — fluid, blood, colour, amount. Leave pad in place
- If pregnant — contractions (baby pains), baby's movements



Do

- Urine pregnancy test ([WBM p279](#))
- If recurrent or chronic pain — **medical consult**
- If recent childbirth, miscarriage, termination of pregnancy — consider endometritis ([WBM p215](#))
- If pregnant — **medical consult**
 - If less than 20 weeks pregnant — consider miscarriage ([WBM p17](#)), ectopic pregnancy ([WBM p16](#))
 - If very unwell — consider ruptured ectopic pregnancy, septic abortion
 - If more than 20 weeks pregnant — consider labour ([WBM p158](#)), preterm labour ([WBM p26](#)), placental abruption ([WBM p17](#)), intrauterine infection ([WBM p31](#))

PID

- Can have one or more of
 - Lower abdomen pain, may be worse on 1 side
 - Abdominal tenderness or guarding
 - Tenderness or pain on bimanual exam ([WBM p278](#))
 - Deep pain when having sex
 - Vaginal discharge
 - Bleeding between periods, after sex
 - Pain on passing urine
 - Fever

Do

- See *PID* ([WBM p260](#))

Generalised abdominal pain

First do abdominal assessment ([p18](#)).

- 3 common causes — gastroenteritis (*below*), bowel obstruction (blocked gut) ([p26](#)), constipation ([p26](#))
- 3 uncommon but very dangerous causes — generalised peritonitis ([p27](#)), torn or ruptured abdominal aortic aneurysm ([p27](#)), intestinal ischaemia ([p28](#))

**Gastroenteritis**

- Often nausea and vomiting before pain starts
- Diarrhoea
- Mild/moderate crampy pain
- May have mild abdominal tenderness
- Often fever, may have fast pulse ([p422](#)), normal BP

Do not

- **Do not** assume abnormal observations are caused by dehydration
 - If no improvement after 2 hours — do POC testing for venous blood gas and electrolytes, **medical consult**

Do

- **Child** — see *Diarrhoea* (p165)
- **Adult**
 - Can give **pain relief** (p377)
 - Can give ORS
 - If vomiting prevents oral intake — can give **normal saline** IV – 10mL/kg up to 1L
 - If severe nausea — **medical consult** about **antiemetic** (p105)

Bowel obstruction (blocked gut)

- Nausea and **vomiting**, often after pain starts
- May have diarrhoea to start with, then **no faeces**
- **Cramping pain, swollen belly**
- Tender abdomen, sometimes firm (guarding)
- Usually fast pulse (p422), may be low BP (p422)
- Fever unusual, may be serious
- May have increased, sometimes tinkling, bowel sounds

Check

- Do POC test for venous blood gas, electrolytes
- If pulse or potassium level abnormal — do ECG

Do not

- **Do not** let person eat or drink anything — may need operation

Do

- **Medical consult**, send to hospital
- Put in nasogastric tube (CPM p81)
- Put in IV cannula (CPM p84)
 - Run **normal saline**
- Give **morphine** for pain (p381)
- If fever — give **ceftriaxone** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses p429)
- Give **antiemetic** to stop vomiting (p105)

Constipation

- Usually little nausea or vomiting
- Small amount and/or hard faeces, may be some diarrhoea (overflow)
- Mild lower abdominal pain, usually crampy
- Always looks well, no fever, normal pulse and BP



Do

- Give dietary advice — high fibre and lots of water
- Can give laxative (eg senna), or bulking laxative (eg psyllium)
- If child not better in a few days — medical or paediatric review

Generalised peritonitis

- Appears very unwell, may cause sepsis and shock
- Severe abdominal pain
- Marked generalised abdominal tenderness, guarding, rigidity
- May have rebound tenderness, percussion tenderness, strong pain on cough
- Signs of severity — T more than 38°C or less than 36°C, pulse more than 100 beats/min, systolic BP less than 100mmHg, O₂ sats less than 90%

Check

- Do POC test for venous blood gas and electrolytes
- If abnormal pulse or potassium levels — do ECG

Do

- **Medical consult**, send to hospital straight away
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in IV cannula (*CPM p84*)
 - Run **normal saline** – 1–2L
- Give **pain relief** — usually **morphine** (*p381*)
- Give **ceftriaxone** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses *p429*)
- Blood cultures — send with person

Ruptured abdominal aortic aneurysm

Almost always fatal. Usually elderly, history of high BP, may have known aneurysm.

- Pain in central abdomen, may go through to back
- May feel pulsating mass — sometimes only after morphine has dulled pain
- Person may lose and regain consciousness (syncope)
- Person becomes very pale with fast pulse (*p422*), falling BP, fast breathing (*p422*)

Do not

- **Do not** push IV fluids without **medical consult** unless person becoming confused or drowsy

Do

- **Medical consult** straight away
- First priority — give **morphine** for pain ([p381](#))
 - Repeat every 3 minutes until comfortable
- Second priority — send to hospital unless already agreed not to operate
 - May not be time
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in IV cannula ([CPM p84](#))
 - Take blood for FBC, UEC, cross match
 - If unconscious give fluids to maintain systolic BP less than 100mmHg — higher than this may cause further bleeding

Intestinal ischaemia

Lack of blood supply to intestines (gut) — few people survive. Usually elderly, often have AF.

- Early clue to diagnosis — severe pain in elderly person with soft abdomen, often in AF
- Pain becomes increasingly severe over hours
 - Abdomen initially soft but becomes more and more tender and firm
- Person becomes very ill over hours with rising pulse and falling BP

Check

- Do ECG
- Do POC test for venous blood gas, including lactate

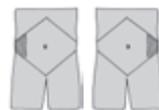
Do

- **Medical consult** straight away, send to hospital
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in IV cannula ([CPM p84](#))
 - Run **normal saline** — 1L
- Give **morphine** ([p381](#))
- Put in indwelling urinary catheter — female ([WBM p281](#)), male ([CPM p205](#))
 - Record hourly urine output

One-sided (flank/loin) pain

First do abdominal assessment ([p18](#)).

- Usually kidney problems. Felt in back or side between ribs and pelvis
- If over 55 years — consider ruptured abdominal aortic aneurysm ([p27](#))



Kidney stone (renal colic)

- Severe one-sided (unilateral) flank pain may go into groin or testicle
- No fever, sometimes fast pulse
- Usually no urinary symptoms
- Vomiting common
- Often past history of kidney stones
- Blood in urine

Check

- If U/A positive for blood — send urine for MC&S

Do

- Give **pain relief** ([p377](#)) — usually moderate or severe pain
- Give **antiemetic** to stop vomiting ([p105](#))
- If no better after 6 hours *OR* if fever develops — **medical consult**, send to hospital
- **Must have** FBC, UEC, renal ultrasound after first episode

Kidney infection (pyelonephritis)

Remember: Severe PID can also present like this ([WBM p260](#)).

- Mild to severe flank pain and tenderness — may be on both sides (bilateral)
- May have urinary symptoms
- Usually unwell — fever, may have fast pulse ([p422](#)), low BP ([p422](#))
- U/A may show leucocytes, nitrites, blood, protein

Do

- See *Kidney infections (pyelonephritis)* ([p414](#))

Anaphylaxis — severe allergic reaction

Medical emergency. Life threatening allergic reaction.

When treating anaphylaxis the **A** in DRS ABC DE also stands for **adrenaline (epinephrine)**. IM adrenaline (epinephrine) will save person's life, the quicker it is given the better. Repeat injections may be needed.

Reaction usually happens very soon after person comes in contact with substance they are allergic to (eg medicine, food, insect bite, some plants and chemicals).

Do first

- **Immediately** you suspect moderate or severe anaphylaxis
 - Get anaphylaxis kit ([p32](#)) and give **adrenaline (epinephrine)**
 - **Life support — DRS ABC ([p10](#))** — start CPR if needed

Ask

- Do they know what caused this
- Feeling hot and itchy
- Tingling or swelling in lips or tongue
- Short of breath
- Worried or frightened
- Crampy abdominal pain, vomiting, diarrhoea

Check

If any of **signs in bold** — moderate or severe anaphylaxis.

- Lumpy or red **rash** (welts, urticaria)
- Face, neck, lips and tongue **swelling quickly**
- **Short of breath, wheeze, loud noise while breathing** (stridor), **hoarse voice**
- Low BP ([p422](#))
- Weak fast pulse ([p422](#)), pale
- **Collapse** — shock or respiratory arrest

Do

- If anaphylaxis caused by injection/infusion — **stop giving medicine** straight away
- Call for help — get someone to bring **anaphylaxis kit ([p32](#))**
- If moderate or severe anaphylaxis (any sign/s in bold) — give adrenaline (epinephrine) by deep IM injection ([p31](#)) into anterolateral thigh
- Remove allergen if visible (eg bee sting, peanut butter)
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- If any abnormal observations — see *Early recognition of sick or deteriorating patients ([p6](#))*, **medical consult**



- Lay on back if needing to have airway opened *OR* put in recovery position to keep airway clear — F 1.8



1.8

Giving adrenaline (epinephrine) for anaphylaxis — deep IM injection

- Get 1 ampoule of **adrenaline (epinephrine)** (1:1000) and draw up correct dose — see Table 1.8
- Use 1mL syringe
 - If measured in insulin syringe — transfer to syringe with needle long enough for deep IM injection. Best in anterolateral thigh
- **Repeat dose every 5 minutes until person improves**
- Consider nebulised **adrenaline (epinephrine)** if noisy breathing — 5 x 1mg ampoule in nebuliser

Table 1.8: Adrenaline (epinephrine) 1:1000 IM doses by age

Age (years)	Approximate weight (kg)	Dose of adrenaline (epinephrine) (mL of 1:1000)
Under 2	5–10	0.1
2–3	15	0.15
4–6	20	0.2
7–10	30	0.3
11–12	40	0.4
Over 12	50+	0.5

- Put in IV cannula (largest possible) (*CPM p84*)
 - If condition severe and can't get cannula in within 1 minute — put in IO needle (*CPM p88*)
- Run **normal saline** or **Hartmann's solution** fast
 - When person starts to improve — slow to maintenance IV fluid (*p16*)
 - Be careful with large amounts of fluid in children, elderly, people with heart or kidney disease
- **Medical consult**
- **Do not** use antihistamines or hydrocortisone for immediate management of anaphylaxis. Not needed until later, should not delay giving adrenaline (epinephrine)
- If improving — keep person resting in clinic and monitor for 4–6 hours
 - Check for signs of recurrence — rash, swelling, hoarseness, trouble breathing, abdominal pain
 - Check temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*). Repeat every 15 minutes
- If getting worse or not completely recovered and well in 4–6 hours — **medical consult** about sending to hospital
 - If child under 16 years — use lower threshold for transfer to hospital

Follow-up

- Find out **exactly** what caused anaphylaxis, record in file notes
- Doctor must talk with everyone involved and decide if it was true anaphylactic reaction. If it was
 - Carefully explain to person what this means — must never take that medicine, eat that food, touch that plant again
 - Record what caused allergic reaction (if known) in large red letters at front of paper file notes or as alert in electronic file notes. *Examples:*
 - **ALLERGIC TO PENICILLIN**
 - **ALLERGIC TO PEANUTS**
- Must tell local hospital and other places with medical records for person
- Consider person getting Medic Alert bracelet
 - From local chemist or phone 1800 882 222
- Consider referral for assessment, possible desensitisation — especially if reaction to medicine that is important for treatment (eg penicillin for RHD)
- If person could be exposed to cause again (eg bee sting) — doctor needs to arrange access to self-injecting adrenaline (epinephrine) pen, education in storage and use

Anaphylaxis kit

- Make sure anaphylaxis kit is in brightly coloured box and clearly labelled
 - Use-by/expiry date of adrenaline (epinephrine) on the front
- 3 x adrenaline (epinephrine) ampoules 1:1000 (1mg/mL) — 1mL ampoules
 2 x alcohol swabs
 2 x syringes — 1mL
 2 x drawing up needles — 18G or 19G blunt
 2 x needles 23G (blue — 32mm)
 1 x adrenaline (epinephrine) doses card (laminated)

Procaine reactions

Number of possible reactions to procaine benzylpenicillin (procaine penicillin) injections. Important to know which one person is having, see Table 1.9.

Do — for all reactions

- Stop giving injection straight away
- Protect person from injury
- Call for help, ask someone to get anaphylaxis kit
- **Life support** — **DRS ABC** ([p10](#))
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Mask 5–10L/min



- Check pulse, RR, BP
 - If weak fast pulse (p422), low BP (p422) — anaphylaxis (p30)
 - If slow pulse (p422), normal BP — faint (below)
 - If fast pulse (p422), normal or high BP (p422) — procaine reaction (p32)
- **Medical consult**, confirm type of reaction

Table 1.9: Reactions to procaine benzylpenicillin (procaine penicillin)

	Faint	Anaphylaxis	Procaine reaction
Frequency	Common	Rare	Very rare
Mental state	Goes quiet	Feels scared	Feels very scared, may see or hear things that are not there, may think they are dying
Skin	Looks pale and sweaty	Red lumpy rash (hives), feels itchy, may have swelling	May be sweaty (perspiring)
Pulse	Slow (p422)	Weak, fast (p422)	Strong, fast (p422)
BP	Normal or slightly low (p422)	Low (p422) – shock	Normal or high (p422)
Breathing	May groan	Wheeze or noisy breathing (stridor)	May be fast (p422)
Other signs	May go stiff with twitching limbs	Irregular heart beat, may collapse	Metallic taste, twitching limbs or fit

Follow-up after any reaction

- Record everything that happened in file notes
- These reactions can be very stressful for person, relatives, clinic staff. Important for clinic staff and community to understand what happened and that no-one was to blame

Faint

Most common reaction — usually because person scared of injection.

Do

- Lay person flat
- May vomit, watch airway carefully
- Keep person and relatives calm. Will get better in a few minutes
- Can have procaine benzylpenicillin (procaine penicillin) again if needed, but lay person down to give

Procaine reaction

Cause not known. Also called pseudo-anaphylaxis or procaine psychosis.

Do

- Understand that reaction is harmless and will stop in 15–30 minutes
- Reassure person, try to keep them comfortable
- Keep everyone calm. Person and relatives will be very frightened

Follow-up

- Talk with person and relatives about 'procaine reactions'. Explain that reaction doesn't usually happen again
 - Person can still have procaine benzylpenicillin (procaine penicillin) — but may not want to
- Record at front of paper file notes or as alert in electronic record —
PROCAINE REACTION (NOT PENICILLIN ALLERGY)
- Consider using different antibiotic in future



Bites — insect, spider and snake

For animal and human bites see *Animal or human bites (p85)*.

Centipede or scorpion bite

May be very painful but usually only lasts 6–12 hours.

- Centipede bites — may be a lot of redness and swelling
- Scorpion bite/sting — may be no mark

Check

- Tetanus status, see *Australian Immunisation Handbook*
- Monitor for 4 hours for systemic toxicity (eg vomiting, headache, sweating)

Do

- Clean bite
- Cold pack (**do not** put ice directly on bite) *OR* hot pack/water may help with pain
- Give **pain relief** (*p377*), if needed

Redback spider bite

Ask

- Pain at bite site
 - Increases over minutes to hours
 - Lasts more than 24 hours
- Pain radiating from bite site to close limb, trunk, local lymph nodes
- Feeling unwell, lethargy, headache
- Abdominal pain, nausea, vomiting
- Increased sweating
- Painful erection (priapism) in boys

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*)
- Bite site may not be obvious
- Signs and symptoms usually obvious in 1–6 hours if going to happen
- **Note:** If these signs/symptoms — think of bite, even if no clear story
 - Sweating around bite site or strange patterns of regional sweating (eg sweating below both knees)
 - May have abdominal pain and/or chest pain
 - Child — irritable and agitated
 - Painful erection (priapism)
- Tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** put on tourniquet or pressure bandage — will make pain worse

Do

- Cold pack (**do not** put ice directly on bite) *OR* hot pack/water may help with pain
- Give pain relief
 - **Paracetamol** oral 4 times a day (qid) — adult 1g, child 15mg/kg/dose up to 1g (*p380*)
 - **AND ibuprofen** (if no contraindications *p381*) oral 3 times a day (tds) — adult 200–400mg, child (over 3 months) 10mg/kg/dose up to 400mg
 - If still pain — **ADD oxycodone** immediate-release oral — start with 0.1mg/kg/dose up to 5mg (if over 1 year)
 - **Medical consult** about ongoing dose and frequency
 - If severe pain — give morphine IV (*p381*)
- **Send to hospital**
 - If severe local pain *OR* significant local or widespread (systemic) signs of envenoming (eg swelling, headache, neurotoxicity)
 - Anyone you are concerned about

Snake bites — land and sea

All people with snake bite — **medical consult, send to hospital urgently.**

- Abdominal pain, vomiting, headache, collapse often first signs
- Signs of muscle weakness from venom injected by bite (envenoming) may take up to 24 hours to develop

Do not

- **Do not** let person move — take transport to person
- **Do not** wash bite site — hospital has test to find out kind of snake from venom left on skin

Do — straight away

Most important thing — stop spread of venom from bite site.

- Keep person as calm and still as possible
- Immobilise snake bite (*CPM p72*)
 - Bandage bite site then whole limb. If bite on trunk or head — just bandage bite site
 - Use firmest bandage you have, elastic much better than crepe
 - Use at least the same pressure as for sprained ankle
 - Use 15cm wide bandage for leg
 - Splint bitten arm or leg to stop it moving (*CPM p229*)
 - Immobilise whole person — use stretcher if available



Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*) AND coma scale score (*p74*), drooping eyelid (ptosis), lack of eye movement (ophthalmoplegia)
 - Repeat every hour — more often if person getting worse
- How is person breathing
- Take blood for FBC, clotting studies, UEC, CK
- U/A for blood and protein
 - Save urine for venom identification
- Tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** give antivenom out bush — unless advised by doctor

Do

- Put in IV cannula (*CPM p84*) — oozing around site may indicate envenoming
 - Give **maintenance fluids** (*p16*)

Do — if danger signs

- **Medical consult, send to hospital urgently**

Snake bite danger signs

- Patient collapse, coma, low BP within 1 hour of bite
- Evidence of paralysis
- Bleeding
 - Bleeding from IV puncture site, bite site
 - Blood in urine (haematuria)
 - Any other bleeding

Burns

Remember — Life support — DRS ABC (*p10*) then treat the burn.

Do first

Protect responders

- Protect people first on the scene from fire, electrical wires, chemicals, other dangers
- If chemical burns or similar risks — use personal protective equipment
 - Gown, gloves, mask, eye protection

Stop the burning process

- If person on fire — stop-drop-cover-and-roll
- If scalds or liquid chemicals — remove any wet clothing
- If chemical burns —
 - Brush powder or solid chemicals from skin (use gloves), remove contaminated clothing
 - If eye involved — immediately double evert eyelid (*CPM p153*) and wash eye (*CPM p151*)
 - Lie on side with affected eye lowermost to protect good eye

Cool the burn

Continue assessment while this is happening.

- **Do not** use ice, ice packs, or refrigerated water — can cause more damage
- Cool burned area with cool water (aim for 15°C) — up to 3 hours after burn
 - Thermal burns — cool for 20 minutes
 - Run or pour cool water over burn (best)
 - *OR* submerge in water. Change water every few minutes
 - *OR* if no suitable water available — wrap burn in towels/cloths soaked in water or **normal saline**, change towels/cloths every 2–3 minutes
 - Alkali burns — pour water over burn for 2 hours or until burning pain stops
 - Acid burns — pour water over burn for 1 hour or until burning pain stops
 - **Do not** wash chemicals over unaffected skin/eye or let water collect in shoes
- Once cooling has started
 - Remove clothing — **do not** try to remove if stuck to burn
 - Remove anything else that might get tight with swelling (eg watch, rings)
- Keep rest of person warm
 - If skin loss more than 10% — risk of hypothermia from cooling (*p62*)
 - Risk highest for babies and small children

Photograph wound

- Take digital photo of uncovered burn (with consent) if possible. Send by email, MMS (phone), web camera, videoconference for **medical/burns unit consult**
 - Phone first and they will tell you how to do this



Ask

- When did burn happen
- What caused burn and how long was it in contact with person
 - Thermal, chemical, electrical (including lightning)
- Where did it happen (eg in closed room, out in camp)
- What has already been done

Check

Check for burns all the way or almost all the way around limbs (80% or more)

- **Medical emergency — medical/burns unit consult** straight away
- Check pulses and capillary refill distal to injury (eg toes, fingers)
 - Capillary refill — press skin (or base of burn if no distal skin) for 5 seconds then release. Will turn white (blanch) — how long does it take for colour to return (refill). Normal refill = 2 seconds
- Work out **area of burn**
 - Measure area that is blistered or deeper burn — **do not** include area that is just red (simple erythema)
 - Count number of 'palm areas' that are burnt — person's own palm is about 1% of their body area
 - *OR* use body chart
 - Lund and Browder Chart — see Table 1.10 (p40) and F 1.9
 - Check again a couple of hours after first assessment unless burn has been dressed
- Work out **depth of burn** — see Table 1.11 (p41)
 - Difference important for deciding how to treat burn
 - Always check again a couple of hours after first assessment unless burn has been dressed
- Decide if major or minor burn, manage accordingly
- Check for any other injuries apart from burns

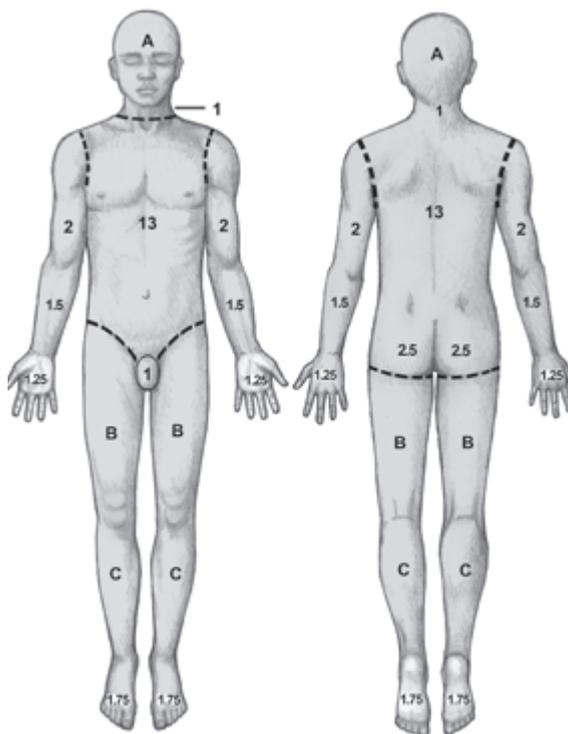
Table 1.10: Calculating TBSA with Lund and Browder chart

	0–1 year	1–4 years	5–9 years	10–14 years	15 years	Adult	TOTAL	Partial thickness	Full thickness
Head A	19	17	13	11	9	7			
Neck	2	2	2	2	2	2			
Torso (front)	13	13	13	13	13	13			
Torso (back)	13	13	13	13	13	13			
Buttocks (R)	2.5	2.5	2.5	2.5	2.5	2.5			
Buttocks (L)	2.5	2.5	2.5	2.5	2.5	2.5			
Genitals	1	1	1	1	1	1			
Upper arm (R)	4	4	4	4	4	4			
Upper arm (L)	4	4	4	4	4	4			
Lower arm (R)	3	3	3	3	3	3			
Lower arm (L)	3	3	3	3	3	3			
Hand (R)	2	2	2	2	2	2			
Hand (L)	2	2	2	2	2	2			
Thigh B (R)	6	7	8.5	9	9.5	10			
Thigh B (L)	6	7	8.5	9	9.5	10			
Lower leg C (R)	5	5	5.5	6	6.5	7			
Lower leg C (L)	5	5	5.5	6	6.5	7			
Foot (R)	3.5	3.5	3.5	3.5	3.5	3.5			
Foot (L)	3.5	3.5	3.5	3.5	3.5	3.5			
%TBSA									

(L) = left, (R) = right



Lund and Browder Chart to calculate total body surface area (TBSA) of burn



1.9

Table 1.11: Working out depth of a burn

Burn characteristics	Superficial		Partial thickness		Full thickness
	Epidermal	Dermal	Mid-dermal	Deep dermal	
Burn colour	Red	Red or pale pink	Dark pink	Blotchy red or white	White
Blisters	No	Yes – thin or popped	Yes – thick walled	Yes or no	No
Capillary refill (seconds)	1–2	1–2	More than 2	More than 2 or absent	Absent
Sensation	Painful	Painful	May be reduced	Reduced	Absent
Ooze	None	Lot	Some	Little	None
Healing	Within 7 days	Within 14 days	2–3 weeks – may need grafting	Grafting needed	Grafting needed
Scarring	None	None or colour change	Yes – if 3 or more weeks to heal	Yes	Yes



Management of major burns

- **Send major (serious) burns to hospital urgently** — usually to burns unit
- **Medical consult** straight away — will work out fluids and pain relief
- May also need direct **burns unit consult**

Major burns

- Burns involving airway (eg inhalation burn from breathing in smoke)
- Burns going all the way, or almost all the way, around neck, chest, arm, leg. **Medical emergency — specialist/burns surgeon consult** straight away
- Special areas burnt — eyes, face, hands, feet, perineum, major joints
- Full thickness burns larger than a 20 cent piece
- Partial thickness burns covering more than
 - 5% of body surface area for child under 17 years
 - 10% of body surface area for person 17 years or over
- Chemical burns
- Electrical burns — unless very minor. Often deeper than they look, especially high voltage or lightning strike
- Burns with other injuries
- If person is very young or very old
- If person has pre-existing medical condition, mental illness, or disability that could affect treatment

Check

- Hoarseness or noisy breathing (stridor), coughing black dust /soot, face burn
 - Person may suddenly get worse and their airway will need to be protected, usually need intubation
- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#)). Repeat at least every 30 minutes
- Hydration — person with major burns needs large amounts of fluids very early on. **Always do medical/burns unit consult**
 - Correct fluid replacement minimises risk of excess swelling — may prevent need for intubation or cuts to release pressure (escharotomy)
- Tetanus status, see *Australian Immunisation Handbook*

Do

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult *OR* mask 5–10L/min
 - If inhalation burns — give high concentration
- Put in IV cannula, largest possible, 2 if you can ([CPM p84](#)). Try for unburnt skin
- Give IV fluids. See *Working out fluids needed* ([p43](#))
- Keep person warm with space/ordinary blanket — person with major burns can't control their temperature



- Give **pain relief** — best given IV/IO. Use morphine in small doses (*p381*)
- Put in nasogastric tube (*CPM p81*), especially for child to avoid vomiting, aspiration
- Elevate burnt limb (keep in raised position)
- If burns to 15% or more of body or extensive burns to perineal area — put in indwelling urinary catheter, measure urine hourly – female (*WBM p281*), male (*CPM p205*)
 - **Medical consult** if urine output less than
 - 1mL/kg/hr for child less than 30kg
 - 0.5–1mL/kg/hr for child weighing 30kg or more
 - 0.5mL/kg/hr for adult *OR* 1mL/kg/hr if electrical burn
- If not done earlier, take digital photo of uncovered burn. Send for **medical/burns unit consult**
- **Medical/burns unit consult** before applying first dressing if possible
- Cover major burns with plastic cling wrap laid lengthways or blueys plastic side to skin *THEN* clean towel/s. Change every 4 hours until sent to hospital
 - **Do not** wrap plastic around limbs — will become tight if they keep swelling
 - **Do not** cover face or chemical burns with plastic wrap — use damp cloth or non-stick dressing
- If delay in sending to hospital or long travel time —
 - Remove plastic wrap
 - Put on soft paraffin, non-medicated dressing, combine dressing, loose bandage
 - **Do not** use any creams or medicated dressings until after burns unit consult

Working out fluids needed

- **Medical/burns unit consult** about fluid resuscitation
 - Fluid formula only a guide to fluid needs
 - If delay in sending to hospital — change according to clinical response (eg urine output, pulse rate). **Medical/burns unit consult**
 - Record accurately — time fluids started, amount given. Send in with person

Be careful with airway burns — give less fluid until you get advice and airway is secure.

- Adults and children need replacement fluids. Older people may need less
- Work out amount of fluid needed for first 24 hours — **start from when person was burnt, not when you first saw them**
 - Give half in first 8 hours
 - Then give rest in next 16 hours
- Adult, child weighing 30kg or more, child less than 30kg with burns to less than 15% of body — replacement fluids
 - $4\text{mL of fluid} \times \text{weight (kg)} \times \% \text{ body surface area burnt} = \text{volume (mL) in 24 hours}$. Give half in first 8 hours, then half in next 16 hours
 - Use **Hartmann's solution** — if not available use **normal saline**

- Child weighing less than 30kg with burns to 15% or more of body — replacement fluids and maintenance fluids at the same time. Use 2 IV cannula or 2 lines
 - **Line 1 — replacement fluids**
 - 4mL of fluid x weight (kg) x % body surface area burnt = volume (mL) in 24 hours. Give half in first 8 hours, then half in next 16 hours
 - Use **Hartmann's solution** — if not available use **normal saline**
 - **Line 2 — maintenance fluids (p16)**
 - Follow advice from medical/burns unit consult or use **normal saline with 5% glucose** — evenly over 24 hours (from time of burn)

Example — working out fluids needed

Child aged 8 years weighing 24kg with burns to 30% of their body.

Replacement fluids

- Total = 4mL x 24(kg) x 30(%) = 2880mL over 24 hours
- Half in first 8 hours = 1440mL = 180mL/hr (or more — depends on time from burn to starting fluid replacement), give evenly over rest of first 8 hours
- Half in next 16 hours = 1440mL = 90mL/hr

Maintenance fluids

- 65mL/hr

Management of minor burns

Minor burns may still need consult with burns unit or to be sent to hospital.

Medical/burns unit consult for advice.

People who often need hospital assessment

- Pain not adequately controlled with oral pain medicines
- Infection, (eg cellulitis) needing IV antibiotics
- Need for bed rest with leg elevated (in raised position)
- Person or carer/s unable to manage dressing care
- Very old or very young
- Child with burn that could be from child abuse or neglect
 - Must also report to child protection services (p143)
- Early treatment to prevent or reduce swelling can prevent chronic problems
 - Gentle compression — use woven short stretch crepe bandage
 - Start with ¼ overlap closest to torso and increase to ¾ overlap as bandage is wound down the limb
 - Elevate body part above heart when at rest

Note: Active muscle contraction and movement very important — help remove swelling. Reassure person that moving will help healing, not harm burn wound.

Remember: Good early management important for good healing. Always get help if not sure.



Burns being managed in the community

Be alert for sudden onset severe sepsis in young children with small burns — can present 2–4 days after burn.

- Advise carer to return to clinic if child seems unwell — check REWS ([p6](#))

Check

- Depth of burn ([p41](#))
- Risk of infection
- Tetanus status, see *Australian Immunisation Handbook*

Burns at risk of infection if

- Caused by dirty/contaminated materials, friction, flames, chemicals
- Rolled in dirt to put out flames, burns first cooled in dirty water
- Happened more than 12 hours before you saw person
- In area with lots of bacteria (eg armpit, umbilicus)

Do

- Clean with **mild soap and water**. **Do not** use skin disinfectant
- Clip body hair from burn wound and 2.5cm around it — not eyebrows
- Dry carefully around burn, but not the burn itself. Let burn air dry
- Give **pain relief** ([p377](#))
- Remove blisters, loose or burned skin
- Dress and review as below

Superficial burns — skin intact

- Use simple moisturising cream several times a day

Superficial burns — blistered **OR** Partial thickness burns — clean

- If oozing (usual for first 3 days) — put on hydrocolloid dressing ([CPM p284](#))
 - Change within 2 days
- If no ooze or when ooze has stopped — use
 - Protective dressing such as film island
 - *OR* adhesive foam
 - *OR* hydrocolloid dressing left intact for 7 days, when little or no ooze

Partial thickness burns at risk of infection **OR** Full thickness burns smaller than a 20 cent piece

- Use **anti-bacterial, silver-coated dressing** held in place with non-woven dressing
 - If using a water activated dressing —
 - Wet (activate) dressing with sterile water then wait a few minutes before putting it on, to lessen stinging/burning
 - Tell person and/or carer to wet dressing at least twice a day with clean water only, then pat dry

- **Do not** use normal saline or salt water, these deactivate dressing
- Leave for 3 days before reassessing
- **OR silver sulfadiazine** cream — 1cm thick layer covered with non-stick dressing (dressing will stick if not enough cream)
 - **Do not** use silver sulfadiazine cream on face, person with sulphur allergy, child under 6 months — **medical/burns unit consult**
 - Wash cream off with sterile **normal saline** and redress every day
 - If it stings or burns for more than 30 minutes after applied — remove

Healed burn wounds that need added protection

- If area may be rubbed (under friction) or knocked — use sticky non-woven dressing
 - **Do not** use on fragile or broken skin
 - Leave on for up to 1 week — may come off itself
 - Healed wound can be damaged if not removed correctly — see *To remove (CPM p285)*

Burns care after hospitalisation

- Follow hospital discharge advice — especially for dressings and compression garments
- Person may need emotional support
- Watch for signs of infection (*below*)
- Advise person/carer to
 - Wash daily. Check skin integrity — look for breaks, blisters, hardness or tightness. Advise clinic if any changes/concerns
 - Massage area with water-based moisturiser up to 3 times a day
 - Return to daily activities and do exercises advised by hospital. These help to
 - Build muscle and strength
 - Improve movement
 - Reduce swelling and stiffness
 - Protect burn area from sun and injury

Infected burns

- Infection likely if
 - Pain and swelling worse after 2 days
 - Not healing in 1 week
 - Burn smelly, pussy, surrounded by red/hot area
 - Person has a fever

Do

- **Medical consult**
- Swab burn area for MC&S (*CPM p388*)
- Dress as partial thickness burns at risk of infection (*p45*)
- Check swab result, give antibiotic according to sensitivities



Chest pain

When someone has chest pain

- Treat as serious and call for help
- Get defibrillator, use as monitor
- ECG only test needed to assess for thrombolysis

Chest pain can be life threatening — heart attack, pneumothorax (p68), blood clot in lung. Could also be indigestion (reflux) (p21), muscle strain, chest infection (p309). Often impossible to tell the difference without special tests.

Table 1.12: Diagnosis of acute chest pain

Symptoms and signs to ask about	Likely diagnosis
Pain started suddenly, no warning <ul style="list-style-type: none"> • Pain can be dull, tight, heavy, squeezing • Usually centre of chest but can be in shoulders, arms, back, neck, jaw, and may be felt on right side • Cool and sweaty, nauseous, short of breath 	Heart pain — includes <ul style="list-style-type: none"> • Heart attack (p48) • Angina — episodic chest pain (p253)
Fever, cough, short of breath <ul style="list-style-type: none"> • Pain sharp, mostly on deep breathing • Reduced breath sounds, abnormal sounds in lungs, especially on 1 side • Comes on gradually over hours to days 	Chest infection (p309)
Pain burning or sharp <ul style="list-style-type: none"> • Pain behind breastbone after eating or when lying down • Often in people who drink alcohol, obese, pregnant 	Reflux (p21) Oesophageal spasm
Pain started with sudden body movement <ul style="list-style-type: none"> • Pain on moving shoulders or upper body, settles when still • Local muscle tenderness 	Muscle pain
Pain started suddenly, short of breath <ul style="list-style-type: none"> • Pain sharp, mostly on deep breathing • Painful swollen leg, may cough up blood • Consider if — cancer, leg in plaster, pregnant, postnatal, operation in past 2 months, lot of time sitting or lying (eg old person, confined to bed) long distance car/plane travel, previous blood clot 	Pulmonary embolus (blood clot in lung) <ul style="list-style-type: none"> • Medical consult
Pain started suddenly, short of breath <ul style="list-style-type: none"> • Pain sharp, mostly on deep breathing • History of cough or trauma • Reduced breath sounds or chest movement on 1 side 	Pneumothorax (p68)

If in doubt — assume it is serious, call for help.

- Always do full assessment
- Many heart attacks are missed because symptoms not typical, especially in young adults, women, people with diabetes

Initial management — all chest pain

Do first

- Person on bed partly sitting up
- Record time they arrived in file notes
- If they look very sick or are very distressed — call for help
 - Move quickly through **Check** and **Ask**

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#)) before any treatment
- Do 12 lead **ECG** immediately — **urgent** review by doctor within 10 minutes
 - Leave leads on — will need to repeat

Ask

- Pain
 - Time it started
 - What it feels like
 - What makes it worse or better — movement, lying/standing, eating, breathing deeply
- Other symptoms — fever, cough, difficulty breathing, nausea
- Any injury related to pain
- Allergies, medicines, other major health problems

Do

- If short of breath, blue (cyanosed), or O₂ sats low — give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%. Avoid too much oxygen
 - Nasal cannula 2–4L/min *OR* mask 5–10L/min
- Give **aspirin** oral single dose – adult 300mg — unless allergic
- Put in IV cannula ([CPM p84](#))
 - Take 15mL blood (EDTA, coagulation studies, and serum tubes)
 - Flush with 5mL **normal saline**
- If systolic BP more than 100mmHg and no contraindications, give —
 - **Nitrate therapy** ([p49](#))
 - 250mL bolus of **normal saline** and assess response
- If person still has pain — may need **morphine** IV (doses [p17](#))
- **If ECG abnormal with ST elevation** — go to Flowchart 1.4 straight away ([p50](#))
- If ECG abnormal with new ST depression *OR* T wave inversion — go to Flowchart 1.5 ([p52](#))
- If ECG normal — do troponin test
 - If positive — see Flowchart 1.5 ([p52](#))
 - If negative —
 - Treat likely condition (eg chest infection) and review
 - Repeat ECG and troponin 6 hours after pain started, **medical consult**
 - If not sure or concerned — **medical/specialist consult**



Nitrate therapy

- **Do not give nitrate therapy** if person has used drugs for impotence
 - Sildenafil or vardenafil in past 24 hours
 - Tadalafil in past 2 days
- **Check BP before each dose**
 - **Do not give nitrate therapy** if systolic BP 100mmHg or less
- Give **nitrate therapy** under tongue (sublingual)
 - **GTN** spray – 1 puff
 - *OR isosorbide dinitrate* tablet – 5mg
 - *OR GTN* ½ tablet – 300microgram — use fresh bottle
- If still pain after 5 minutes — give second dose of **nitrate therapy**
 - **GTN** spray – 2 puffs
 - *OR isosorbide dinitrate* tablet – 5mg
 - *OR GTN* tablet – 600microgram
- If still pain after 10 minutes — consider morphine IV (doses [p17](#))
 - If good effect and systolic BP still more than 100mmHg — can continue nitrate dosing every 5 minutes in addition to morphine

Thrombolysis

- **Only give** thrombolysis therapy (tenecteplase) to people with STEMI — see Table 1.13
 - Always assess for contraindications (*below*)
 - Always do **medical consult** before giving
 - See Table 1.14 ([p50](#)) for doses
- If chest pain goes away or is coming and going — may not be indicated. **Medical/specialist consult** before giving
- All thrombolytic therapy for STEMI should be followed immediately by therapeutic anticoagulation with **heparin** or **enoxaparin**

Table 1.13: Indications for thrombolysis

Pain	<ul style="list-style-type: none"> • Chest pain that could be a heart attack — see Table 1.12 (p47) <ul style="list-style-type: none"> ◦ Lasted at least 20 minutes ◦ Not relieved by nitrate therapy ◦ Started less than 12 hours ago
AND	
ECG	<ul style="list-style-type: none"> • ST segment elevation <ul style="list-style-type: none"> ◦ 1mm or more in 2 adjacent limb leads <ul style="list-style-type: none"> ▪ 2 of – II, III, aVF <i>OR</i> both I and aVL ◦ <i>OR</i> 2mm or more in 2 adjacent chest leads <ul style="list-style-type: none"> ▪ 2 of – V1, V2, V3, V4, V5, V6

Contraindications to thrombolysis

Always ask about these — **medical/specialist consult** before giving thrombolysis.

Absolute contraindications

- Active internal bleeding (eg gastrointestinal, urinary)
- Head injury in past 3 months
- Suspected aortic dissection (severe chest pain with stroke symptoms)
- Any previous bleeding inside head
- Stroke in past 3 months
- Known brain tumour or aneurysm

Relative contraindications

- Taking warfarin
- Procedures involving internal blood vessels (eg central venous line)
- Major surgery in past 3 weeks
- Prolonged CPR — more than 10 minutes
- Internal bleeding in past 4 weeks (eg gastrointestinal, urinary)
- Active peptic ulcer
- Chronic, poorly-controlled, severe high BP
- BP more than 180mmHg systolic or 120mmHg diastolic on arrival
- Stroke more than 3 months ago
- Dementia
- Pregnancy

Obtaining consent

Explain to person

- Benefits
 - Less damage to heart muscle — especially important with anterior or extensive infarcts
 - 2 lives saved for every 100 people treated
- Risks
 - For every 100 people treated
 - 3 people will have serious bleeding (eg gastrointestinal)
 - 1 person will have stroke, due to bleeding inside head
 - There is no guarantee they are definitely having a heart attack

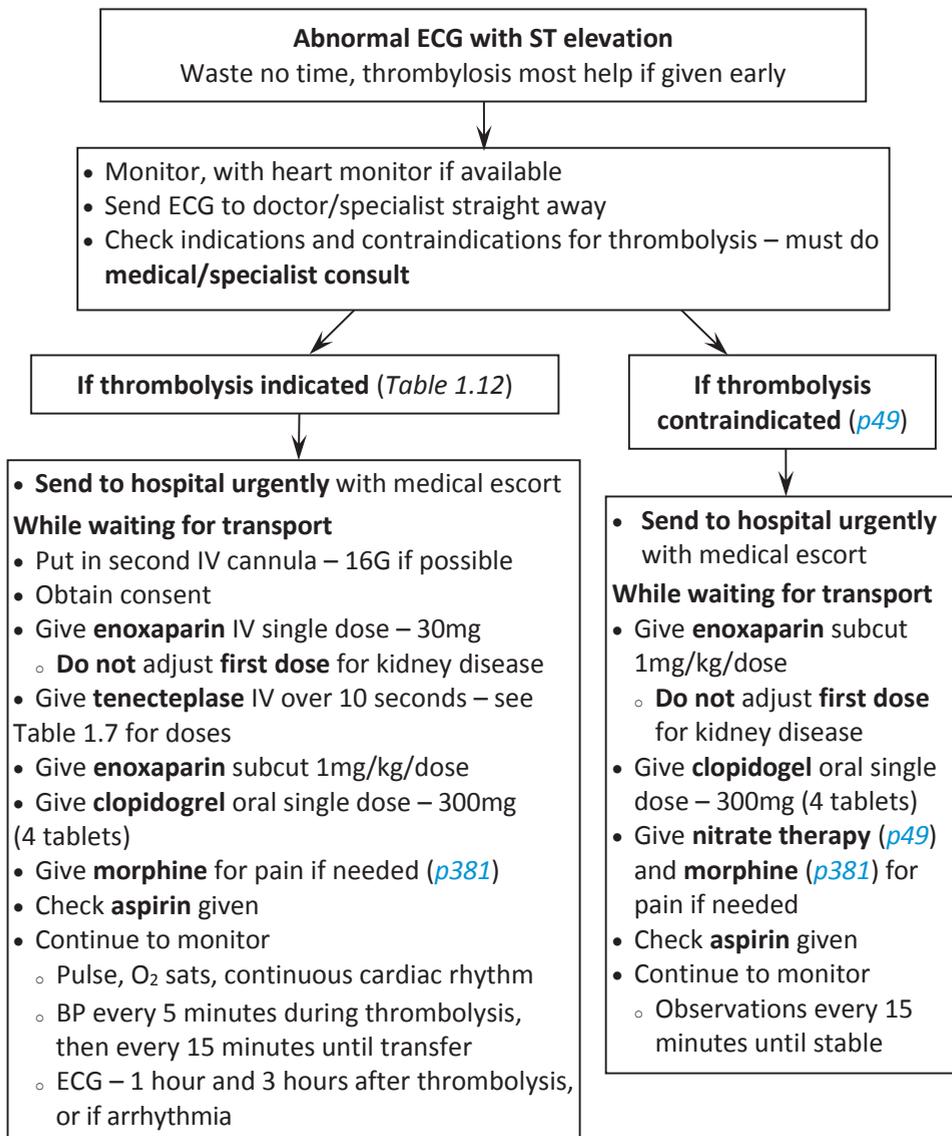
Table 1.14: Dose of tenecteplase IV

Weight (kg)	Tenecteplase IV (unit)	Tenecteplase IV (mg)	Volume of reconstituted fluid (mL)
Less than 60	6,000	30	6
60–69	7,000	35	7
70–79	8,000	40	8
80–89	9,000	45	9
90 or more	10,000	50	10



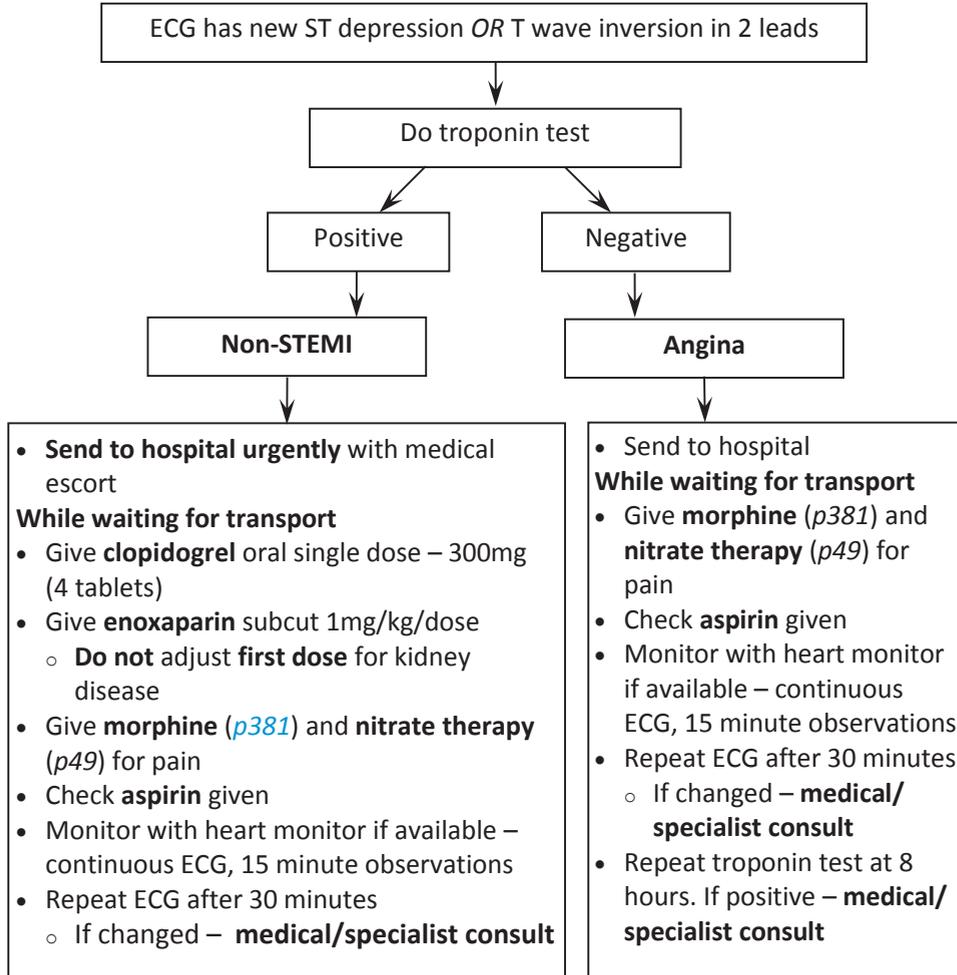
Acute coronary syndrome (ACS) with ST elevation

Flowchart 1.4: Managing ST elevation myocardial infarction (STEMI)



Acute coronary syndrome (ACS) without ST elevation

Flowchart 1.5: Managing ACS without ST elevation



Follow-up

All people with angina or heart attack need careful follow-up to lessen risk of more heart disease. See *Assessing and reducing cardiovascular risk* (p230), *Coronary artery disease* (p250).



Abnormal heart rhythms (arrhythmias)

Conscious and haemodynamically stable (BP can be measured, pulse can be felt) with irregular pulse or heart rhythm.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- If abnormal heart rate or low BP —
 - Do ECG
 - *OR* use defibrillation pads of AED to do rhythm analysis

Do

- If O₂ sats low — give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 2–4L/min *OR* mask 5–10L/min
- **Medical consult** about treatment
- If signs of shock ([p66](#)) *OR* **pulse or BP can no longer be measured** — see *Life support* — *DRS ABC* ([p10](#))

Domestic and family violence

Domestic/family violence is a crime. Children who witness violence can suffer long-term effects — consider counselling, support.

You **must know** your responsibilities under laws in your state/territory that relate to violence against adults and children, and to mandatory reporting.

- Usually directed at **intimate partner** — spouse, girlfriend, ex-partner, child. Often by a man against a woman, but consider violence in **all** forms of relationships
- Can involve sexual, physical, emotional, or economic violence, threats of violence, behaviour that causes fear — see *Sexual assault in adults (WBM p327)*, *Child neglect, abuse, sexual abuse (p143)*
 - May not be obvious — usually happens privately
 - Part of continuing and growing pattern of behaviour that may escalate — could go from emotional to physical violence
 - Certain population groups are at higher risk of violence — Indigenous women and children, disabled people, refugees or new arrivals, the elderly
- You **must report** any violence against children, including emotional harm — mandatory reporting (*p143*)

Consider domestic/family violence when

- Injury doesn't match story of how it happened
- Injuries covered by clothing — breasts, abdomen, chest, unusual or hidden places on body
- Injuries to abdomen or private parts (genitals), injuries when pregnant
- Treating women with gynaecological or anxiety problems
- Person repeatedly comes to clinic with injuries or vague symptoms
- Delay in seeking medical attention, doesn't want to talk about what happened
- If concerned about a child — see *Child neglect, abuse, sexual abuse (p143)*

Person may

- Appear nervous or ashamed
- Describe person who did it as bully or getting angry easily
- Seem uncomfortable or anxious when partner present
- Be accompanied by partner who won't let them speak or hangs too close
- Have symptoms of chronic stress, anxiety (*p196*), depression (*p201*)

Remember: Safety is first priority for person and practitioner.

Do

- Thorough physical assessment
 - **Always** ask about strangulation (*WBM p331*), especially in intimate relationship assaults
- **Treat person's injuries**



- Check if person has social, emotional or health concerns
 - Self-harm, thoughts of self-harm, partner threatening self-harm
 - Drug and/or alcohol (grog) misuse
 - Sleeping or eating problems
 - Loneliness or isolation from family and friends
 - Sexual problems or STIs
- A** – Ask them who it is/isn't OK to talk to before involving family or other support people, arrange appropriate interpreter if needed.
- **Do not** confront or accuse likely offender. Avoid doing anything that might make them angry or violent with you, other staff, or person you are helping
 - Make sure you talk to person where they feel safe, alone if they want. May mean seeing person again later
 - Ask direct **non-blaming** questions that won't cause shame or guilt
 - **Can you tell me what happened?** Has your partner ever hit you? Has anyone at home threatened to hurt you or your children? Are you ever afraid for yourself or the children? **Have you got somewhere safe to stay?**
- B** – Believe what they tell you — listen to their story, be supportive and responsive, don't judge them or lay blame.
- C** – Call in supports — women's shelter, police, specialist support services. They can give person the right legal advice.
- Ask person if you can refer them to local or regional services — domestic/family violence support service, women's shelter, emergency accommodation, emergency travel support
 - Ask if they want to report what happened to police, offer private telephone. If they are reluctant, ask if you can ring for them
 - **If you suspect child abuse** — you **must report** to child protection service ([p143](#)), mandatory reporting
 - In some states/territories you must report suspected domestic/family violence
- D** – Document history, injuries, management plan.
- Record in detail what person says happened, how they presented — but remember it is not your job to investigate complaint
 - Measure and describe injuries, use drawings. May be needed in court
 - Management plan — if person stays in community
 - Check they have a safe place to stay
 - Record support people
 - Make sure they know who to contact, how to get help quickly
 - Review person again within 24 hours and regularly until crisis has passed
 - Offer referrals for counselling and support
- E** – Ensure (make sure of) ongoing safety.

If you suspect violence but person denies it — talk about what someone could do to be safer if it did happen. Make it clear that violence is unacceptable without criticising them or partner. Sometimes victim may not feel able to leave their violent home. Accept their choice.

- Talk about a **safety plan** to avoid possible violence, including
 - Warning signs when violence is likely to happen
 - Ways to avoid violence — getting away, having excuse to leave, safe places to go and people to be with, not being alone with violent person
 - Plan for the children
 - Talking with relative who can discourage attacker from violence
 - Getting restraining order or Apprehended Violence Order (AVO). Contact local police for more information
- If you have serious concerns about safety of person who is refusing help —
 - Talk about situation with your manager
 - Report situation to police

F – Follow-up.

- Follow-up injuries. Use this time, when not in crisis, to talk
- Check their safety plan each time they come to clinic — people move around, key supports can leave community. Should have important documents together in safe place — may need them in a hurry
- Talk to person about cycle of violence — violence followed by making up, then good times, then build up and violence again
- Work with local domestic/family violence support service on ongoing safety of person

Domestic/family violence impacts on long-term physical and emotional health. Make sure victims are offered routine health checks — Adult Health Check ([CPM p123](#)), mental health assessment ([CPM p112](#)), school-aged health check ([CPM p121](#)), child health check ([CPM p118](#)).

Remember: If you feel upset or distressed by what you have seen or had to do — ask for help from your manager, and/or telephone counselling service.

- Bush Support Services phone 1800 805 391



Fits — seizures

- **After first fit — always do medical consult** straight away and **send to hospital** for investigation
- People with known epilepsy should have management plan in file notes
- **Be ready to manage airway — midazolam** depresses breathing

Do first

Remember — Life support — DRS ABC ([p10](#)).

Ask

- How long person has been fitting
- Whether they have had a fit before
- What happened before the fit
- What happened during the fit — could there be other injuries

Check

- If pregnant or recently given birth — severe pre-eclampsia ([WBM p21](#)) can cause fits during pregnancy and up to 4 weeks postpartum

Do

- Gentle suction of vomit from mouth
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in recovery position — F 1.10. Protect them from hurting themselves
- Check BGL. If less than 4mmol/L — see *Low blood glucose (hypoglycaemia)* ([p91](#))
- **Do not** leave person alone
- Prepare **midazolam** (*below*) for 2 doses
- Follow Flowchart 1.6 ([p59](#))



1.10

Giving midazolam

Give in mouth between cheek and teeth (buccal), in nose with atomiser, or IM/IV/IO.

Cheek (buccal)

- Use undiluted liquid **midazolam** in syringe without needle (doses [p58](#))
- Put end of syringe between cheek and teeth, on side closest to ground
- Give slowly until fitting stops or total dose given

Nose (nasal) with atomiser

- Check nostril is clear
- Use undiluted liquid **midazolam** in syringe without needle (doses [p58](#))

- Connect atomiser to syringe — F 1.11, put tip into nostril — F 1.12
- Apply reasonable pressure on syringe plunger to deliver medicine as fine mist-like spray



1.11

IM

- Use undiluted liquid **midazolam** (doses *below*)
- Full effect takes 5–10 minutes

IV/IO

- Mix **midazolam** 5mg/mL with **normal saline** to make 1mg/mL
 - 1mL ampoule midazolam (5mg) with 4mL normal saline
- Give dose slowly over 2 minutes (doses *below*)
 - Giving too fast may cause breathing to slow or stop (respiratory depression)



1.12

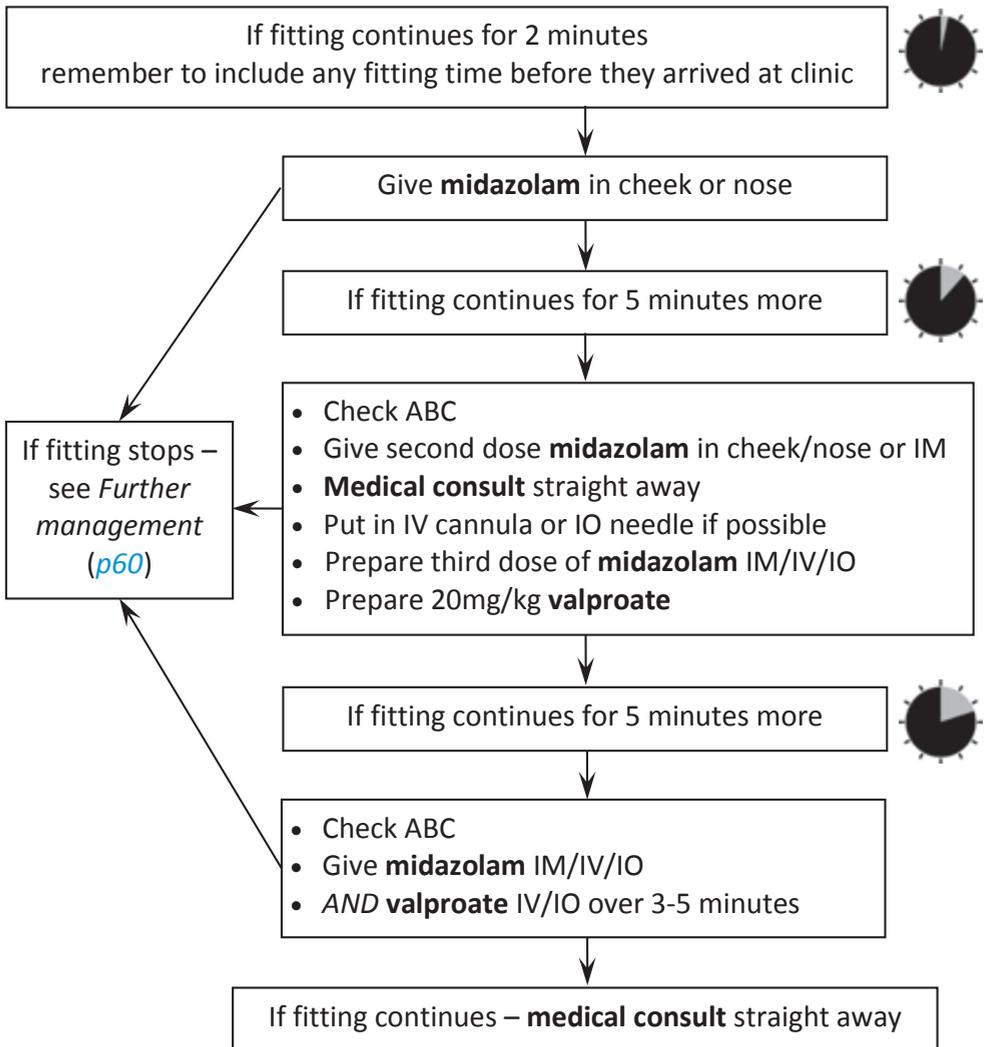
Table 1.15: Midazolam doses#

Age	Weight (kg)	Cheek or nose 0.3mg/kg/dose	Cheek or nose 0.3mg/kg/dose	IM 0.15mg/kg/dose	IM 0.15mg/kg/dose	IV/IO 0.15mg/kg/dose
		Dose (mg)	Dose (mL) Undiluted – 5mg/mL	Dose (mg)	Dose (mL) Undiluted – 5mg/mL	Dose (mg = mL) Diluted to make 1mg/mL Mix 1mL (5mg/mL) with 4mL normal saline
Under 3 months	2	0.6	0.12	0.3	0.06	0.3
	3.3	1	0.2	0.5	0.1	0.5
3 months	6.2	1.86	0.4	0.93	0.2	0.93
6 months	7.6	2.28	0.5	1.14	0.23	1.14
1 year	9	2.7	0.54	1.35	0.3	1.35
2 years	12	3.6	0.72	1.8	0.4	1.8
3 years	14	4.2	0.9	2.1	0.42	2.1
4 years	16	4.8	1	2.4	0.5	2.4
6 years	20	6	1.2	3	0.6	3
8 years	25	7.5	1.5	3.75	0.75	3.75
10 years	32	9.6	2	4.8	1	4.8
12+ years	33 or more	10	2	5	1	5

Doses (mL) rounded up to the nearest 0.2mL unless this is more than 10% above recommended dose.



Flowchart 1.6: Managing fits



Valproate doses

- Give **valproate** IV/IO over 3–5 minutes – adult 800mg, child 20mg/kg/dose up to 800mg (doses [p442](#))
- May also need ongoing infusion — **medical consult**
 - Adult 1–2mg/kg/hour up to 2.5g/day, child 1.6mg/kg/hour up to 2.5mg/day (doses [p442](#))

Further management

Ask

- Ask people who saw fit exactly what happened
- Has person had fits before
 - If person usually takes medicine for fits — have any doses been missed
- Has person deliberately taken an overdose of medicine or child taken someone else's tablets — what kind, how much, when
- For females — are they pregnant, or did they give birth in the last 3 weeks
- Has person been drinking a lot of alcohol (grog) or sniffing petrol recently
- Has person been unwell recently (eg infection, electrolyte disturbances)
- Has person had a head injury recently
- Other medical history, usual medicines, allergies

Check

- Airway and breathing — after fit has stopped
- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- BGL
- Examine carefully for sickness or injury that may have caused fit — consider meningitis ([p101](#)), head injury ([p72](#)), stroke
- Coma scale score ([p74](#))
- If known epileptic — blood for serum drug levels

Do

- If breathing blocked (obstructed) or noisy — put in nasopharyngeal ([CPM p46](#)) or oropharyngeal ([CPM p45](#)) airway
 - If they spit out airway or gag — leave in recovery position — F 1.10
- If pregnant — use wedge to tilt her to left side, see *Fits in the second half of pregnancy* ([WBM p19](#))
- Put in IV cannula ([CPM p84](#))
- Check BGL and serum sodium level (if available)
 - If BGL less than 4mmol/L — see *Low blood glucose (hypoglycaemia)* ([p91](#))
- If temp high —
 - Take off excess clothing
 - Give **paracetamol** up to 4 times a day (qid) – adult 1g, child 15mg/kg/ dose up to 1g ([p380](#)). Best given rectally

If person has had fit before

- Keep in clinic for at least 4 hours after fit has stopped — watch closely
- Check temp, pulse, BP, RR, O₂ sats and work out REWS ([p6](#)) every 30 minutes for first 2 hours
 - *THEN* every hour for next 2 hours or until fully recovered
- Take blood to check if taking anticonvulsant medicines



Medical consult if

- Person still drowsy 2 hours after fit has stopped
- Person has never had a fit before
- Baby or child
- Pregnant
- Need more than 1 dose of midazolam to control fit
- Having a lot of fits, or not waking up between them
- Fit only affects 1 part of the body (focal/partial – eg 1 arm, 1 side)
- Other significant sickness at the same time
- T 38.5°C or more, 30 minutes after fit
- Taking anticoagulants (eg warfarin, dabigatran)
- Possibility of overdose/poisoning
- Recent head injury, fall
- You are worried for any other reason — irregular pulse, rash, meningism

Follow-up

- When person goes home
 - Someone responsible must stay with them all the time for next 12 hours
 - Make sure carer/s know how to keep person safe and put them in recovery position — F 1.10 (p57) if they have another fit
- Talk with person about their medicines — are they taking them correctly
- Talk with person and their family/carer about things they shouldn't do — driving, swimming, sleeping too near the fire
- Medical review

Hypothermia

Remember — Life support — DRS ABC (*p10*).

Follows exposure to cold, affects all body organs and systems.

- **Mild** (core T 32–35°C) — alert and shivering. Use passive rewarming, may not need to send to hospital if no complications and sole cause is environmental exposure
- **Moderate** (core T 28–32°C) — drowsy, not shivering, may appear drunk or as if they had stroke. Need active rewarming and advanced support
- **Severe** (core T less than 28°C) — unconscious, with or without vital signs

In severe hypothermia person may appear lifeless and mistakenly be pronounced dead. If in doubt — start and continue resuscitation. Evidence of death includes airway obstruction (eg vomit, snow, debris), or injuries incompatible with life.

Check

- Core temp (best with low reading thermometer or probe), pulse, RR, BP, O₂ sats (best centrally) — work out REWS (*p6*)
- 12 lead ECG, continue to monitor
- Take blood for BGL, serum potassium, hCG, blood culture, FBC
- If not able to monitor core temp — use history, clinical signs
 - Consider other causes, predisposing factors (eg sepsis, stroke)

Do not

- **Do not** give Hartmann's solution

Do — if mild

- Protect cervical spine in trauma (*CPM p66*)
- Stop further heat loss by removing wet clothing, rubbing dry
 - Have clinic room or ambulance uncomfortably warm
- Rewarm person
 - Put on dry clothing, wrap in dry blankets or sleeping bag, cover head
 - Put heat packs/covered hot water bottles under arms (axilla), on groin, abdomen, base of neck
 - In remote context — skin-to-skin contact
 - Suggest family member gets in sleeping bag with person
- Give something sweet to drink
- If signs of infection (eg UTI *p411*, pneumonia *p309*, skin infection *p387*) — **medical consult** and treat
 - If no signs of infection but under 3 months *OR* elderly *OR* chronic illness (eg diabetes, chronic kidney disease) — treat for severe sepsis (*p6*)

Do — if moderate

As for mild *AND*

- **Medical consult** — can deteriorate very quickly. Expert advice needed while stabilising person and waiting to send to hospital

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in IV cannula (*CPM p84*) or IO needle (*CPM p88*)
 - Warm IV fluids to 43–45°C
 - Give **normal saline** – 250–500mL bolus
 - *THEN* give **normal saline with 5% glucose** infusion – adult 150–200mL/hr *OR* match IV input with urine output
- Put in indwelling urinary catheter – female (*WBM p281*), male (*CPM p205*)
 - Do U/A, hourly urine measures
 - If female — do urine pregnancy test
- If any chance person long-term or regular heavy drinker of alcohol, or malnourished — give **thiamine** IV infusion – 100mg over 30 minutes

Do — if severe

As for moderate *AND*

- **Medical consult** straight away — expert advice needed

In severe hypothermia — high risk of ventricular fibrillation (VF).

- Must be moved very gently, no sudden movements
- Nurse flat, change position slowly, carefully
- Cut away clothing, don't drag off
- Intubation (*CPM p51*) may bring on VF, but still follow usual emergency care, with **very careful** handling

Starting CPR

- See *Life support — DRS ABC (p10)*
- Feel for neck (carotid) or groin (femoral) pulse for **at least 30–45 seconds**
- If you feel any pulse, no matter how slow — chest compressions **not** needed. Concentrate on rewarming person
 - Only indications for compressions are no heart beat (asystole), VF, VT
- Once started, CPR must continue until return of circulation, or death diagnosed
 - Circulation should return when core temp around 32°C
 - May take hours, needs huge commitment of resources and effort
- Use 30 compressions and 2 breaths at rate of 100 compressions/minute
 - **Do not** give usual resuscitation (ALS) medicines until core T 30°C or more
 - When core T more than 32°C — standard resuscitation algorithms and decision making used
- Defibrillation indicated for VT or VF — 200J biphasic or 360J monophasic for adults, 4J/kg for children (doses *p16*)
 - May not work if core T less than 32°C
 - Try once. If doesn't work — **do not** shock again until core T 30°C or more
 - Continue CPR

Injuries — abdomen and pelvis

Remember — Assessing trauma — primary and secondary survey (*CPM p35*).

- If pregnant — see *Injuries in pregnancy (WBM p34)*
- Can be serious abdominal injuries without external evidence of trauma
- Injuries to liver, spleen, pelvis can quickly cause life-threatening blood loss
- Fast pulse (*p422*) may be only sign
- Penetrating injury to chest or buttocks can involve abdominal organs
- If fractured lower ribs — consider injury to liver or spleen
- Pain and tenderness can
 - Be masked by other serious injuries or impaired level of consciousness
 - Be absent if spinal cord injury
 - Develop slowly over hours (eg peritonitis due to bowel or vessel damage)

Ask

** Indicates symptom that suggests pelvic fracture.*

- Mechanism of injury
 - Blunt, penetrating, more than 1 area injured (multi-trauma)
 - Amount of force — takes a lot of force to fracture pelvis
 - Side-impact car accident*, motorbike accident*, pedestrian hit by car*
- Other injuries
- Pain
 - Abdominal pain (*p18*)
 - Back pain
 - At shoulder tip — may mean bleeding inside abdomen
 - On lower limb movement*
 - On weight bearing or walking*
- Allergies, medicines, medical history, time they last ate

Do first

- Give **pain relief** (*p377*) before starting secondary survey examination. Person will be more relaxed, assessment more accurate

Check

Remember: Log-roll (*CPM p68*) if concerned about spinal injury, or if possible penetrating injury to back causing circulation or breathing problems.

Abdomen extends

- Front and sides — from nipples to tops of thighs
- Back — from tips of the shoulder blades to buttock creases

**Indicates sign that suggests pelvic fracture.*

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*). Continue to monitor
- Look for wounds, bruising



- Look for shortening* or rotation* of lower limb/s, flexed hip/s*
- Look for bleeding or bruising of private parts (genitals)*
- Gently feel pelvis for tenderness*, swelling*, irregularity*
- Gentle abdominal exam ([p18](#))
- Rectal exam ([CPM p203](#)) — only after **medical consult**. Consider if
 - Fast pulse (shock)
 - Abdominal pain/tenderness
 - Likely pelvic fracture with urethral or bladder injury
 - Blood at penis (urethral opening), bruised scrotum
- If blood at vagina, urethral opening — vaginal exam, after **medical consult**
- U/A if possible, urine pregnancy test in women 12–52 years
- If wound — check tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** spring pelvis
- **Do not** put in indwelling urinary catheter if signs of urethral or bladder injury (eg blood in urethra, bruised scrotum) — **medical consult**
- **Do not** remove any object sticking into abdomen
- **Do not** poke or feel about inside (probe) wound
- **Do not** replace exposed bowel or gut contents
- **Do not** let person eat or drink anything — may need operation

Do

- **Medical consult**, send to hospital straight away
- If in shock — give frequent boluses — adult 250–500mL, child 10–20mLs/kg. Assess response
 - Use blood if available, or use **Hartmann's solution** or **normal saline**
 - If head injury or not alert — target systolic BP of more than 90mmHg
 - Otherwise target systolic BP of 80–90mmHg
- Give **pain relief** ([p377](#))
- Put in indwelling urinary catheter if needed and no sign of urethral or bladder damage – female ([WBM p281](#)), male ([CPM p205](#))

Do — if pelvic fracture

- As soon as you suspect pelvic fracture (any symptom/sign with * suggests pelvic fracture) — put on pelvic binder following the manufacturer's instructions or apply pelvic sheeting ([CPM p231](#))

Do — if deep or open wound

- Cover wounds with sterile dressing soaked in **normal saline** then cling wrap
 - Lay cling wrap lengthways. If wrapped around body it can become too tight, reducing breathing and circulation
- Give **ceftriaxone** IM/IV single dose – adult 1g, child 50mg/kg/dose up to 1g (doses [p429](#))

Injuries — bleeding

Remember — Assessing trauma — primary and secondary survey (*CPM p35*).

Check

- Always look for signs of shock — can be due to life-threatening bleeding
 - More likely if significant injury — car crash, fall, beaten up, stabbed

Signs of shock

- Pulse weak and fast (adult — more than 100/min, child *p422*), difficult to feel
 - Old people may not get fast pulse due to heart trouble or medicines (eg beta blockers)
 - Low BP for age (*p422*)
 - Restless, confused, drowsy, occasionally unconscious
 - Pale, cool, moist skin
 - Capillary refill longer than 2 seconds
 - Air hunger/increased RR
-
- Important to consider
 - Internal (hidden) bleeding into abdomen, pelvis (*p64*) or chest (*p68*)
 - Major injuries to limbs (*p80*)
 - Young person or pregnant woman (*WBM p34*) can lose dangerous amount of blood without looking very unwell

Remember: Visible bleeding can occur at the same time as internal bleeding or tension pneumothorax as causes of shock in trauma.

Do not

- **Do not** remove any object sticking out of wound

Do

- Try to stop visible bleeding
 - Apply firm direct pressure with gloved hands, with or without pad — F 1.13
 - If something in wound — apply pressure to pads above and below (or around) object
 - Reduce fractures or dislocations
 - Infiltrate site with **lidocaine (lignocaine) + adrenaline (epinephrine) 1:100,000** (eg scalp wounds)
 - When bleeding controlled — bandage pad in place (*CPM p224*), elevate (raise) part, immobilise if needed
- If lot of blood has been lost — lie person down



1.13

If signs of shock

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min



- Put in 2 IV cannula, largest possible (*CPM p84*), or IO needles (*CPM p88*)
- Run blood if available, otherwise **Hartmann's solution** or **normal saline** – adult 500mL, pregnant woman 1L, child 20mL/kg for child (doses *p16*)
 - Reassess for more fluids
- **Medical consult**, send to hospital

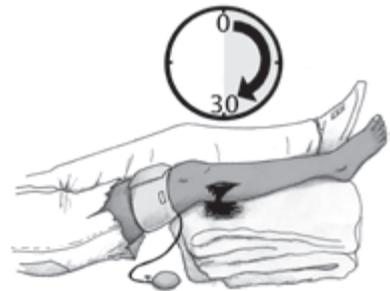
Follow-up

- Check every 15 minutes
 - Pulse — consider more IV fluids if pulse more than 100/min (adult)
 - Pain and anxiety also cause fast pulse
 - BP — give more IV fluids if systolic BP less than 90mmHg (adult)
- Put in indwelling urinary catheter – female (*WBM p281*), male (*CPM p205*)
 - If urine output less than 0.5mL/kg/hr — probably needs more fluids

Bleeding arm or leg

If firm pressure for 10 minutes and elevating arm/leg doesn't stop bleeding —

- Put BP cuff on arm/leg above and close to wound, blow up to 30mmHg above systolic BP — F 1.14
 - Leave for 30 minutes
 - Let BP cuff down for 2 minutes
 - Blow up again and leave for another 30 minutes
 - Repeat until more help arrives



1.14

AND/OR

- Try to find bleeding point and stop by
 - Direct pressure and infiltration of **lidocaine (lignocaine) + adrenaline (epinephrine) 1:100,000**
 - If this doesn't work and good view of blood vessel — suture or clamp, if skilled
 - Put clamps on carefully or nerves that run beside blood vessels may be permanently damaged

If torrential bleeding that still hasn't stopped —

- Put on tourniquet, several centimetres above (proximal to) wound — **do not** remove
 - Record time applied
- **Medical consult, send to hospital urgently**
 - Best chance to save limb if arrive within 4 hours of putting on tourniquet

After you have stopped any bleeding

- Check pulse, BP, how warm skin is, colour of skin
- Give more IV fluids as needed — 'Plug the leak and fill the tank'

Injuries — chest

Remember — Assessing trauma — primary and secondary survey (*CPM p35*).

Danger signs

- Trouble breathing — RR less than 10/min or more than 30/min (adult)
 - Altered chest movement
 - Chest wound (remember to look carefully at back as well)
 - Hard to hear breathing with stethoscope over any part of lungs (*CPM p189*)
 - Shock — fast pulse (*p422*) or low BP (*p422*)
 - O₂ sats less than 94%
- If any danger signs — consider life-threatening but treatable problem
 - Blocked upper airway
 - Tension pneumothorax (*below*)
 - Massive haemothorax (*p69*)
 - Penetrating chest injury (*p70*)
 - Flail chest (*p70*)

Pneumothorax

Tension pneumothorax

Air trapped between outside of lung and inside of ribcage, under high pressure.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*). Record time in file notes
- Serious trouble breathing (respiratory distress)
- Blue colour (cyanosis)
- Pale (shock)
- Distended neck veins
- Less or no chest movement on injured side
- Less or no breath sounds on injured side (*CPM p189*)
- Increased drumminess to percussion (hyper-resonant) on injured side (*CPM p188*)
- Crackly feeling under skin (crepitus) around neck and top of chest, caused by bubbles of air (subcutaneous emphysema)
- Fractured ribs — bruising, pain, tenderness
- Shift of windpipe (trachea) away from injured side — late sign
- Low BP (*p422*) — late sign

Do

- **Medical consult**, send to hospital straight away
- If arrested — needle decompression straight away (*CPM p57*)
- Give 100% **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min



- Needle decompression (*CPM p57*)
 - Leave cannula in place and opened to air
- Put in chest drain (*CPM p59*)
 - If person stable — not urgent. Can wait hours before putting in drain
- Give **pain relief** (*p377*)
- Put in 2 IV cannula (*CPM p84*)
- Assess/manage other injuries

Non-tension pneumothorax

Air trapped between outside of lungs and inside of ribcage, not under pressure.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*). Record time in file notes
- Not very breathless
- Not in shock

Do

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in 2 IV cannula (*CPM p84*)
- Give **pain relief** (*p377*)
- **Medical consult**, send to hospital
 - If person flying — may need to put in chest drain (*CPM p59*)

Massive haemothorax

Large amount of blood in chest cavity between lungs and inside of ribcage.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*). Record time in file notes
- Trouble breathing
- Less or no chest movement on injured side
- Less or no breath sounds on injured side (*CPM p189*)
- Less drumminess to percussion (duller) on injured side (*CPM p188*)

Do

- **Medical consult**, send to hospital
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in 2 IV cannula, largest possible (*CPM p84*)
- If low BP (*p422*) — run blood if available, otherwise **Hartmann's solution** or **normal saline** in 250–500mL boluses. Target systolic BP 80–90mmHg

If serious trouble breathing (respiratory distress)

- Check for tension pneumothorax ([p68](#)) — do needle decompression ([CPM p57](#))
- If air rushes out — leave cannula in place, opened to air
- If still serious trouble breathing — put in chest drain ([CPM p59](#)). Expect a lot of blood
- Assess/manage other injuries
- Give **pain relief** ([p377](#))

Penetrating (open or ‘sucking’) chest injury**Check**

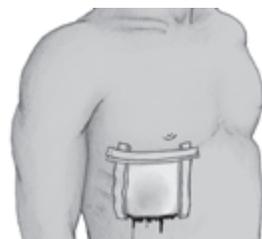
- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#)). Record time in file notes

Do not

- **Do not** remove objects sticking into chest
- **Do not** poke or feel around in (probe) wound

Do

- **Medical consult** straight away, send to hospital
- Give **oxygen** to target O₂ sats 94–98%
OR if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Cover wound, tape on 3 sides only to make a valve — F 1.15
- Use piece of thin, flexible, waterproof paper or material a bit bigger than wound (eg *Op-site* or defibrillator pad packet, thin strong paper)
 - **Do not** use gauze or combine dressing
- Put in 2 IV cannula ([CPM p84](#))
- Give **pain relief** ([p377](#))
- Give **ceftriaxone** IM/IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
 - If allergic to penicillin — **medical consult**
- Assess/manage other injuries



1.15

Flail chest

Usually happens when chest smashes against steering wheel or something hard. Caused by 2 or more ribs being fractured in 2 places.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#)). Record time in file notes
- One part of ribcage sucks in and rest moves out when person breathes in
- Very short of breath



Do

- **Medical consult** straight away, send to hospital
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in 2 IV cannula (*CPM p84*)
- Give **pain relief** (*p377*)

Fractured ribs

- Most fractured ribs are not complicated
- If a lot of pain or person unwell — consider
 - Flail chest (*p70*)
 - Damage to organs underneath fracture — lungs, liver with right lower rib fractures, spleen with left lower rib fractures

Check

- Localised tenderness over rib/s
- Pain if you gently spring chest. Gently squeeze chest once from side to side or front to back
 - If no pain — unlikely to be fractured rib
- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*)

Do

- Give **pain relief** (*p377*)
- Encourage person to do regular coughing and breathing exercises (10 deep breaths and 2 coughs every hour) to lessen risk of pneumonia
 - If they can't do this — **medical consult**, may need to go to hospital

Remember:

- Pneumothorax may develop slowly. Consider if having trouble breathing later
- X-rays of little use for fractured ribs — unless worried about pneumothorax or flail segment

Injuries — head

Remember — Assessing trauma — primary and secondary survey (*CPM p35*).

Assessment

- All people with a head injury must be treated as though they also have a neck (cervical spine) injury (*p88*)
- If unconscious person has been drinking — always treat as head injury and do **medical consult**
 - **Do not** assume altered consciousness is due to alcohol
- Send to hospital for CT scan, further assessment and management if
 - Severe or moderate head injury
 - Skull fracture
 - Minor head injury with other serious injury/instability

Initial assessment — all head injuries

- If person has **any** risk factors (*p73*) — may have **serious head injury** and/or increased risk of deterioration. **Medical consult** after initial assessment and stabilisation

Ask

- Has person had any alcohol (grog) or other drugs

Check

- Do quick check for level of consciousness using AVPU. If only P or U — may need airway protection
 - **A** lert — eyes open, understanding, following commands, talking
 - Tell person not to move their head
 - **V** oice — not alert but responds to your voice
 - **P** ain — responds only to pain. Squeeze muscle at top of shoulder — F 1.16
 - If only small response (eg low groan without opening eyes) — treat as unresponsive
 - **U** nresponsive — unconscious, not responding
- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*)
- BGL
- Pupil reactions (*p73*), coma scale score (*p74*) — record time in file notes
- Signs of skull fracture
 - Laceration or blood filled swelling (haematoma) on scalp
 - Bruising around eyes (raccoon eyes) or behind ears (Battle's sign)
 - Clear or blood-stained fluid (CSF) from ears or nose
 - Blood in ear canal or behind eardrum
 - Bleeding into white of eye (*p356*), and can't see back edge of bleed



1.16



- **Wearing sterile gloves**, feel for skull fractures/bogginess under cuts and bruises on head or face
- **Skull fractures aren't always directly under cuts or bruises, can easily be missed on examination.** If in doubt — **medical consult**
- Limb weakness, lack of movement
- Other risk factors (*below*)

Risk factors

- Child under 12 months or adult over 65 years
- Unconscious for more than 5 minutes after injury
- Coma scale score ([p74](#))
 - Less than 14 on arrival
 - Drops by 2 or more or Motor score by 1 or more
 - Less than 15 after 2 hours
- Pupils unequal (*below*)
- Any localised or one-sided weakness
- Stab or 'penetrating' wound to head
- Suspected skull fracture ([p72](#))
- Fitting — especially if delayed fit
- Vomiting — especially if continues to vomit
- Remains drowsy
- Remains confused
- Bad headache
- Known bleeding disorder — taking blood thinners (anticoagulants), liver disease, dialysis
- Dangerous cause
 - Bad car crash — thrown from car, car badly damaged, someone killed, car going more than 60km/hr
 - Pedestrian hit by vehicle
 - Fall from more than 1m *OR* fall from horse, ladder, bicycle
 - Hit by bat or club

Having 2 or more risk factors more of a concern than having only 1.

- Person with drowsiness, confusion, headache, vomiting and not improving within 4 hours probably has serious head injury

Pupil reactions

- Pupils should be the same size
- Both should get smaller (constrict) when a light is shone into either eye

Check

- Move out of direct sunlight or have someone shade person's eyes so you can see pupils clearly

- Look at both pupils with a bright light
 - Are pupils the same size
 - Does size change when bright light shone into them
 - Is reaction time fast or slow
- If pupils, dilated, sluggish, unequal — F 1.17 — may be due to
 - Eye injury
 - Increased intracranial pressure (eg bleeding into brain)
 - Some eye drops
 - Some toxins, chemicals



1.17

Note: Difference in pupil size of 0.5–1mm may be normal for person (anisocoria). Check carefully for difference in reaction.

Coma scales

Used to assess severity of head injuries.

- Check person understands English before using coma scales — if not use AVPU (p72)
- Same person should do all assessments so patterns and small differences can be noticed. If not possible — show new person how assessment was done
- Painful stimulus above neck is most reliable. Use pressure in notch above eye (supraorbital pressure) — F 1.18

If coma scale score falling

- **Drop of 2 or more points in score is very serious**
 - May be problems other than head injury (eg shock)
 - May be due to rising intracranial pressure

Check

- Airway, breathing pattern
- Temp, pulse, RR, BP, O₂ sats — work out REWS (p6)
- BGL



1.18

Do

- **Medical consult** straight away
- Give **oxygen** to target O₂ sats at or near 100%
 - Non-rebreather mask 10–15L/min
 - *OR* if breathing poorly — bag-valve-mask ventilation
- Treat any chest or respiratory issues (eg pneumothorax p68)
- Put in IV cannula (CPM p84)
 - Run **normal saline** as needed — aim for systolic BP more than 100mmHg
- If low BGL — see *Low blood glucose (hypoglycaemia)* (p91)
- Keep temp normal — warm up if T less than 34°C, cool if T more than 38°C



Glasgow Coma Scale

Check	Response	Score
EYES Are person's eyes open	Opens eyes by themselves	4
	Only opens eyes if you ask them to	3
	Only opens eyes in response to pain	2
	Will not open eyes	1
	E Score	
VERBAL Does person know • Their name • Where they are Are they making sense	Knows their name and where they are, making good sense	5
	Not sure what their name is or where they are, talking, but not making much sense	4
	Talking rubbish only, not making any sense	3
	Only making strange sounds	2
	Making no sounds	1
	V Score	
MOTOR What movements does person make	Obeys commands — does simple things you ask • If body paralysis (quadriplegia) — ask to poke out tongue or raise eyebrows	6
	Localisation — purposeful movement to change painful stimulus (supraorbital pressure), attempts to remove or avoid it	5
	Withdrawal — pulls arm or leg away in response to local pain (pinched limb)	4
	Abnormal flexion in response to pain (supraorbital pressure) — clenches fists and bends wrists and elbows, without localisation	3
	Abnormal extension in response to pain (supraorbital pressure) — straightens wrists and elbows, without localisation	2
	No movement	1
	M Score	
	TOTAL SCORE	

Scoring the coma scale

- Don't record amnesia as confusion
- If in doubt between 2 levels — score at lower level
- Report scores of component parts (eg E3, V2, M5) as well as total score
 - Motor score (M) most useful

Interpreting score

- 3–8 — severe head injury ([p77](#))
- 9–13 — moderate head injury ([p77](#))
- 14–15 — minor head injury ([p78](#))

Adelaide Coma Scale

Use for children under 10 years.

Check	Response	Score
EYES Are child's eyes open	Opens eyes by themselves	4
	Only opens eyes if you ask them to	3
	Only opens eyes in response to pain	2
	Will not open eyes	1
	E Score	
VERBAL*	Smiles, interacts	5
	Cries but can be comforted (consolable)	4
	Cries and can occasionally be comforted	3
	Cries and can't be comforted (inconsolable), agitated	2
	Making no sounds	1
	V Score	
MOTOR** What movements does child make	Obeys commands — does simple things you ask	6
	Localisation — purposeful movement to change painful stimulus (supraorbital pressure) (eg rolls away, pushes your hand away), keeps eyes shut	5
	Withdrawal — pulls arm or leg away in response to local pain (pinched limb)	4
	Abnormal flexion in response to pain (supraorbital pressure) — clenches fists and bends wrists and elbows, without localisation	3
	Abnormal extension in response to pain (supraorbital pressure) — straightens wrists and elbows, without localisation	2
	No movement	1
	M Score	
	TOTAL SCORE	

* Child over 5 years can often answer simple questions.

** Child over 2 years can often follow commands.

Scoring the coma scale

- Don't record amnesia as confusion
- If in doubt between 2 levels — score at lower level
- Report scores of component parts (eg E3, V2, M5) as well as total score
 - Motor score (M) most useful

Interpreting score

- 3–8 — severe head injury ([p77](#))
- 9–13 — moderate head injury ([p77](#))
- 14–15 — minor head injury ([p78](#))



A score of 15 on coma scale doesn't mean 'normal'. Can still have altered cognitive function.

Management

Moderate or severe head injury

Moderate — coma scale score 9–13.

Severe — coma scale score 3–8.

Check first

- Is **airway** open and secure ([p11](#))
- Head injury assessment ([p72](#))
- Repeat regularly — coma scale score ([p74](#)), pupil reactions ([p73](#)), limb movement, RR, BP
 - If any of these change — **medical consult** straight away

Position

- Tilt head of bed up 15–30°. If concern about spinal injury — tilt whole bed
- Keep neck (cervical spine) still — use semi-rigid collar ([CPM p66](#))
 - Make sure collar is not pressing on jugular veins. If not sure — remove collar and use cushioning/padding to keep head and neck in position

Do

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in 2 IV cannula ([CPM p84](#)), largest possible
- In head injury too much IV fluid can cause swelling on the brain
 - If bleeding from other injuries causes fast pulse ([p422](#)) or low BP ([p422](#)) (shock) — give IV fluids in 250–500mL boluses to keep systolic BP 90–100mmHg
- If fitting ([p57](#)) —
 - Give **midazolam** ([p57](#))
 - **Medical consult** about loading with **levetiracetam** — IV infusion over 30 minutes – 20mg/kg/dose (doses [p440](#))

Do also — if severe

- **Medical consult** — may need to
 - Give **antiemetic** to stop vomiting ([p105](#)) — non-sedating preferred
 - If not already given for fitting — **medical consult** about loading with **levetiracetam**. IV infusion over 30 minutes – 20mg/kg/dose (doses [p440](#))
- If getting worse despite resuscitation (eg unequal pupils, deteriorating level of consciousness, one-sided [unilateral] paralysis) — may need mannitol or hypertonic saline. **Medical consult**, doctor should talk with retrieval team

- If scalp skin broken — give **cefazolin** IV/IO every 8 hours (tds) until evacuated — adult 2g, child 50mg/kg/dose up to 2g (doses [p428](#)). Can give IM if needed but painful
 - If anaphylaxis to penicillin or cephalosporins — give **clindamycin** IV every 8 hours (tds) until evacuated — adult 600mg, child 15mg/kg/dose up to 600mg (doses [p430](#))

Check — when stabilised

- Examine rest of body for other injuries
- Tetanus status, see *Australian Immunisation Handbook*

Minor head injuries

Coma scale score 14–15.

Check

- Head injury assessment ([p72](#))

Do

- Observe person in clinic until at least 4 hours after injury
- If over 65 years — **medical consult**, CT scan if available
- Can be sent home at 4 hours after injury if **all** these things are OK
 - Unconscious for less than 5 minutes
 - Coma scale score 15
 - Improving clinically
 - No weakness, numbness, tingling anywhere
 - No ongoing drowsiness, confusion, headache, vomiting
 - No known bleeding disorder (eg warfarin use), bad liver disease, dialysis
 - Adult at home who is able to look after them

Follow-up

- Give verbal and written advice (in appropriate language if available) to person or carer
- Tell them to come back to clinic if any of these things happen
 - Confusion, drowsiness, slurred speech
 - Vomiting, headaches, fitting
 - Unusual clumsiness
 - Acting strangely, change in behaviour
 - Bleeding or fluid loss from ears or nose



Skull fracture

Check

- Head injury assessment ([p72](#))

Do

- If skull fracture — **medical consult**, send to hospital
 - High risk of bleeding in/around brain — CT scan needed
- Skull x-ray — only if needed to confirm fracture before sending to hospital
 - If decision already made to send to hospital — x-ray not needed

Bleeding scalp wound

Check

- Head injury assessment ([p72](#))
- Tetanus status, see *Australian Immunisation Handbook*

Do

- Stop bleeding — apply firm direct pressure using hands or pad
 - If artery spurting blood — clamp with artery forceps or suture
 - Most bleeding stops after adequate suturing or stapling
- Local anaesthetic ([CPM p289](#)) — use **lidocaine (lignocaine) 1% + adrenaline (epinephrine) 1:100,000** if available
- Clean using large amounts of **normal saline**
 - Always remove dirt and hair
 - If pieces of bone — leave in place
 - IV antibiotics as for compound fracture ([p81](#))
 - **Medical consult**
- Clip or shave hair around wound
- Suture with 3.0 monofilament or silk ([CPM p298](#)), or staple ([CPM p300](#))

Injuries — limbs

Remember — Assessing trauma — primary and secondary survey (*CPM p35*).

- Very large amount of blood can be lost with fractured thigh (femur) or other long bones
- Injuries to hands or fingers can cause long-term problems if not treated properly
 - If not sure what to do — always talk with someone more experienced

Ask

- About pain
- What happened, when it happened

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*)
- Check for pain, swelling, limb deformity. May mean fracture, damaged ligaments or tendons
- Check movement of joints. If less or more movement than normal or painful — may mean injury to tendon or joint (eg dislocation)
- Always compare one side of body with other
- Check hand or foot of injured limb for
 - Pulses and warmth. If no pulse or skin cool — may mean damage to artery (blood vessel)
 - Feeling (sensation). If no feeling (numb) — may mean damage to nerve

Do

- **If signs of nerve or circulation problems** (cool, pulseless limb) —
 - Gently straighten limb, apply firm traction until pulse returns
 - **Medical consult**
- Give **pain relief** (*p377*)

Fractured major bones

Fractures to thigh bone (femur), upper arm (humerus).

Do

- Put in 2 large bore IV cannula (*CPM p84*)
 - Run **normal saline** even if BP normal — 10mL/kg for child, 1L for adult
- Treat as closed fracture (*below*) or compound fracture (*p81*), as needed

Closed fractures

No skin wounds over fractured bone.

Do — if pulses, movement and feeling normal

- **Medical consult**, send to hospital



- Try to put limb back into normal shape. If pulse or feeling no longer normal — **stop**
- Splint limb (*CPM p229*), put on back slab (*CPM p234*), or strap to other limb or body, so person can't move joint above or below fracture. Gives good pain relief
 - Recheck pulses and feeling (sensation) when done
- Keep limb in raised position (elevated)
- Give **pain relief** (*p377*)

Do — if pulses weak or absent, or reduced feeling

- **Medical consult** straight away

Compound fractures

Fracture is compound (open) if bone or fracture bruise (haematoma) exposed to outside environment in any way.

- When skin broken — high risk of tissue and bone infection
- Bone doesn't always poke through skin. May just be small skin puncture
- If not sure — treat all wounds near broken bone as compound fracture
- Treat facial fractures involving sinuses as compound

Check

- Look carefully at broken skin over or near suspected fracture. Can you see bone underneath
- Tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** poke or probe wound
- **Do not** close/suture
- **Do not** let person eat or drink anything — will need surgery

Do — manage as closed fracture PLUS

If signs of shock, altered mental state, more pain than expected, visible necrosis or gas crepitus — **medical consult** and send to hospital straight away.

- **Medical consult**, send to hospital
- Control any bleeding
- Clean and wash out wound with **normal saline**
- Cover with sterile dressing soaked in **normal saline**, then cling wrap laid lengthways
- Give **cefazolin** IV/IO every 8 hours (tds) until evacuated – adult 2g, child 50mg/kg/dose up to 2g (doses *p428*). Can give IM if needed but painful
- If anaphylaxis to penicillin or cephalosporins — give **clindamycin** IV every 8 hours (tds) until evacuated – adult 600mg, child 15mg/kg/dose up to 600mg (doses *p430*)

Injuries — soft tissue

Remember — Assessing trauma — primary and secondary survey (*CPM p35*).

- If **bites or fist cut by teeth** — see *Animal or human bites (p85)*
- If **burn** — see *Burns (p38)*
- If **stab wound** — see *Spear and knife wounds (stab wounds) (p87)*

Do first

Check for injuries that are or might become complicated.

Injuries to arteries

- Signs of arterial bleeding include
 - Spurting blood, large blood loss, reduced or no pulses, cool limb
 - Bruise (haematoma) rapidly increasing in size or pulsing/throbbing
- Apply pressure straight away
- See *Injuries — bleeding (p66)*

Injuries also involving bones

- If **signs of nerve or circulation problems** (cool, pulseless limbs) —
 - Gently straighten limb, apply firm traction until pulse returns
 - **Medical consult, send to hospital urgently**
- See *Injuries — limbs (p80)*

Injuries to nerves

- Check for numbness

Injuries to tendons or joints

- Joints move less or more than they should
- If penetrating injury close to a joint —
 - **Medical consult, send to hospital urgently**
 - Give **cefazolin** IV every 8 hours (tds) until evacuated — adult 2g, child 50mg/kg/dose up to 2g (doses *p428*)
 - If anaphylaxis to penicillin or cephalosporins — give **clindamycin** IV every 8 hours (tds) until evacuated — adult 600mg, child 15mg/kg/dose up to 600mg (doses *p430*)
- See *Joint sprains (p373)*

Injuries to hands or fingers

- Can cause long-term problems if not treated properly. If not sure what to do — always get help or advice
- Penetrating injuries to palm side of hands or fingers
 - Palmar spaces can become infected — **medical consult**
 - Always give antibiotics
 - Give **cefazolin** IV every 8 hours (tds) until evacuated — adult 2g, child 50mg/kg/dose up to 2g (doses *p428*)



- If anaphylaxis to penicillin or cephalosporins — give **clindamycin** IV every 8 hours (tds) until evacuated – adult 600mg, child 15mg/kg/dose up to 600mg (doses [p430](#))
- Review next day for redness or swelling
- Injuries to nail bed — can lead to problems with nail growth
 - See *Injuries — fingernails and toenails* ([CPM p273](#))

Injuries involving high pressure injection

- Usually to hands or fingers
- May be very severe with only tiny surface injury — do **medical consult**

Check

Is wound

- Complicated — tendon, joint or bone involvement
- Severe — crush injury or extensive tissue damage

- Carefully check wound for foreign bodies
- If person has history of RHD, endocarditis, artificial heart valves — see *Prevention of endocarditis* ([p297](#))
- Tetanus status, see *Australian Immunisation Handbook*
- If wound infected or not improving with antibiotics — wound swab ([CPM p388](#))

Do

- If object sticking into body — **medical consult** about removing
- Give **pain relief** ([p377](#))
 - Back slab often useful ([CPM p234](#))
- If wound needs to be debrided or gently scrubbed to remove dirt — consider local anaesthetic
 - **Lidocaine (lignocaine) 1%** injection — up to 0.3mL/kg
 - **Lidocaine-prilocaine (lignocaine-prilocaine) cream** OR gauze soaked in **lidocaine (lignocaine) 2%**
 - Takes about 30 minutes to work
- If injury to finger needs sutures or closer examination — may need nerve block ([CPM p305](#))
- Clean wound
 - If wound very dirty or dead tissue present — **medical consult**
 - **Dirty wounds** — clean and irrigate with **normal saline**
 - **Clean wounds** — irrigate with **normal saline**
 - Use **normal saline** for all follow-up dressings

If less than 8 hours old and clean

- If **not** complicated and **not** severe —
 - Close if needed
 - Antibiotics **not** needed

- If complicated, or severe, or appears infected —
 - **Do not** close
 - Give antibiotics — see Table 1.16
 - *OR* if significant fresh or salt water exposure — see *Water-related skin infections* (p392)
 - Consider sending to hospital

Table 1.16: Antibiotics for soft tissue injuries by wound type

<p>Mild contamination <i>OR</i> shallow puncture <i>OR</i> mild infection <i>OR</i> more than 8 hours old</p>
<ul style="list-style-type: none"> • Amoxicillin-clavulanic acid oral twice a day (bd) for 5–7 days – adult 875+125mg, child 22.5+3.2mg/kg/dose up to 875+125mg (doses p425) • If allergic to penicillin — <ul style="list-style-type: none"> ◦ Cefalexin oral 4 times 00a day (qid) for 5–7 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses p427) ◦ <i>AND</i> metronidazole oral twice a day (bd) for 5–7 days – adult 400mg, child 10mg/kg/dose up to 400mg (doses p434) • If anaphylaxis to penicillin — <ul style="list-style-type: none"> ◦ Ciprofloxacin oral twice a day (bd) for 5–7 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses p430) ◦ <i>AND</i> clindamycin oral 3 times a day (tds) for 5–7 days – adult 450mg, child 10mg/kg/dose up to 450mg (doses p430)
<p>Complicated or severe wound <i>OR</i> stab (knife/spear) wound <i>OR</i> heavy contamination <i>OR</i> severe infection</p>
<p>Give until evacuated</p> <ul style="list-style-type: none"> • Cefazolin IV every 8 hours (tds) – adult 2g, child 50mg/kg/dose up to 2g (doses p428) • <i>AND</i> metronidazole IV every 12 hours (bd) – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses p434) • If anaphylaxis to penicillin or cephalosporins — medical consult about giving <ul style="list-style-type: none"> ◦ Ciprofloxacin oral twice a day (bd) – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses p430) ◦ <i>AND</i> clindamycin IV every 8 hours (tds) – adult 450mg, child 10mg/kg/dose up to 450mg (doses p430)

If less than 8 hours old and dirty *OR* more than 8 hours old

- Give antibiotics — see Table 1.16
 - *OR* if significant fresh or salt water exposure — see *Water-related skin infections* (p392)



- If **not** complicated and **not** severe —
 - Clean with **normal saline**. Cut away dead and badly damaged tissue (debride), trim wound edge
 - If less than 8 hours old and now clean — close
 - If less than 8 hours old and still not clean *OR* more than 8 hours old —
 - **Do not** close
 - Dress wound daily
 - Consider sending to hospital
- If complicated or severe — **medical consult**, send to hospital

Follow-up

- If infection doesn't get better or gets worse — **medical consult**, may need to send to hospital

Animal or human bites

Fists cut by teeth in fight are treated as a human bite.

Check

Always check for embedded foreign bodies (eg teeth).

- Check for complications
 - Bone, joint or tendon involvement
 - Wounds over knuckles that may connect with tendon or joint
- Assess for high risk of infection — any of
 - Delayed presentation (8 hours or more)
 - Puncture wounds that can't be debrided adequately (eg cat bites, crocodile bites)
 - Wounds on hands, feet or face
 - Complicated wounds
 - People with weakened immune system — dialysis, diabetes
- Tetanus status, see *Australian Immunisation Handbook*
- Take wound swab if
 - More than 8 hours old
 - Any sign of infection
 - Cat bite
- If severe or established infection — collect blood for cultures

Do

- Clean wound

Less than 8 hours old and no signs of infection

- If high risk of infection ([p86](#)) —
 - Give antibiotics — see Table 1.17
 - Review daily
- If small, clean, uncomplicated wound — antibiotics **not needed**

More than 8 hours old OR mild infection OR cat bite

- Give antibiotics — see Table 1.17
- Review daily

Severe or established infection

- **Medical consult**, send to hospital
- Give antibiotics while waiting for evacuation — see Table 1.17

Table 1.17: Antibiotics for bite injuries by wound type

<p>No signs of infection, but high risk OR mild infection OR cat bites</p> <ul style="list-style-type: none"> • If delay in starting antibiotics (more than 8 hours) — procaine benzylpenicillin (procaine penicillin) IM single dose – adult 1.5g, child 50mg/kg/dose up to 1.5g (doses p435) <ul style="list-style-type: none"> ◦ THEN amoxicillin-clavulanic acid oral twice a day (bd) for 5 days – adult 875+125mg, child 22.5+3.2mg/kg/dose up to 875+125mg (doses p425) • If no delay — amoxicillin-clavulanic acid oral twice a day (bd) for 5 days – adult 875+125mg, child 22.5+3.2mg/kg/dose up to 875+125mg (doses p425) • If unable to give oral antibiotics — procaine benzylpenicillin (procaine penicillin) IM every 24 hours for 5 days – adult 1.5g, child 50mg/kg/dose up to 1.5g (doses p435) • If allergic to penicillin — <ul style="list-style-type: none"> ◦ Ciprofloxacin oral twice a day (bd) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses p430) ◦ AND clindamycin oral 3 times a day (tds) for 5 days – adult 450mg, child 10mg/kg/dose up to 450mg (doses p430)
<p>Severe or established infection</p> <p>Medical consult — give until evacuated</p> <ul style="list-style-type: none"> • Metronidazole IV every 12 hours (bd) – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses p434) • AND ceftriaxone IV/IM every 12 hours – adult 1g, child over 1 month 50mg/kg/dose up to 1g (doses p429) <ul style="list-style-type: none"> ◦ If 1 month and under — medical consult • If anaphylaxis to penicillin or cephalosporins — give <ul style="list-style-type: none"> ◦ Ciprofloxacin oral twice a day (bd) – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses p430) ◦ AND clindamycin IV every 8 hours (tds) – adult 450mg, child 10mg/kg/dose up to 450mg (doses p430)



Spear and knife wounds (stab wounds)

May be damage inside, long way from where knife or spear went into body (eg heart, lungs, spine).

Check

- For injuries to arteries ([p82](#)), nerves, joints or tendons ([p82](#))
 - Signs of arterial bleeding include
 - Spurting blood, large blood loss, reduced or no pulses, cool limb
 - Bruise (haematoma) rapidly increasing in size or pulsing/throbbing
- Tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** remove any deeply embedded object (eg knife, spear) from wound
- **Do not** poke or feel around in (probe) stab wounds
 - Above elbow, above knee
 - *OR* with arterial bleeding
- **Do not** close unless needed to stop bleeding

Do

- Stop the bleeding
 - Apply firm direct pressure using gloved hands or pad
 - If something still in wound — apply pressure to pads above and below (or around) object
 - Pack wound with gauze soaked in **normal saline** *OR* alginate dressing
- If bleeding not settling —
 - Infiltrate with **lidocaine (lignocaine) 1% + adrenaline (epinephrine) 1:100,000**
 - Interrupted sutures ([CPM p294](#))
- Clean thoroughly
- Bandage ([CPM p224](#))
- Give antibiotics — see Table 1.16
- Give **pain relief** ([p377](#))
- **Always send to hospital if any of**
 - Wound in high risk area — head, neck, chest, abdomen, buttocks, thighs
 - Injury to arteries, nerves, tendons
 - Object (eg knife, spear) still in wound
 - Observations or general condition getting worse
- If significant blood loss, deterioration, or wound in high risk area — put in 2 large bore IV cannula ([CPM p84](#))
- If significant blood loss or shock
 - Give blood *OR* frequent boluses of **normal saline** or **Hartmann's solution** — adult 250–500mL, child 10mL/kg
 - Target systolic BP — 80–90mmHg (adult)

Injuries – spinal: risk and assessment

Remember — Assessing trauma — primary and secondary survey (*CPM p35*).

Risk of injury

If alert and sober, no other serious or painful injury, no pain in neck or back, no pins and needles, no numbness, no weakness in arms or legs — spinal fracture or dislocation extremely unlikely.

Unconscious person

- If trauma — suspect spinal injury and immobilise

Conscious person

- Suspect neck (cervical spine) injury and immobilise if
 - Way they were injured (mechanism) makes it likely
 - Motor vehicle accident with speed more than 60km/hr or thrown from vehicle
 - Pedestrian or cyclist hit by vehicle at speed more than 30km/hr or backed over by vehicle
 - Fall from more than 1m *OR* fall from ladder, bicycle
 - Kick or fall from horse
 - Thrown over handlebars of bike
 - Dived or fell head first into shallow water
 - Severe electric shock (thrown/fell)
 - Elderly patient with fall and head/neck injury
 - *AND* any of
 - Significant tenderness at posterior midline of cervical spine
 - Localised (focal) neurological deficit
 - Decreased level of alertness
 - Evidence of intoxication (alcohol and/or drugs) — do not attempt to immobilise if resistant, calm person and manage discomfort
 - Pain that might distract person from pain of cervical spine injury
- Suspect back (thoracolumbar spine) injury and immobilise if
 - Way they were injured (mechanism) makes it likely
 - *AND* any of
 - Localised (focal) midline tenderness
 - Localised (focal) neurological deficit
 - Serious distracting pain elsewhere
 - Decreased level of alertness
 - Obvious spinal deformity
 - Suspected/confirmed neck (cervical spine) injury
- If person appears drunk or otherwise intoxicated —
 - Do not attempt to immobilise if resistant
 - Calm person and manage discomfort



Suspected spinal injury

- **Do not** log-roll person with suspected spinal injury unless checking back for penetrating injury or loading on/off a stretcher
 - Log-rolling may make spinal cord or chest injuries worse, cause bleeding from pelvic fractures, cause unnecessary pain and anxiety
- If person alert, co-operative, sober and no back pain or neurological problems — ask them to roll on their side or sit up to let you examine their back

Check

- Do quick check for level of consciousness using **AVPU**. If only P or U — may need airway protection
 - **A** lert — eyes open, understanding, following commands, talking
 - Tell person not to move their head
 - **V** oice — not alert but responds to your voice
 - **P** ain — responds only to pain. Squeeze muscle at top of shoulder — F 1.19
 - If only small response (eg low groan without opening eyes) — treat as unresponsive
 - **U** nresponsive — unconscious, not responding
- Is chest rising normally when person breathes in
- Temp, pulse, RR, BP, O₂ sats — work out REWS (p6)
- Look for wounds, bruising, swelling of neck and spine
- Feel for tenderness along spine from back of head (occiput) to just below top of buttocks (sacrum)
- Check for incontinence of urine or faeces, blood around anus



1.19

Neurological assessment

- Can person move their fingers and toes
- Check for loss of feeling
 - Muscle on top of shoulder (trapezius) (C4)
 - Pads of the index finger (C6), middle finger (C7), little finger (C8)
 - Nipple (T4)
 - Umbilicus (T10)
 - Pubic symphysis pubis (T12)
 - Outside of the foot (lateral) (S1)
- Check grip strength, and foot and ankle power (plantar and dorsiflexion)
- Check for an erection in males (sign of spinal cord injury) — absence of an erection does not mean there is not a spinal injury

Do — if suspected spinal injury

- Immobilise cervical spine with semi-rigid collar (*CPM p66*) and light-weight cushioning or rolled towels

- Immobilise person on spine board/vacuum mattress for transport
- Use PAT slide/spine board for transfers
 - Log-roll (*CPM p68*) for positioning of PAT slide/spine board
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in 2 IV cannula (*CPM p84*)
 - Run **normal saline** — **medical consult** about rate
- If paralysis — systolic BP of 90 is OK if urine output OK
 - Also look for and treat other causes of low BP
- Put in indwelling urinary catheter – female (*WBM p281*), male (*CPM p205*)
- Give **antiemetic** to stop vomiting (*p105*) — non-sedating preferred
- **Medical consult**, send to hospital. Consider flying straight to nearest capital city
- Escorting doctor should put in nasogastric tube (*CPM p81*)

If in town

- Call ambulance straight away
- **Do not** move person until ambulance arrives unless in life-threatening danger. If you need to move — try to maintain alignment, recheck **DRS ABC D**

If out bush

- See *Immobilising the spine (CPM p64)*
Remember: Maintaining airway more important than immobilisation
- Put on semi-rigid collar (*CPM p66*)
 - If person conscious and airway secure — support with light-weight cushioning or rolled towels — F 1.20
- If person unconscious — nurse on back (supine) with suction available
 - Recovery position could cause further cord damage, only use if no other way to keep airway open



1.20

If it hurts to move their neck

- Don't move it
 - Support neck as best you can with towels and cushioning or have someone support head in position of comfort and transport person like this



Low blood glucose (hypoglycaemia)

All clinics should keep and maintain **Emergency low blood glucose kit** (p93).

Happens when BGL low enough to cause symptoms and signs — can happen in diabetic and non-diabetic people.

- **Potential medical emergency** — brain needs glucose and brain cells start to die very quickly without it
- Person with usually high BGL may have symptoms with higher BGL (eg 5–6mmol/L)
- Treat newborn with BGL less than 2.6mmol/L immediately — see *If low blood glucose* (WBM p78)
 - Newborns very susceptible, high risk of complications

If any decreased level of consciousness, odd behaviour, serious infection, serious overdose, fit, trauma — **always** test BGL.

Many causes — alcohol, oral glucose control medicines, aspirin, beta-blockers, insulin, sepsis, toxins.

If person unconscious — **medical emergency**.

- **Life support** — **DRS ABC** (p10)
- If BGL less than 2.6mmol/L for child 10 years and under or less than 4mmol/L for child over 10 years or adult — do not delay, treat straight away
 - If any chance person is a regular heavy drinker of alcohol — give **thiamine IV 100mg before glucose**
- If IV/IO access — give glucose
 - Child 10 years and under — 2mL/kg **glucose 10%**
 - Child over 10 years or adult — 50mL **glucose 50%** (25g glucose)
- If no IV/IO access — give **glucagon IM**
 - Child less 25kg — 0.5mg (½ vial)
 - Child 25kg or more or adult — 1mg (1 vial)
- If glucose or glucagon not available — put glucose gel or honey on inside of cheek (buccal mucosa)
 - Child and adult 15g of **glucose gel** or 2 teaspoons of **honey**
- **Medical consult**

Signs and symptoms of low blood glucose

- Person may
 - Be sweaty, pale, clammy, taking deep breaths
 - Be hungry, weak, tired, dizzy, have the shakes
 - Be drowsy, confused, tearful, behave differently, appear 'drunk'
 - Be aggressive, suspicious, potentially dangerous
 - Have fits (p57), lose consciousness

- Newborns and infants may have
 - Poor tone (floppiness), weak cry, poor feeding, breathing problems (stopping breathing [apnoea], cyanosis), tremor, seizures

Ask

- If on any medicines — have they taken their medicine, could they have taken someone else's
- If child — could they have taken medicines or alcohol
- Have they eaten that day, what (any carbohydrate foods)
- Any vomiting and/or diarrhoea
- Unwell recently — sepsis, fever and chills, cough, urinary problems

Check

- BGL. If less than 4mmol/L — treat
- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Coma scale score ([p74](#))
- Do they have right medicines — check bottles/packets, dose aid

Do

If person conscious but unable to eat or drink

- See *Life support* — *DRS ABC* ([p10](#))
- **Medical consult** as soon as possible, but don't delay treatment
- Put 2 teaspoons honey in person's mouth or smear glucose paste on inside of person's cheek. May increase sugar level even if they can't swallow it
- Give **glucagon** IM — usually kept on resuscitation trolley
 - Child 5 years and under — 0.5mg (½ vial)
 - Child over 5 years or adult — 1mg (1 vial)
- If **glucagon** not available *OR* no response to **glucagon** after 5 minutes — put in IV cannula ([CPM p84](#)) and give
 - Child under 10 years — 2mL/kg **10% glucose**
 - If **10% glucose** not available — dilute 1 part 50% glucose with 4 parts WFI
 - Child 10 years and over and adult — 50mL **50% glucose**
- When improved
 - If BGL less than 4mmol/L — give simple sugar/glucose
 - If BGL 4mmol/L or more — give long-lasting carbohydrate
- See *Follow-up* ([p93](#))



If person conscious and can eat and drink

- Give **simple** (fast-acting) **sugar/glucose** (equal to 15g carbohydrate)
 - 200mL diluted cordial, 6 jelly beans, 60mL of 75g OGTT mix, 90mL of glucose drink, 2–3 teaspoons of sugar
- **Medical consult**
- Check BGL after 10 minutes
 - If BGL less than 4mmol/L — give more simple sugar/glucose
 - If BGL 4mmol/L or more — give **long-lasting** (slow-release) **carbohydrate** (starch)
 - *Examples:* 4 dry biscuits/crackers, 1½ *Weetbix*, 1–2 slices bread or damper, 1 piece of fruit, 1 cup of milk
- See *Follow-up (below)*

Follow-up

- Check BGL again 30 minutes after last test
 - If BGL less than 4mmol/L — repeat treatment
- Check BGL hourly — until BGL more than 5mmol/L on 2 tests in a row
 - Will take longer if
 - Kidney failure, liver failure, sepsis not ruled out. **Medical consult**
 - Taken blood glucose lowering medicine — takes long time to wear off. **Medical consult**
 - If BGL still less than 4mmol/L — repeat treatment
- If person goes home — someone must stay with them for next 4 hours. May have low blood glucose again. Carer needs to be able to recognise signs of low blood glucose, give simple sugar/glucose if needed
- Advise to have carbohydrates with each meal for next couple of days **AND not** to drive or operate machinery
- If cause not known further investigation is needed — **medical consult**, send to hospital
- If person known diabetic — repeated hypoglycaemia needs to be treated and followed up with health care management plan

Food is not always easy to find in clinic. Look for real sugar or honey/jam kept with tea and coffee.

Every clinic should have **Emergency low blood glucose kit** with

- Tubes of glucose gel and/or cordial* and/or jelly beans
- *Weetbix*, and/or dry biscuits/crackers
- Copy of this protocol

* Sugar sweetened — not 'diet' or 'lite' cordials.

Marine bites, stings and poisonings

Box jellyfish sting

Number of species of box jellyfish. Major box jellyfish (*Chironex fleckeri*) sting most likely to be fatal. Symptoms usually obvious straight away.

Remember — Life support — DRS ABC (p10).

Will have

- Strong pain from time of sting
- Marks on skin
- Been in contact with sea water — includes tidal rivers and creeks

May have

- Fast pulse (p422), high BP (p422)
- Sting lines on skin — whip weals, may be frosted ladder pattern
- Trouble swallowing, breathing, talking
- Stopped breathing, have no pulse

Do not

- **Do not** use pressure bandage

Do

- Pour vinegar over sting area for at least 30 seconds
- Remove tentacles (even if no vinegar), especially from child
 - Use gloves and/or forceps if available. If not use fingers — may cause minor stings if vinegar not used first, but not dangerous
- Always stay with person — send someone for help

Serious box jellyfish sting

Unconscious, serious breathing or circulation problems (check heart rhythm).

- If pulseless or cardiac arrest — start CPR including ventilation
 - Mouth-to-mouth, bag-valve-mask or mechanical ventilation
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult *OR* mask 5–10L/min
- **Give box jellyfish antivenom straight away**
 - 1 ampoule IV/IO — mixed in 10mL **normal saline**

Note: Anaphylaxis (p30) due to antivenom rare, but can happen

- If no immediate response — give more ampoules of **antivenom**
- If doesn't get better *OR* breathing or circulation get worse —
 - Continue CPR with ventilation
 - People can survive for hours with supported ventilation
 - **Medical consult** straight away — may suggest
 - More **box jellyfish antivenom** (up to 6 ampoules if available)



- **Adrenaline (epinephrine)** IV/IO – adult 1mg, child 0.01mg/kg/dose up to 1mg (doses [p17](#))
- **Morphine** for pain relief ([p381](#))
- **Must follow all doctor's instructions before stopping CPR and ventilation**

Mild to moderate box jellyfish sting

Conscious, normal breathing and circulation.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#)). Repeat every 15 minutes
- Tetanus status, see *Australian Immunisation Handbook*

Do

- Keep person still
- **Medical consult**
- Use ice packs for pain. If pain not relieved — give **morphine** ([p381](#))

Send to hospital if

- Antivenom given
- Stings to face, private parts (genitals), hand or multiple stings
- Child, unless minor sting not needing morphine
- Adult with pain not relieved by ice and 1 injection of morphine

Stonefish sting

May have

- Strong pain from time of sting
- Swelling of sting site and limb

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** use pressure bandage or tourniquet — increases pain, tissue damage
- **Do not** use hot water after lidocaine (lignocaine) has been injected

Do

- Put stung area into hot water — 40–45°C (not burning)
 - Test water first with unaffected limb
 - Don't use for longer than 90 minutes

- If pain continues
 - Inject **lidocaine (lignocaine) 1%** along sting track – up to 2mg/kg/dose
 - Opioid may be needed ([p381](#))
 - Regional nerve block may be useful ([CPM p305](#))
- **Medical consult** — may need to go to hospital for stonefish antivenom

Send to hospital if

- More than mild pain and/or local effects
- Mild pain that doesn't go away — may have foreign body in wound

Catfish sting

- No known antidote

Do

- Manage as for stonefish sting ([p95](#))
- X-ray or ultrasound sting site — piece of barb often breaks off in wound

Stingray barb injury

- No known antidote

May have

- Pain at sting site — may get worse 30–90 minutes after injury
- Wound that bleeds, then becomes pale and bluish-white
- Significant local trauma, damage to underlying structures — nerves, tendons and heart, lungs if chest wall puncture (rare)
- Swelling of limb
- Rarely — more serious symptoms like nausea, vomiting, increased spit (saliva), diarrhoea, sweating, fainting, muscle cramps, irregular heart beat (arrhythmia), fits

Check

- Tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** use pressure bandage
- **Do not** let person eat or drink anything until sure they don't need to go to hospital

Do

- Control any obvious bleeding
- Wash wound with soap, clean fresh water
- Put stung area into hot water — 40–45°C (not burning)
 - Test water first with unaffected limb



- If strong pain continues —
 - Inject **lidocaine (lignocaine) 1%** in and around wound – up to 2mg/kg/dose
 - Opioid may be needed ([p381](#))
 - Regional nerve block may be useful ([CPM p305](#))
- **Medical consult** — may suggest antibiotics if wound more than 6 hours old

Send to hospital if

- Stabbing or penetrating stingray barb injuries — for x-ray or ultrasound
 - May need surgery to look for pieces of barb, remove dead tissue
- Barb has injured chest ([p68](#)) or abdomen ([p64](#))

Irukandji syndrome

- Caused by various small 4-tentacled tropical jellyfish. Serious symptoms can be delayed 2–12 hours after sting — occasionally come on over several hours
- No known antidote

Early symptoms

- At first person may have
 - Pain or tingling at sting site. May be very mild, usually settles after 30 minutes
 - Sting site is often slight or can't be seen

Late symptoms

- 5–60 minutes after sting person may
 - Appear very unwell
 - Have strong pain, often in waves. Often starts in lower back and spreads to limbs, abdomen, chest muscles
 - Be sweating a lot in local areas or whole body, pale
 - Feel anxious, restless, like they are going to die
 - Have headache, nausea, vomiting
 - Have fast pulse ([p422](#)), high BP ([p422](#))
- After 2–12 hours
 - Rarely — develop acute cardiac-related pulmonary oedema
 - Shortness of breath, BP drops, O₂ sats low
 - Symptoms can last 1–2 days

Remember — Life support — DRS ABC ([p10](#)).

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#)). Repeat every 15 minutes

Do not

- **Do not** apply fresh water to sting site
- **Do not** rub affected area
- **Do not** use pressure bandage

Do

- Pour vinegar over sting area (if seen) for at least 30 seconds
- Put in IV cannula (*CPM p84*)
 - Flush with 5mL **normal saline** every 4 hours
- Give **pain relief** (*p377*) — pain may be severe
- If settles quickly with treatment — observe in clinic for 6 hours
 - Advise to stay in community for 24 hours, return to clinic or get help straight away if symptoms get worse or they feel sick

Send to hospital if

- Pain not relieved by 1 injection of **morphine**
- High BP (*p422*) not relieved by **morphine**
- Low BP (*p422*)
- Shortness of breath, low O₂ sats (from pulmonary oedema)

Blue ringed octopus bite

- Small venomous octopus found in Australian coastal waters. Saliva has potent fast-acting paralytic neurotoxin, tetrodotoxin
- No known antidote

May have

- Small and/or painless bite, usually when octopus contacts bare skin out of water
- Tingling around lips or elsewhere
- Rapid onset progressive muscle weakness (flaccid paralysis) — 5–30 minutes
- In severe cases — respiratory paralysis, respiratory failure, cardiac arrest if untreated

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*). Repeat for up to 6 hours

Do

- Remove person from water
- Support respiration if needed — may need prolonged ventilation (eg mouth-to-mouth, bag-valve-mask, mechanical ventilator)
 - People can survive for hours with supported ventilation
- Put in IV cannula (*CPM p84*)



Send to hospital if

- Definite blue ringed octopus bite
- Developing paralysis

Fish poisoning — ciguatera

- Poisoning caused by eating tropical or subtropical fish containing toxins from marine organisms (ciguatoxins)
 - Mild to severe gastrointestinal illness and neurological effects
- No known antidote

May have

- Gastrointestinal effects that develop within 2–12 hours — diarrhoea, abdominal pain, nausea, vomiting
- Neurological effects that develop over 24 hours
 - Pins and needles (paraesthesia) around mouth, hands, feet
 - Cold allodynia — an unpleasant or painful sensation when touching cold water or cold objects
 - Joint pain, muscle pain (myalgia), unsteadiness (ataxia)
- Rarely — trouble breathing, slow pulse ([p422](#)), low BP ([p422](#)), unconscious ([p113](#))

Do

- Treat symptoms — NSAIDs may be useful (if no contraindications [p381](#))
- Put in IV cannula ([CPM p84](#))
 - Give IV fluids if severe diarrhoea

Send to hospital if

- More than mild symptoms, increasing symptoms

Fish poisoning — tetrodotoxin (puffer fish)

- Tetrodotoxin in the flesh of some marine and freshwater fish (eg puffer fish) and crabs can cause paralysis
- No known antidote

May have

- History of eating puffer or similar fish, or crabs
- Nausea, occasional vomiting, tingling lips, progressive weakness, unsteadiness (ataxia) — after 30 minutes to several hours
- Respiratory failure or paralysis in severe cases

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#)). Repeat for up to 24 hours

Do

- Support respiration if needed — may need prolonged ventilation (eg mouth-to-mouth, bag-valve-mask, mechanical ventilator)
 - People can survive for hours with supported ventilation
- Put in IV cannula (*CPM p84*)
- If developing paralysis — send to hospital

Sea snake bite

Manage the same as land snake bite (*p36*).

Note: Only effective antivenom is CSL sea snake antivenom.



Meningitis

Meningitis develops quickly and can cause disability or death.

If you suspect meningitis —

- **Medical consult** straight away
- Treatment needs to be started quickly

Consider meningitis in

- **Any child** who
 - Is very unwell
 - Has had a fit — especially with fever
 - Has had antibiotics for 1–2 days for any infection but is still unwell
 - Comes back unwell within 1 week of completing course of antibiotics
- **Any adult** who
 - Is very unwell
 - Is old, sickly, or alcohol misuser with confusion and fever
 - Has a first fit

Any person presenting with a headache and fever more than once must have a **medical consult** and be considered for referral to hospital.

Take care with young babies, old people, anyone who has been on antibiotics recently — meningitis may appear differently (atypical) in them.

Ask and Check

- Always suspect meningitis if
 - 2 or more signs with *
 - Child has fever with no obvious underlying cause

Apparent cause for fever (eg infection) doesn't rule out meningitis.

- Fever*
- Vomiting
- Rash — flat red-purple blotches/spots (purpuric or petechial) that don't blanch under pressure
- Fitting
- *ALSO* in child under 2 years
 - Not feeding well
 - Drowsiness
 - Irritable* (eg high pitched 'cat' cry)
 - Bulging fontanelle
- *ALSO* in older child or adult
 - Headache*
 - Sensitive to light (photophobia)
 - Neck stiffness*
 - Coma scale — altered mental status* (*p74*)

Note: Late sign — normal coma scale score does not rule out meningitis

- Positive Kernig's sign (lift thigh to 90° then straighten knee — severe pain in thigh). No pain does not rule out meningitis

Check

- Temp, pulse, BP, RR, O₂ sats, coma scale score ([p74](#)) — work out REWS ([p6](#)). Repeat every 15 minutes until evacuated
- Take blood for blood cultures ([CPM p375](#)), collect throat swab ([CPM p389](#)) — try to do before giving antibiotics, but **do not** delay treatment if you can't get samples

Do

- **Medical consult** straight away, **send to hospital urgently**
- Put in IV cannula ([CPM p84](#))
- Give **dexamethasone** IV single dose – 0.15mg/kg/dose (doses [p439](#))
 - If not available — give **hydrocortisone** IV single dose – adult 200mg, child 4mg/kg/dose up to 200mg (doses [p439](#))
 - If unable to get IV access — give either IM
- Give **ceftriaxone** IV single dose – adult 4g, child 100mg/kg/dose up to 4g (doses [p429](#))
 - **AND benzylpenicillin** IV single dose – adult 2.4g, child 60mg/kg/dose up to 2.4g (doses [p427](#))
 - If unable to give IV — give both IM
 - If allergic to penicillin — **medical consult**
- If child 1–2 months — also give **gentamicin** IV single dose – **medical consult** about dose

While waiting to send to hospital

- Look after person in a quiet, dark room
- **Medical consult**
 - About giving maintenance fluids — **do not** give more than 30mL/kg fluid without advice from emergency consultant
 - Document time and plan for next review
- Be ready to support airway and give **oxygen** if needed
- If pain and fever — give **paracetamol** up to 4 times a day (qid) – adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
- Be ready to treat fits ([p57](#))
- If they won't reach hospital within 4 hours — **medical consult**
 - May need repeat dose of benzylpenicillin or corticosteroid

Do not

- **Do not** leave person alone
- **Do not** allow person to go home until meningitis has been excluded and an alternative cause of symptoms has been found



Follow-up

- Carefully check any person who has been in contact with sick person and has fever in next 2 weeks

Public health issues

- If meningitis confirmed
 - Notify local CDC/PHU
 - Make list of people in household the person has been in contact with in past week. Record weights of all children under 30kg
- If meningococcal or HiB meningitis confirmed
 - Send list of contacts and weights to CDC/PHU
 - CDC/PHU will tell you if you need to treat contacts, give you advice about immunisation

Nausea and vomiting

- **Symptoms** with many causes — range from easily treatable to serious and life-threatening. Thorough history and clinical examination needed
 - **Must identify and treat cause.** If cause not found — **medical consult**
- See Table 1.19 for **some** causes of nausea and vomiting *AND* signs and symptoms that **may** help with diagnosis

Ask

- How long and how often has person been vomiting, amount of vomit — risk of dehydration
- Colour and content of vomit
- Other symptoms — diarrhoea, pain, fever, headache, sensitive to light (photophobia)
- Ability/interest in taking fluids, urine production — check for dehydration
- Is it a swallowing problem, do food or liquids get stuck in throat
- Treatments already tried and response
- Medical history — frequent vomiting, migraine, abdominal surgery, other serious illness (eg diabetes, CKD)

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Assess for dehydration
 - For child see *Assessing dehydration* ([p166](#))

Do

Remember — Life support — DRS ABC ([p10](#)).

- Find and treat cause and complications
 - Check for serious abdominal cause ([p18](#))
 - If pregnant — see *Nausea and vomiting in pregnancy* ([WBM p115](#))
- Monitor response to treatment
 - If severe unresponsive vomiting — **medical consult**

Adult

- If dehydrated — give fluids
 - Mild dehydration — oral fluids
 - Moderate/severe dehydration — **medical consult**, consider IV fluids
- Give antiemetic — see also Table 1.18. Be alert for oculogyric crisis ([p106](#))
 - **Metoclopramide** oral/IM/IV every 4–6 hours – 60kg+ 10mg, 40–59kg 5mg
 - *OR* **prochlorperazine** IM/IV every 8 hours (tds) – 12.5mg
 - *OR* **ondansetron** wafer every 8 hours (tds) – 8mg, if sedation a problem or others have not worked



Child

- The younger the child, the harder to find the cause, and the higher the risk of severe dehydration
- If dehydration — see *Fluid rates for treating dehydration* (p169)
- Can be gastroenteritis — usually vomiting **and** diarrhoea
 - If main complaint vomiting, especially with significant pain — gastroenteritis unlikely. **Medical consult**
- **Do not** give antiemetic without **medical consult**
 - If antiemetic advised —
 - If 6 months or over — **ondansetron** wafer 2–4mg single dose
 - *OR* as advised by doctor

Table 1.18: Commonly used antiemetics

Medicine	Cautions	Route	Frequency	Doses
Metoclopramide	Pregnancy: A – safe to use Breastfeed: Safe to use Risk: Oculogyric crisis (p106)	Oral IM Slow IV	Up to 3 times a day (tds)	Adult <ul style="list-style-type: none"> • Less than 60kg — 5mg • 60kg or more — 10mg Child 40kg or more* <ul style="list-style-type: none"> • 5mg
Ondansetron — non-sedating	Pregnancy: B1 – do not use in first trimester Breastfeed: Appears safe	Oral wafer	Up to 3 times a day (tds)	Adult <ul style="list-style-type: none"> • 8mg Child 6 months and over* <ul style="list-style-type: none"> • 2–4mg (doses p441)
Prochlorperazine	Pregnancy: C – safe in early pregnancy Breastfeed: Safe to use Risk: Oculogyric crisis (p106)	IM Slow IV	Up to 3 times a day (tds)	Adult <ul style="list-style-type: none"> • 12.5mg Child <ul style="list-style-type: none"> • N/A
Promethazine — sedating	Pregnancy: C – safe to use, avoid close to delivery Breastfeed: Appears safe	Oral Deep IM	Up to 4 times a day (qid)	Adult <ul style="list-style-type: none"> • Oral 25mg • IM 12.5mg Child 2 years and over* <ul style="list-style-type: none"> • Oral 0.5mg/kg/dose up to 25mg • IM 0.25mg/kg/dose up to 12.5mg (doses p442)

* **Medical consult** before giving to children.

Complications

Most complications the result of repeated vomiting.

- Dehydration
- Abnormal sodium levels — can cause altered level of consciousness, fitting
- Abnormal potassium levels — can cause heart arrhythmias
- Aspiration pneumonia
- Malnutrition
- Small oesophageal tears — small amount of blood (bright red or brown flecks) mixed with vomit. Observe in community if this the only problem

Large oesophageal tears — large amount of vomited blood, may have abdominal or chest pain.

- **True emergency**
- **Medical consult, send to hospital urgently**

Oculogyric crisis

Metoclopramide and **prochlorperazine** can cause an oculogyric crisis. Symptoms include stiffness, bending back of head, grimace, twisting back, rolling eyes up.

Can happen at any age — more common in children and young women.

- Give **benzotropine** IM/IV single dose – adult 1mg, child 0.02mg/kg/dose up to 1mg (doses [p439](#))
- **Medical consult** straight away



Table 1.19: Some causes of nausea and vomiting

Other signs and symptoms	Likely cause
History of drug use, alcohol on breath, reduced inhibition, slurred speech, reduced motor control, bloodshot eyes	Drugs (eg alcohol p209 , cannabis p218)
History of medicine consumption	Prescription medicines (eg morphine p381)
Abdominal cramps, diarrhoea	Gastroenteritis (p25), food poisoning
Green bile, crampy abdominal pain, swollen belly, diarrhoea then no faeces	Bowel obstruction (blocked gut) (p26)
Undigested food in vomit	High abdominal obstruction
Problems swallowing. Food/fluids stuck in gullet	Uncoordinated swallowing, oesophageal blockage
Blood in vomit	Oesophageal tear, penetrating peptic/gastric ulcer (p20), oesophageal varices (may be associated with alcohol misuse)
Right lower abdominal pain, mild fever	Appendicitis (p23)
Severe abdominal pain, marked tenderness, rebound or percussion tenderness, fever	Peritonitis (p27)
Severe upper abdominal pain that may radiate to back, epigastric tenderness	Pancreatitis (p20)
Fast pulse, fast breathing, low BP, confusion, agitation, dizziness	Sepsis (p6)
Headache, dislike of loud noises, dislike of bright lights (photophobia), visual disturbances	Migraine
History suggesting head injury, bruising, decreased level of consciousness (coma scale)	Head injury (p72), intracranial bleed
Chest pain — typical or atypical	Heart attack (p48)
Ketones, protein, blood in urine	Kidney failure (p244), diabetes (p254), diabetic ketoacidosis (p255)
Pregnancy — usually first trimester	Morning sickness (WBM p115)
Feeling of motion — room spinning, sweating, abnormal eye movements	Vertigo — also a symptom, need to determine cause
May also be anxiety or depression	Emotional, stress related

Near hanging

A drop less than body height that causes injury by strangulation.

Do first

- Call for help. If safe for you, get the person down as quickly as possible
 - If person off the ground — get strongest people present to help soften landing. Protect head from hitting ground if possible
 - If alone — cut rope and get person down. **Do not** worry about possible injuries from fall. **Do not** wait for help
- Remove rope from neck straight away — check no string or thin cord left. This is important to get blood flowing again
- See *Assessing trauma — primary and secondary survey (CPM p35)*
 - Maintain clear and safe airway — may need suction
 - If unconscious with clear airway and breathing normally — put in recovery position
- Airway usually not badly damaged, can be intubated if needed
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Neck injuries rare, may occur from impact when cut down
 - Protect neck with semi-rigid collar as for spinal injury if needed (*CPM p66*)
 - If any stridor or hoarseness — use inline immobilisation (*CPM p64*) not cervical collar
 - Cervical spine protection not needed if alert, no midline cervical tenderness, no neurological deficit
- Give **pain relief** if needed (*p377*)

Person can recover much better than expected from near hanging — always attempt resuscitation.

Check

- Temp, pulse, RR, BP, O₂ sats if possible — work out REWS (*p6*)
- Coma scale score (*p74*)
- Listen to lungs for crackles (*CPM p189*)
- Be aware of effects of alcohol or other drugs — never leave alone
- May be confused or combative — from not enough oxygen to the brain

Do

- Put in IV cannula (*CPM p84*)
- If low BP (*p422*) — give **normal saline** boluses — adult 250mL, child 10mL/kg per bolus
 - Target systolic BP 100mmHg (adult)
- **Medical consult**, send to hospital — may develop complications even if they appear OK now



- If seizure —
 - Give high flow **oxygen**
 - Remove any constriction to the neck (eg cervical collar) and elevate head of bed to 30°
 - If seizure doesn't stop within 2 minutes or recurs within 30 minutes — give **midazolam** ([p57](#))
- **Send to hospital urgently** if any of
 - Hoarse voice, stridor
 - Difficulty breathing
 - O₂ sats less than 94% on air (needing oxygen)
 - Altered level of consciousness or combative

May deteriorate rapidly and need intubation and positive pressure ventilation.

Follow-up

- Psychological/psychiatric support when stable and longer term
 - Make sure person sees mental health team for ongoing support
- Family, community members, clinic staff may also need support
 - Consider suicide risk, especially if exposed to same stressors
 - Clinic staff — Bush Support Services, phone 1800 805 301
- If female attempts hanging — urine pregnancy test ([WBM p279](#))
- If person dies — doctor and police need to be told, coroner notified

Nose bleeds (epistaxis)

Usually from septum (central divider) close to tip of nose. Can be from back of nose, usually in older people — may be more severe, harder to control.

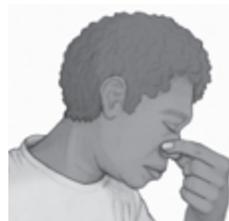
- Recurrent or large nose bleeds — foreign body, tumour, bleeding problem

Medical consult if

- Taking oral anticoagulant or antiplatelet medicine (eg warfarin, aspirin)
- History of recurrent nose bleeds — be aware of risk of anaemia
- Underlying bleeding disorder

Check

- Airway
- Temp, pulse, RR, BP, O₂ sats — work out REWS (p6)
 - If high BP (p422) — **medical consult**
 - If low BP (p422) and pulse fast for age (p422) — see *Nose bleed leading to shock (p111)*



1.21

Do

- Sit person up — leaning forward
- Pinch fleshy lower part of nose (just below upper bony part) closing the nostrils together — must be uncomfortably tight to work properly. Person can often do this — F 1.21
 - **Hold for 15 minutes by the clock.** If pressure released at any time — counting must restart
- Check for ongoing bleeding. Repeat pinching if needed
 - Check that pinch technique is good
- Ask person to gently spit out any blood that trickles down back of throat — helps you know when bleeding stops
- When bleeding stops, tell person not to sniff or blow nose for rest of day

If bleeding continues after more than 30 minutes of pinching

- **Medical consult**
- If technique good — consider posterior bleeding or medical reason (eg high BP, aspirin)
- Ask person to blow nose to clear clots. Improves visibility and access
- Apply pressure from inside by putting folded swab or ribbon gauze soaked in **lidocaine (lignocaine) 1% + adrenaline (epinephrine) 1:100,000** in nostril/s
- Hold for 10 minutes, then remove pack/s and quickly look for bleeding site — need good light and good head position
- If bleeding site can be seen — can 'burn' with silver nitrate stick. Safe if
 - Done on medical consult advice and confident about doing procedure
 - Only 1 side of septum is done
 - **AND** no known or suspected bleeding disorder



If bleeding still continues

- Put in anterior nasal pack. If person anxious — consider giving antiemetic ([p105](#)) and sedation first
 - *Merocel* ([CPM p169](#)) or *RapidRhino* ([CPM p170](#)) prepared nasal packing
 - OR gauze nasal packing ([CPM p170](#))
- After packing, check in throat for blood still trickling down from nose
- Give **amoxicillin** oral 3 times a day (tds) – adult 500mg, child 15mg/kg/dose up to 500mg (doses [p425](#))
- **Medical consult**, send to hospital
 - Not urgent if bleeding stopped and/or haemodynamically stable
- To remove *Merocel* pack — see *To remove* ([CPM p169](#))
- To remove *RapidRhino* pack — see *To remove* ([CPM p170](#))

If still bleeding

- **Medical emergency, send to hospital urgently** — see *Early recognition of sick or deteriorating patients* ([p6](#))
- Anterior pack may not be well placed — repack while waiting for transfer
- If bleeding still continues after second packing — suspect bleeding from back of nose (posterior)

Nose bleed leading to shock

- Put in IV cannula ([CPM p84](#))
 - Run **normal saline** 10–20mL/kg
- **Medical consult**, send to hospital
- While waiting — pack nose using balloon catheter ([CPM p171](#))

Further management

- If bleeding site burned — tell person to put oily cream (eg antiseptic cream, *Vaseline*) in nostril 2–3 times a day and gently rub outside of nose to spread it around
 - Will stop large scab and lessen the risk of another nose bleed
- Give first aid information and simple steps to stop or manage nose bleeds

In child

- Usually local trauma or inflammation in anterior nose, settles with pinching. Often scab (crusting) in nose removed (picked, knocked, lifted off)
- Foreign bodies in nose may cause bleeding, foul or pussy discharge
 - May need urgent referral to ENT specialist for removal. Small batteries can cause big problems, remove as soon as possible
- If bleeding heavy — review in 1 day, POC test for Hb
- If frequent nose bleeds, easy bruising, other bleeding episodes — medical review, check FBC and clotting studies, consider referral to ENT specialist

Poisoning

Poisons Information Centre — emergency number: 131 126.

If person unconscious, drowsy or having a fit — see *Life support — DRS ABC* (p10), *Unconscious person* (p113), *Fits — seizures* (p57).

Ask — person or family

- What was taken — is there label for poison name, type, manufacturer
- When it was taken
- How much was taken — how many tablets, how much liquid, inhaled for how long
 - If person's prescribed medicine — how much more than normal dose
- Was it taken on purpose (deliberately) or by accident
- Were alcohol (grog) or other drugs taken as well
- Nausea, vomiting, pain, shortness of breath
- Any treatment given already

Check — if person awake

- Temp, pulse, RR, BP, O₂ sats, weight, lung sounds — work out REWS (p6)
- Do POC test for BGL
- Coma scale score (p74), pupil reactions (p73)
- Do ECG
- Look for other problems — especially redness or swelling of mouth, airway

Do not

- **Do not** cause vomiting unless told to by Poisons Information Centre
- **Do not** give anything by mouth unless told to by Poisons Information Centre — even for corrosive substances like bleach, petrol, diesel, battery acid

Do

- If trouble breathing or reduced level of consciousness — give oxygen to avoid respiratory depression
 - **Oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult *OR* mask 5–10L/min
- Call Poisons Information Centre — 131 126
 - Have above information about person and poison ready
 - Centre staff will advise you about management
- **Medical consult** about person, advice you have been given, do you need to send to hospital, management plan
- If poison taken deliberately — contact mental health services, see *Suicide risk* (p207)



Unconscious person

- **Common causes for being unconscious in remote areas**
 - Low blood glucose ([p91](#))
 - Alcohol, drug overdose
 - After a fit ([p57](#))
 - Shock ([p10](#))
 - Subarachnoid haemorrhage
 - Head injury ([p72](#))
 - Infections, especially meningitis ([p101](#))
 - If child — poisoning, infection, child abuse
- May be more than one cause — fit from low BGL *AND* being drunk/using drugs *AND* head injury from accident

Do first

- If not breathing and unresponsive —
 - Call for help
 - Start CPR and attach defibrillator/AED — see *Life support* — *DRS ABC* ([p10](#))
- If breathing and unresponsive with signs of head/facial trauma —
 - Call for help
 - Clear airway, make sure adequate breathing — see *Assessing trauma* — *primary and secondary survey* ([CPM p35](#))
 - Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
 - See *Injuries* — *head* ([p72](#))
 - Protect neck (cervical spine) — see *Immobilising the spine* ([CPM p64](#))
- If breathing normally and no risk of head, face or spinal injury — put in recovery position — F 1.22, F 1.23
 - Put in IV cannula ([CPM p84](#)) — flush with 5mL **normal saline** every 4 hours

Ask — friends and family

- Did person become unconscious suddenly or slowly
- Any symptoms before
 - Weakness, dizziness, fever, headache
 - Diarrhoea, vomiting — may cause shock, especially in child
- Had person been drinking
- Had person taken or injected medicines, drugs
- Usual medicines
- Injuries (eg hit over head, bled a lot)
- Bites (eg snake, spider)
- Has person been depressed
- If person has
 - Fits (epilepsy)
 - High BP — may cause stroke, heart attack



1.22



1.23



- Diabetes
- Lung problems — high CO₂ level, low oxygen (hypoxia)
- Heart disease — heart attack, stroke
- Liver or kidney disease
- Thyroid disease
- Asthma
- Any allergies
- Has person been
 - Outside in cold for too long — see *Hypothermia* (p62)
 - In the heat, working, walking, exercising hard — see *Heat Illness* (p360)

Check

- Recheck **DRS ABC**
- Temp, pulse, RR, BP, O₂ sats — work out REWS (p6). Coma scale score (p74), pupils (p73)
 - Do every 30 minutes — watch for trends
- BGL
 - If less than 2.6mmol/L for child 10 years and under or less than 4mmol/L for child over 10 years or adult — **do not delay, treat straight away**. See *Low blood glucose (hypoglycaemia)* (p91)
- Check electrolytes for low or high sodium levels
- Look from top-to-toe for signs of
 - Stroke — one side of body or face looks, moves, has reflexes different to other (asymmetry)
 - Injury — cuts, head injury, pupils different sizes, blood or clear fluid (CSF) from ear or nose
 - Overdose
 - Pupils very large (dilated) — anticholinergics
 - Pupils very small (pinpoint) — opioids
 - Shock (p66) — low BP (p422), weak fast pulse (p422)
 - Infection — fever (p422), fast pulse (p422), fast breathing (p422), rash
 - Meningitis (p101) — rash, neck stiffness
 - Snake bite (p36) — may have bite marks, bleeding
- Do ECG — may indicate overdose or subarachoid haemorrhage
- If unconscious for long time — pressure areas
- Look for medical alert bracelet

Do

- **Medical consult**, may need to send to hospital
- Recheck **DRS ABC**
- If pinpoint pupils — may be drug (opioid) overdose, give naloxone (p440)
- If unconscious for long time — put in indwelling urinary catheter — female (*WBM* p281), male (*CPM* p205)
 - If urine dark and U/A positive for blood (myoglobinuria) — **medical consult**



2 Child health

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Anaemia (weak blood) in children

- **Low iron in young children delays development and learning** — prevention is vital
- Treatment should include home visits, if possible — for family support, help with feeding and nutrition, giving oral iron

Most common cause of anaemia is low iron (iron deficiency).

- Reasons for low iron include
 - Low iron in mother before and during pregnancy ([WBM p132](#))
 - Low birth weight and/or preterm birth
 - Starting food later than 6 months, not enough food or iron-rich foods
 - Drinking cow's milk or tea before 1 year, drinking tea before 5 years
 - Recurrent infections
 - Hookworm — less common with regular de-worming

Preventing iron deficiency in preterm and small babies

- Babies born with low iron stores are likely to become iron deficient in their first 6 months
- Babies at risk of low iron stores
 - Birth weight less than 2500g
 - Preterm babies, even if 2500g or more, especially if mother had diabetes

Do

- Medical or child health nurse review for all small (low birth weight) or preterm babies on return to community
- Give supplementary oral **iron** from 1 month — 1mL (6mg elemental iron) per dose
 - Once a day if possible
 - Provide 2 weeks supply at a time — review uptake after 2 weeks
 - *OR* give daily dose twice a week under supervision in clinic or community by same (dedicated) staff member
- Check Hb level at 6 months — see Table 2.1
 - If normal — continue supplementary oral **iron** 1mL twice a week until 1 year
 - If low — start treatment regimen. See Table 2.2 ([p118](#))

Preventing iron deficiency in young children

Both mothers and children need a healthy diet high in iron. Woman with healthy iron levels before pregnancy likely to have baby with good iron stores.

Do not

- **Do not** give cow's milk (fresh, powdered, UHT) as a drink before 1 year — give breast milk or appropriate infant formula only, and clean water after 6 months
- **Do not** give tea, sweet drinks, fruit juice to babies or young children

Do

- Where hookworm is or has been common — regular de-worming ([p419](#))
- Prevent and treat anaemia in both pregnant ([WBM p132](#)) and non-pregnant ([p303](#)) women



- Advise mothers that their smoking can contribute to iron deficiency anaemia in children — provide information and encouragement to quit

From around 4 months

- Give supplementary oral **iron** to all breastfed babies — 1mL (6mg elemental iron) per dose
 - Once a day if possible
 - Provide 2 weeks supply at a time — review uptake after 2 weeks
 - *OR* give daily dose twice a week under supervision in clinic or community by same (dedicated) staff member
- Encourage breast milk only until around 6 months — on demand
- Check Hb at 6 months
 - If normal — stop supplement and promote age appropriate food
 - If low — start treatment regimen. See Table 2.2 (p118)

From around 6 months

- Continue breastfeeding on demand but offer food before breast milk
- Give age appropriate food several times a day (p154). Include
 - **Food high in iron** every day
 - **Best** — liver and kidney, red meat, chicken, fish
 - **Good** — bread and cereals (whole grain, iron fortified), baked beans, green vegetables (fresh, tinned, frozen), egg, smooth peanut butter
 - **Foods high in vitamin C** with meals to help iron be absorbed (eg bush berry, tomato, orange, mandarin, mango, pawpaw, capsicum)

Screening

- Check Hb every 6 months from 6 months to 5 years
 - Hb testing not needed before 6 months
- Make sure POC machine well maintained and calibrated, collection done correctly — see *Testing haemoglobin (CPM p383)*
- Treat and follow-up all children who have anaemia
- Most anaemia in children due to low iron. FBC usually not needed
- **Do FBC if**
 - Hb less than 90g/L
 - Still has anaemia after treatment with **iron** medicine
 - Child unwell, signs like bruising or bleeding

Diagnosis

Table 2.1: Diagnosis of anaemia — using Hb by age

Age	6–11 months	1–4 years	5–7 years	8–11 years	12–15 years – male	12–15 years – female
Hb (g/L)	Less than 105	Less than 110	Less than 115	Less than 119	Less than 125	Less than 118



- FBC suggests iron deficiency if
 - Hb low for age
 - Mean cell volume (MCV) less than 72fL, red cell volume distribution width (RDW) more than 16%
 - Blood film shows a hypochromic-microcytic picture
- Iron studies usually not needed

Ask

- About diet — usual food and drinks (including breast milk) each day
- When foods were started
 - When cow's milk and meat started, how much each day
- About family supports, money, social situation
 - Who is responsible for feeding child, who else could help
- About diarrhoea, other sickness

Check

- Measure height and weight, plot on growth chart
- Full head-to-toe examination — child may have other problems as well

Treatment

- Treat anaemia — see Table 2.2 *AND* look for and manage other problems (eg growth faltering [p158](#))

Table 2.2: Hb level and what to do

Hb result	What it means	What to do
Low for age (Table 2.1) but 90g/L or more	Likely to be iron deficient	<ul style="list-style-type: none"> • Give iron medicine <ul style="list-style-type: none"> ◦ Oral — liquid or tablet (p119) ◦ <i>OR</i> IM (p119) ◦ <i>OR</i> IV (p120) • Give albendazole oral single dose — 6–11 months 200mg, 1 year and over 400mg • If Hb less than 100g/L — medical review • Follow-up (p120)
Less than 90g/L at any age If Hb less than 80g/L — medical consult straight away	May be other cause of anaemia	<ul style="list-style-type: none"> • Treat as above • Take blood for FBC and red cell folate • Medical review • Follow-up (p120)

Encourage healthy eating and diet high in iron for strong blood.

Medicines

- **Iron** medicine is dangerous in overdose
- Need to keep in childproof container, in a safe place



Oral iron

- Oral **iron** medicine must be given for full 3 months when treating anaemia
- Give dose
 - Once a day if possible
 - Provide 2 weeks supply at a time — review update after 2 weeks
 - *OR* give daily dose twice a week under supervision in clinic or community

Children 20kg or under

- **Ferro-Liquid** 1 mL = 6mg/mL elemental iron

Table 2.3: Ferro-Liquid treatment doses (6mg/mL)

Weight	Dose	Duration
Under 5kg	Medical consult	
5–10kg	5mL (30mg)	For 3 months
11–15kg	10mL (60mg)	
16–20kg	15mL (90mg)	

Children over 20kg

- 1 **iron tablet** (80–105mg elemental iron) once a day for 3 months

Iron by IM injection

- **Do not** give if fever (T more than 38°C) or very unwell
- Carefully review child's file notes and check with carer to find out if anaemia has been treated in past 3 months
 - Hb may still be rising from previous iron doses
- IM **iron** can very rarely cause anaphylaxis

Table 2.4: Iron polymaltose (eg *Ferrum H*, *Ferrosig*) IM Injection by weight and Hb level (50mg/mL strength)

Weight	Frequency and dose Hb 70–89 g/L	Frequency and dose Hb 90–110 g/L
Under 8kg	1mL on 3 alternate days (total 3mL over 6 days)	1mL on 2 alternate days (total 2mL over 4 days)
8–10kg	1mL on 4 alternate days (total 4mL over 8 days)	1mL on 3 alternate days (total 3mL over 6 days)
11–13kg	2mL on 3 alternate days (total 6mL over 6 days)	2mL on 2 alternate days (total 4mL over 4 days)
14–16kg	2mL on 3 alternate days then 1mL on 4th alternate day (total 7mL over 8 days)	2mL on 3 alternate days (total 6mL over 6 days)
17–19kg	2mL on 4 alternate days then 1mL on 5th alternate day (total 9mL over 10 days)	2mL on 3 alternate days then 1mL on 4th alternate day (total 7mL over 8 days)



- Use **iron polymaltose** (eg *Ferrum H, Ferrosig*) only
- Use z-track technique (*CPM p350*) — ventrogluteal or anterolateral thigh
- Give every second day (alternate days) until total dose given
 - **Do not** give more than maximum dose per day

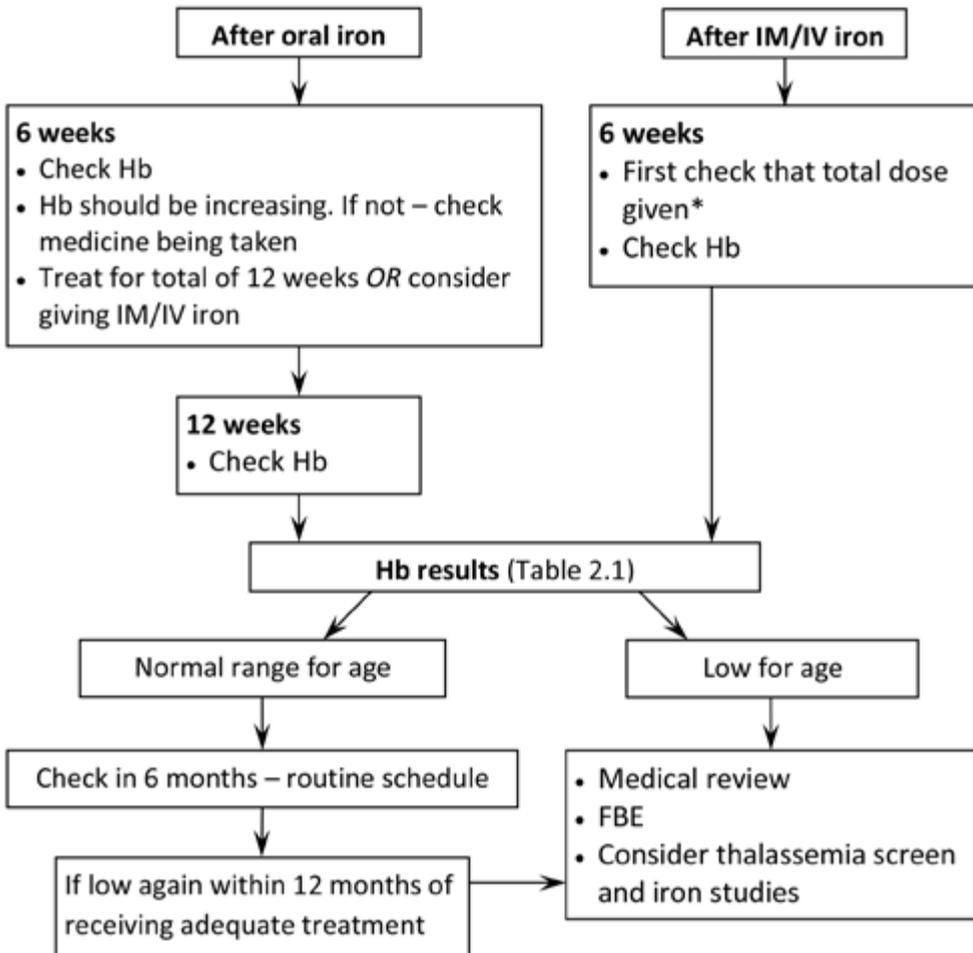
Iron by IV infusion

- If 3 or more IM injections needed — consider giving iron in hospital by IV infusion. **Medical consult**

Follow-up

- **Always encourage healthy diet with foods high in iron every day**

Flowchart 2.1: Checking Hb after iron treatment



*If total dose not given but Hb in normal range after 6 weeks — recheck in another 4 weeks.



Babies under 2 months who are sick or have a fever

Small babies can get sick very quickly. Signs of serious sickness can be non-specific — be aware of warning signs (*below*).

Always do medical consult straight away about any young baby who is sick or hot (T more than 38°C) — needs to be investigated in hospital.

Ask

- How baby is feeding, sleeping, crying
- Cough or problems with breathing
- Diarrhoea or vomiting
- Carer concerns

Check

- Temp, pulse, RR, O₂ sats, colour, capillary refill — work out REWS (*p6*)
- Medical history, discharge summary
- Weight — check for recent weight change
- BGL

Warning signs	
History	Examination
<ul style="list-style-type: none"> • Baby not feeding well • Feeling hot • Crying more or less than usual • Coughing a lot • Less alert — more sleepy than usual, hard to wake • Vomiting • Diarrhoea • Few wet nappies — low urine output • Seizures 	<ul style="list-style-type: none"> • T more than 38°C or less than 36°C • High pitched cry, weak cry • Irritable, stiff, floppy • Lips — pale/ashen/blue • Dry mouth and tongue • Bulging or sunken fontanelle • Fast or slow pulse (normal 120–160/min) • Fast breathing — RR more than 60/min • Stops breathing for short periods (apnoea) • Noisy breathing, grunting, nasal flaring, chest indrawing • Distended abdomen • Cold or mottled arms or legs, non-blanching rash • Low BGL <ul style="list-style-type: none"> ◦ Newborn — less than 2.6mmol/L ◦ Baby — less than 4mmol/L

Do

If baby has any warning signs —

- **Medical consult, send to hospital urgently**
- Talk about what to do while waiting for transport. Doctor should talk with paediatrician. If doctor not available within 30 minutes — clinic staff to contact paediatrician
 - How often to do observations
 - Giving fluids — breastfeeds, nasogastric, IV
 - Giving antibiotics
 - **Cefotaxime** IV every 6 hours – 165mg /1.8mL mixed [50mg/kg/dose].
If **cefotaxime** not available — **medical consult**
 - **PLUS amoxi/ampicillin** IV every 6 hours – 165mg/1.8mL mixed [50mg/kg/dose]
 - Giving **oxygen** to target O₂ sats 94–98%
 - Nasal cannula 1–2L/min *OR* mask 5–10L/min
- Collect blood and urine for cultures before giving antibiotics if possible — but **do not** delay antibiotics waiting for samples

If baby not very unwell, doesn't have T more than 38°C, no other warning signs —

- Review regularly — at least every day
- Check temp, pulse, RR, O₂ sats, capillary refill, weight — work out REWS at each review ([p6](#))
- If not getting better, or getting worse — **medical consult**
- If baby develops any warning signs — **medical consult** straight away



Breathing problems in children

Symptoms and signs	Likely problem	Treatment
Baby 2 months or under with fast breathing (p124), working hard to breathe, stopping breathing (apnoea), fever (T more than 38°C)	Serious infection (p124)	Medical consult
Child with fast breathing (p124), fever (T more than 38°C), looks unwell	Chest infection	Age 2–11 months — p126 Age 1–5 years — p127 Age over 5 years — p309
Child with cough, fast breathing (p124), wheeze, but normal temp — age 2–11 months	Chest infection (p124) Bronchiolitis (p130)	Relievers (bronchodilators) usually don't work at this age
Child with cough, fast breathing (p124), wheeze, but normal temp — age 1 year or over	Asthma (p134) Chest infection (p124) Bronchiolitis (p130)	Trial reliever
Wheeze, cough, known history of asthma. Wheeze or short of breath on physical activity. Frequent night cough	Asthma (p134) Viral induced wheeze	Asthma therapy (p139), asthma action plan (p141)
Barking cough, noisy when breathing in (stridor)	Croup	Medical consult
Coughing in spells, with or without whoop. Vomiting, going red in face, blue lips (cyanosis), stopping breathing (apnoea) with coughing spells	Whooping cough	Medical consult
Noisy breathing, wheeze, story of choking on something	Inhaled foreign body	Medical consult
Frequent infection, chronic moist or productive cough	CSLD (p131)	Medical review, management plan
Child with heart disease and fast breathing (with or without fever)	Cardiac failure Chest problem	Medical consult
Child with diabetes and fast breathing (with or without fever)	Consider diabetic ketoacidosis	Check BGL, U/A Medical consult

Chest infections — 2 months to 5 years

- Child with cough and fast breathing probably has a chest infection
- Flu (influenza) is viral chest infection that presents in different ways. Manage based on presenting symptoms and local recommendations for current flu season

- Best indicator of pneumonia in children is fast breathing (high RR) (*below*)
- Chest indrawing or any danger signs ([p125](#)) are best indicators of child being very sick (severe disease)
- If available, chest x-ray may help with diagnosis

- Most important decisions are
 - Which children need antibiotics
 - Which children need to go to hospital

Table 2.5: Fast breathing in children

Age	RR for fast breathing (suggests infection)
2–11 months	50/min or more
1–5 years	40/min or more

Ask, look and listen before touching and disturbing child.

Ask

- How long has child been sick
- Does child have a cough, for how long
- How long has child had trouble breathing
- Diarrhoea and/or vomiting
- Stopped feeding or drinking
- Urine output (wet nappies or last urine)

Look

Child should be calm, not crying, better if not feeding.

- **RR** — count for 1 minute, do at least twice to be sure and take the average
- For chest indrawing — lower part or border of rib cage moves in when child breathes in
- For nasal flaring — nostrils widen when child breathes in. Sign they are working hard to breathe

Listen

- Cough
- Noisy breathing
- Audible wheeze — whistling sound usually heard when breathing out
- Stridor — vibration noise usually heard when breathing in



Check

- Temp, pulse, RR, BP, O₂ sats, capillary refill — work out REWS (*p6*)
- For danger signs (*below*), signs of meningitis (*p101*), dehydration (*p166*), skin infection (*p387*)
- For risk of severe disease (*below*), or possible chronic lung disease (*below*)
- O₂ sats — wait for stable reading
- Breathing sounds with stethoscope (*CPM p189*) — listen to both lungs

Danger signs

- Not interested in what is happening, drowsy (lethargic)
- Not able to eat/feed
- Stops breathing for short periods (apnoea) — mainly younger children
- Fits (seizures)

Always do medical consult — usually need to send to hospital.

Is child in at-risk group for severe disease

- Severe growth faltering
- History of preterm birth
- Previous severe pneumonia
- Known chronic lung disease
- Heart disease

Always do medical consult — may need to send to hospital.

Could child have CSLD (*p131*)

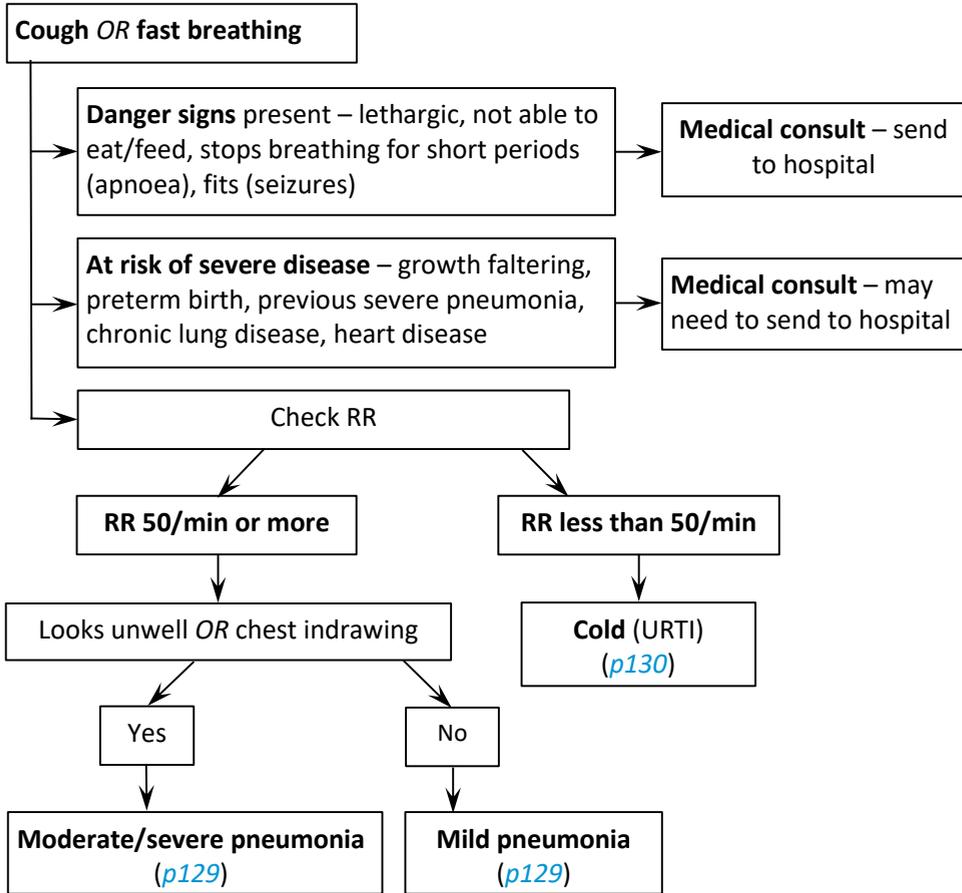
- Look through file notes for any of these
 - 2 or more chest infections in last year
 - Treated for pneumonia in last 4 weeks
 - Moist or productive cough for more than 4 weeks
 - 3 hospital admissions for chest problems (ever)
 - Episode of severe pneumonia (in ICU)
 - Chest deformity (puffed up)
 - Signs all the time when listening with stethoscope (eg crackles, unequal air entry, bronchial breathing, wheeze)

Do

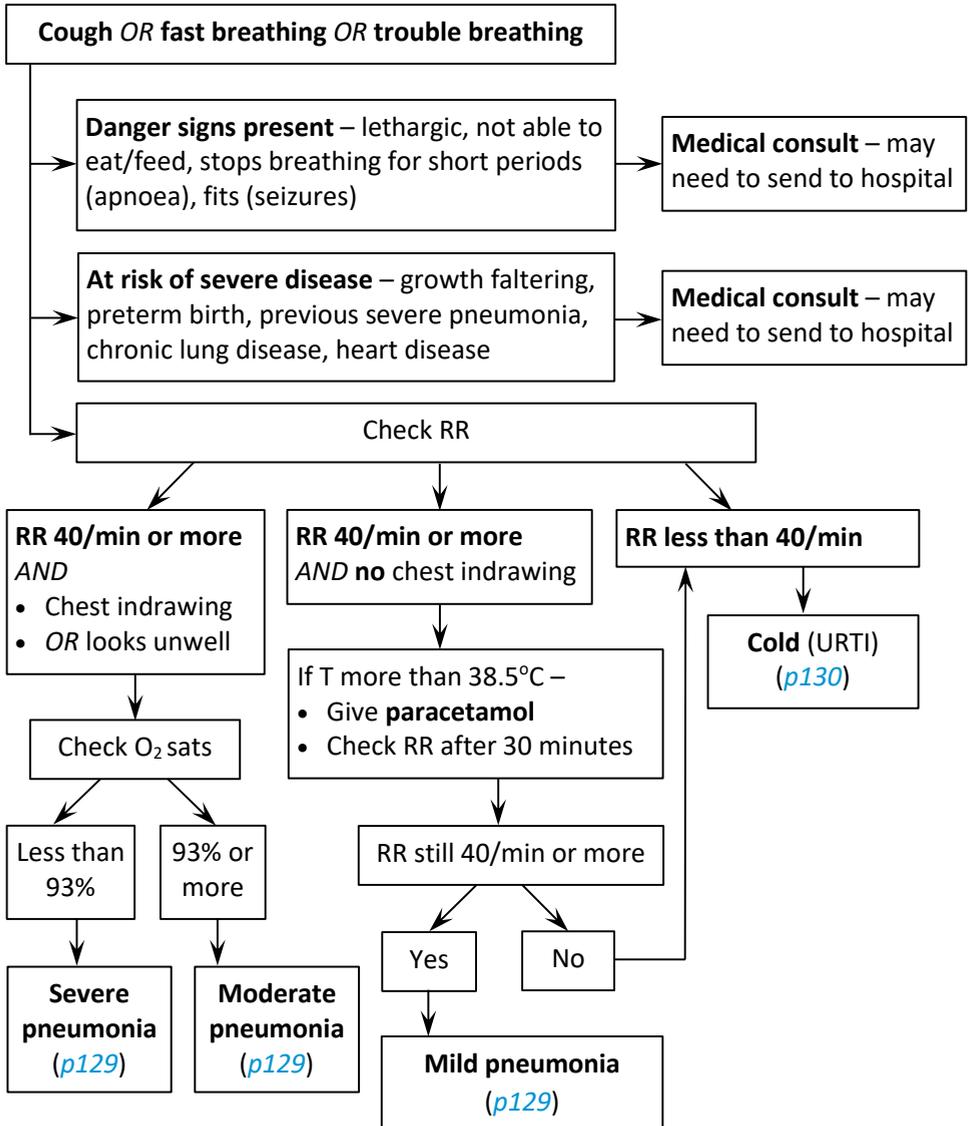
- Assess, and treat as appropriate

Assessment

Flowchart 2.2: Assessment of chest infections — child 2–11 months



Flowchart 2.3: Assessment of chest infections — child 1–5 years



Does child with fast breathing also have a wheeze

- Can you hear a wheeze with ear or stethoscope
 - If not sure — treat as child without wheeze
- **Child under 12 months with wheeze**
 - Relievers not recommended — this age group rarely responds
 - See *Bronchiolitis* (p130)
- **Child 1–2 years with wheeze**
 - To decide if reliever will help give **salbutamol** 100microgram/dose puffer with spacer and mask — 4 puffs
 - If no difference after at least 10 minutes — child very likely has bronchiolitis. **Do not** give any more salbutamol — see *Bronchiolitis* (p130)
 - If child better (still has fast breathing but less) —
 - Give **up to 3 doses** 20 minutes apart (1 dose = 4 puffs)
 - Each puff is sprayed into the spacer and inhaled for a few breaths before the next puff
 - If child **no longer has** fast breathing or chest indrawing during trial — treat as asthma (p134)
 - If child **still has** fast breathing and chest indrawing 20 minutes after third dose — treat as pneumonia. Give antibiotics — see *Treatment* (p127)
- **Child 3–5 years with wheeze**
 - To decide if reliever will help — give **salbutamol** 100microgram/dose puffer with spacer
 - **Up to 3 doses** 20 minutes apart (1 dose = 4 puffs)
 - Each puff is sprayed into spacer and inhaled for a few breaths before next puff
 - If child no longer has fast breathing or chest indrawing during trial — treat as asthma (p134)
 - If child still has fast breathing and chest indrawing 20 minutes after third dose — treat as pneumonia. Give antibiotics — see *Treatment* (p126)

Could child have croup

Barking cough and vibration noise when breathing in (stridor).

- Assess as for chest infection — 2–11 months (p126), 1–5 years (p127)
- Always do **medical consult**

Could child have whooping cough (pertussis)

Coughing in spells, with or without a whoop. Vomiting, going red in face, blue lips (cyanosis), or stopping breathing (apnoea) with coughing spells.

- Always do **medical consult**

Could child have inhaled foreign body

Noisy breathing, wheeze on 1 side (unilateral), story of choking on something.

- Always do **medical consult**



Treatment

Severe pneumonia

- **Medical consult**, send to hospital
- Give **oxygen** to target O₂ sats 94–98%
 - Nasal cannula 1–2L/min *OR* mask 5–10L/min
- Give **benzylpenicillin** IV/IM single dose – child 30mg/kg/dose up to 1.2g (doses [p427](#))
- *AND* **gentamicin** IM single dose (doses [p433](#))

Moderate pneumonia

- If fast breathing for age ([p124](#)) and chest indrawing *OR* O₂ sats less than 95% on room air —
 - Give **oxygen** to target O₂ sats 94–98%
 - Nasal cannula 1–2L/min *OR* mask 5–10L/min
- Give **benzylpenicillin** IV/IM every 6 hours (qid) for 1 day – child 30mg/kg/dose up to 1.2g (doses [p427](#)) — then review
- Treat initial fever to allow assessment of respiratory distress
 - Give **paracetamol** – child 15mg/kg/dose up to 1g ([p380](#))
- Keep child in clinic until O₂ sats consistently 95% or more and can feed well
- **Medical consult** about need to send to hospital
- If stays in community and better after 1 day — give **procaine benzylpenicillin (procaine penicillin)** IM every 24 hours for 5 days – child 50mg/kg/dose up to 1.5g (doses [p435](#))

Review

- If improves to ‘mild’ in 24 hours — treat as for mild pneumonia *BUT* give antibiotics for a total of **5 days**
- If no better after 24 hours or gets worse on any day — **medical consult**, send to hospital
- Health education — resources available online

Mild pneumonia

- Give
 - **Procaine benzylpenicillin (procaine penicillin)** IM every 24 hours for 3 days – child 50mg/kg/dose up to 1.5g (doses [p435](#))
 - *OR* **amoxicillin** oral 3 times a day (tds) for 3 days – child 25mg/kg/dose up to 1g (doses [p425](#))
 - *OR* **amoxicillin** oral twice a day (bd) for 3 days – child 35mg/kg/dose up to 1.5g (doses [p425](#))

Both antibiotics work well if whole course of medicine completed. IM procaine benzylpenicillin (procaine penicillin) better unless very sure all oral medicine will be taken.

- Review daily while on treatment
 - If not getting better — **medical consult**
 - May need to treat for 5 days
 - May need to review diagnosis

Follow-up — pneumonia and other chest infections sent to hospital

- Review after 1 week — should be well, may still have cough
- Review after 4 weeks
 - If still has wet cough that is not getting better — give **amoxicillin-clavulanic acid** oral twice a day (bd) for 14 days then review — child 22.5+3.2mg/kg/dose up to 875+125mg (doses [p425](#))
 - If still has wet cough on review — continue **amoxicillin-clavulanic acid** for another 14 days
 - If still has wheeze — **medical consult**, see *Chronic suppurative lung disease and bronchiectasis in children* ([p131](#)), *Asthma in children* ([p134](#))
- Medical review if 2 or more chest infections in last year or persistent cough after 4 weeks of antibiotics

Cold (URTI)

- Give **paracetamol** up to 4 times a day (qid) — child 15mg/kg/dose up to 1g if needed ([p380](#))
- Review in 1 day
 - If RR still less than 40/min *AND* no danger signs — review as needed

Bronchiolitis

- Follow steps for pneumonia — but **do not** give antibiotics
- **Follow-up** as per pneumonia if symptoms persist for more than 4 weeks — give antibiotics if indicated by symptoms
 - Watch for signs of asthma developing



Chronic suppurative lung disease and bronchiectasis in children

Respiratory disease with frequent infections and chronic moist or productive cough.

- **Consider CSLD in child who has any of**
 - 2 or more chest infections in past year
 - Treated for pneumonia in last 4 weeks
 - Moist or productive cough that doesn't respond to 4 weeks of antibiotics
 - 3 admissions to hospital for chest problems (ever)
 - Episode of severe pneumonia (in ICU)
 - Chest deformity (puffed up)
 - Always signs when listening with stethoscope — crackles, unequal air entry, bronchial breathing

Ask

- About exposure to smoke — passive smoke, campfires
 - Support family members to quit smoking, arrange other methods to cook, keep child away from smoke

Check

- Nutritional status and growth
- **Immunisation** status, especially **pneumococcal**. See *Australian Immunisation Handbook*
- If productive cough — sputum for MC&S

Do

- Arrange chest x-ray
- Medical review
 - Check file notes, hospital discharge summaries, with family — for number and severity of chest infections, treatment in hospital, frequency of cough, productive cough, exercise tolerance, other respiratory symptoms
- If unwell, trouble breathing, weight loss, growth faltering — may need to send to hospital
- Refer to paediatrician for
 - Confirmation of diagnosis, hospital treatment if needed
 - Further investigations — HRCT scan, immune function tests, bronchoscopy
- Make management plan including physio, treatment of exacerbations
 - Encourage exercise
 - Educate carers about CSLD — Chronic Lung Sickness flipchart www.healthinonet.ecu.edu.au/uploads/resources/20047_20047.pdf

Follow-up

Look in file notes for management plan, most recent letter from paediatrician.

- Follow-up usually
 - Clinic review every month — see Table 2.6
 - Medical review every 3 months
 - Paediatrician review every 6 months
- Revise management plan together — consider telehealth case conferences
- Some children may have regular hospital admissions for IV antibiotics and more intensive chest physiotherapy, some will be on weekly antibiotics

Table 2.6: Clinic review for CSLD

Check	Do
Chest physiotherapy (<i>CPM p194</i>) <ul style="list-style-type: none"> • Check file notes for physio plan <ul style="list-style-type: none"> ◦ Head down postural drainage not recommended ◦ If no plan — ask for one • When does child have physio • Do family/carers know what to do — provide resources 	<ul style="list-style-type: none"> • Encourage family/carers to give chest physiotherapy every day • Encourage child to exercise every day • Ask physio for help if needed
Weight	<ul style="list-style-type: none"> • If weight gain poor — see <i>Infant and child growth and nutrition (p154)</i> • May need nutritional supplements — specialist consult
Immunisations	<ul style="list-style-type: none"> • Make sure all immunisations given, including <ul style="list-style-type: none"> ◦ Flu immunisation every year ◦ Pneumococcal immunisation as needed. See <i>Australian Immunisation Handbook</i>
Wheeze	<ul style="list-style-type: none"> • If child wheezy — asthma medicines might help (<i>p137</i>)
Exposure to smoke	<ul style="list-style-type: none"> • Avoid smoke from cigarettes, wood fires • Warn children with CLSD about danger to their lungs from smoking
Regular medicines	<ul style="list-style-type: none"> • Make sure child taking medicines • Some will be on maintenance antibiotics and/or asthma medicines
Signs of acute episode (<i>p133</i>) (exacerbation)	<ul style="list-style-type: none"> • See <i>Acute episode (exacerbation) of CSLD (p133)</i>



Acute episode (exacerbation) of CSLD

- **Diagnose exacerbation if**
 - Increased cough
 - Change in colour or amount of sputum
 - Increasing shortness of breath
 - Can't exercise as usual without shortness of breath

Note: Usually no fever or chest signs.

Check

- Sputum for MC&S

Do

- Increase chest physiotherapy to twice a day (*CPM p194*)
- Encourage child to regularly cough up and spit out sputum into tissue or suitable container. Dispose of safely
- Talk about extra nutrition needs
- Work out which antibiotic to use
 - Look at past sputum culture results, sensitivity patterns
 - Look at management plan, specialist letter
 - Consider child's and family's ability to manage regular medicine
 - If unsure — **medical/paediatrician consult**
- Give antibiotics. **Note:** Doses higher than usual
 - First choice — **amoxicillin-clavulanic acid** oral twice a day (bd) for 14 days – child 22.5+3.2mg/kg/dose up to 875+125mg (doses *p425*)
 - If allergic to penicillin — **medical consult**. May suggest **cefaclor** oral twice a day (bd) for 14 days – child 25mg/kg/dose up to 800mg (doses *p427*)
 - Second choice — **azithromycin** oral once a week for 4 weeks – child 30mg/kg/dose up to 1g (doses *p426*)
 - If not improving in 2 weeks —
 - Give same antibiotic at same dose for another 14 days
 - Medical review — may need to go to hospital for IV antibiotics

Follow-up

- Review at 3 days, then at 1 week, then at 2 weeks
 - If not getting better or getting worse — medical review
 - May need to send to hospital for IV antibiotics
 - Check sputum result
- Long-term — make sure management plan being followed, reviews happen when they should

Asthma in children

Caused by tightening of muscles (bronchospasm) and increased mucus production inside airways. Symptoms come and go.

- **Consider asthma if**
 - Shortness of breath (dyspnoea) and/or wheeze (whistling sound on breathing out) with physical activity
 - Wheeze with other allergy symptoms (eg sneezing, eczema)
 - Family history of asthma
 - Recurrent wheeze with chest infection, if over 1 year
 - Dry frequent cough, especially at night, without a cold

Diagnosis

- Confirmed by
 - Clinical response to inhaled bronchodilators — improvement in shortness of breath or wheeze
 - *OR* documented change in lung function with bronchodilator use
- Cough without wheeze or shortness of breath is rarely asthma. Check for CSLD/bronchiectasis ([p131](#))
- In infants and toddlers wheeze is often due to bronchiolitis or transient early wheeze, not asthma

Do first

- See *Very severe asthma* straight away ([p137](#)) if
 - Severe trouble breathing
 - Blue lips or tongue (cyanosis)
 - O₂ sats less than 90% on air
 - Drowsy, unconscious, collapsed or exhausted
 - Reduced air entry or silent chest

Ask

- About wheeze and cough, what makes them worse
- How many days have they been sick
- Do they have asthma action plan ([p141](#)), have they followed it
- What medicines have they already used to manage attack
- Previous hospitalisations for asthma, especially intensive care admissions
- Exposure to tobacco smoke

Check

- Temp, pulse, RR, BP, O₂ sats, capillary refill — work out REWS ([p6](#))
- Look at how they are breathing
- Listen to front and back of chest for wheeze, air entry ([CPM p189](#))



Do

- **Assess how bad the attack is** — mild, moderate, severe. See Table 2.7
- Treat accordingly
- If T more than 38.5°C — **medical consult**

Table 2.7: How bad is the asthma now

Sign	Mild*	Moderate* to severe	Very severe
Behaviour	Normal	Normal	Agitated or distressed, may look exhausted
Talking	Easily	Phrases only	Single words
Chest recession	No	Mild	Moderate or marked
Wheeze	Variable	Moderate	May be soft due to small amount of air movement
O ₂ sats on room air	94% or more	90–93%	Less than 90%

*If not sure if mild or moderate — treat as moderate.

Mild asthma

- Give reliever — **salbutamol** 100microgram/dose puffer with spacer. If under 3 years or unable to use mouth piece — use mask
 - Each puff is sprayed into spacer and inhaled for a few breaths before the next puff
 - Under 6 years – 4 puffs
 - 6 years or over – 8 puffs
- If child has been sick for a few days or on regular preventer treatment — give **prednisolone** oral single dose – child 1mg/kg/dose up to 50mg (doses [p441](#))
- Check response to treatment after 20 minutes
 - **If not better** and still has wheeze and/or trouble breathing —
 - If 2 years or over — treat as moderate asthma ([p136](#))
 - If under 2 years — very likely bronchiolitis not asthma. Stop reliever, see *Bronchiolitis* ([p130](#))
 - **If better** — keep in clinic for 1 hour. If condition stable — send home
 - Advise **salbutamol** 100microgram/dose puffer with spacer every 4 hours – 4 puffs if under 6 years, 8 puffs if 6 years or over
 - Advise to follow asthma action plan if symptoms get worse. Write or update plan if needed, give copy to child/family ([p141](#))
 - Review next day
- If more than 1 attack in last year — medical review, check and revise asthma action plan ([p141](#))
- Arrange asthma education. Use culture specific resources if available

Moderate asthma

- **Medical consult**
- Give **oxygen** to target O₂ sats 94–98%
 - Nasal cannula 1–2L/min *OR* mask 5–10L/min
- Give **salbutamol** with nebuliser
 - Under 6 years – 2.5mg
 - 6 years or over – 5mg
 - Repeat dose after 20 minutes
- If not getting better — add **ipratropium** to nebuliser
 - Under 6 years – 250microgram
 - 6 years or over – 500microgram
- Give **prednisolone** oral single dose – child 1mg/kg/dose up to 50mg (doses [p441](#))
- Check how hard child is breathing every 15 minutes
 - **If not better** — treat as severe asthma (*below*)
 - **If better** — keep in clinic for 1 hour. If condition stable — send home
 - Advise **salbutamol** 100microgram/dose puffer with spacer every 3-4 hours – 4 puffs if under 6 years, 8 puffs if 6 years or over
 - Give **prednisolone** oral once a day for 2 more days – child 1mg/kg/dose up to 50mg (doses [p441](#))
 - Make management plan. Update asthma action plan, give copy to child/family ([p141](#))
 - Review every day
 - Arrange asthma education. Use culture specific resources if available
 - Medical review at next visit

Severe asthma

- **Urgent medical consult**, send to hospital straight away
- Give **oxygen** to target O₂ sats 94–98%
 - Nasal cannula 1–2L/min *OR* mask 5–10L/min
- Give **salbutamol** with nebuliser
 - Under 6 years – 2.5mg
 - 6 years or over – 5mg
 - Repeat dose after 20 minutes
- **If not getting better** — add **ipratropium** to nebuliser
 - Under 6 years – 250microgram
 - 6 years or over – 500microgram
- Repeat **salbutamol** with **ipratropium** every 20 minutes
- Give **hydrocortisone** IM/IV – child 4mg/kg/dose up to 100mg (doses [p439](#)) — can repeat after 6 hours
- **If not getting better** — treat as very severe asthma ([p137](#))



Very severe asthma

Severe trouble breathing, blue lips or tongue (cyanosis), O₂ sats less than 90%, drowsy or unconscious, collapsed or exhausted, reduced air entry or silent chest.

- **Urgent medical consult**, send to hospital straight away
- Give **oxygen** and continuous nebulised **salbutamol**
 - Put 5mg in nebuliser, refill every time it empties
- Give **hydrocortisone** IM/IV – child 4mg/kg/dose up to 100mg (doses [p439](#)) — can repeat after 6 hours
- Give nebulised **ipratropium** every 20 minutes for 3 doses. Add to salbutamol already in nebuliser
 - Under 6 years – 250microgram
 - 6 years or over – 500microgram
 - Continuous monitoring of pulse, RR, O₂ sats — work out REWS ([p6](#))
- **If getting better** — consider reducing **salbutamol** to every 30 minutes
 - Under 6 years – 2.5mg
 - 6 years or over – 5mg

Asthma medicines

Table 2.8: Asthma medicines

Used as	Medicine type	Examples
Reliever — relief of symptoms	Bronchodilator	<ul style="list-style-type: none"> • Salbutamol • Terbutaline • Ipratropium
Preventer — prevent symptoms happening	Inhaled corticosteroid	<ul style="list-style-type: none"> • Beclometasone • Budesonide • Ciclesonide • Fluticasone propionate
Preventer — prevent symptoms happening	Oral	<ul style="list-style-type: none"> • Montelukast
Combined therapy — preventer and long-acting reliever	Inhaled corticosteroid + long-acting beta ₂ agonist (LABA)	<ul style="list-style-type: none"> • Budesonide + formoterol (eformoterol) • Fluticasone propionate + salmeterol

Table 2.9: Total daily doses of inhaled corticosteroids (ICS) for children

Inhaled corticosteroid	Low dose (microgram)	Medium dose (microgram)	High dose (microgram)
Beclometasone (with HFA – CFC free)	100	100 ⁺ –200	200 ⁺ –400
Budesonide	100–200	300–400	400 ⁺ –800
Ciclesonide	80	160	160 ⁺ –320
Fluticasone propionate	100	100 ⁺ –200	200 ⁺ –500

Inhaled therapy devices

- Puffers (metered dose inhalers/MDIs) work best with spacer
 - Have child show you their puffer ([CPM p360](#)) and spacer ([CPM p364](#)) techniques
 - Check they know how to make a bush spacer ([CPM p365](#))
- Relievers (bronchodilators) work as well with puffer and spacer as with nebuliser — except in very severe asthma
 - Salbutamol 100microgram/dose puffer 8–12 puffs = salbutamol 5mg nebulised
 - See Table 2.10 for spacer types and sizes

Table 2.10: Puffers and spacers

Age (years)	Type and size
Under 3	Puffer with small volume spacer and mask
3–6	Puffer with small volume spacer
Over 6	Puffer with small or large volume spacer

- Other devices available for older children (8 years and over) — find device child prefers or works best for them
 - Dry powder devices (DPIs) (eg turbuhaler, accuhaler)
 - Can get blocked in very humid climates
 - Need to be able to take a big enough breath to make work
 - Not usually recommended for young children

Managing ongoing asthma

Goals in asthma management

1. Child and family understand and can manage asthma — including how to use devices and make a bush spacer ([CPM p365](#))
2. Assess asthma type, severity and control
3. Achieve and maintain best lung function
4. Prevent exacerbations
5. Know and avoid triggers, avoid smoke



6. Develop and maintain shared asthma action plan ([p141](#))
7. Educate child and family, use culturally appropriate resources if available, involve ATSIHP. Review regularly

Management

- Manage by asthma type — see Table 2.11
- Adjust asthma medicines (up or down) according to severity and level of control — see Table 2.12
 - Aim for good control with least amount of medicine, especially with inhaled corticosteroids

Table 2.11: Management by asthma type

Asthma type	Management
Infrequent, intermittent (occasional) asthma <ul style="list-style-type: none"> • Short mild attacks more than 6 weeks apart • Usually triggered by virus • No symptoms between attacks 	<ul style="list-style-type: none"> • Use salbutamol for symptoms
Frequent intermittent (mild) asthma <ul style="list-style-type: none"> • Mild/moderate attacks less than 6 weeks apart • No symptoms between attacks 	<ul style="list-style-type: none"> • Use salbutamol for symptoms and before physical activity if needed • Consider preventer <ul style="list-style-type: none"> ◦ Montelukast (2 years and over) ◦ <i>OR</i> if symptoms not controlled — low dose inhaled corticosteroid (Table 2.9)
Persistent asthma <ul style="list-style-type: none"> • Frequent attacks — mild, moderate or severe • Symptoms between attacks • Hospital admissions 	<ul style="list-style-type: none"> • Use salbutamol for symptoms and before physical activity • Use preventer <ul style="list-style-type: none"> ◦ Start with low dose inhaled corticosteroid (Table 2.9) <i>OR</i> montelukast (2 years and over) ◦ If symptoms not controlled — <ul style="list-style-type: none"> ▪ Low dose inhaled corticosteroid <i>AND</i> montelukast (2 years and over) ▪ <i>OR</i> medium dose inhaled corticosteroid (Table 2.9) ◦ If symptoms still not controlled — <ul style="list-style-type: none"> ▪ 6 years or over — consider combined therapy (ICS + LABA) ▪ Under 6 years — refer to specialist

Table 2.12: Levels of asthma symptom control

Level of control	Features — over 4 week period
Good control	All of <ul style="list-style-type: none"> • Daytime symptoms — 0–2 days/week <ul style="list-style-type: none"> ◦ Last only a few minutes, quickly relieved by bronchodilator • No limitation of activities • No symptoms during night or when wakes up • Need to use reliever — 0–2 days per week*
Partial control	Any of <ul style="list-style-type: none"> • Daytime symptoms — 3–7 days/week <ul style="list-style-type: none"> ◦ Last only a few minutes, quickly relieved by bronchodilator • Any limitation of activities • Any symptoms during night or when wakes up • Need to use reliever — 3–7 days/week*
Poor control	Either of <ul style="list-style-type: none"> • Daytime symptoms — 3–7 days/week <ul style="list-style-type: none"> ◦ Last from minutes to hours or recurring, partially or fully relieved by bronchodilator • 3–4 features of partial control in 1 week

* Not including reliever used for prevention before physical activity.

Regular reviews

- How often will depend on type of asthma — check asthma action plan ([p141](#))
- Child on long-term corticosteroids should see paediatrician at least once a year
- If child needs high dose corticosteroids and/or symptoms persist — consider other diagnosis (eg bronchiectasis)

Ask

- How often and when do they get symptoms — cough, wheeze, waking at night or early morning
- How often do they use reliever during day and night
- Does asthma stop them doing things (eg running, playing, going to school)
- Any problems with medicines they are taking or with devices (eg spacers)

Check

- Every 6 months, check that puffer and spacer or other devices used correctly
- If over 6 years — spirometry (lung function) ([CPM p191](#))
- Flu and pneumococcal immunisation status, see *Australian Immunisation Handbook*

Do

- Review and update asthma action plan with child and family ([p141](#))
- Give advice on avoiding triggers (eg no smoking in house, avoid camp fire smoke)



Asthma action plan

Every child with asthma needs **written or picture based asthma action plan** developed in consultation with a doctor. Keep copy at home, at school, in file notes. Make sure child and/or family understand how to use it.

- Includes
 - What to do when
 - Child well
 - Asthma a bit worse, they get cold or chest infection
 - Asthma severe
 - How often they need regular reviews, medical reviews, paediatrician reviews
 - When to collect medicines, have immunisations
 - Illustrated Indigenous asthma action plans available online

ASTHMA ACTION PLAN

Name _____ Date _____

When my asthma is well controlled

Reliever (for relief of wheeze or cough)
_____ Use _____ times a day

Preventer Yes/No
_____ Use _____ times a day
_____ Use _____ times a day

Symptom controller Yes/No
_____ Use _____ times a day

Before exercise/physical activity I take _____

When my asthma is getting worse or I have a cold

If the cough or wheeze increase or at the first sign of a cold

Reliever
_____ Use _____ times a day

Preventer Yes/No
_____ Use _____ times a day
_____ Use _____ times a day

Symptom controller Yes/No
_____ Use _____ times a day

When the asthma gets better go back to the 'well controlled' plan.

When my asthma is severe or getting worse quickly

Emergency medicines _____

If still getting worse, go to the clinic or hospital.

When the asthma gets better go back to the 'well controlled' plan.

Check up at the clinic every _____ months even if well.

Check up with doctor _____

Check up with paediatrician / specialist _____

Medicines due _____ Immunisations due _____



Child neglect, abuse, sexual abuse

Important to understand definitions of abuse and neglect that apply in your state/territory and how to make child protection report/notification.

Child protection services

NT

- NT Family and Children's Services — Central Intake Team
 - 24 hour phone line — 1800 700 250

SA

- Family and Youth Services — Child Abuse Report Line
 - 24 hour phone line — 131 478

WA

- Department for Child Protection
 - Contact your local country office

Looking after yourself

- For most people the reality of child abuse and/or neglect is deeply distressing
- May help to talk to someone about your feelings — counsellor, Bush Support Services 1800 805 391

Child neglect

Parent/carer fails to provide level of physical and/or emotional care that child needs to grow and develop well. Child neglect includes

- Physical neglect
 - Not providing child's basic needs such as food, clothing or shelter
 - Not supervising child well enough, not providing for their safety
- Emotional neglect — not meeting child's needs for affection, nurturing, stimulation
 - May ignore, humiliate, intimidate or isolate child. Can be difficult to prove
- Educational neglect — not making sure child receives an appropriate education
- Medical neglect — not providing appropriate health or dental care
 - Refusing care or ignoring medical advice

Neglect can be complex and hard to identify. Don't be judgemental.

- Parents/carers may neglect children if
 - They don't know what children need to grow well
 - They don't have enough money or have problems managing money
 - They have a mental illness, unable to care for child when unwell
 - They have problems with substance abuse, gambling, domestic/family violence
 - They didn't want the child
 - Child has medical condition or disability making them hard to care for

Do

- Support parents/carers to solve problems
 - Give information about what child/young person needs at different stages
 - Ask about substance use and domestic/family violence
 - Develop plan to make sure needs are met
- Discuss with colleagues and record in file notes — concerns, support offered or attempted, outcomes
- Talk with child health team, doctor, paediatrician about concerns
- If child remains at risk, even with support — notify child protection service ([p143](#))

Emotional or physical abuse

- Changes in behaviour that **may** indicate abuse
 - Nightmares, sleep walking
 - Avoids physical or other contact with certain people or groups
 - Changes in general behaviour or conduct
 - Changes in activities, how/what games they play

Emotional abuse

Suspect emotional abuse if

- Parent/carer
 - Constantly criticises or teases child/young person
 - Makes unreasonable demands relative to age/maturity of child/young person, criticises or belittles them when they can't meet demands
 - Blames child/young person for everything that goes wrong
 - Calls child/young person names, sees them as 'evil'
 - Exposes child/young person to domestic/family violence
 - Isolates child/young person

Do

- Observe interactions between parents/carers and child/young person — warm and responsive or hostile and threatening
- Ask child/young person how they feel, if they are safe. Take what child/young people says seriously
- Support parents to solve problems
 - Give information about what child/young person needs at different stages
 - Ask about substance use and domestic/family violence
 - Develop plan to make sure needs are met
- Discuss with colleagues and record in file notes — concerns, support offered or attempted, outcomes
- Talk with child health team, doctor, paediatrician about concerns
- If child remains at risk, even with support — notify child protection service ([p143](#))

Physical abuse

Non-accidental injury caused by parent/carer. May be deliberate, from physical discipline, from inadequate supervision. May include hitting, punching, biting, burning, shaking, kicking. Doesn't depend on intent of parent/carer.

When child presents with any injury

- Always record detailed story of how injury occurred
 - Ask what happened, where it happened, when it happened, who was there, what went wrong
- Use body diagram to record where injuries or bruises are

Consider abuse in infant under 1 year if

- Bruises with no clear explanation that makes sense. See *Inconsistencies (below)*
- Any fracture
- Any injury to a child who is not yet walking
- Unexplained neurological symptoms or obvious head injury
 - May be from shaken baby syndrome
 - If not sure — **always** talk with more experienced clinician or child protection service ([p143](#))

Consider abuse in child or young person if

- Injury (eg bruise, burn), with shape you recognise (eg hand, belt buckle)
- Burn with neat edge (eg infant with burns to feet that look like socks)
- More than one injury of different stages/duration
- Delay in seeking medical treatment, especially if painful injury
- Child/young person, or someone else, tells you they were hurt by parent/carer
- No story to explain injury
- Inconsistencies (*below*)

Inconsistencies are when

- Story of how injury happened suggests minor injury, but injury severe
- Story of how injury happened changes each time story is told
- People who saw what happened tell very different stories
- Story **developmentally unlikely** — child of this age unlikely to be able to do what was said
- Story **biomechanically unlikely** — this sort of injury is unlikely to result from that sort of story
- Story **epidemiologically unlikely** — this sort of injury very unlikely

Do — if you suspect physical abuse

- Manage any injury
- Record injuries
- Make sure child is safe. May need to send to hospital

- Notify child protection service ([p143](#))
- If not sure — **get advice** from child protection service or senior clinician

Child sexual abuse

Child sexual abuse is a **crime**. **Must notify child protection service** ([p143](#)) if you believe child/young person has been sexually abused (mandatory reporting).

You must know

- How your state/territory defines child sexual abuse
 - May need to report sexual activity under certain ages even when there is consent
 - Your organisation's policy for managing suspected child abuse
-
- Offender usually known to child/young person, may be member of family, may be with the child in the clinic
 - Sexual abuse may be
 - Obvious (eg physical indicators, trauma). Commonly called rape
 - Suspected when seeing child/young person for another medical problem — STI, pregnancy, genital sores, injury to genital area, buttocks, thighs, breasts
 - Suspected because someone told you, you heard rumour
 - Disclosed (told) to you by child/young person

Child sexual abuse — definition

Child sexual abuse is a broad term to cover activities involving use of child/young person for sexual gratification by adult or older child/young person. Includes any act that exposes child/young person to, or involves them in, sexual activity beyond their understanding, or that goes against community norms or the law.

- Activities include
 - Making child/young person look at sexually explicit materials or behaviours
 - Taking visual images of child/young person for pornographic purposes
 - Touching, fondling and/or masturbation of child/young person
 - Having child/young person touch, fondle or masturbate abuser
 - Oral sex performed by child/young person
 - Oral sex performed on child/young person by abuser
 - Anal or vaginal penetration of child/young person
 - Making child/young person engage in sexual penetration of others

Symptoms that *may* indicate child sexual abuse

- Physical evidence — not common

- Physical symptoms may include genital or anal pain, soreness, bleeding, discharge, rash, frequency or pain on passing urine, STIs, pregnancy
 - Interpreting these symptoms depends on
 - Age and developmental level of child/young person
 - For older adolescents the presence/absence of consent
 - Sexualised play
 - If worried about child/young person's behaviour or psychological health — **medical/mental health consult**, whether or not you suspect sexual abuse
- Manage sexual abuse sensitively to protect child/young person and clinic staff. Following disclosure or suspicion of abuse there may be threats toward child/young person, their family, alleged offender and/or their family, clinic staff.

Do

- If you suspect sexual abuse — **must** notify child protection service ([p143](#))
 - About presentation
 - To plan management
- Plan for safety of child/young person, their family, clinic staff including ATSIHPs who are part of the community
 - May need to evacuate child/young person to make sure everyone is safe

Recent sexual abuse

- **Medical consult** with staff from sexual assault service
 - They will advise how to proceed, preserve evidence

Do not

- **Do not** try to question child/young person yourself — best done by trained interviewers
- **Do not** wash child/young person before talking with medical staff from sexual assault service — may disturb forensic evidence
- **Do not** do internal examination unless needed for treatment of serious/life threatening injuries — may disturb forensic evidence, should not be done by anyone without sexual assault training

Do

- If child/young person tells you about sexual abuse — record accurately
- Assess and manage clinical situation
 - Temp, pulse, RR, BP, O₂ sats, capillary refill — work out REWS ([p6](#))
 - **Look** for injuries, treat as needed. See *Assessing trauma — primary and secondary survey* ([CPM p35](#))
- Get support from experienced staff

Collecting body fluid loss for forensic evidence

- Collect any urine and other body fluid loss
 - For young child, use nappy
- Save all nappies, pads, clothing removed from child/young person

- Send all items with person — include clothing, blankets etc
 - Put each item in separate paper bag (not plastic). Label, seal bags with tape, sign across closure
 - Record name of person receiving items (eg nurse on evacuating plane), get their signature to maintain chain of forensic evidence

While waiting for evacuation

- Continue observations
- Record clinical findings and what you did
 - Include how you were notified, who was present, what was said, what child/young person was wearing, any clothing removed or added by you
- Take **accurate and detailed** notes of what happened — as told to you
 - Child/young person will sometimes tell you what happened. If they do — record it word for word, but don't ask questions. Not your job to collect a statement, leave this to police
- Be supportive and **believe** them. Reassure them you will do all you can to keep them safe
- **Never** force child/young person to talk

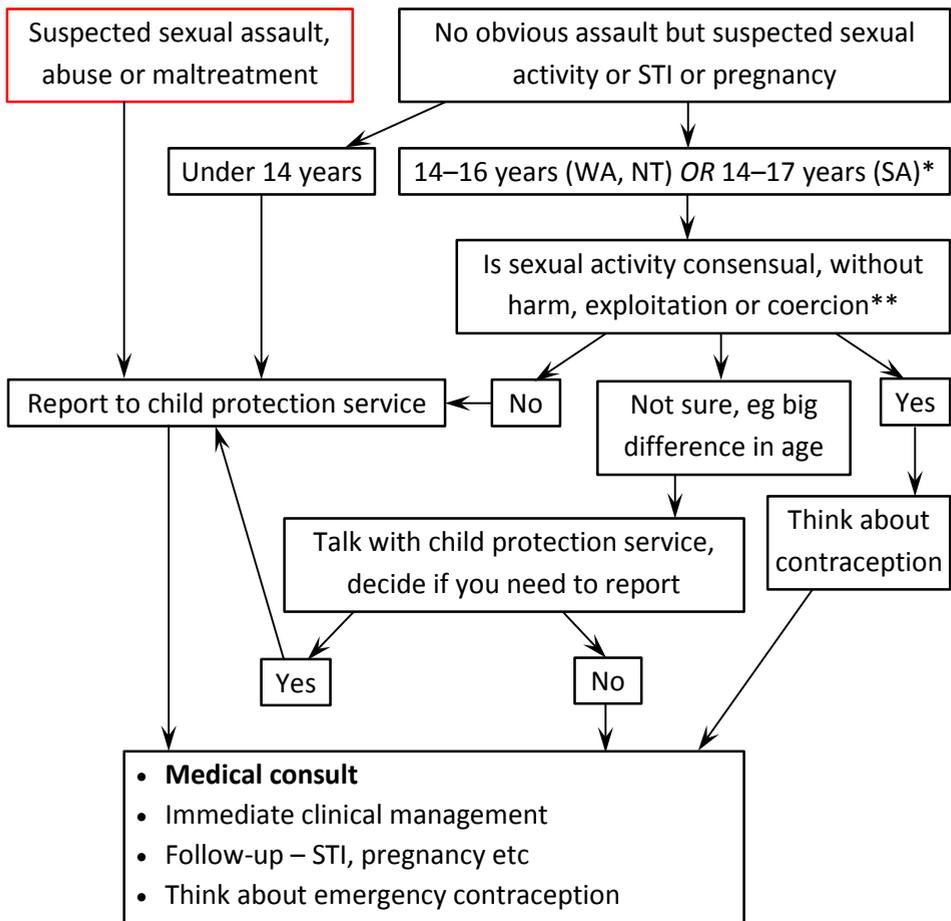
Note: Your documentation and attention to detail may be important if prosecution proceeds.

Suspected sexual abuse

- If you think child/young person under 18 years is being or has been sexually abused — you must notify child protection service ([p143](#))
 - Suspicion is the key issue in proceeding with notification. Suspicion of sexual abuse is managed and notified according to Flowchart 2.4
- **Consider current safety of child/young person**
- Young person's intellectual and emotional development may lag behind physical age. Age may suggest they can give consent, but intellectual and emotional development may not. May be vulnerable to exploitation, not understand what is happening
- Sexual abuse often begins with non-invasive behaviours, but progresses to oral/anal/vaginal sex
- Usually no physical or medical evidence of sexual abuse. May be signs in behaviour that indicate child/young person stressed
- Talk with parents/carers about concerns, changes in child/young person's behaviour
 - **Avoid** saying explicitly you are concerned about sexual abuse, as child/young person may be inappropriately questioned
 - Where possible advise protective parent/carer you are making report to child protection service
 - If not confident to do this — talk with child protection service ([p143](#))

- Support child/young person and protective parent/carer — will probably be stunned, not know what to believe
 - Expect to be pressured to not believe child/young person
 - If not confident to do this — get help from someone who can
- **Do not** talk about child/young person's allegations, or your suspicions. Principles of confidentiality will protect you and child/young person
- **Be aware:** Often other types of abuse happen with sexual abuse. May also be physical or emotional abuse, exposure to domestic/family violence, neglect

Flowchart 2.4: Guidelines for suspected sexual assault, abuse or maltreatment of person under 18 years



* Upper age is age of consent — varies by location.

** In NT — mandatory for health practitioners to report sexual activity in 14–15 year olds if age difference between partners more than 2 years.

Note: State/territory legislation is subject to change. Correct at June 2017.

STI testing in children

- STI testing is not an appropriate way to confirm or form a suspicion of sexual abuse
 - Negative STI test doesn't exclude sexual abuse in a child/young person
- If obvious sexual abuse — **medical/paediatrician/sexual assault doctor consult** before doing STI test
- If child/young person sexually active *OR* suspected sexual abuse —
 - If under 14 years — **medical consult** about STI testing
 - If 14 years and over — see *STI checks for young people* (p276)

Follow-up

People affected by sexual abuse (child/young person, parent/s, other people) may suffer distress days to years later.

- Talk to sexual assault service about counselling options for victims of sexual abuse
- Contact child protection service (p143) if
 - Ongoing concerns about child/young person's safety
 - You have new information

Making a report

- You will need to provide
 - Child's name and date of birth
 - Parent/carer name/s
 - Address
 - Why you suspect/believe child/young person has been sexually abused — something you saw or heard, behaviours that made you worried, something child/young person told you
 - Any injuries or medical issues
 - Where child/young person is now
 - Whether you have concern for anybody's safety (eg child, you, other people)
 - If alleged perpetrator named — who they are, if you know where they are
- Don't forget to talk with child protection service about what happens next
- Sexual abuse can't always be substantiated — this doesn't mean it didn't happen, only that there was not enough evidence to prove it. This doesn't lessen your responsibility to report suspected sexual abuse

Child development issues

Child growth and development are important signs that a child is healthy — physically, emotionally, culturally, spiritually. Rapid physical, cognitive development in first 2 years of life important for the rest of their lives. Dealing with problems during this time is much more effective than with older children or adolescents.

Development assessed by looking at movement, language, social development, vision, hearing. There is a range of normal — see *Child health check (0–5 years)* (*CPM p118*)

Small babies

Preterm birth (less than 37 weeks) or very low (less than 1500g) or low (less than 2500g) birth weight puts babies at increased risk for many medical and developmental problems.

- If baby kept in hospital — support continued breastfeeding or expressing to maintain breast milk

Check

- Check antenatal and birth records, hospital discharge summary for medical, family or social problems, alcohol or drug use, planned follow-up
- Paediatrician's discharge summary for ongoing monitoring schedule

Feeding and weight gain

- Promote and support breastfeeding on demand
- If using formula — check parents/carers make it up correctly and hygienically (*WBM p236*), give right amount
- Weight gain usually shows some catch up over first 6 months
- Child's line on growth chart should still follow shape of printed curve, but may be below it for some time

Development

- Always ask about problems with hearing, vision
- Cerebral palsy, intellectual impairment more common in these children

Do

- Medical review
- Make management plan — include paediatric and allied health reviews
- Refer **early** if child becomes unwell
- Start oral iron at 1 month (*p116*)
- Check Hb at 6 months then every 6 months, or as advised by paediatrician, up to 5 years
- If over 6 months — check vaccinations up to date, including influenza vaccine

Fetal alcohol spectrum disorder (FASD)

Range of problems including learning and behavioural difficulties, abnormal physical features.

- May be diagnosed in children whose mother drank alcohol during pregnancy
- More common if moderate to large amounts of alcohol consumed

Alcohol and pregnancy

- No amount of alcohol known to be safe in pregnancy
- Pregnant women who drink a lot of alcohol are more likely to have children with FASD

- Even small amounts of alcohol may cause problems
 - Pregnant women (or women trying to become pregnant) should not drink alcohol
 - Women drinking a lot of alcohol should use contraception
- If pregnant woman using alcohol —
 - Support her to stop drinking
 - Tell her not drinking gives her child the best chance of being healthy
 - **Do not** give impression that her child is already damaged, this can lead to more drinking

FAS/FASD

- FASD is a spectrum — Fetal Alcohol Syndrome (FAS) is most severe form
- Children with FASD can have a range of physical, learning and behavioural problems
 - Behavioural difficulties — impulse control, maintaining attention
 - Growth problems, small heads, unusual facial features
- Children from families who have alcohol/substance use problems are more likely to have developmental problems (FASD related or not)
 - Need close monitoring
 - May need help with stable care arrangements or assessment by child protection services

Diagnosis of FASD based on 4 factors

- Growth deficiency — height and/or weight below the 10th percentile at any stage with no known cause. Causes to exclude — congenital infections, chronic gastroenteritis, malnutrition
- FAS facial features — see website for National Organisation for FASD Australia
- Central nervous system (CNS) abnormalities may include
 - Small head (circumference less than 3rd percentile), abnormal MRI, seizures
 - Major problems with learning, memory, understanding, language, motor skills, and/or attention



- Exposure to alcohol in the womb — confirmation not needed for FASD diagnosis if all 3 FAS facial features present

Do

- Refer to paediatrician for diagnosis
- Collect all available information on
 - Growth — plot and highlight point when length was at lowest centile
 - Mother's alcohol intake — be non-judgemental
 - Ask — how often do you drink alcohol, how many standard drinks per day, how often do you have 6 or more drinks on one occasion
 - Schooling and childcare — performance, attention, adverse behaviour, developmental delay
- If FASD diagnosed —
 - Continue to support family and do routine child health checks
 - Involve paediatrician, allied health (eg dietitian, speech pathologist, OT, physio), family support services
 - Need management plan — include long-term learning and behaviour management
 - Encourage early childhood education, play group, quality childcare. Inform school of condition (with parent/carer consent), arrange special education assessment and support

Talk with parents about referral to alcohol service.

If another pregnancy possible — high priority to prevent another case of FASD.

Infant and child growth and nutrition

- In the first 2–3 years of life good nutrition is especially important for
 - Healthy growth and brain development
 - Reducing risk of developing chronic diseases (eg diabetes, heart disease, kidney disease)
 - Learning to eat a range of healthy foods, to drink water
- Children grow well with
 - Healthy nurturing environment that includes love, care, play
 - Good antenatal and postnatal care for mothers and babies
 - **Only** breast milk until around 6 months of age
 - Variety of age appropriate foods introduced at around 6 months — see Table 2.13
 - Baby ready to eat when sitting and holding head up, interested and trying to grab food

Table 2.13: Age appropriate food and fluids for infants and young children

Introduce at	Key message	Fluids	Food
Birth to around 6 months	<ul style="list-style-type: none"> • Breast milk has all nutrients needed • Give oral iron supplement from 4 months in Indigenous populations (p117) 	<ul style="list-style-type: none"> • Breast milk only – on demand <ul style="list-style-type: none"> ◦ No other food or fluids needed ◦ Protective antibodies to boost infant's immune system 	
Around 6 months – first foods	<ul style="list-style-type: none"> • Babies need food in addition to breast milk • First foods should be iron rich as infant's iron store is very low (depleted) • Starting solids too early or too late can make the baby sick or grow slowly 	<ul style="list-style-type: none"> • Offer food before breast milk • Clean cool boiled water in a cup 	<ul style="list-style-type: none"> • Give food at least 2–3 times a day in addition to breast milk • Offer food before breast milk • Offer around 2–3 spoonfuls increasing to ½ a cup (125mL) • Thick, smooth texture foods rich in iron <ul style="list-style-type: none"> ◦ Iron-fortified cereal (eg <i>Farex</i> or <i>Weetbix</i>) with expressed breast milk or clean cool boiled water ◦ Soft mashed meat or eggs ◦ Soft mashed fruit and vegetables ►



Introduce at	Key message	Fluids	Food
As baby learns to eat and swallow solid food	<ul style="list-style-type: none"> Baby ready for lumpier textures which encourage chewing and speech development 	<ul style="list-style-type: none"> Offer food before breast milk Clean cool boiled water in a cup 	<ul style="list-style-type: none"> Give food at least 4–6 times a day Change texture from smooth to soft and lumpy <ul style="list-style-type: none"> Iron-fortified cereal (eg <i>Farex</i> or <i>Weetbix</i>) with expressed milk, clean cool boiled water or cow's milk* Soft meat, eggs Smooth peanut paste Soft fruits and vegetables Dairy products* (eg yoghurt, cheese) Finger foods <ul style="list-style-type: none"> Pieces of cheese or meat Pieces of fruit and cooked vegetables
12–24 months	<ul style="list-style-type: none"> Infants should be eating a wide range of healthy family foods Solid foods should now be providing most of baby's nutritional needs 	<ul style="list-style-type: none"> Offer food before breast milk Clean water in a cup Cow's milk in a cup* 	<ul style="list-style-type: none"> 3 meals plus 1–2 snacks a day Variety of foods that rest of family eating Talk about importance of offering foods from each food group — refer to <i>Australian Guide to Healthy Eating</i>. Includes <ul style="list-style-type: none"> Meat, chicken, fish, baked beans, eggs Vegetables, fruits Bread, cereals — preferably wholegrain, iron enriched Dairy foods

*Do not use cow's milk as a **drink** before 12 months (OK with cereal or in dairy products such as yoghurt).

Do not add salt or sugar to food.

Promoting healthy growth

All young children have the same potential to grow.

- Many factors influence child growth including good nutrition, sleep, nurturing care by parents/carers, good general health, parents' height
- Encourage and support breastfeeding, good nutrition, physical activity, healthy lifestyles for children and families
- Listen and respond to parent's/carer's concerns
- Remind parents/carers to show patience and encouragement as children learn to eat

- Talk with parents/carers about scheduled child health check (*CPM p118*) — show them how their child is growing and developing
- Support community activities that promote positive parenting and healthy eating
 - Childcare, playgroup, school, men's groups, women's centre, family centre
- Work with dietitian and/or child health team on activities to promote child health
- Advocate for appropriate, healthy and affordable food for babies and children

Promote for all children

- From 0–5 years
 - Breastfeeding for as long as mother and child want
 - Oral iron supplement from 4 months for all breastfed babies (*p117*)
 - Healthy iron-rich solids from around 6 months (*p117*), increasing amount and variety of texture as child grows. See *Age appropriate foods and fluids (p154)*
 - Variety of vegetables and fruit every day — including bush foods
 - Drinking plenty of water
 - Plenty of physical activity — toddlers (1–3 years) and preschoolers (3–5 years) should be active for at least 3 hours a day
- Also for school-aged children
 - Healthy eating, regular physical activity and sport, positive body image
 - School-aged children should be active for at least 2 hours a day
- Avoiding
 - Tea or sweet drinks — including caffeinated and sugary drinks, soft drinks, cordial, fruit drinks and juice
 - Note:** Fruit drinks are mostly sugar and water
 - Sweet and fatty foods (eg lollies, fried foods)
 - More than 2 hours of 'screen time' a day — TV, computer, mobile phone

Monitoring growth

Growth monitoring is one part of child health check (*CPM p118*)

- Regular checks mean growth problems can be found and responded to early
- Preterm (less than 37 weeks) or low birth weight babies (less than 2500g) — may need individual management plan
- Follow Table 2.14 or local endorsed program for all other children
 - If problem identified — include extra monitoring in care plan developed with family, primary care team, paediatrician
 - Growth problems most often occur at 6–12 months

Do

- Always use calibrated equipment in good condition, use same equipment if possible



Weight

- Babies, children under 2 years — on baby scales, naked (no nappy or singlet)
- 2–3 years — on adult scales, wearing nappy/pull ups only
- 3–5 years — on adult scales, wearing singlet and underpants or nappy only

Length or height

- Babies, children under 2 years — lying down (length) with 2 people holding, using fixed board or measuring mat, without nappy
- 2 years and over — standing up (height) using stadiometer, without shoes
 - Record to nearest 0.1cm

Head circumference

- Find and measure widest part of head (horizontally)
 - Use narrow, non-stretch, flexible tape

Note: Shape of growth curve (p158) is more important than height and weight.

Table 2.14: How often to monitor growth for well* infants and children

Age	Weight	Length/height	Head circumference
Birth	✓	✓	✓
0–8 weeks	Day 3, day 5, then every 2 weeks	✓	✓
6–8 week baby check	✓	✓	✓
4 months	✓	✓	✓
6 months	✓	✓	✓
9–18 months	Every 3 months	Every 3 months	✓
2–5 years	Every 6 months	Every 6 months	Every 6 months until 3 years

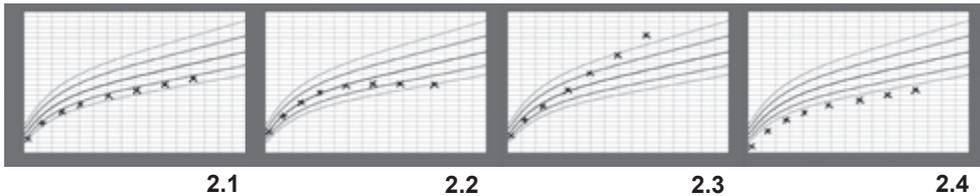
*If problems with growth — need Growth Action Plan and extra monitoring.

Do — after measuring growth

Every time child weighed and measured — **look at growth chart** (p158).

Growth line for normal weight gain will follow the shape of one of the curved lines on chart.

- Shape of curve on growth chart shows whether growth OK or not
 - Is child's curve following — F 2.1, flattening or going down — F 2.2, or rapidly going up — F 2.3 compared to curved line on chart
 - Baby who was preterm or low birth weight may be low on growth chart but still growing and gaining weight. Growth curve should still follow shape of curve on chart — F 2.4
- Show chart to parents/carers, talk about child's growth. Always talk about importance of breastfeeding and/or age appropriate food and drinks (p154)



Growth charts

Growing well

- Child's line going up, generally following shape of curved line printed on growth chart — F 2.1 and F 2.4, and there is good catch up after illness
- Let parents/carers know date of child's next health check, encourage to attend

Growth faltering

- Child's line beginning to flatten or go down compared to line on growth chart – F 2.2 — even after growing well for 6 months
 - See *Growth problems (below)*, *Starting a Growth Action Plan (p159)*

Excess weight gain

- Child's line going up or above line on growth chart – F 2.3
 - See *If overweight or obese (p162)*

Growth problems

- Use growth charts (*above*) to identify growth problems early, and work out how serious growth problems are
- Can be many reasons why child putting on too little or too much weight. Often combination of medical, social, environmental issues involving child, family, community

Growth faltering assessment

When child is not growing as expected according to the growth chart.

- Can be caused by undernutrition, infections, other medical problems

Assess breastfeeding and/or food intake

- Ask about breastfeeding (*WBM p199*), how often, how long
 - Baby breastfeeding well if
 - Usually content — sleeping well, not crying too much, smiling, active
 - Several wet nappies a day, soft faeces
 - Breastfed on demand, unrestricted feeding day and night
 - Mother generally pain free and comfortable. If not — check positioning, attachment. Midwife, lactation consultant, child health nurse can help
- If formula fed — correct for age, how often, how much taken, prepared correctly (*WBM p236*)
- Ask about mother's diet, medicines, smoking, drug, alcohol (grog) intake



- Ask about child's food intake ([p154](#))
 - At around 6 months — if child has started iron rich solids (2–3 times a day)
 - From 6–12 months — if child is offered food regularly/when hungry (4–6 times a day)
 - What food and drinks has child had in last 24 hours
 - Where, what, how often, how much child eats
- Who helps with feeding, who buys and prepares food
- Does family have any problems with child's eating

Assess and assist with social and environmental issues

- Issues may include
 - Carers and family — mental health issues, domestic/family violence, drug or alcohol problems, gambling etc
 - Maternal depression ([WBM p221](#)) — including low mood, exhaustion, helplessness, hopelessness, not caring for baby
 - Use screening tool, see [EPDS \(WBM p222\)](#)
 - Access to money, nutritious food, support people
 - Housing conditions — including overcrowding, plumbing, cooking facilities, fridge, soap and household cleaning products
- Explore solutions with family, local community services (eg childcare, council)

Starting a Growth Action Plan

Consider medical, dietary, social, environmental issues. Provide age appropriate support and education, reassurance, and then follow-up weight within 7 days.

- Involve parents/carers in finding causes for growth problems and solutions
 - Be careful to maintain respectful professional relationship
 - Be sensitive to cultural beliefs and values
 - **Do not** judge or criticise
- Recommend age appropriate foods ([p154](#)) how much, how often
- Encourage family to be involved in activities that develop relationship with child

Growth faltering management

Do not let growth faltering continue — investigate reasons, act quickly, follow up.

- If child moves to another community — follow up with other clinic

Do

- Encourage and support breastfeeding on demand — with oral iron supplement from 4 months ([p117](#))

- If under 6 months —
 - Encourage more frequent and longer breastfeeds
 - If formula fed — check preparation of formula (*WBM p236*), discourage other drinks
- If over 6 months — advise
 - Offer age appropriate foods (*p154*) as meal or snack 5 times a day **before** breastfeeding
 - Add iron-fortified cereal to other food to improve texture, iron content
 - Talk with doctor, child health nurse and/or dietitian

Assess and treat

- See *Checklist for medical problems* (Table 2.15), treat as needed
- If child recently or often sick — offer extra food for catch-up growth
- Give medicines as per Table 2.16 once at diagnosis
 - Repeat **albendazole** after 3 weeks

Table 2.15: Checklist for medical problems

Problem	Check and Do
Anaemia (<i>p116</i>)	POC test for Hb
Urine	Collect urine for MC&S (<i>CPM p393</i>)
Faeces	If diarrhoea (<i>p165</i>) — collect faeces for MC&S and OCP (<i>CPM p398</i>)
Chest	Check for moist cough, frequent chest infections — chronic lung conditions (<i>p131</i>)
Skin (<i>p387</i>)	Look for sores or scabies
Ears (<i>p172</i>)	Examine ear, treat any problems

Feeding when sick

- Keep feeding child unless there is a specific reason to fast
- Sit child up to eat, lying down is choking hazard
- Sick infants need extra breast milk/formula for hydration and energy
 - If trouble breastfeeding — give expressed breast milk/formula from clean cup or spoon
- If diarrhoea (*p165*) — give extra fluids (ORS, breast milk) to prevent/treat dehydration
- Offer older child small, healthy meals often, but don't force child to eat
- If child vomits — wait 10 minutes then offer fluids and food again
- Child may be hungry as they recover, offer extra meal or snacks for around 2 weeks



Table 2.16: Medicines for growth faltering

Medicine	Comment
Oral zinc – if 6 months or over <ul style="list-style-type: none"> • Zinc once a day for 7 days – 20mg elemental zinc <ul style="list-style-type: none"> ◦ This is 1.8mL if using 50mg/mL zinc sulfate (50mg/mL zinc sulfate = 11.3mg/mL elemental zinc) 	Follow immediately with drink to cover taste. For infants, breast milk or formula. For older children, flavoured drink
Albendazole oral once a day for 3 days – 6–11 months 200mg, 1 year and over 400mg <ul style="list-style-type: none"> • Do not give if under 6 months • Repeat dose after 3 weeks 	To treat <i>Strongyloides</i>
If diarrhoea (p165) – <ul style="list-style-type: none"> • Give metronidazole oral once a day for 3 days – child 30mg/kg/dose up to 2g (doses p434) • OR tinidazole oral single dose – child 50mg/kg/dose up to 2g (doses p437) 	To treat <i>Giardia</i>

Follow-up

- Follow Growth Action Plan — **review weekly** for 4 weeks
 - If actions not done — problem solve with parents/carers
- **Under 6 months** and no weight gain after 2 weeks
 - **Medical consult** within one week
- Talk with dietitian, child health nurse or doctor if
 - **6 months – 2 years** and no weight gain after 4 weeks
 - **Over 2 years and no weight** gain after 2 months
- Nutritional supplement drinks (*below*) may be needed in the short term for at risk infants/children if not enough food available
- Make sure the family has support — access to food program if available
- If child neglect suspected — team discussion and **medical consult**
 - Consider referral to child protection services (p143)

Nutritional supplement drinks

Used in growth faltering for ‘catch-up’ growth. Must be prescribed by doctor.

- **Only use**
 - For child aged 1–5 years weighing more than 8kg
 - If weight less than 8kg — refer to paediatrician
 - If child doesn't have diarrhoea
 - For short time as part of Growth Action Plan
- Advise parent/carer it is not a substitute for food, continue promoting healthy diet



Do

- Use appropriate supplement for age of child (eg *Fortini Multifibre, Pediasure*)
- Start with 1 bottle/day (200mL) for 1 week
- Check that child is drinking supplement
- Encourage child to eat small frequent meals to help improve appetite
- Consider referring any child prescribed supplements to dietitian

Follow-up weekly

- Ask if supplement is being used — stop providing if not being used
- Weigh weekly
 - If child drinking supplement and growth faltering continues — increase to twice a day
 - If gaining weight well after 1–2 months — give half the amount for 2–4 more weeks then stop
- Continue to follow Growth Action Plan

Overweight or obese

Early obesity a risk factor for chronic disease. If child's weight for age growth curve is increasing rapidly according to their growth chart (see F 2.3), they may be at risk of becoming overweight or obese.

- **Identification, assessment and prevention** of obesity most important — can address issues early and help prevent the child from becoming overweight or obese
- **Do not** aim for weight loss but preventing further weight gain — allow child to 'grow into' their weight
- BMI for age and gender (*CPM p108*) indicates risk of overweight or obesity and need for intervention

Remember: Making changes for overweight child needs to involve the whole family and are lifelong

Ask

- Assess breastfeeding and/or food intake
 - Breastfeeding — how often
 - Formula feeding (*WBM p236*) — how often, correct amount and mixture given, prepared correctly
 - Food intake — is child receiving recommended healthy age appropriate foods (*p154*)
- Physical activity — time spent being active each day

Check

- Weight, height, BMI (*CPM p108*)
- Plot BMI on chart — must use same chart each time
 - WHO charts for children 0–19 years
 - *OR* CDC charts for children 2 years or more



- If 0–5 years (WHO chart [CPM p109](#))
 - BMI-for-age 97th percentile or over (z-score more than +2) — overweight or obese
- If 5–19 years (WHO chart [CPM p110](#))
 - BMI-for-age 85th percentile (or z-score +1) — overweight
 - BMI-for-age 97th percentile (z-score +2) — obese

Do

- Encourage family to
 - Eat together — no TV, screens
 - Increase physical activity ([CPM p144](#)) — walking with child to school, outdoor play
- Advise — daily activity
 - To get involved in sport and recreation activities
 - Limit screen time for children to less than 2 hours a day
- Advise — healthy food habits
 - Regular healthy meals, including breakfast and snacks
 - Which foods to have often and what to avoid
 - Limit availability of
 - Sweetened drinks such as soft drinks, cordial, fruit juice
 - Fried snacks and takeaway foods
 - Don't use foods as treats, rewards or to control behaviour
- Advise — children get enough sleep
 - Regular bedtimes, no TV in bedrooms

Follow-up

- Monitor weight, height, BMI ([CPM p108](#)), waist circumference — monthly, 3 monthly, yearly as growth becomes more normal. See *School-aged health check* ([CPM p121](#))
- Support and encourage small successes — slowing of weight gain, weight staying the same, height gain
- If no improvement or in obese range
 - Refer to doctor and paediatrician — may refer to dietitian, exercise program
- Refer to paediatrician if signs of complications
 - Sleep apnoea, diabetes, high BP, hip problems (eg slipped femoral epiphysis)
 - Pre-existing conditions getting worse (eg asthma, reflux)

Dental and oral problems — 6 months to 5 years

- If tooth pain, swelling, abscess — see *Pain in teeth or gums* (p335)

Strong Teeth for Little Kids

Messages for all parents and carers

- Breastfeed your baby, then wean to feeding cup not bottle
- If bottle fed — **do not** put baby to sleep with bottle
- Help clean child's teeth twice a day
 - From 18 months use smear of children's low-fluoride toothpaste — spit don't rinse out
- Give child plenty of water to drink
- Healthy food — no sweet drinks, lollies, cake, ice cream
- Brush your own teeth twice a day with soft toothbrush, fluoride toothpaste — after breakfast and before bed
- Visit the dentist for a check up every year

Lift the Lip

At 6 months old, then at least at every child health assessment you should **look inside mouth**.

- Use torch and dental mirror to help you see around mouth and back teeth
- If possible, clean teeth with toothbrush (no toothpaste) for better view
- Look at all teeth and gums for signs of tooth decay or gum disease (red, swollen gums) — see Table 2.17

Table 2.17: Tooth decay in young children

Tooth decay	Do
White spot areas (not yet a hole)	<ul style="list-style-type: none"> • Steps to follow for strong teeth — primary oral health care <ul style="list-style-type: none"> ◦ Show how to brush teeth with fluoride toothpaste* — do not rinse out! ◦ Smear fluoride toothpaste on decayed teeth — do not rinse out! ◦ <i>OR</i> apply fluoride varnish if trained (<i>CPM p173</i>) — repeat every 6 months as part of coordinated plan ◦ Encourage tooth brushing with soft toothbrush and fluoride toothpaste* twice a day — at home and other places children spend time (eg childcare, kindergarten)
Active decay (light yellow to brown holes)	<ul style="list-style-type: none"> • Steps to follow for strong teeth (<i>as above</i>) • Refer to dentist <ul style="list-style-type: none"> ◦ 1–3 small holes — less urgent ◦ 4 or more small holes or large hole/s — urgent
Arrested decay (blackened holes)	<ul style="list-style-type: none"> • Steps to follow for strong teeth (<i>as above</i>)

* Fluoride toothpaste recommended for children 18 months and older. May be used from 12 months if high risk — **dentist consult**.



Diarrhoea

- If young baby — see *Babies under 2 months who are sick or have a fever* (p121)

Common complications of diarrhoea

- Dehydration — must replace fluids (rehydrate)
- Wrong balance of body chemistry (eg metabolic acidosis, low bicarbonate, low potassium)
- Gut not being able to digest 'milk-sugar' (lactose intolerance)

Food during and after diarrhoea

- Always continue breastfeeding or normal formula
- Breastfed infants often feed more than usual — encourage this
- Formula fed infants should be given formula every 3 hours
 - Using lactose-free formula may reduce duration of diarrhoea and risk of worsening dehydration
- Continue feeding with good foods

Good foods

- Rice, bread, cereals, potato, banana, yoghurt, fruit, vegetables

Do not give

- Sports drinks — may increase fluid loss
- Food or drinks high in fat or sugar (eg chocolate, lollies, coke, other soft drinks, undiluted fruit juice, tea, other very sweet drinks)
- Antidiarrhoeal (antimotility) medicines (eg loperamide)
- Antiemetics (anti-nausea medicine) — except ondansetron

Ask

- Diarrhoea — when did it start, how often, is it watery, blood, mucus
- Vomiting — when did it start, how often, green (bile), spurting across room (projectile)
- Drinking and eating
 - How well child breastfeeding, drinking, eating
 - What are they eating, drinking
- Urine — how much urine, how many wet nappies
- Other sickness also present, contact with sick people

Check

- Temp, pulse, RR, O₂ sats, capillary refill — work out REWS (p6)
- Naked weight
- Full head-to-toe examination
 - Infections can cause diarrhoea — ear (p172), chest (p124), UTI (p184), meningitis (p101)
- Abdomen (p18) — swollen or tender
- Growth chart (p158) — is child growing well

- Signs of dehydration
- Is family coping (eg food, money problems, carer worrying)

Assessing dehydration

- Best way to measure dehydration in child is to work out percentage of weight loss
- If child's weight has been recorded in file notes in past few weeks use this to work out if they have lost weight — percentage of weight loss is about the same as percentage of dehydration

Table 2.18: Level of dehydration by percentage of weight loss

Dehydration	Mild	Moderate	Severe
Weight loss	Less than 5%	5–10%	More than 10%

- **Working out percentage (%) weight loss**
 - % weight loss = % dehydration
 - $[\text{Recent well weight} - \text{today's weight}] \div [\text{recent well weight}] \times 100$
Example: Weight last week was 13.5kg and weight now is 12.6kg
 $(13.5 - 12.6) \div 13.5 = 0.067$, then $\times 100$ (to make %) = **6.7%**
 - Child has moderate dehydration
- If recent weight not known — do clinical assessment of dehydration. See Table 2.19

Table 2.19: Clinical assessment of dehydration

Sign	Mild	Moderate	Severe
Main signs			
General appearance	Well, alert	Thirsty, restless or lethargic but irritable when touched	Drowsy, limp, cold or sweaty +/- unconscious
Eyes	Normal	A bit sunken	Very sunken
Tears	Tears	Less tears	No tears
Mouth and tongue	Moist	Sticky	Dry
Other signs			
Pulse rate	Normal	Fast	Weak, fast
Capillary refill	Normal — less than 2 seconds	2 seconds	More than 2 seconds
Skin pinch	Normal — goes back quickly	Goes back slowly	Goes back very slowly

Do

- **Medical consult if**
 - Moderate or severe dehydration



- Any of the following — may not be gastroenteritis
 - Fever
 - Shortness of breath or fast breathing
 - Altered conscious state, convulsions
 - Neck stiffness
 - Bulging fontanelle
 - Non-blanching rash (doesn't disappear when you press on it)
 - Blood or mucus in faeces
 - Severe or localised abdominal pain, swollen abdomen
- Send to hospital if
 - **Severe dehydration — this is medical emergency**
 - Signs of shock ([p66](#))
 - Neurological abnormality (eg drowsy or unusually irritable)
 - Significant abdominal tenderness or swelling
 - Green (bile) vomit
 - Baby with vomit spurting across room (projectile vomiting)
 - Another major sickness at same time (eg pneumonia)
 - No urine passed all day
 - It is late and you are not sure about managing child overnight
- Consider sending to hospital if
 - Moderate dehydration — especially if attempts at oral rehydration fail
 - Deep breathing — you suspect acidosis
 - Floppy — you suspect low potassium (hypokalaemia)

Do — if severe dehydration

Medical emergency.

- **Medical consult**
- Put in IV cannula ([CPM p84](#))
 - If can't get IV cannula in — put in IO needle ([CPM p88](#))
 - Take blood for electrolytes, if able
- Start **IV/IO fluids — Hartmann's solution or normal saline**
 - If in shock — give 20mL/kg as a bolus
 - If BP doesn't improve — repeat
 - If not in shock — give 20mL/kg/hour over 2–4 hours, depending on progress and medical advice
 - Aim to correct dehydration over 4 hours
- **OR** give nasogastric ORS (unless in shock)
- While waiting to send to hospital
 - Check pulse, RR, capillary refill every 15 minutes
 - Check BGL — if low (hypoglycaemia) may need to use rehydration solution containing glucose for maintenance
 - Record amount of diarrhoea and vomiting
 - Collect faeces and urine samples for pathology tests if possible

Do — if moderate dehydration

- Give ORS using cup, spoon, syringe, bottle — see Table 2.20
 - Doses see Table 2.21
- If 6 months or over and vomiting a lot — consider giving **ondansetron** wafer (doses [p441](#)). May help prevent need for IV rehydration
- **Medical consult**
- Check progress every half hour. If not drinking ORS — use nasogastric tube ([CPM p81](#))
- Check at 4 hours
 - How much ORS taken
 - How much diarrhoea and vomiting has there been
 - Weight, pulse, dehydration
- If better — weight gain, drinking well
 - Send home with ORS to continue at home — 10mL/kg after every diarrhoea action. Check again in 12 hours
- If still dehydrated
 - **Medical consult**
 - Continue ORS or use IV rehydration, as for severe dehydration

Do — if mild dehydration

- Give extra fluids — see Table 2.20
 - Give ORS using a cup, spoon, syringe, bottle
 - If child won't drink ORS — give usual fluids, but not high in sugar
- Check within 12 hours *OR* within 6 hours if under 6 months
 - How much ORS have they taken
 - How much diarrhoea and vomiting has there been
 - Weight, pulse, dehydration
- If better — not dehydrated, weight gain, drinking well
 - Send home with ORS to continue at home — 10mL/kg after each watery diarrhoea
 - Review daily until diarrhoea stops
- If more dehydrated
 - Treat as moderate dehydration
 - **Medical consult**

Do — if no dehydration

- Offer extra fluids/breastfeeds
- Give ORS 10mL/kg after every watery diarrhoea ([p169](#))
- If child won't drink ORS — give usual fluids, but not high in sugar
- If diarrhoea or vomiting continues — review next day



Fluids for treating dehydration

Table 2.20: Dehydration level and fluid rates

Dehydration	Review	Fluid rate	Method
Severe	<ul style="list-style-type: none"> • 10 minutes • Medical consult, send to hospital 	<p>Hartmann's solution or normal saline 20mL/kg</p> <ul style="list-style-type: none"> • If in shock — give as a bolus <ul style="list-style-type: none"> ◦ Repeat if BP does not improve • If not in shock — give over 2–4 hours depending on progress and medical advice <ul style="list-style-type: none"> ◦ Aim to correct dehydration over 4 hours 	IV or IO
Moderate	<ul style="list-style-type: none"> • Check every 30 minutes • Full review of hydration status in 2 hours • If no better — medical consult 	<ul style="list-style-type: none"> • Small frequent doses ORS — at least 10mL/kg/hr • Continue breastfeeding/formula/good foods 	Oral or NGT
Mild	<ul style="list-style-type: none"> • 12 hourly • If under 6 months — at least every 6 hours • Care for at home. Ask carer to return if lots of diarrhoea, child thirsty or lethargic 	<ul style="list-style-type: none"> • Extra fluids/ORS AND 10mL/kg after diarrhoea • Continue breastfeeding/milk formula/good foods 	Oral — cup, spoon, bottle, ice block

Table 2.21: Approximate ORS over 1 hour to replace fluid loss for child with moderate dehydration

Weight	Under 5kg	5–9kg	10–14kg	15–20kg
Amount of ORS (mL) over 1 hour at 10mL/kg	50mL	50–90mL	100–140mL	150–200mL

Note: Give extra ORS 10mL/kg after every watery diarrhoea.

Tips for giving ORS

- ORS prevents and treats dehydration — it doesn't stop diarrhoea
- If child vomiting a lot — start with 5mL every 1–2 minutes
 - Increase amount as child tolerates it
 - If over 6 months — consider giving **ondansetron** wafer (doses [p441](#)). May help prevent need for IV rehydration

- Use clock or timer so parent/carer can give ORS every 5 minutes
- Record how much ORS taken
- Give with spoon, cup, syringe, bottle (avoid bottle if breastfed)
- Mix ORS sachets with chilled water (makes it taste better)
 - If ORS sachets not available see *Making oral rehydration salts* (CPM p80)
- Try ORS ice blocks — but make sure same volume given

Special situations

- If blood and mucus in diarrhoea — likely to be caused by *Shigella*
 - Send faeces for MC&S and OCP
 - If fever, malnourished, unwell — give **azithromycin** —
 - Oral single dose on first day — child 10mg/kg up to 500mg
 - *THEN* oral once a day for another 4 days — child 5mg/kg up to 250mg
- If evidence of *Strongyloides* infection — see *Worms* (p416)
- If several linked cases of diarrhoea (eg children in daily close contact with each other, from same school class) —
 - Collect faeces samples for MC&S
 - Notify CDC/PHU

Persistent vomiting

- Routine use of antiemetics not recommended in acute gastroenteritis
- If significant, persistent vomiting after starting oral rehydration —
 - **Medical consult**
 - If 6 months or over — can give **ondansetron** wafer (doses p441)
 - Consider using nasogastric tube

Persistent diarrhoea

If diarrhoea for more than 7 days — treat as persistent diarrhoea. More common in malnourished children. May be caused by

- Gut being unable to digest some parts of milk (lactose intolerance)
- Gut damage
- Long-lasting or recurrent acute infections
- Parasitic infections like *Giardia* or *Cryptosporidium*

Ask

- How long diarrhoea has lasted

Check

- Weight (naked)
- Dehydration (p166)
- Child's growth on growth chart (p158). Is child growing well



Do

- If dehydrated — give ORS ([p169](#)) and send to hospital
- If growth faltering ([p158](#)) — **medical consult**, may need to send to hospital
- Collect faeces for MC&S and OCP on 2 occasions
- Encourage good diet ([p154](#))
- If baby formula fed — change to lactose-free formula
- If 6 months or over — **elemental zinc** once a day for 14 days – 20mg
 - This is 1.8mL if using 50mg/mL zinc sulfate (50mg/mL zinc sulfate = 11.3mg/mL elemental zinc)
- Treat for *Giardia*
 - Give **metronidazole** oral once a day for 3 days – child 30mg/kg/dose up to 2g (doses [p434](#))
 - *OR* **tinidazole** oral single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p437](#))

Follow-up

Check on child every 2–3 days.

- Examine and weigh child
- Ask about diarrhoea
 - If diarrhoea continues but child well — **medical consult**
 - If diarrhoea continues and child unwell — **medical consult** about sending to hospital
- Check faeces results for worms ([p417](#)) — treat if present

Prevention

Tell parents and carers how to help prevent spread of infection causing diarrhoea.

- Hand washing — most important. Use soap (liquid if available) and wash hands
 - After using toilet or changing nappy
 - Before getting meals ready or eating
- Do not share towels or clothing
- Children should not go to school or day-care while they have diarrhoea/vomiting and should wait 24 hours after last episode to return
- Children shouldn't use swimming pools until all symptoms have gone
 - *OR* for 2 weeks if they have *Cryptosporidium* infection

Ear and hearing problems

Ear infections in Aboriginal children can become chronic, causing hearing impairment and long-term learning and social problems. Important to treat ear problems *AND* manage disability related to hearing loss.

Prevention strategies

To reduce otitis media (ear infections)

- Breastfeed
- Avoid smoke — cigarettes and campfire
- Tell families about the spread of germs — about regularly washing children's face and hands with soap
- Tell children to blow nose until there is no snot left when they sniff
 - If no tissue — use bush hanky (blow one nostril at a time onto ground) then wash hands and face
- If bottle fed — feed baby in upright position
- Don't discourage swimming (unless child gets runny ears afterwards)
- Immunisations — on time

To prevent ear damage and hearing impairment

- Examine ears whenever children come to clinic
- Treat ear infections, follow-up with expert advice and ensure recovery — doctor, ENT specialist, audiologist

To prevent disability in children due to poor hearing

- Strategies to help child listen — use clear louder speech, let child watch face of speaker, give lots of opportunities to learn speech and language
- School strategies — classroom or individual amplification, sit child in place with less distractions
- Get advice from or refer to audiologist and speech pathologist
- Give information to family and school about child's disability and strategies to manage

Treatment strategies

Prioritise treatment as follows

1. Children under 3 years with pus (discharge)
2. Children under 10 years with hearing loss more than 25dB in better ear and speech or communication problems
3. Children 3–10 years with pus (discharge)
4. Children under 10 years with chronic ear disease and hearing loss more than 35dB



- Clinic management of ear disease
 - Use patient information and recall system, appropriate referrals
 - Train new clinic staff in diagnosis, treatment, communicating with families and teachers about ear health, follow-up, available services
 - Staff need to know how to clean ear with tissue spears (dry mop) (*CPM p164*) or syringe (*CPM p165*), put in drops properly (*CPM p166*), teach parents/carers to dry mop and put in drops

Ask

- How long has problem lasted — less than 6 weeks, 6 weeks or more, 3 months or more, unknown
- Pain, tenderness
 - In ear, when moving outer ear, behind ear
- Swelling, itch
- Runny ear
 - Type and amount of discharge
 - How long has it been present
- Any problems with hearing

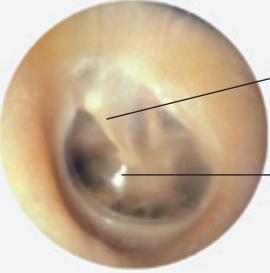
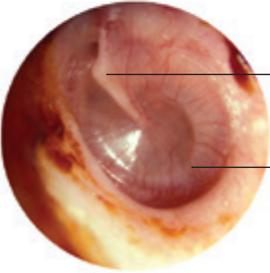
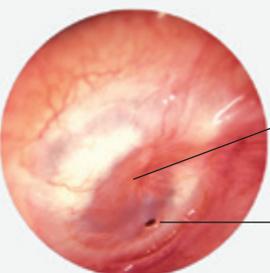
Check

- Temp
- Discharge — type and amount
- Otoscopy exam — check eardrum for colour, bulge, hole (perforation)
- If not too painful — test eardrum movement (*CPM p161*)

Otoscopy examination

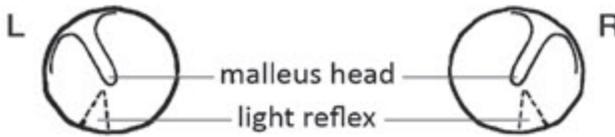
- Need clear view of eardrum
 - If pus (discharge) or wax — clean ear canal with tissue spears (*CPM p164*)
 - If a lot of pus (discharge) — may need to syringe (*CPM p165*)
- To help understand what you are seeing — see *Ear examination chart (p174)* and F 2.5 (*p175*)
 - If still not sure — take photo or video of eardrum (if possible) and email to ENT clinic
- If hole in eardrum — note and record in file notes
 - Size — small/pinhole (less than 2%), medium, large
 - Size of the hole will determine if topical antibiotics are effective
 - Location

Ear examination chart

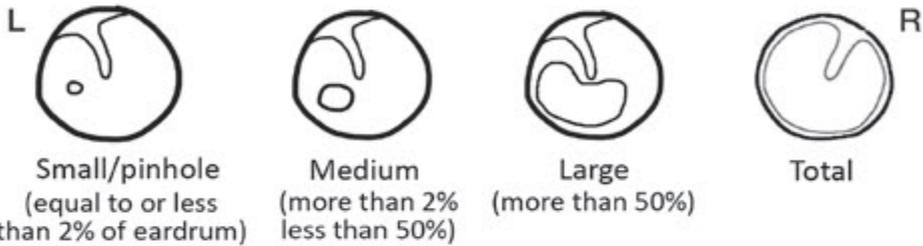
 <p>Handle of malleus Light reflex</p> <p>Normal eardrum L</p>	 <p>Handle of malleus Light reflex</p> <p>Normal eardrum R</p>
 <p>Malleus sticking out Eardrum may look sucked in (retracted)</p> <p>Otitis media with effusion (OME) L</p>	 <p>Medium perforation (15%)</p> <p>Dry perforation R</p>
 <p>Pus causing eardrum to bulge</p> <p>Acute otitis media (AOM) L</p>	 <p>Reduced bulging but eardrum still red Pinhole perforation (less than 2%)</p> <p>Acute otitis media with small perforation (AOMwiP) R</p>
 <p>Medium perforation (30%) Pus and mucus</p> <p>Chronic suppurative otitis media (CSOM) L</p>	 <p>Middle ear structures worn away Large perforation (75%)</p> <p>Chronic suppurative otitis media (CSOM) R</p>



Normal eardrum



Perforated eardrum



Note: In total perforation, the tiny ossicle bones of the ear (malleus, incus, staples) may not be seen if they have been worn away by infection.

Unsafe perforation of the eardrum



Note: A perforation in the upper (attic) region of the eardrum may be a cholesteatoma (p181) and must be seen by a doctor

Scarring of the eardrum



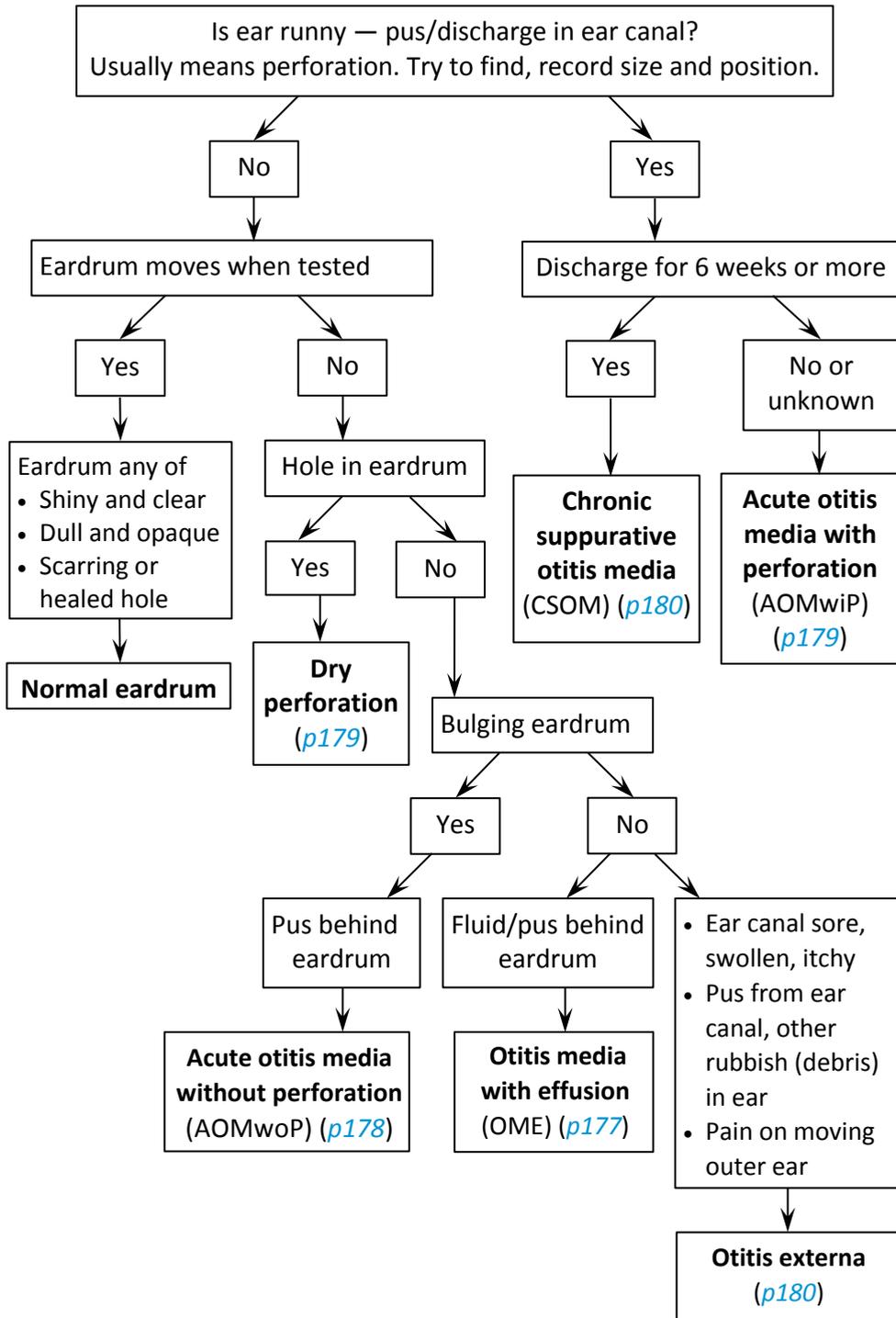
2.5

Assessment

- Diagnosis of ear conditions
 - Key features seen on otoscopy (CPM p158) — hole in eardrum (perforation), pus (discharge), eardrum bulge
 - Movement of eardrum — tympanometry or with puffer (CPM p161)
 - See Flowchart 2.5

Note: Runny ear usually means a perforation. Always try to find perforation and record its size and position.

Flowchart 2.5: Diagnosing ear problems



- If hole in upper (attic) region — may be cholesteatoma. Medical review within 1 week
- If red eardrum, fever, pain, irritability — acute otitis media
- If 3 episodes of AOM (with or without perforation) in last 6 months, or 4 episodes in last 12 months — recurrent AOM

Management

Treatment — general principles

- If pain relief needed — give **paracetamol** up to 4 times a day (qid) — adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
 - **Medical consult** if pain severe and not managed by paracetamol
- If small (pinhole) perforation — topical antibiotics (eg ear drops) not used, can't pass through hole into middle ear. Oral antibiotics should be given
- If using ear drops — gently push on ear flap (tragal pumping) to help ear drops reach middle ear. Teach parents how to do this
- If persistent otitis media (any type) for more than 3 months — refer child for hearing test (audiology)

Otitis media with effusion (OME) — glue ear

Can be hard to diagnose. Hearing problems often only symptom.

Do

- See *Treatment — general principles (above)*

If problem for less than 3 months

- Reassure parents/carers
- No investigation or treatment needed
- Medical review at 3 months to check for resolution
- If any hearing, speech, language concerns — refer to audiology

If OME in both ears for 3 months or more — persistent OME

- Medical review
- Consider long-term antibiotics, especially in young child at high risk of CSOM
 - Give **amoxicillin** oral twice a day (bd) for 2 months — adult 1g, child 25mg/kg/dose up to 1g (doses [p425](#)), then review
 - If allergic to penicillin — **medical consult**
- Refer for hearing test
 - If hearing loss more than 25dB — consider referral to ENT specialist
 - Grommet surgery may improve hearing in short term, but risk of complications in child at high risk of CSOM
- Talk with parents about stimulating speech and language in young child — lots of talking, going to preschool, childcare, early learning program
- If concerns about speech, language, behaviour development — refer to paediatrician

Acute otitis media without perforation (AOMwoP)

Bulge but no hole. If hole healed but pus in canal — treat as AOMwiP ([p179](#)) and ask parent/carer to bring back for review.

Do

- See *Treatment — general principles* ([p177](#))

Do — if low risk

- Low risk — non-Indigenous and no strong family history of AOM or complications
- Tell person to come back to clinic if no improvement in 48–72 hours and then give **amoxicillin** oral twice a day (bd) for 7 days – adult 1g, child 25mg/kg/dose up to 1g (doses [p424](#))

Do — if high risk

High risk otitis media

- All Indigenous children
- Non-Indigenous children
 - Under 2 years with both ears affected
 - If sick (eg fever), severe ear ache
- Talk with family about importance of antibiotics to prevent CSOM
- Give **amoxicillin** oral twice a day (bd) for 7 days – adult 1g, child 25mg/kg/dose up to 1g (doses [p424](#))
 - If child has been on antibiotics in past 30 days — give **amoxicillin** oral twice a day (bd) for 7 days – adult 2g, child 50mg/kg/dose up to 2g (doses [p424](#))
 - If allergic to penicillin — give **trimethoprim-sulfamethoxazole** oral twice a day (bd) for 7 days – adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg (doses [p437](#))
- Review after 48–72 hours. If no improvement —
 - Check compliance and if treatment is understood
 - Increase dose to **amoxicillin** oral twice a day (bd) – adult 2g, child 50mg/kg/dose up to 2g (doses [p424](#))
 - If allergic to penicillin — **medical consult**
- Review again after 48–72 hours
 - If no improvement — give **amoxicillin–clavulanic acid** oral twice a day (bd) for 7 days – adult 2+1.4g, child 50+7.1mg/kg/dose up to 2+1.4g (doses [p425](#))
- Review again after another 48–72 hours
 - If no improvement — **medical consult**
- If child under 2 years — may need many weeks of antibiotics to get better
- Review 4 weeks after treatment stopped



Dry perforation (hole)

Do

- See *Treatment — general principles* (p177)
- Advise family to bring child back to clinic straight away if pus (discharge) from ear. Treat as AOMwiP (*below*)
- If hole in eardrum for more than 3 months — hearing test, medical review
 - If hearing impairment — make sure hearing support aids used at home and school
- If child over 6 years with perforation not healed in 6–12 months or hearing loss more than 20dB — refer to ENT specialist, may need surgical repair

Acute otitis media with perforation (AOMwiP)

Do

- See *Treatment — general principles* (p177)
- Give **amoxicillin** oral twice a day (bd) for at least 14 days, and until ear is dry for 3 days – adult 2g, child 50mg/kg/dose up to 2g (doses p424)
- **AND** if perforation larger than pinhole or can't be seen, or duration of discharge unknown — also give **ciprofloxacin** ear drops twice a day (bd) – 5 drops
- Review after 7 days. If ongoing pus (discharge) or perforation — change to
 - **Amoxicillin–clavulanic acid** oral twice a day (bd) – adult 2+1.4g, child 50+7.1mg/kg/dose up to 2+1.4g (doses p425)
 - **AND ciprofloxacin** ear drops twice a day (bd) – 5 drops
- Review after a further 7 days. If ongoing discharge — **medical consult**
- **Review weekly** and continue antibiotics until signs of AOM resolved
- If not resolved within 6 weeks — treat as CSOM (p180)
- If AOM completed resolved — review after 4 weeks

Recurrent AOM (rAOM)

3 episodes of AOM (with or without perforation) in last 6 months, or 4 episodes in last 12 months.

Do

- See *Treatment — general principles* (p177)
- **Medical consult**
- Refer for hearing test
- If under 2 years and at high risk of CSOM — consider preventive antibiotics
 - Give **amoxicillin** oral twice a day (bd) for 3 months – child 25mg/kg/dose up to 1g (doses p424), then review
 - If allergic to penicillin — **medical consult**
 - Tell parents/carers that preventive antibiotics should reduce number of infections by about half
- If doesn't improve — continue antibiotics, refer to ENT specialist, paediatrician

Chronic suppurative otitis media (CSOM)

Perforation with pus (discharge) for 6 weeks or more.

Do

- See *Treatment — general principles* (p177)
- Clean with tissue spears (CPM p164) OR syringe (CPM p165) with **povidone-iodine** diluted 1:20
 - If pus thick — syringe first
- Give **ciprofloxacin** ear drops twice a day (bd) until ear dry for 7 days – 5 drops
- If pinhole perforation — also give **amoxicillin** oral twice a day (bd) for 3 months – child 25mg/kg/dose up to 1g (doses p424)
- Teach parents to clean/dry mop ears with tissue spears, put in drops
- Talk with parents about stimulating speech and language in young child — lots of talking, going to preschool, childcare, early learning program
- Review weekly
- Continue until CSOM resolved — no pus for more than 3 days
 - If ear dry (no pus) but still perforation at end of treatment — treat as dry perforation (p179) and refer for hearing test
- If still pus (discharge) after 3 months — **persistent CSOM**
 - Clean ear, give drops daily at clinic
 - Medical review
 - Refer to ENT specialist. Exclude cholesteatoma (p181)
 - Hearing test, refer to paediatrician, speech pathology
 - Manage hearing impairment

Otitis externa

Check for hole in eardrum — could really be middle ear disease.

Do

- See *Treatment — general principles* (p177)
- Clean ear carefully with tissue spears (CPM p164)
- Give
 - **Dexamethasone-framycetin-gramicidin** ear drops
 - Put in drops by tilting head and filling ear canal (CPM p166)
 - OR **triamcinolone-neomycin-gramicidin-nystatin** ointment
- If ear canal very swollen — put in drops using an ear wick (CPM p166)
 - Change wick every 2 days
 - If swelling has gone down — remove ear wick, clean canal and give drops as above
- Keep ears dry (no swimming or wetting) for 2 weeks after finishing treatment
- If not better in 1 week OR severe symptoms and poorly controlled pain — **medical consult**



Infected grommets

Do

- See *Treatment — general principles* (p177)
- If uncomplicated (no fever or associated illness) —
 - Clean ears with tissue spears
 - Give **ciprofloxacin** ear drops twice a day (bd) for 7 days or until ear dry for 3 days – 5 drops
 - Keep ear dry (no swimming or wetting) during treatment
 - **Do not** give oral antibiotics
- If complicated (sick child, T 38.5°C or more, illness needing oral antibiotics, swelling on inside and outside of ear canal) — **medical consult**
- Chronic discharge for more than 3 months — refer back to ENT

Acute mastoiditis

- Rare but can be fatal — infection can spread to brain. Starts as AOM then becomes infection in bone behind ear (mastoid)
- Child very unwell (toxic)
- Tenderness, usually swelling behind ear over mastoid bone — F 2.6
- Ear may stick forward at funny angle



2.6

Do

- **Medical consult, send to hospital urgently**
- Take blood for blood cultures (*CPM p375*) before giving antibiotics
- Give **flucloxacillin** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses p432)
- **AND gentamicin** IV single dose (doses p433)
- If allergic to penicillin — **medical consult**

Cholesteatoma

Abnormal skin growth (cyst) in middle ear behind eardrum. Can occur after repeated infections, may gradually increase and destroy bones of middle ear.

- Consider cholesteatoma if
 - CSOM with perforation in top (attic) area
 - Granulation tissue, or scaly material seen through persistent perforation
- Refer all possible cases to ENT specialist for evaluation, management — must be seen within 1 week
- If in pain — **medical consult**, send to hospital

Foreign bodies

Things that shouldn't be in ear (eg stones, insects).

- Most foreign bodies can be syringed out with warm water (*CPM p165*)
- **Never** use forceps to remove foreign body
- Before syringing — can drown insect with vegetable oil, lidocaine (lignocaine) 1%, or tetracaine (amethocaine) 1%
- Hard wax can be softened before syringing
 - **Sodium bicarbonate** solution (¼ teaspoon in 10mL water) twice a day (bd) for 3–4 days – 4 drops
 - *OR* **docusate sodium** ear drops — fill canal with drops for 2 nights
- If problems — **medical consult**, refer to ENT specialist if needed
- If pain, fever (T more than 38°C), bloody pus (discharge) from ear — **medical consult** straight away

Hearing impairment

- Otitis media causes hearing impairment that ranges from mild to severe
 - Hearing loss is often temporary but with repeated episodes of otitis media loss can become permanent
- If hearing loss for more than 3 months in both ears
 - Risk to language development and learning — refer to speech pathologist
 - Refer for rehabilitation including hearing aids (eg Australian Hearing), speech pathology

Hearing tests

- Most newborn babies have hearing screen for nerve deafness before leaving hospital
 - Some babies will need further testing at 9 months due to risk factors (eg family history, suspected meningitis)
- Tests can be done from when baby can sit and turn head (about 9 months)
- Audiogram measures hearing in decibels (dBs) at different pitches (frequencies). Used to predict what problems likely, what assistance may be needed

Note: Audiology services will advise what referrals are needed.

Communication strategies

Hearing loss is a risk to language and cognitive development. Loss in early years more likely to cause long-term problems.

- Hearing loss can cause problems with language (especially English as second language at school), vocabulary, reading, spelling, numeracy, social development, socialising, behaviour, general wellbeing
- During early years, support mild hearing loss by
 - Exposure to lots of language rich interactions with family (eg singing, reading, telling stories)



- Linking into community play groups, childcare, other early years development programs
- School-aged
 - Encourage parents/carers to talk to school about child's hearing loss
- Strategies to use when talking to person with hearing loss
 - Use first language, with interpreter if needed
 - Get close to person
 - Face person, help them to look at your face
 - Reduce background noise
 - Use simple language, short sentences
 - Check person understands what has been said, repeat if needed
 - Use more gestures and/or pictures

Table 2.22: Understanding hearing test results

Hearing test result	Expected hearing and communication disability	Action
0–20dB loss in one or both ears	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Review if still concerned
Loss in one ear only — other ear normal	<ul style="list-style-type: none"> • Hearing speech when background noise • Localising sounds 	<ul style="list-style-type: none"> • Talk with family about possible problems • Amplification can help
Better ear Mild 21–30dB loss	<ul style="list-style-type: none"> • Hearing speech when background noise • Hearing soft speech sounds • Learning language 	<ul style="list-style-type: none"> • Hearing and educational support • Encourage use of amplification • Communication strategies
Better ear Moderate 31–60dB loss	<ul style="list-style-type: none"> • Hearing speech even in quiet place • Learning a new language • Listening at a distance • Following group conversation 	<ul style="list-style-type: none"> • Hearing and educational support • Encourage use of amplification • Communication strategies
Better ear Severe 61–90dB loss <i>OR</i> Profound 91 or more dB loss	<ul style="list-style-type: none"> • Unable to hear speech • Unable to acquire language 	<ul style="list-style-type: none"> • Specialised hearing services — including educational support • Encourage use of amplification • Communication strategies

Urine problems — 2 months to 12 years

- If young baby — see *Babies under 2 months who are sick or have a fever* (p121)

Urinary tract infection (UTI)

- Consider UTI if
 - Young child — irritable, unexplained fever, poor feeding, vomiting, weight loss or poor growth
 - Older child — urinary frequency, pain on passing urine (dysuria), abdominal or flank pain, vomiting

Ask

- Pain when passing urine (dysuria)
- Passing urine more often than usual (frequency)
- Abdominal pain (p18) or flank/loin pain (p28)
- In boys
 - Red, swollen penis or foreskin — balanitis (p189)
 - Ballooning of foreskin on urination, poor stream — phimosis (p189)
 - Foreskin retracts behind glans and becomes trapped, extremely painful — paraphimosis (p190)

Check

- Head-to-toe examination
 - Temp, pulse, RR, BP, O₂ sats, capillary refill — work out REWS (p6)
- Weight, growth assessment
- Collect clean urine sample (p185)
 - If over 2–3 years — midstream sample
 - If young child who won't pass urine on request — clean catch or finger tap
 - If very unwell — bladder tap or catheter
- U/A — only look at leucocytes and nitrites when considering UTI
- If positive nitrites and/or leucocytes *OR* high clinical suspicion of UTI
- (eg previous UTIs) — send urine for MC&S

Do

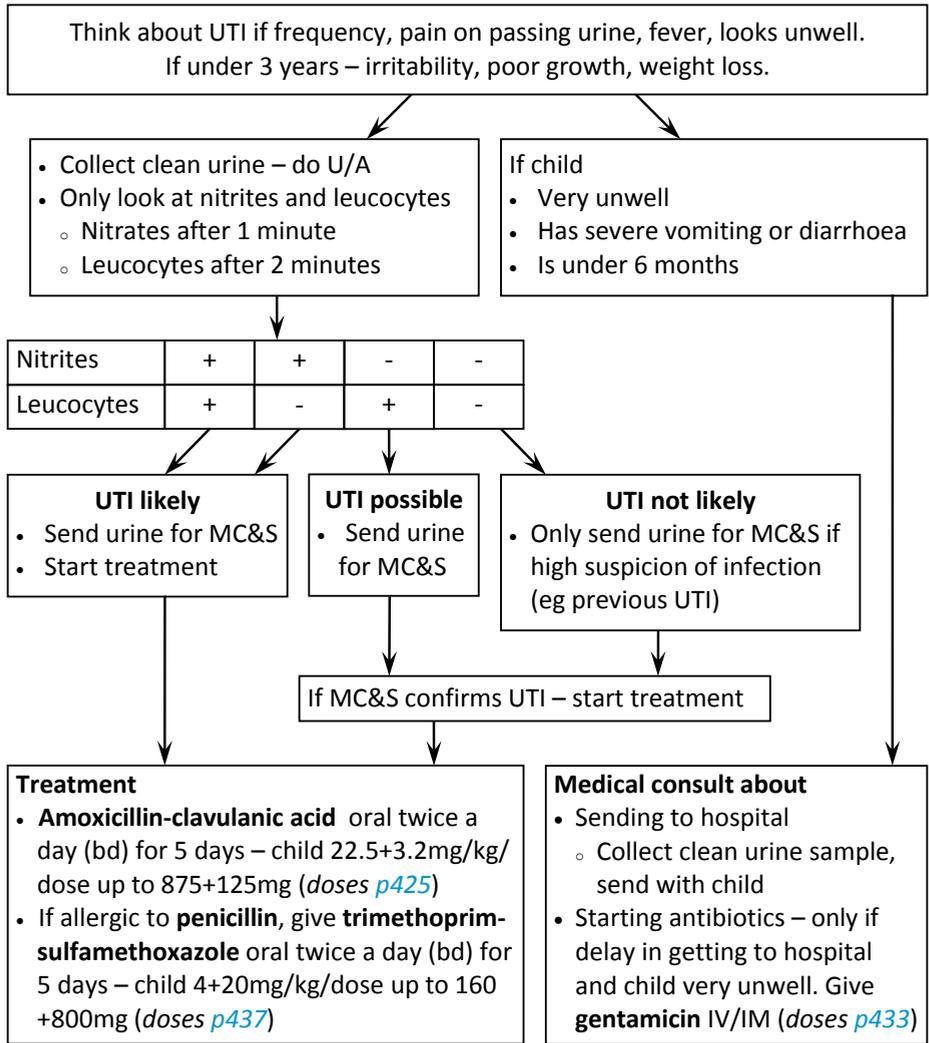
- Follow Flowchart 2.6
- UTIs in older children can sometimes be caused by sexual abuse
 - Urine test for STI not a good screening test for sexual abuse
 - **Do not** use without talking with parents and then only if also other reasons to suspect sexual abuse — see *Child sexual abuse* (p146)



Table 2.23: Collecting urine samples

Collection method	How done	Advantages	Disadvantages
Midstream urine	<ul style="list-style-type: none"> • Clean genital area with water • Do not collect first urine • Collect sample in sterile container after flow started 	<ul style="list-style-type: none"> • Lessens contamination 	<ul style="list-style-type: none"> • Needs cooperation • Not possible in young child
Clean catch	<ul style="list-style-type: none"> • Clean genital area with water • Wait for infant to void • Catch urine in sterile container after flow started 	<ul style="list-style-type: none"> • Much less contamination than bag sample 	<ul style="list-style-type: none"> • Needs effort and patience from clinic staff or parent
Finger tap (CPM p395)	<ul style="list-style-type: none"> • 15–20 minutes after a good feed • Hold child up under armpits • Tap suprapubic area • Catch midstream urine in clean jar 	<ul style="list-style-type: none"> • Safe and easy collection method for newborns and infants • Not invasive — doesn't upset parents 	<ul style="list-style-type: none"> • Urine to be collected in a specified time frame — may fail
Bladder tap (CPM p396)		<ul style="list-style-type: none"> • Sterile collection in infants under 18 months 	<ul style="list-style-type: none"> • Invasive • Clinician must be trained
Catheter	<ul style="list-style-type: none"> • Female (WBM p281) • Male (CPM p205) 	<ul style="list-style-type: none"> • Sterile urine collection in child who can't void on command 	<ul style="list-style-type: none"> • Invasive • Clinician must be trained
Urine bag (CPM p394)		<ul style="list-style-type: none"> • Useful for excluding UTI 	<ul style="list-style-type: none"> • Contamination rates high. If suggests UTI — confirm with better collection method if possible

Flowchart 2.6: Investigation and management of possible UTI



Follow-up

- All urine MC&S results need to be seen by doctor for interpretation — see Flowchart 2.7
 - Interpretation depends on collection method — always write collection method on pathology form
- Medical review for all children with confirmed UTI
- Repeat U/A 1 week after completing antibiotics

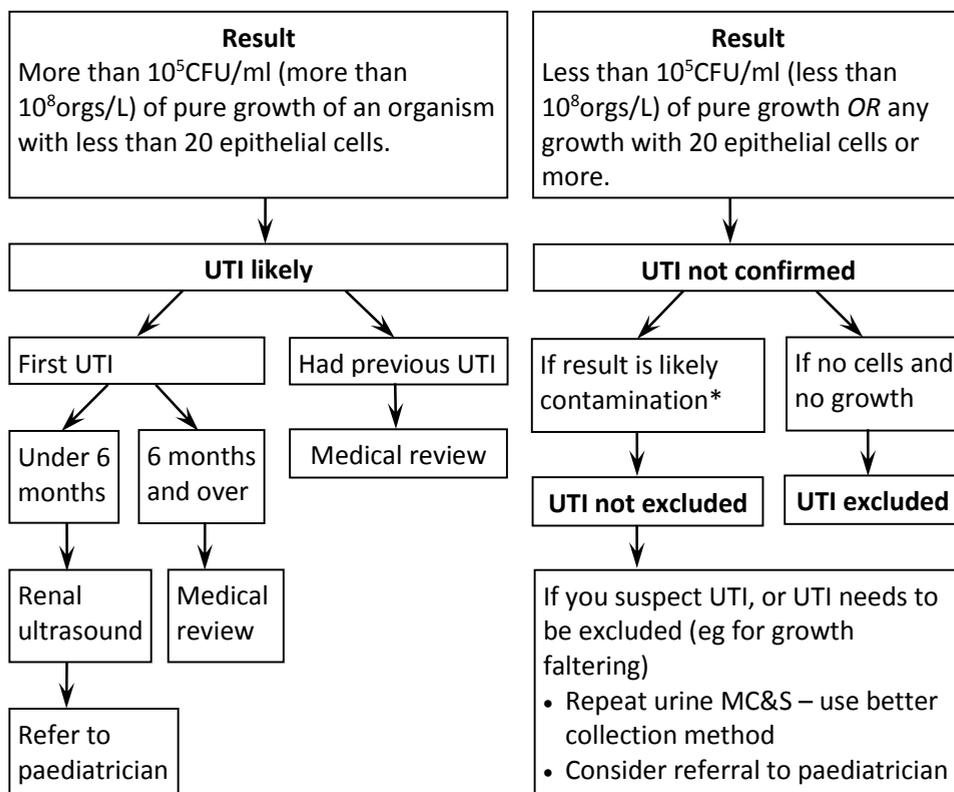
Follow-up first UTI — proven by MC&S

- Initial treatment with antibiotics — see Flowchart 2.6



- Renal ultrasound to check for structural problems in urinary system in babies under 6 months *OR* if complicated UTI — talk with paediatrician

Flowchart 2.7: Interpreting urine MC&S results



* Mixed growth or epithelial cells or bag sample.

Blood or protein in urine

Post-streptococcal glomerulonephritis (PSGN)

Consider PSGN if

- Moderate (2+) or more blood on U/A
- *OR* visible blood in urine (macroscopic haematuria) — urine dark (tea colour)

AND

- Swelling (oedema) of face or legs — check with parent/s or carer/s
- *OR* unusual and fast weight gain (from oedema)
- *OR* high BP for age ([p422](#)) — correct cuff size important for right BP measurement

Note: Usual presentation is cola coloured urine and puffy face — most easily seen on waking, may not be obvious at other times.

Do

- **Medical consult** — may need to send to hospital for investigations (C3, C4, ASOT, Anti-DNAse B, UEC)
- If high BP ([p422](#)) — **medical consult, send to hospital urgently**
 - Talk to paediatrician about need to
 - Give **furosemide (frusemide)** straight away if BP very high for age
 - Restrict fluids, give more **furosemide (frusemide)** or antihypertensive medicine during transfer
- Notify CDC/PHU

Subclinical cases

- Recent Group A streptococcal infection and blood on U/A — but no high BP or swelling (oedema)
- Don't need to go to hospital — but need to notify doctor and CDC/PHU
- Follow-up at 12 weeks
 - Repeat C3, C4 to check return to normal
 - Repeat U/A and BP
 - Weekly U/A not needed

Other causes of blood in urine (haematuria)**Microscopic — blood only seen on U/A**

Often found in well child. Causes include fever, infection, kidney stones, other kidney problems, nappy rash, genital sores, injury. In many cases no cause found.

Check

- History of kidney problems
- BP
- U/A for protein
 - Repeat in 1 week
 - *OR* if sick with a fever — repeat after sickness resolved
- Full head-to-toe examination, weight
- Look for swelling (oedema)
- Look for sores, inflammation, rashes in private parts (genital area)

Do

- If high BP for age ([p422](#)) — **medical consult** straight away
 - Correct cuff size important for right BP measurement
- If positive protein on U/A — send urine for ACR
 - If ACR high — medical/paediatric review
- If blood trace or 1+ on U/A, BP normal, no protein in urine (proteinuria), normal renal function — usually benign. Non-urgent medical review



Protein in urine (proteinuria)

If protein more than trace on U/A.

Check

- BP
- Consider UTI, STI, etc
- Send urine for ACR

Do

- If high BP for age ([p422](#)) — **medical consult** straight away
 - Correct cuff size important for right BP measurement
- If ACR high — medical/paediatrician review

Vesico-ureteric reflux (VUR)

Urine flows from bladder back up to kidneys.

- Can cause kidney damage if severe
- May need long-term antibiotics to prevent UTIs. Plan developed by paediatrician or paediatric urologist will include antibiotics and follow-up

Problems in boys

Balanitis

Infection of foreskin and glans penis. Common in young boys.

Check

- Swelling, redness, pain, fever (T more than 38°C)
- Swab for MC&S

Do

- Give **trimethoprim-sulfamethoxazole** oral twice a day (bd) for 5 days – child 4+20mg/kg/dose up to 160+800mg (doses [p437](#))
- If not getting better — check MC&S result, use antibiotic based on sensitivity
- If repeated infections — **medical consult**
- Encourage hygiene, washing with soap every day

Phimosis

Can occur after balanitis due to scarring of foreskin.

Ask

- Ballooning of foreskin when passing urine
- Poor stream

Check

- Tight foreskin (small hole)

Do

- Use **betamethasone valerate cream 0.05%** twice a day (bd) for 3–4 weeks
 - Spread directly on foreskin

Follow-up

- Review to check it is resolved
- If not resolved — refer to surgeon

Paraphimosis

Foreskin retracted behind glans penis and gets stuck. Swollen penis, very painful.

Do

- **Medical consult**
- Needs urgent reduction ([CPM p207](#))



3 Mental health and drug problems

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Mental health emergency

- In mental health emergency person has
 - Marked disturbance of thought, mood, behaviour
 - *AND* risk of serious physical or psychological harm to self or others
- Examples of mental health emergencies
 - Acute suicidal or self-harm ideas or behaviour
 - High-risk behaviours due to mental illness
 - Psychiatric/behavioural change due to urgent medical condition
 - Psychological crisis due to severe stress, trauma, situational crisis

Safety

During mental health emergency consider safety of all concerned — person, staff, carers, community people.

- **Do not** be a hero
- Assess potential risk to self and others
- Know your organisation's safety policy
- Make sure you are not alone — get help (eg family, night patrol, police). Have them stay quietly nearby
- If person aggressive or has weapon — keep away
 - If inside — make sure person can leave room
 - Ideally you should have separate exit (room with 2 doors)
- Keep person away from places where weapons might be kept — or take away any potential weapons
- Limit number of people talking to person and control what is said to them — to lessen confusion
- **Do not** restrain person, seek police intervention if necessary

Do first

- Get help from ATSIHP and/or family who are trusted and can help to calm person
- **Medical consult** for advice and support, as soon as possible
- Use **calming techniques** if appropriate/possible
 - Talk with person in quiet place with lots of light — speak calmly and clearly, use simple language, use interpreter if needed
 - Be aware of your non-verbal cues — be calm and non-threatening, with open relaxed body posture, direct eye contact may be confronting
 - Calm person — tell them you are trying to help
 - The louder they become the softer you should speak
 - Only have one person (and interpreter if needed) talking with them — to avoid confusing them
 - Personalise situation — use person's name, acknowledge their feelings
 - Work with them on a way to deal with their concern
 - **Do not** promise what you can't give

- Advise person that use of violence may result in police involvement, if appropriate
- **Do not** persist if calming techniques appear to not be working
- Person may need to be sedated straight away (*below*), or held in police custody
 - If IV/IM sedation given — must stay in clinic for observation and airway management

Check

- Patient file notes
- Obtain history from family, police, community workers
- If possible — do physical examination including
 - Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*)
 - BGL
 - U/A, urine for drug screen
 - If confusion or drowsiness — coma scale score (*p74*)
- Consider head injury (*p72*), epilepsy (fits), medicine toxicity, substance use (intoxication), electrolyte imbalance, thyroid disease, infection (eg chest *p309*, ear *p172*, UTI *p411*, meningitis *p101*, encephalitis)
- Do mental status examination (*CPM p113*) if appropriate

Do

- Decide if person will be managed in community or sent to hospital
 - Consider hospital if
 - Person getting worse
 - Situation out of control
 - Family, community or clinic can't manage safely
 - Know your regional mental health referral and admission processes
- Calming techniques if appropriate/possible (*p192*)

Sedation

- Usually ordered by doctor
- May be useful if person
 - Agitated — including DTs/'horrors'/fits from alcohol withdrawal
 - Waiting for transport to hospital
 - Starting treatment in community
- **Oral sedation**
 - Give **diazepam** — adult 5–10mg — repeat as needed every 2–6 hours up to 40mg/day
 - *OR* **olanzapine** wafer — adult 5–10mg — repeat as needed every 2–6 hours up to 20mg/day
- **IM sedation**
 - If oral sedation not working *OR* person severely agitated or threatening harm — use IM medicine

- Give **midazolam** – adult 5–10mg — repeat every 20 minutes if needed up to 20mg/day
 - **Midazolam** very short acting — consider adding longer lasting oral **benzodiazepine** once person settled

Sedation can be dangerous — oral sedation safest.

- Use oral sedation unless person very disturbed or refusing to take tablets — then use IM sedation. Avoid IV sedation
- **Diazepam** and **midazolam** together can put breathing at risk. **Be ready to manage airway and breathing**
- **Do not** give **benzodiazepines** (eg diazepam) to child, or person who is very drunk. Wait 6–8 hours after last drink
- Give older people lower doses
- Do observations before, during and after sedation

After sedation

- Put in 2 wide bore IV cannula (*CPM p84*). If sending to hospital — put in cubital fossa/upper forearm to leave room for wrist restraints. Splint elbow straight
 - May need fluids, BP may drop due to sedation
 - If transporting person (*CPM p23*) — IV access needed
- **Medical consult** about how often to take observations
 - Temp, pulse, RR, BP, drowsiness levels

Other medicines

Antipsychotics

If person has psychotic symptoms — **medical consult** and give

- **Oral**
 - Usual antipsychotic medicine if on one — check file notes
 - *OR* **olanzapine** wafer – adult 5–10mg
 - *OR* **risperidone** – adult 0.5–2mg
- *OR* **IM**
 - **Haloperidol** – adult 5–10mg *AND* **benzatropine** – adult 1–2mg
 - **Do not** put person on stomach after giving haloperidol — risk of throat (laryngeal) spasm
 - Start with lower doses for child/adolescent, older person, person who has not used antipsychotics before

Extra benzatropine may be needed with haloperidol if side effects (eg stiffness, tremor, slowed movement). Less likely to be needed with risperidone or olanzapine.

Olanzapine and midazolam together can put breathing at risk. **Be ready to manage airway and breathing.**

Sending person to hospital

- Further assessment at hospital usually needed. Can be voluntary or involuntary. Not all patients will be admitted
- **Medical consult** to organise sending to hospital — see local protocols
- Involuntary assessment
 - If person meets requirements under state/territory *Mental Health Act* — they can be sedated and/or restrained and sent to hospital for assessment and treatment without their permission. See *Transport – person who may become violent (CPM p23)*
 - Authorised by doctor or authorised/designated mental health practitioner. **Always consult doctor or on-call psychiatrist**

Important that you understand

- Requirements for involuntary assessment or treatment under your state/territory *Mental Health Act*
- How to contact an authorised/designated mental health practitioner
- What needs to happen if person being sent to hospital in another state/territory

Anxiety

Affects the way a person thinks, feels, behaves.

- Panic attack — mind and body overreact to situation
 - Usually less than an hour — starts suddenly, gets worse quickly
 - Person may think they are going to die, having a heart attack, going mad
- Phobia — strong anxiety/fear reaction to certain situations or objects
- Anxiety and fear reactions can last for months or years, often triggered by stressful event or can be a side effect of another medicine
- Anxiety disorders often occur with depression, substance misuse

Person may show symptoms

- **Spiritual**
 - Worry more than usual about traditional or normal life matters
 - Uncomfortable or uneasy spirit
- **Thoughts and emotions**
 - Feeling of worry, panic, lack of control over life, impending sense of doom, being judged negatively by others (eg thought to be stupid, ugly)
 - Fear of having a heart attack, going mad, going crazy
 - Intrusive thoughts/memories/nightmares or flashbacks about traumatic events
- **Physical**
 - Pacing, agitated, body shakes, unable to relax, restless, 'on edge'
 - Headache, chest pain, racing heart, tight chest, stomach pain/nausea, faint
 - Breathless/hyperventilating — breathing fast, shallow, dry mouth
 - Choking feeling, can't swallow
 - Trouble getting to sleep, waking frequently
- **Behavioural**
 - Gives up easily, finds it hard to finish things
 - Using more alcohol or other drugs
 - Avoiding things that make them anxious — people, leaving home, certain things or places, reminders of traumatic events
 - Always looking out for danger (hypervigilant)
 - Repetitive behaviours
 - Seeking reassurance all the time

Anxiety disorders

Do first

- Take person somewhere calm and quiet (if possible)
- Be calm and supportive. Reassure them they are safe, experience will stop
- Encourage slow deep breathing through nose — take a few seconds to breathe in, then a few seconds to breathe out, at least 10 times



Ask

- About worries
 - Symptoms ([p196](#))
 - When did these feelings start
 - What triggers feelings, how long do they usually last
 - What helps
- Thoughts of self-harm or suicide ([p207](#))
- Unhappy or sad mood — see *Depression* ([p201](#))
- Cultural explanation — is presentation outside what is normal in community now
- Family history of anxiety
- Alcohol (grog) ([p209](#)) and/or drug use, long-term and recent

Check

- File notes for medical history, medicines review
- Temp, pulse, RR, BP, O₂ sats
- Clinical assessment to exclude physical cause for symptoms

Do

- **If short-term symptoms** — 2–3 days
 - Review in 1 week — anxiety may get better itself
- **If long-term, more serious anxiety condition, not getting better**
 - Take blood for FBC, UEC, LFT, TFT, BGL, syphilis serology
 - Medical review — advice about treatment, psychologist referral

Ongoing management

- **Mental health team consult** if not responding to treatment
- Make management plan ([CPM p128](#))
 - Consider mental health plan if applicable
 - Practical problem solving — what is important to do first, how to do it
- Education about anxiety, relaxation training, practise slow deep breathing

Confusion — delirium and dementia

Confusion can be caused by delirium, dementia, depression, psychosis.

Important to work out which one person has.

- **Delirium** — acute disturbance of thinking, behaviour, inability to concentrate (stay on train of thought). Usually **sudden onset**
 - Fluctuating conscious state, disoriented to time, place and/or person, disturbed sleep, poor concentration and memory, hallucinations, delusions
 - Usually due to underlying sickness. Dementia, head injury, intellectual disability (cognitive impairment) increase risk of delirium.

Urgent medical problem — often reversed by treating underlying cause.

- **Dementia** — progressive disturbance of thinking and behaviour, overall loss of function, often loss of ability to learn or remember. Usually **slow onset**
 - Problems with memory, orientation, language, personality, ability to carry out everyday activities, maintain relationships
 - Can be hallucinations, delusions, anxiety, depression
 - Other symptoms — wandering, agitation, increased confusion at end of day (sundowning)
 - **Common causes include Alzheimer's disease, vascular cognitive impairment.** No cure, but can usually be managed.
- **Depression** ([p201](#)) — common, can occur with or appear like dementia
- **Psychosis** ([p205](#))

Ask

- What is worrying person or their family
- Is memory getting worse, very forgetful
- Does person recognise family members, familiar landmarks
- Change in personality or behaviour — aggressive, agitated, sleep disturbed or not sleeping, talking at night, wandering around, staying alone
- Unable to look after self — cooking, shopping, hygiene, dressing, toileting
- Is this recent (days) or has it been happening over a long time (months)
- Medicines — confusion can be due to side effects or withdrawal
- Using alcohol (grog) or other drugs
- History of mental illness (eg mood swings, sad, depressed [p201](#))
- Can they hear and see well — changes in senses can make confusion worse
- Hallucinations or delusions
- Recent head injury — consider subdural bleed
- Symptoms of infection (eg UTI [p411](#), pneumonia [p309](#), tertiary syphilis [p281](#))
- Constipated — can worsen confusion
- Vital to obtain a history from family member or informant as well as person



Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*)
- BGL
- U/A
- Assess person's thinking (cognition) with cognitive assessment (*p200*)
- If recent onset or injury — coma scale score (*p74*)
- Head-to-toe examination — physical sickness, injury, depression

Delirium

Check

- Important to diagnose underlying condition and treat it — consider
 - Infection (eg pneumonia *p309*, UTI *p411*)
 - Medicine side effects
 - Substance misuse — intoxication, withdrawal
 - Do Clinical Institute Withdrawal Assessment (CIWA) (*p210*)
 - Severe constipation
 - Other medical conditions (eg kidney failure, liver disease)
 - Low blood glucose (*p91*)
 - Head injury (eg subdural bleed) (*p72*)
 - Low oxygen (hypoxia)

Do

- Address any medical problems identified
 - If O₂ sats low — give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult *OR* mask 5–10L/min
- **Medical consult**
 - May need further investigations (eg blood tests for underlying condition)
 - May need to send to hospital

Dementia

Check

- Take blood for FBC, UEC, LFT, Ca, PO₄, TFT, vitamin B12, serum folate, syphilis serology, HIV, vitamin D, HTLV1 (if in Central Australia)

Do

- Medical review — further investigations, cognitive assessment, treatment, referral to appropriate specialist
- Take time to do full assessment. Important person and/or carer understand they will need to come back several times
 - Consider starting with baseline cognitive assessment (*p200*)
- Medicines available for Alzheimer's disease — need specialist approval

- Antipsychotic medicines only needed if agitation severe, safety of person or others at risk — **medical consult**
 - Doses need to be lower for older people, people with chronic disease
- If you think person has depression — assess ([p201](#))

Follow-up

- Make management plan ([CPM p128](#))
 - Support for carer/s, education about dealing with difficult behaviour
 - If on medicines — carer and family need education about medicine
 - Medicine review every 3 months
- Refer to aged care team — can help with advice, respite, nursing home placement if family wants
- Talk with patient about who they want to make decisions for them, if they can't make decisions for themselves. Document in file notes

Cognitive assessment

Use standard screening tools to see how brain working and thinking (cognition) — preferably same version as aged care or disabilities team.

Explain that you will ask questions that may seem simple. If English not first language use interpreter or ATSIHP.

- Kimberley Indigenous Cognitive Assessment (KICA-COG and KICA Carer) for Indigenous people
- Mini Mental State Examination (MMSE) for non-Indigenous people



Depression

If pregnant, recent baby or stillbirth — see *Perinatal depression and anxiety* ([WBM p221](#)).

Signs and symptoms

- Feeling more sad, down, or miserable than usual, crying a lot
- Lack of interest or pleasure in things they usually enjoy
- Significant loss of self esteem
- Sense of hopelessness, loss, guilt, shame
- No appetite or hungry all the time, lost or gained weight
- Sleep disturbed, sleeping too little or too much, no energy, slow speech and thinking
- Irritability, trouble concentrating or thinking clearly

If depression symptoms and hypomania (high energy levels, positive mood), but no manic episodes — consider Bipolar 2 disorder. **Medical/mental health consult.**

Ask

- About suicide ([p207](#))
- About safety — theirs, children, others
- About symptoms and signs (*above*). Any triggers — relationship problems, domestic/family violence, death in family, gambling or money issues, housing problems
- About medicines and drugs person is using. Consider if causing symptoms (eg side effect, withdrawal)
- Previous episodes of depression and treatments — antidepressants or other medicines, side effects
- Cultural explanation — is presentation outside what is normal in community now

Check

- Clinical assessment to exclude physical cause — infection, anaemia, thyroid problems
 - Temp, pulse, RR, BP, weight, waist circumference
 - Do ECG
 - Take blood for FBC, UEC, fasting lipids, Ca, BGL, LFT, TFT
 - Full STI check – male ([p272](#)), female ([WBM p238](#)). Include HIV and syphilis serology
 - Collect urine for drug screen
 - Urine pregnancy test for women of childbearing age
- Mental status examination ([CPM p113](#))
- Depression screening — Patient Health Questionnaire 9

Patient Health Questionnaire 9 (PHQ9)

Screening tool to identify symptoms. Diagnosis requires further assessment by a doctor.

Over the past 2 weeks how often have you been feeling the following?		None (Score 0)	A little bit (Score 1)	Most of the time (Score 2)	All of the time (Score 3)
1	Have you been feeling slack, not wanting to do anything?				
2	Have you been feeling unhappy, depressed, really no good, that your spirit was sad?				
3	Have you found it hard to sleep at night or had other problems with sleeping?				
4	Have you felt tired or weak, that you had no energy?				
5a*	Have you not felt like eating much even when there was food around?				
5b*	Have you been eating too much food?				
6	Have you been feeling bad about yourself, that you are useless, no good, that you have let your family down?				
7	Have you felt that you can't think straight or clearly, it's hard to learn new things or concentrate?				
8a*	Have you been talking slowly or moving around really slow?				
8b*	Have you felt that you can't sit still, you keep moving around too much?				
9†	Have you been thinking about hurting yourself or killing yourself?				
Total score (0–27)					

* Scores for depression symptoms. Only count highest score for each of these sets of questions (ie 5a or 5b, 8a or 8b).

Interpreting score

† If positive score on question 9 — see *Suicide risk* (p207).

- 0–4 — likely to be well (unless positive answer to question 9)
- 5–9 — likely mild depression
 - Talk with person about result, provide education. Offer referral to mental health team for further assessment if you or person concerned
- 10 or more — likely moderate to severe depression. **Medical consult**



Do

- If person thinking of self-harm or suicide — see *Suicide risk* (p207)
- **Medical consult**
 - Consider possible physical causes of depression symptoms
 - Talk to mental health team about diagnosis, management, medicines
 - Antidepressant medicines (*below*) for moderate to severe depression
 - Benzodiazepines (eg diazepam, temazepam) — short-term use only
- Person with severe depression may need to be sent to hospital

Follow up

- Make management plan (*CPM p128*), mental health care plan if applicable
 - Education about depression
 - Referral to mental health team if you or person concerned

Antidepressant medicines

Choosing a medicine

- Not much difference in effect between different antidepressants
- Consider type of presentation (eg agitated, poor sleep), severity
- Consider other medical conditions they have, medicines they are taking, pregnancy, breastfeeding, previous adverse effects, interactions with alternative medicines
- Risk of suicide — older tricyclic antidepressants more toxic in overdose than modern medicines (eg SSRIs, SNRIs)

Treating with antidepressants

- Must take every day — give tips on how to remember
- May take 2 weeks to see full effect
- May be increased suicide risk when starting medicine, before depression improves
- Review after 2 weeks. Monitor side effects, adherence — may need dose adjusted
- Trial for at least 4 weeks before changing medicine type, unless severe adverse effects
 - Check wash-out periods when changing medicines. See *AMH, Therapeutic Guidelines*
- Treatment needs to continue for at least 9 months — less chance of depression coming back (relapse)
- Withdraw slowly when stopping treatment. If withdrawn too quickly — may feel very sick
- Review regularly during treatment and for 6 months after recovery
- Possible side effects at beginning of treatment — nausea, headache, agitation, insomnia, sedation, diarrhoea, high BP. Should pass in a week
- Possible long-term side effects — weight gain/loss, changes in libido/sexual function

Serotonin syndrome

- Rare reaction to too much serotonin in CNS. Causes excess nerve cell activity. Severe cases can be fatal if not treated
- Symptom progression — restlessness, sweating, tremor, shivering, jerky muscle spasms or overactive reflexes (myoclonus), confusion, fits, death
- Increased risk with SSRIs or SNRIs if
 - Given with other medicines that increase serotonin (eg other antidepressants such as MAOIs), stimulants (eg amphetamines), opioids (eg morphine, tramadol), serotonin receptor agonists (eg sumatriptan), lithium
 - Not long enough wash-out period when changing medicines
 - Starting medicine or increasing dose
- If you suspect serotonin syndrome — **stop all medicines AND medical consult** straight away

SSRIs

- Usually taken in morning
- Common — citalopram, sertraline, fluoxetine, fluvoxamine, paroxetine
 - Paroxetine — do not use in pregnancy, with caution in childbearing years
 - Not recommended for children under 18 years without specialist advice (eg child psychiatrist)

SNRIs

- Usually second line treatment
- Common — venlafaxine (usually slow-release XR), desvenlafaxine
- Monitor BP and lipids

Others

Mirtazapine

- Good for depression with insomnia — take at night
- Weight gain likely, may raise blood fats

Moclobemide

- No sexual dysfunction

Duloxetine

- Monitor BP
- Caution with alcohol, liver disease

Tricyclic antidepressants (eg amitriptyline)

- Usually third line treatment for depression, lot of serious side effects
- Used for chronic pain, migraine

Monoamine oxidase inhibitors (MAOIs)

- Not recommended, serious side effects, strict diet needed, no alcohol



Psychosis

Condition of the mind, defined as a loss of contact with reality. Affects a person's thinking, talking, behaviour and mood.

- Can be due to a number of mental health problems — schizophrenia, bipolar disorder, depression, alcohol/drug misuse
- Physical conditions can look like psychosis (eg epilepsy, delirium [p199](#))
- Signs and symptoms may include
 - Delusions — strongly held false beliefs that are not true of person's cultural or religious background
 - Hallucinations — hears (auditory), sees (visual), tastes, smells or feels (sensory) things that are not really present
 - Thought disorganisation — not able to think straight, conversation hard to follow
 - Severe agitation, restlessness, anxiety, hostility, aggression
- For advice on talking with person who may have mental illness — see *Mental health assessment* ([CPM p112](#))

Some experiences can be culturally explained — important to ask ATSIHP or family member for advice.

Acute management — new case

- Clinical assessment to rule out physical causes
 - Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
 - Do ECG
 - U/A, send urine for drug screen
 - Pregnancy test for women of childbearing age
 - Consider head injury ([p72](#)), infection (eg chest [p309](#), ear [p172](#), UTI [p411](#)), epilepsy (fits), encephalitis, medicine toxicity, electrolyte imbalance, thyroid dysfunction
- Mental health assessment ([CPM p112](#))
- Take blood for FBC, ESR, UEC, LFT, TFT, HbA1c, fasting lipids and BGL, hepatitis, HIV, syphilis serology
- Standard STI check — man ([p272](#)), woman ([WBM p238](#)), young person ([p276](#))
- If very agitated or disturbed — see *Mental health emergency* ([p192](#))
- If threatening self-harm — see *Suicide risk* ([p207](#))
- For help with **immediate management** — **medical/mental health consult**
 - If acutely unwell and major risks identified — transfer to hospital

Treatments

Antipsychotic medicines

- Oral medicines are first choice when managing psychosis
- Need for long-term medicine usually decided by psychiatrist. Can include oral tablets or depot injections

- Always check manufacturer's directions for preparing and giving depot medicines

Side effects

- Long-term side effects can include extra-pyramidal side effects, tardive dyskinesia, Neuroleptic Malignant Syndrome
- If woman has changes in menstrual cycle and milk from breasts when not breastfeeding (galactorrhoea) — check blood prolactin levels

Be aware: Antipsychotic medicines increase risk of heart disease, diabetes (metabolic syndrome) — see *Combined checks for chronic diseases* (p239).

Extra-pyramidal side effects (EPSE)

- Muscular shaking (tremors)
- Muscular spasms, including spasm of larynx (dystonia)
- Muscular stiffness, rigidity (Parkinsonism)
- Restlessness, agitation (akathisia)
- Involuntary twisting/squirming (dyskinesia)
- Eyes up, hard to look down (oculogyric crisis)
- Tongue/mouth movements (dyskinesia)
- Drooling, dribbling (hypersalivation)

Do

- Immediate treatment — **benzotropine** IM single dose – adult 1–2mg
 - Symptoms should resolve in 15 minutes

Neuroleptic Malignant Syndrome (NMS)

Rare but potentially fatal complication of antipsychotic medicines.

Check

- High temp, altered consciousness, confusion, muscle stiffness
- May have fluctuating pulse and BP, fast RR, raised CK

Do — if you suspect NMS, treat as **medical emergency**

- **Send to hospital urgently**
- **Stop all antipsychotic medicines** straight away
- Maintain fluids (hydration)

Ongoing management in community

- Usually multiprofessional, multiservice provider approach
- Medical review to make management plan (*CPM p128*), mental health care plan — to help support person to stay in community
 - Must include relapse prevention strategies, physical health, psychological health, social and environmental health, support for carers, legal considerations



Suicide risk

Suicide or self-harming behaviour can be a common problem.

- If someone is talking about killing or hurting themselves — always take it seriously
- Most people who think about suicide don't want to die, they want their pain to go away (want problems to be solved)

Suicide risk assessment

Ask about

- Suicide — ask directly if thinking of suicide
 - *Examples:* Do you want to kill yourself, end your life, finish up, make yourself dead
- Current plan — do they know when, where and how they plan to end their life? Do they have access to means required to end their life
- Situation or story — what has happened that might contribute to person feeling suicidal
 - *Examples:* Relationship problems, argument, shame, money problems, sexuality
- Feelings — how this situation made them feel
 - *Examples:* Desperate, alone, angry, jealous, hurting, sad, hopeless, guilty, shame, weak
- Background — tried to end their life before? Lost someone close through suicide
- Alcohol (grog) and drug use — can be dangerous when person in suicidal state
- Mental health issues — medicines, family history
- Safety — what is going to keep them safe over next 48 hours and longer term
 - *Examples:* Strong family member to keep watch, clinic staff support
- Protective factors — what is going to stop them from ending their life
 - *Examples:* Children, family, spiritual or cultural beliefs, employment, sport

Do not

- **Do not keep suicide talk secret**
 - Keeping person safe is a duty of care — tell them you are concerned about their safety and wellbeing and need to share this information with people who care
 - Make sure person knows who you are telling and why
 - Other details about what person tells you can remain confidential
- **Do not** promise more than you can give
- **Do not** leave person on their own

Do

• Medical/mental health team consult

- Talk with them about suicide risk assessment — they will help assess level of risk
- Decide if person will be managed in community or sent to hospital — may need to send against their wishes under *Mental Health Act*

Send to hospital if

- Clear suicide intent — clear plan, access to means
- Person won't promise not to suicide
- No support people and person can't be managed safely in community
- Evidence of severe mental illness — psychosis ([p205](#)), depression ([p201](#))

If person stays in community

- Make sure reliable person can stay with them at all times
 - Record who support people are
 - Make sure they know who to contact, how to get help quickly
 - Provide information to support person about their role in monitoring person at risk — ensuring person can't access alcohol, weapons, ropes
- Engage with person — get them to promise not to self-harm/suicide for a certain time, usually until you can see them again
- If situation changes — do suicide risk assessment again

Follow-up

- Review person again within 24 hours and regularly until crisis has passed
- Appointment with mental health team for assessment
- Begin treatment for underlying health problems (eg depression, psychosis) — make management plan ([CPM p128](#))
- Advise not to use alcohol (grog) or other drugs — may increase thoughts of suicide, impulsive behaviour
- Refer for counselling and treatment — medical, psychological, alcohol and other drugs services
- Focus on achievable goals ([CPM p129](#))
 - Explain that suicide is only one of a number of options
 - Talk with person about other things they could do, people who can help them
 - Aim to delay self-harm rather than change person's mind (eg can you keep yourself safe while we try to help you) — mood change can be slow but the urge to suicide may pass quickly
 - AimHi Stay Strong Plan — brief intervention style tool, introduces goal setting. Available online http://www.menzies.edu.au/page/Resources/Stay_Strong_Plan__four_page



Alcohol withdrawal

If person who usually drinks 40–60g or more of alcohol a day (4–6 or more standard drinks) stops drinking — risk of alcohol withdrawal for the next 5 days.

A standard drink contains 10g of alcohol — takes a healthy liver about 1 hour to remove this alcohol from the body.

- 1 standard drink =
 - 425mL light beer
 - 375mL mid-strength beer
 - 285mL full-strength beer
 - 100mL wine
 - 60mL port
 - 30mL spirits

- If regular drinker unwell — may be in withdrawal. More likely if
 - Drinks every day and often drinks a lot (4–6 or more standard drinks a day) *OR* has a regular binge pattern with more than 6 standard drinks per session, every 2–3 days
 - Past history of withdrawal or seizures
- Uncomplicated withdrawal
 - Usually starts 6–24 hours after last drink of alcohol
 - Any combination of anxiety, agitation, tremor, sweating, high heart rate (tachycardia), can't sleep (insomnia). May be mild, hard to detect
- Severe alcohol withdrawal syndrome
 - Delirium tremens (DTs, 'horrors') can happen up to 6 days after stopping.
 - Mix of anxiety, agitation, disorientation, hallucinations, dehydration, high heart rate, high BP, low-grade fever
 - Risk of death
 - Need to transfer to hospital
 - Withdrawal fits may happen in first 3 days after stopping alcohol
 - May happen if other illness at same time
 - May be first feature of withdrawal

Alcohol withdrawal management

- Assess and manage based on Clinical Institute Withdrawal Assessment (CIWA) score ([p210](#)) *AND* other risk factors ([p211](#))
 - Get advice from doctor or alcohol and drug service if not familiar with CIWA

Ask

- When person had last drink
- How they usually drink (eg regular or binge drinker)
- How much they usually drink
- What time of the day do they start drinking alcohol

Table 3.1: Clinical Institute Withdrawal Assessment (CIWA)

Observational assessment. Add up score for 10 criteria = score for person.

<p>1. Nausea and vomiting</p> <p>0. No nausea and no vomiting</p> <p>1. Mild nausea and no vomiting</p> <p>2.</p> <p>3.</p> <p>4. Intermittent nausea, with dry retching</p> <p>5.</p> <p>6.</p> <p>7. Constant nausea, frequent dry retching or vomiting</p>	<p>2. Tremor</p> <p>0. No tremor</p> <p>1. Not visible, but can be felt fingertip to fingertip</p> <p>2.</p> <p>3.</p> <p>4. Moderate</p> <p>5.</p> <p>6.</p> <p>7. Severe, even with arms not extended</p>	<p>3. Sweating</p> <p>0. No sweat visible</p> <p>1. Barely perceptible sweating, palms moist</p> <p>2.</p> <p>3.</p> <p>4. Beads of sweat obvious on forehead</p> <p>5.</p> <p>6.</p> <p>7. Drenching sweats</p>
<p>4. Anxiety</p> <p>0. No anxiety, at ease</p> <p>1. Mildly anxious</p> <p>2.</p> <p>3.</p> <p>4. Moderately anxious, or guarded, so anxiety inferred</p> <p>5.</p> <p>6.</p> <p>7. Equivalent to acute panic states as seen in severe delirium or acute schizophrenic reactions</p>	<p>5. Agitation</p> <p>0. Normal activity</p> <p>1. Somewhat more than normal activity</p> <p>2.</p> <p>3.</p> <p>4. Moderately fidgety and restless</p> <p>5.</p> <p>6.</p> <p>7. Paces back and forth during most of the interview, or constantly thrashes about</p>	<p>6. Tactile disturbances</p> <p>0. None</p> <p>1. Very mild itching, pins and needles, burning or numbness</p> <p>2. Mild itching, pins and needles, burning or numbness</p> <p>3. Moderate itching, pins and needles, burning or numbness</p> <p>4. Moderately severe hallucinations</p> <p>5. Severe hallucinations</p> <p>6. Extremely severe hallucinations</p> <p>7. Continuous hallucinations</p>
<p>7. Auditory disturbances</p> <p>0. Not present</p> <p>1. Very mild harshness or ability to frighten</p> <p>2. Mild harshness or ability to frighten</p> <p>3. Moderate harshness or ability to frighten</p> <p>4. Moderately severe hallucinations</p> <p>5. Severe hallucinations</p> <p>6. Extremely severe hallucinations</p> <p>7. Continuous hallucinations</p>	<p>8. Visual disturbances</p> <p>0. Not present</p> <p>1. Very mild sensitivity</p> <p>2. Mild sensitivity</p> <p>3. Moderate severity</p> <p>4. Moderately severe hallucinations</p> <p>5. Severe hallucinations</p> <p>6. Extremely severe hallucinations</p> <p>7. Continuous hallucinations</p>	<p>9. Headache, fullness in head</p> <p>0. Not present</p> <p>1. Very mild</p> <p>2. Mild</p> <p>3. Moderate</p> <p>4. Moderately severe</p> <p>5. Severe</p> <p>6. Very severe</p> <p>7. Extremely severe</p>
<p>10. Orientation — Ask: Who am I? Where are you? What time of day is it? Has anything been happening in the community?</p> <p>0. Person ✓ Place ✓ Time ✓ Orientated, aware of community events</p> <p>1. Person ✓ Place ✓ Time ✓ Disorientated to community events</p> <p>2. Person ✓ Place ✗ Time ✗ Does not know community events</p> <p>3. Person ? Place ✗ Time ✗ Does not know community events</p> <p>4. Person ✗ Place ✗ Time ✗ Disorientated</p>		



Risk factors for complicated withdrawal

- Person had withdrawal fits, DTs, severe withdrawal before, or many withdrawal episodes
- Significant illness — cellulitis, pneumonia, diabetes, heart condition, severe liver disease, kidney disease (dialysis), respiratory disease, mental illness, epilepsy
- Uses other drugs (eg opioids, benzodiazepines)
- Drinking at high level over long time period more likely to lead to major withdrawal problems

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- BGL
- Full examination
- CIWA ([p210](#)) — recheck every 30–60 minutes until stable. Condition can change quickly
- Signs of withdrawal
 - Any of — anxiety, agitation, disorientation, sweaty, tremor, fast pulse ([p422](#)), insomnia, hallucinations

Do

- If CIWA score more than 6 — **medical consult**
- Monitor regularly
 - Give medicines as needed
 - Watch for dehydration — give fluids as needed
 - Look after person in quiet, dim room
 - Make sure responsible person is with them all the time

May need to send to hospital if

- Getting worse — CIWA score increasing despite treatment
- Need to monitor in clinic for longer than 4 hours
- Had withdrawal fits or DTs in the past
- Signs of head injury ([p72](#))
- Other significant illness (eg pneumonia [p309](#))
- T more than 38.5°C, very fast pulse ([p422](#)), very high or low BP ([p422](#))
- Fits

Give medicines as needed

- **Antiemetic** for nausea or vomiting ([p105](#))
- **Loperamide** oral single dose for diarrhoea — adult 4mg
 - *THEN* loperamide oral — 2mg after each bowel action, up to 16mg/day
- **Thiamine** IM once a day for 3 days — adult 200mg into buttock
 - *THEN thiamine* oral once a day for at least 1 month — adult 100mg
 - *AND multivitamin* once a day for at least 1 month — 1 tablet

- **Paracetamol** up to 4 times a day (qid) for pain – adult 1g ([p380](#))
- **Diazepam** (doses *below*)

Diazepam doses

Diazepam lessens agitation and other symptoms (eg hallucinations), helps prevent fits and DTs.

Do not give diazepam

- Until at least 6–8 hours after last alcohol
 - If head injury or medical condition possible cause for confusion
- **Medical consult** before giving **diazepam**
 - After giving — **recheck CIWA** every 30 minutes for at least 2 hours
 - If CIWA increases — **medical consult**, may need to repeat or increase dose
 - If CIWA score still more than 10 after 2 hours — **medical consult**, may need to go to hospital
 - If old person, person with significant lung, liver or kidney disease (acute or chronic) — give half dose, watch closely for over-sedation

Table 3.2 Diazepam doses for alcohol withdrawal

Pattern of withdrawal	Diazepam doses and what to do
Withdrawal fits or DTs in past	<ul style="list-style-type: none"> • Give diazepam oral – 10mg every hour until CIWA less than 6 or sedated • When CIWA stays at less than 6 for 2 hours <ul style="list-style-type: none"> ◦ Give diazepam oral – 10mg 4 times a day (qid) for 1 day ◦ Then taper dose to nothing over 2–3 more days
Mild CIWA 6–9 and no other risk factors (p211)	<ul style="list-style-type: none"> • May not need diazepam • Can give diazepam if agitation score 4 or more <ul style="list-style-type: none"> ◦ Diazepam oral 3–4 times a day for 2 days – 5–10mg ◦ Taper dose to nothing over 2–3 more days
Moderate to severe CIWA 10–16 <i>OR</i> CIWA 8 and other risk factors (p211)	<ul style="list-style-type: none"> • Give diazepam oral every 2 hours until CIWA less than 6 or sedated – 10–20mg • Base dose on how agitated person seems <ul style="list-style-type: none"> ◦ If agitation score 4 — oral 10mg ◦ If agitation score 7 — oral 20mg • When CIWA stays at less than 6 for 2 hours <ul style="list-style-type: none"> ◦ Give diazepam oral 4 times a day (qid) for 1 day – 10mg ◦ Then taper dose to nothing over 2–3 more days
Very Severe CIWA more than 16	<ul style="list-style-type: none"> • Give diazepam oral straight away – 20mg • Put in IV cannula (CPM p84) • Medical consult, send to hospital urgently



- **Do not** exceed these diazepam doses
 - If 90kg or under — 40mg oral in first 24 hours
 - If over 90kg — 60mg oral in first 24 hours

Follow-up

- Review daily until well
- Refer to alcohol and drug service, mental health service if needed
 - May recommend anti-craving medicines (eg naltrexone, acamprosate)
- Make management plan ([CPM p128](#)), provide brief intervention ([CPM p138](#))

Amphetamines and other stimulants

- Stimulants include methamphetamine (crystal meth, ice, P, burn, base, pure, speed) — stronger stimulant, causes more severe behavioural problems
- Taken by injecting, snorting, swallowing, smoking

Effects of amphetamines/stimulants

- Decreased sleep, increased happiness, confidence, energy, sex drive
- Can cause preterm labour, miscarriage, damage to unborn baby
- If used close to birth — baby may be unsettled, irritable, hard to feed, withdrawal symptoms in first few weeks
- Transferred through breast milk

Be aware: Can cause potentially life-threatening serotonin syndrome ([p204](#)).

Intoxication

- Over confident, talking loudly and/or fast, restless, excited, agitated, aggressive, pacing, repetitive acts, panic states, not hungry/eating, may not have slept
- High temp ([p422](#)), fast and/or irregular pulse ([p422](#)), high BP ([p422](#)), low BGL ([p91](#))
- Pupils dilated and sluggish reaction to light
- Fits, delirium, unconscious

Acute psychosis

- Symptoms usually stop soon after drug use stops, but can have symptoms for weeks or months — see *Psychosis* ([p205](#))

Chronic toxicity

- Skin itching and chronic scabs from itching
- Muscle and limb twitches, increased 'startle' responses
- Weight loss — due to poor appetite, poor nutrition, social circumstances
- Poor concentration and attention, memory loss, anxiety, panic attacks, hallucinations, flashbacks
- Social isolation

Remember: Even months after stopping regular use, a single moderate dose of stimulant can lead to rapid return of abnormal behaviour patterns.

Withdrawal

- Usually 7–15 days
- Withdrawal depression can lead to thoughts of suicide ([p207](#)), self-harm

Management

Do first

Remember — Life support — DRS ABC ([p10](#)).

- If obvious acute psychosis and risk of harm to self, others — see *Mental health emergency* ([p192](#))



Table 3.3: Stimulant withdrawal

Time since last use	Common symptoms
1–3 days Comedown or 'crash'	<ul style="list-style-type: none"> • Exhaustion, increased sleep, lack of energy • Depression, poor appetite, poor fluid intake • Restlessness, irritability, aggression
2–10 days Withdrawal	<ul style="list-style-type: none"> • Strong urges to use stimulant — may use other substances (eg alcohol, opiates, benzodiazepines) • Mood swings from irritability to feeling flat/depressed • Very disturbed sleep, strange thoughts (eg feeling paranoid) • Poor concentration (feeling 'scattered'), easily upset • Headaches, general aches and pains, stiffness • Appetite increased • Altered perceptions (seeing, touching, hearing)
7–8 days Prolonged withdrawal — symptoms getting better	<ul style="list-style-type: none"> • Mood swings from irritability to feeling flat/depressed • Disturbed sleep • Cravings still present • Appetite increased • Feeling bored
1–3 months	<ul style="list-style-type: none"> • Return of normal sleep, mood, activity levels • Major improvements in general health, mood

Ask

If person unable to respond — ask family or friends.

- What have they taken and how (eg smoking, tablets, injection)
- When did they have it last (day/date and time)
- How often and how much used
- Does anyone think using it has caused person harm
- Other drugs used — prescribed, legal, illegal
- Existing mental illness
- Thoughts of self-harm or suicide ([p207](#))

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Coma scale score ([p74](#)), pupil size, hydration, BGL
- Amphetamine Withdrawal Assessment Scale ([p217](#))
 - If acute withdrawal — do hourly
- U/A — positive blood may mean muscle break down
- If drug use unclear — urine drug screen
 - Results may take weeks, still important for long-term management
- Other illness or injuries — head injury ([p72](#)), infection from IV drug use (eg endocarditis, encephalitis)

Do

- Use calming techniques ([p192](#))
- **Medical consult**
 - If marked agitation, insomnia, aggression — give **diazepam** oral — adult 10mg hourly until sedation score 1 (a bit sleepy but easy to rouse — [p382](#))
 - If needs more than 40mg/day — **medical consult**
 - If psychotic features — give **olanzapine** oral — adult 5–10mg/dose up to 20mg/day
 - If needs more than 20mg/day — **medical consult**
 - Ongoing psychotic symptoms
 - Blood in urine
- Give food and drinks to maintain nutritional status, fluid balance
- If BGL less than 4mmol/L — see *Low blood glucose (hypoglycaemia)* ([p91](#))
- If presenting as opioid overdose — see *Opioids* ([p221](#))

Follow-up

- Refer to alcohol and drug service, mental health service if needed
- Make management plan ([CPM p128](#)), provide brief intervention ([CPM p138](#))

Amphetamine Withdrawal Assessment Scale

Observational assessment only.

Use to assess getting better or getting worse (severity of withdrawal) but not to adjust withdrawal medicine doses.



Table 3.4: Amphetamine Withdrawal Assessment Scale — observational assessment

Observed behaviour	Initial	After 1 hour	After 2 hours	After 3 hours
Irritability No Mild Moderate Severe				
Depression No Slow to respond but active Moderately withdrawn Withdrawn, unresponsive				
Racing thoughts/speed of conversation No Mild Moderate Severe				
Restless/agitated Normal activity Somewhat more than normal activity Moderately fidgety or restless Unable to stop or stand still				
Hallucinations No Mild Moderate Severe, everything looks strange or different				
Drowsiness No Mild Moderate Severe, can't stay awake				
Nausea and vomiting No Mild Intermittent nausea and dry retching Constant nausea, frequent dry retching/ vomiting				
Sleep Sufficient Some sleep Moderate/restless sleep No sleep				

Cannabis

- Also called marijuana, gunja, yarndi, dope, pot, weed
- Commonly mixed with tobacco

Be aware: Synthetic cannabis may cause severe paranoia, seizures, agitation, death.

Effects of cannabis

- Cannabis and tobacco smoke damage lungs, reduce physical fitness. Worse if smoked together or inhaled through water (bong)
- **Intoxication**
 - Relaxed, happy
 - Confused or aggressive
 - Reduced coordination and driving impairment
 - Panic, feel anxious or paranoid (everyone is against them)
 - Lots of vomiting (cannabis hyperemesis syndrome), abdominal cramps, anxiety
 - Lasts for 2–3 days, relieved by hot showers
- **Withdrawal**
 - When person who is dependent stops or cuts down, may get withdrawal symptoms — trouble sleeping, cranky feelings, hostility
 - Not medically dangerous but uncomfortable, can be worrying for family
 - Can start within 24 hours of stopping use, peak around 4–10 days, last several weeks
 - May increase risk of violence, self-harm, suicide ([p207](#))
 - Lots of vomiting (cannabis hyperemesis syndrome)
- **Acute psychosis**
 - Have delusions (believe things that are not true), hallucinations (see or hear things that are not there), other psychotic symptoms
 - Symptoms usually stop soon after intoxication subsides, but can have symptoms for weeks or months
- **Long-term health effects**
 - Chronic lung disease, reduced physical fitness
 - Often causes problems with memory, concentration, motivation
 - Decreased ability to organise and learn complex information
 - Increased risk of oral issues due to dry mouth
- **Vulnerable populations**
 - Existing mental health condition — may make symptoms worse, reduce effectiveness of medicine. See *Mental health emergency* ([p192](#)), *Mental health assessment* ([CPM p112](#))
 - Pregnant — increased risk of low birth weight babies, risk of neonatal withdrawal syndrome. See *Postnatal care of baby* ([WBM p228](#)), *Brief interventions* ([CPM p138](#))



- Young people at risk of greater harm — leaving school, homelessness, social vulnerabilities

Do

- All cannabis users should be offered help to stop — see *Brief interventions* ([CPM p138](#))
- Special effort should be made if
 - History or family history of mental illness
 - Pregnant or breastfeeding
 - Person experiencing long-term effects on health and wellbeing

Managing cannabis cessation or withdrawal

- Cannabis users may also have tobacco dependency ([p223](#))
- Make management plan ([CPM p128](#))
- Refer to drug and alcohol service, mental health team if needed
- **Medicines**
 - Gradual reduction of cannabis use can be effective in achieving cessation without support of additional medicine
 - **Medical consult** about medicines if needed. Give until agitation settled and review daily
 - **Diazepam** oral – adult 5–10mg/dose up to 20mg/day
 - **OR olanzapine** oral – adult 5–10mg/dose up to 20mg/day
 - If existing psychotic illness — consider increasing usual antipsychotic medicine

Note: Avoid using diazepam daily for more than 1 week. May start new addiction.

Kava

Depressant drug made from kava shrub. Made into a drink used in Top End communities. Causes a type of drunkenness, can cause health problems.

Being drunk on kava (intoxication)

- Usually relaxed, calm without violent feelings
- Pupil dilation, red eyes
- Numbness in mouth/throat at first, sleepiness after drinking more
- Causes muscle relaxation so person may not walk properly

Acute problems from kava

- Injuries due to severe drowsiness
- Unconscious

Long-term problems from kava

- Malnutrition and weight loss from lack of appetite/interest in food
- Dry scaly skin (kava dermatitis) — ‘crocodile skin’, ‘like dried seaweed’
- Liver damage, raised liver enzymes (GGT, ALP), low white blood cell count
- Increased risk of melioidosis, infections, complications of heart disease
- May worsen mental health illness — symptoms of depression

Check

- Temp, pulse, RR, BP, weight
- Full physical examination, including skin
- Take blood for FBC, LFT
- Are Adult Health Check ([CPM p123](#)) and immunisations up to date
- Number of bags of kava usually used, number of people shared with

Do

- Talk with kava drinkers about
 - If heart disease or pregnant — cut down or stop drinking kava
 - Increased risk of serious infections
 - Using kava with alcohol (grog), benzodiazepines, other drugs — may make sedation/dangerous sleepiness effects of all drugs worse

1–2 months after stopping drinking kava — skin and liver problems usually return to normal, underweight people tend to regain lost weight.



Opioids

Use of opioids increasing — prescription and over the counter (eg paracetamol+codeine, ibuprofen+codeine). In remote areas opioids usually taken orally, but some IV use and smoking. **Chronic use will result in dependence.**

- If person asks for opioid medicines prescribed elsewhere — you **must**
 - Follow your organisation's policy about supply
 - Contact current provider to obtain valid history and pain diagnosis
- Do **medical consult** — doctor to check Doctor Shopping hotline
- If person seeking opioid medicines for dependency issues —
 - Treat symptoms without opioids
 - Collect urine sample and send for drug screen 'Opioid use'
 - **Medical consult** or get advice from Drugs and Alcohol Clinical Advisory Service

Remember: No one dies from withdrawal but they do die from overdose. Opioids are pregnancy category C — may cause serious harm to fetus.

Effects of opioids

- Pain relief
- Decrease anxiety, calm, some euphoria
- Strong respiratory system depressant
- Slows bowel and causes constipation

Opioid intoxication (overdose)

- Drowsy
- Slow RR, low BP, pupils pinpoint
- Unconscious, respiratory arrest

Opioid withdrawal

- Restless, agitated, irritable
- Pupils dilated, high BP, fast pulse
- Runny nose, sneeze, goose bumps
- Muscle ache, gut ache, diarrhoea

Do first — if unconscious

Remember — Life support — DRS ABC (*p10*).

- **Medical consult**
- Give **naloxone** IV single dose – adult 0.4mg — observe for 4 hours
 - If IV access difficult — give IM into anterolateral thigh or upper arm
 - If more than initial dose needed — **medical consult**. May need
 - Second dose **naloxone** IV single dose – adult 0.2mg
 - To send to hospital

Be aware: Giving naloxone to someone dependent on opioids may cause rapid reversal of overdose, trigger aggressive behaviour due to acute withdrawal.

Ask — person, family or friends

- What has person taken and how — tablets, injection, smoking
- When did they have it last (day/date and time)
- How often and how much used
- Other drugs used — prescribed, legal, illegal
- Existing physical and mental illness (eg thoughts of self-harm or suicide)
- Who is their usual prescriber

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Coma scale score, pupil size
- Do ECG
- BGL
- U/A (positive blood may mean muscle break down), drug screen
- Other illness or injuries — head injury, trauma, sepsis

Do

- Be calm, supportive, reassuring
- Explain what is happening to them, what you are doing
- If significant withdrawal — **medical consult**

Give medicines as needed

- Opioid replacement not needed
- Treat symptomatically for 3–5 days. Adult doses
 - **Paracetamol** oral up to 4 times a day (qid) – 1g ([p380](#))
 - Muscle ache — **ibuprofen** (if no contraindications [p381](#)) oral 3 times a day (tds) – 200mg
 - Nausea and vomiting — **metoclopramide** oral 3 times a day (tds) – 10mg
 - Abdominal cramps — **hyoscine butylbromide** oral 3 times a day (tds) – 10mg
 - Diarrhoea — **loperamide** oral single dose – 4mg *THEN* **loperamide** oral – 2mg after each bowel action, up to 16mg/day

Follow-up

- Refer to drug and alcohol service, mental health service if needed
- Notify usual prescriber of opioids of overdose episode
- Make management plan ([CPM p128](#)), provide brief interventions ([CPM p138](#))

Tobacco

Can also be chewed or put behind ear (topical skin absorption), particularly native tobacco (eg pitchuri, mingkulpa).

Second-hand (passive smoke)

- Second-hand smoke from cigarettes can cause lung and heart disease, ear infections in children, SIDS in babies
- Ask everyone not to smoke around children — smoke-free house and car

All people who use tobacco should be offered help to stop, but especially

- Pregnant women
- Anyone who lives with young children
- People under 18 years
- People with heart disease or breathing problems

Ask

- History of smoking — how many, how long
- Assess dependence — smoking soon after waking, more than 10 cigarettes a day, withdrawal irritability in previous attempts, problems stopping

Do

- Brief interventions ([CPM p138](#))
- Counselling and support (eg Quitline). Indigenous counsellors available
- Consider nicotine replacement therapy (NRT) ([below](#)) or urge reduction medicines ([p225](#))

Follow-up

- Make management plan ([CPM p128](#))
- Talk with person about relapse prevention — action strategies to prevent starting tobacco use again (eg QUIT program, other recreational activities)
- Offer resources — Remote AOD Program (Yarning about tobacco)

Medicines to help quitting

- Most people quit smoking without medicines
- Medicines helpful with higher levels of nicotine dependence
- Combine with counselling and support for best effect
- May need to use for 8–12 weeks

Nicotine replacement therapy (NRT)

- 2 types of NRT can be used together if one alone not working
- Can use with urge reduction medicine ([p225](#))
- Can use after urge reduction medicines to prevent relapse

Nicotine patches

- Available over the counter or on PBS — prescription with commitment to quit counselling program (eg Quitline), for up to 12 weeks
- Put **nicotine patch** on upper arm in morning, take off at bedtime
 - Change site of patch each day
 - Patch may cause local skin reactions (eg redness, itch, rash)
- Smoking while using nicotine patches can cause nausea, vomiting, palpitations, chest pain, other symptoms
- May be used in pregnancy if heavy tobacco use (continuous smoking) and all non-medicine approaches have been unsuccessful. **Medical consult** first for risk-benefit assessment
 - If used — advise to take off at night

Oral NRT

- Available over the counter
- Nicotine absorbed by mucous membrane of mouth (buccal)
- **Do not** eat or drink while using, reduces absorption

Nicotine gum

- Assess dental health (*CPM p172*)
- 2mg strength for low to moderate dependence — maximum 10 pieces/day
- 4mg strength for moderate to high dependence — maximum 3–4 pieces/day
 - After 4–8 weeks reduce to 2mg
- Taper then stop based on person's craving
- Tell person
 - Use only when needed
 - **Do not** chew gum all the time
 - Chew slowly until peppery taste, then rest inside cheek until taste fades
 - Chew and rest each piece of gum for 20–30 minutes
 - **Do not** swallow gum

Nicotine lozenges

- Best used for break-through cravings with patches
- 2mg strength for low to moderate dependence
- 4mg strength for moderate to high dependence
- If used alone — 1 lozenge every 1–2 hours for 6 weeks, 1 lozenge every 2–4 hours for 3 weeks, then 1 lozenge every 4–8 hours for 3 weeks
- Dissolve lozenge in mouth, move from side to side
- **Do not** chew or swallow whole

Nicotine inhalator

- Plastic tube with replaceable nicotine cartridge inside
- Amount of nicotine released depends on cartridge size. If 15mg — maximum 6 cartridges/day
- Use short, shallow puffs



- Takes about 24 seconds for nicotine from inhalator to start working on brain. Takes about 20 minutes of active puffing to empty cartridge
- May be good for people who miss hand-to-mouth action of smoking
- Works best in warmer weather conditions, try keeping in warm pocket

Urge reduction medicine

- Varenicline reduces desire to smoke
- Need authority prescription with commitment to quit counselling program (eg Quitline)
- Start medicine at least 7 days before stopping smoking (check product information)
- Can use with NRT — but both not covered by PBS at the same time
- **Medical consult** before giving varenicline
- Start at 0.5mg once a day for 3 days
 - Increase to 0.5mg twice a day (bd) for 4 days
 - Increase to 1mg twice a day (bd) for 23 weeks
- If kidney disease with eGFR less than 30, maximum dose 1mg/day
- **Do not** use if pregnant, breastfeeding, under 18 years
- Watch for behaviour or mood changes (eg agitated, anxious, thoughts of self-harm). Caution in people with mental illness or heart disease
- Rare severe skin side effects — allergic reaction, swollen or blistered skin

Pregnant or breastfeeding women

- Smoking causes major problems for baby
- Advise all pregnant women to stop smoking
- Try non-medicine approaches first
- Can use short-acting NRT products — gum, lozenges, inhalator
 - Monitor use and side effects
 - NRT patches may be used in pregnancy if heavy tobacco use (continuous smoking) and all non-medicine approaches have been unsuccessful. **Medical consult** first for risk-benefit assessment
 - If used — advise to take off at night
- **Do not** use oral medicines

People with heart disease

- Advise quitting is most important action to lessen risk of heart attack
- NRT and oral medicines can be used
- Talk with cardiologist about NRT patch if less than 4 weeks since heart attack, or severe angina

Volatile substance misuse

- Fumes inhaled using small container (sniffing), soaked cloth (huffing), plastic bag (bagging), spray can (chroming)
- Volatile chemicals quickly pass through lungs into central nervous system. Intoxicating effect short (minutes) so typically repeated use over several hours

Immediate effect

- Feeling friendly, happy, 'high' within 1–5 minutes
- Dizzy, numbness, muscle weakness, unsteady walk, slurred speech, blurred vision, nausea, vomiting
- Disconnected from environment, hallucinations (seen and heard), strange behaviour, poor judgement, unconscious
- Chest pain — suffocation (loss of oxygen), rapid pulse, abnormal heart rhythm
- Risk of — choking (inhaled vomit), fits, coma, death
- 'Hangover' headache — may last a few days

Long-term effects

- **General** — poor appetite, poor nutrition, tired, problems sleeping, headache, weakened immune system
 - Signs of use — loss of vision and smell, sores around mouth and nose
- **Central nervous system** — fits, poor memory, poor coordination, mood swings, irritable, depressed, brain damage, peripheral nerve damage
- **Cardiorespiratory system** — coughs/colds, breathless, pneumonia, irregular heartbeat, high or low BP, heart damage, heart attack
- **Pregnancy** — miscarriage, birth defects, low birth weight, lung problems, SIDS

Acute management

Remember — Life support — DRS ABC ([p10](#)).

- No safe level of volatile substance use
- You must know reporting requirements under your state/territory legislation
- **If person intoxicated — observational assessment only**

3 main problem areas

- Physical sickness, injury
- Fits
- Self-harm or aggressive behaviour

Make sure you and person are safe

- See *Mental health assessment* ([CPM p112](#)) for interviewing safely
- If you smell fumes on person or clothes — work in area with fresh air, remove any items that may cause ongoing fume exposure
 - Warn person not to be exposed to flame/smoking



Ask

- Identify substance used — opal fuel, unleaded fuel, deodorant, lighter fluid, glue, paint, other aerosols
- Medicines, other drug use
- Pregnancy
- Physical illness — include diabetes (p254), RHD (p294), chronic lung disease (p314)
- Mental illness
 - Thoughts or ideas of suicide (p207) or self-harm
 - Frightened, worried, seeing or hearing things

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (p6)
- BGL
- Do ECG to identify arrhythmia — **medical consult**
- Coma scale score (p74). If less than 14 — check regularly
- Assess for dehydration
- Physical sickness, injuries, burns — include meningitis (p101), head injury (p72), chest infection (p309), breathing problems (p307), fits (p57), poisoning (p112)

Do not grab, scare, chase person. May stress heart if weakened by volatile substance misuse.

Do

- Stay calm, supportive and explain what is happening
- Monitor person for 2-4 hours until stable
- If seeing or hearing things that are not present — see *Psychosis* (p205)
- If severe behaviour — see *Mental health emergency* (p192)
- Contact family/carer
- If person can swallow safely — give water, ask family to give them food
- Decide where to look after person, who will care for them
- **Medical consult** if worried or getting worse — may need to be sent to hospital

Looking after person in community

- If mildly restless, cooperative, not unwell —
 - Send home with family — make sure someone stays with person and knows how to contact you if something goes wrong
 - If person doesn't settle with rest and fresh air — review
 - Plan follow-up

- If very restless, aggressive, family having trouble —
 - **Medical consult**
 - Give **diazepam** oral – adult 5–10mg/dose up to 40mg/day
 - If psychotic features — consider **olanzapine** oral – adult 5–10mg/dose up to 20mg/day

Follow-up and ongoing management

- Withdrawal symptoms usually last 2–5 days, but may be present for up to 2–3 weeks. Be supportive, treat symptoms if needed
- Talk with alcohol and drug service about management plan ([CPM p128](#)) for ongoing care and progress review. May need residential rehabilitation
 - Provide brief intervention ([CPM p138](#)), relapse prevention for quitting
 - Consider causes for episode/s — include child neglect and abuse ([p143](#)), domestic/family violence ([p54](#)), and safety concerns
 - Consider cognitive assessment ([p200](#)), suicide risk assessment ([p207](#))
- If baby born to mother who used volatile substances while pregnant — baby needs paediatric review



4 Chronic diseases

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Assessing and reducing cardiovascular risk

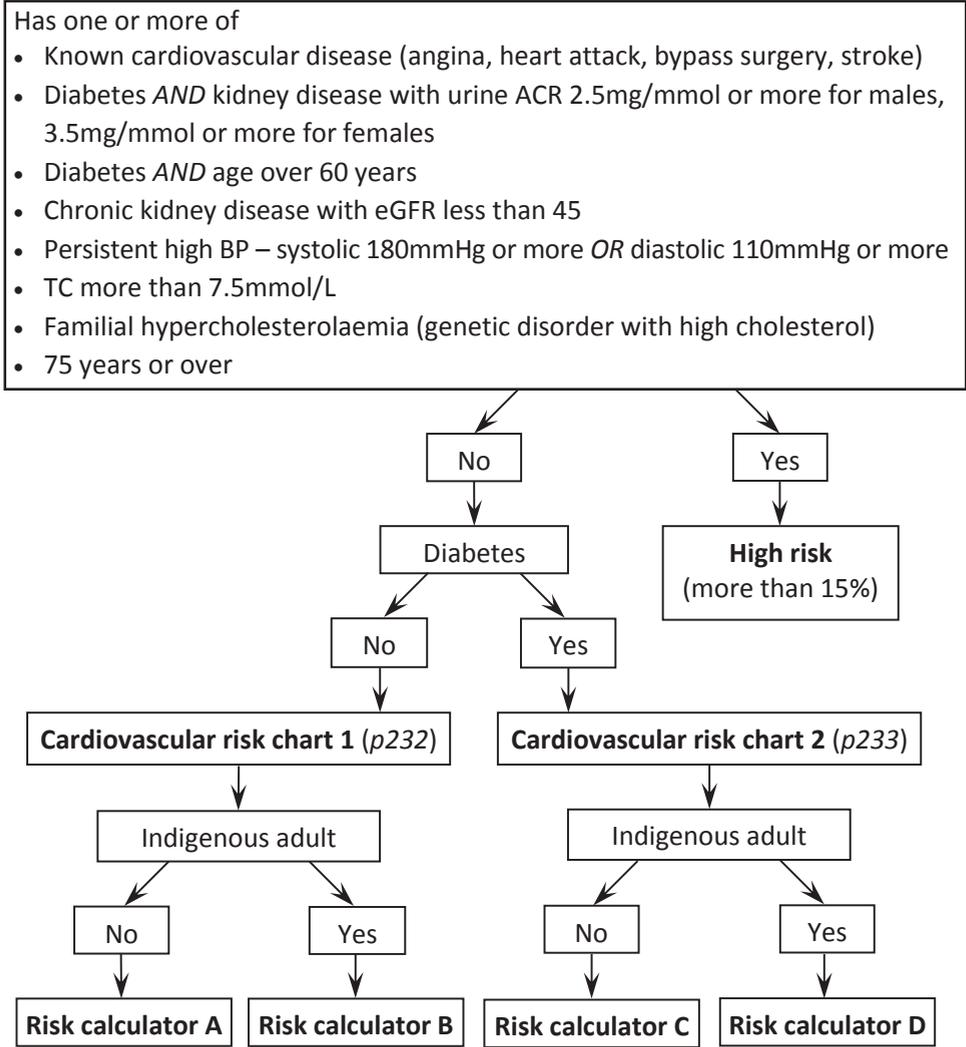
Level of absolute cardiovascular risk is the chance of heart attack or stroke in the next 5 years. Looks at key risk factors together. Treat to reduce risk.

Risk categories

- **Low** — less than 10% chance of heart attack or stroke in next 5 years
- **Moderate** — 10–15% chance of heart attack or stroke in next 5 years
- **High** — more than 15% chance of heart attack or stroke in next 5 years

Assessing absolute cardiovascular risk

Flowchart 4.1: Assessing absolute cardiovascular risk. Indigenous adults 20 years and over, and non-Indigenous adults 45 years and over



Note: Tools for calculating cardiovascular risk may be available on your clinic patient information system.



Reviewing absolute cardiovascular risk

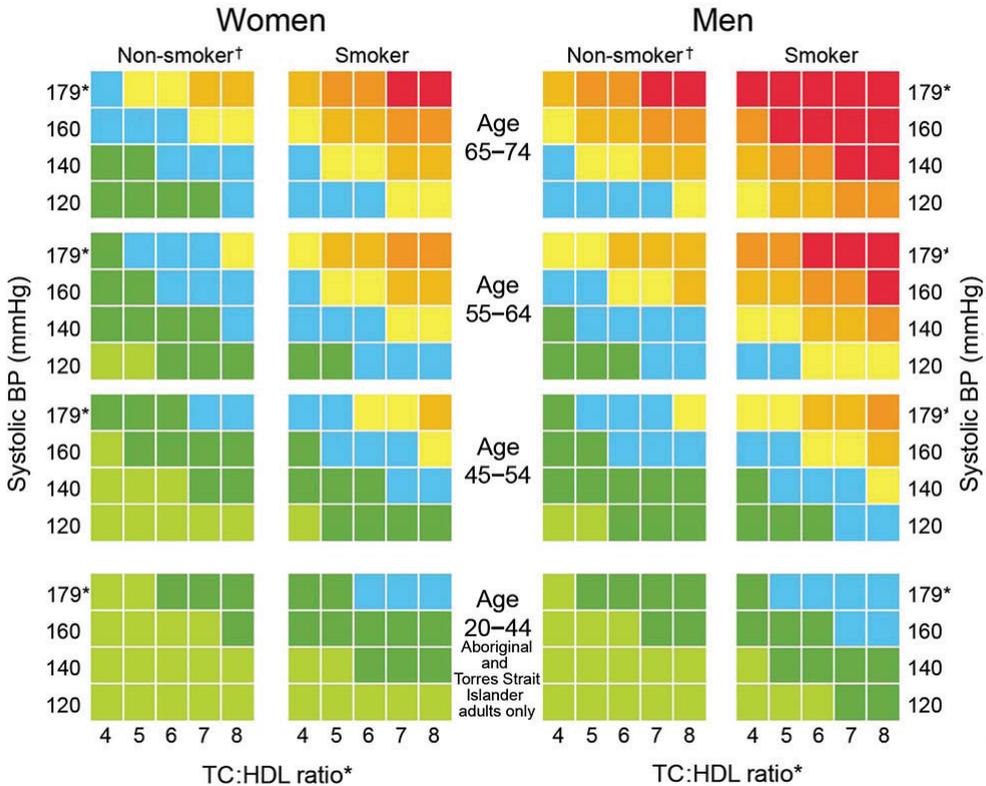
- Low — every 2 years with Adult Health Check (*CPM p123*)
- Moderate — every year
- High — continue to manage as high-risk
 - Treat to maximum tolerated doses regardless of targets
 - **Do not** stop medicines when they reach targets

Reducing absolute cardiovascular risk

Table 4.1: Reducing absolute cardiovascular risk

Risk factor	Goal / Action
Smoking (<i>p223</i>)	<ul style="list-style-type: none"> • Quit smoking
Overweight/obesity	<ul style="list-style-type: none"> • Less saturated fats, salt. See <i>Healthy diet (CPM p143)</i> • More physical activity • Waist circumference: men — 94cm or less, women — 80cm or less
Alcohol	<ul style="list-style-type: none"> • No more than 2 standard drinks/day (<i>p209</i>)
Physical activity (<i>CPM p144</i>)	<ul style="list-style-type: none"> • 30 minutes moderate activity most days or every day
High BP (<i>p268</i>)	<ul style="list-style-type: none"> • Target BP less than 130/80 • BP lowering medicine (ACE inhibitor or ARB)
High blood glucose levels (<i>p255</i>)	<ul style="list-style-type: none"> • Aim for HbA1c 53mmol/mol (7%) or less • Oral medicines for glucose control, often need insulin as well
Abnormal blood fats (lipids) (<i>p242</i>)	<ul style="list-style-type: none"> • Monitor levels • Treat to target • Statin recommended
Kidney disease (<i>p244</i>)	<ul style="list-style-type: none"> • Monitor eGFR and urine ACR • Target BP less than 130/80 • BP lowering medicine (ACE inhibitor or ARB)
Depression (<i>p201</i>)	<ul style="list-style-type: none"> • Identify and treat depression
Absolute cardiovascular risk high (more than 15%)	<ul style="list-style-type: none"> • Treat with statin <i>AND</i> ACE inhibitor or ARB • Aspirin recommended if known CVD — heart attack, angina, ischaemic stroke

Cardiovascular risk chart 1 – ADULTS WITHOUT DIABETES



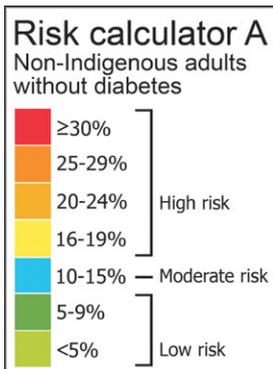
* If systolic BP 180mmHg or more OR TC more than 7.5mmol/L — always high risk (more than 15%).

† Non-smoker — never smoked or stopped smoking at least 12 months ago.

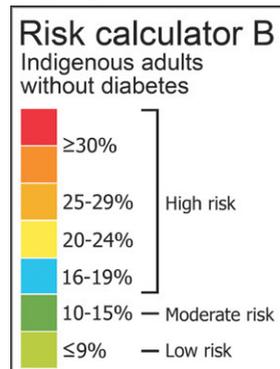
How to use Cardiovascular risk charts

Use to calculate risk for Indigenous adults aged 20–74 years and non-Indigenous adults aged 45–74 years. Allows for much higher rates of CVD in young Indigenous adults.

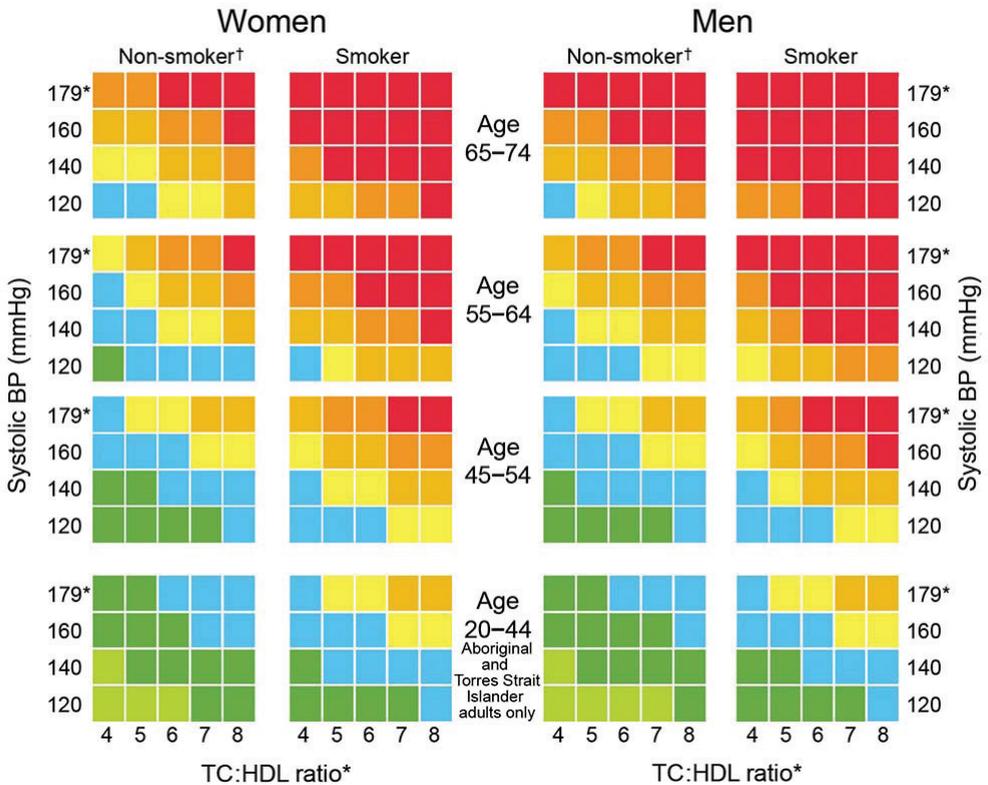
- Use chart related to person's diabetes status, sex, smoking, age



- Choose coloured box closest to person's systolic BP and TC: HDL ratio (can use non-fasting TC). If person's result falls on a line — move up to box above
- Check colour of box against appropriate Risk calculator to work out level of risk for person



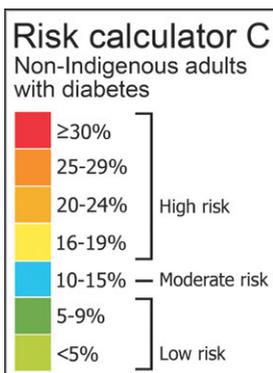
Cardiovascular risk chart 2 – ADULTS WITH DIABETES



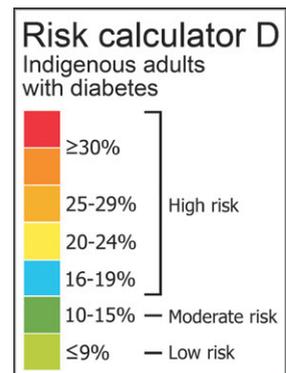
* If systolic BP 180mmHg or more OR TC more than 7.5mmol/L — always high risk, more than 15%.
 † Non-smoker — never smoked or stopped smoking at least 12 months ago.

How to use Risk calculators

Match colour of person's box from Cardiovascular risk chart to Risk calculator to work out level of risk. Use Risk calculator appropriate to person.



- **Indigenous adult**
 - Without diabetes — Risk calculator B
 - With diabetes — Risk calculator D
- **Non-Indigenous adult**
 - Without diabetes — Risk calculator A
 - With diabetes — Risk calculator C



Interpreting results

Body measurements — adults

- Body mass index (BMI) and waist circumference are better indicators of disease risk than weight
- Calculate BMI (*CPM p108*), measure waist (*CPM p111*)

Table 4.2: BMI interpretation — normal waist circumference*

BMI	What it means	What to do
Less than 18.5	Underweight	<ul style="list-style-type: none"> • Medical consult • Advise healthy eating (<i>CPM p143</i>), keeping active (<i>CPM p144</i>)
18.5–24.9	Healthy weight	<ul style="list-style-type: none"> • Advise healthy eating (<i>CPM p143</i>), keeping active (<i>CPM p144</i>)
25–29.9	Overweight	<ul style="list-style-type: none"> • Advise to lose weight (<i>CPM p145</i>) or not gain more weight — healthy eating, increased activity
30 or more	Obese	<ul style="list-style-type: none"> • Medical consult • Advise to lose weight (<i>CPM p145</i>) — healthy eating, increased activity

* Some people have normal BMI but bigger than normal waist circumference. This is a risk — advise to lose weight, be active.

Table 4.3: Waist circumference interpretation

Waist circumference (cm)	What it means	Advice to give
Male less than 94 Female less than 80	Normal	<ul style="list-style-type: none"> • Maintain healthy weight — healthy eating (<i>CPM p143</i>), keep active (<i>CPM p144</i>)
Male 94–102 Female 80–88	Increased risk of chronic disease	<ul style="list-style-type: none"> • Keep active (<i>CPM p144</i>) • Not gain more weight (<i>CPM p145</i>)
Male more than 102 Female more than 88	Greatly increased risk of chronic disease	<ul style="list-style-type: none"> • Lose weight (<i>CPM p145</i>) — healthy eating, increased activity

Testing for diabetes

- Diagnosis of diabetes needs
 - Diabetes (high blood glucose) symptoms and 1 abnormal test
 - If no symptoms — 2 abnormal tests done on different days
 - Any combination of abnormal OGTT, venous BGL, HbA1c
 - **Do not** use OGTT until at least 6 weeks after giving birth (postpartum)
 - **Do not** use HbA1c if under 18 years, more than 12 weeks pregnant, less than 4 months after childbirth (postpartum)

- Glucose meter readings can't provide a diagnosis — readings need to be checked with accurate testing method (eg venous blood glucose)

Venous blood glucose

Table 4.4: Interpreting venous blood glucose results

Fasting venous BGL (mmol/L)	Random venous BGL (mmol/L)	What it means	What to do
Less than 5.5	Less than 5.5	<ul style="list-style-type: none"> • Normal 	<ul style="list-style-type: none"> • Repeat venous blood glucose in 2 years
5.5–6.9	5.5–11.0	<ul style="list-style-type: none"> • Could be <ul style="list-style-type: none"> ◦ Diabetes ◦ Impaired glucose tolerance ◦ Impaired fasting glucose 	<ul style="list-style-type: none"> • If no risk factors* — <ul style="list-style-type: none"> ◦ Repeat venous BGL in 1 year • If also risk factors* — <ul style="list-style-type: none"> ◦ Fasting 75g OGTT <ul style="list-style-type: none"> ▪ If not possible — do non-fasting 75g OGTT OR HbA1c ◦ Cardiovascular risk assessment (p230) ◦ Medical review within 1 month
7.0 or more	11.1 or more	<ul style="list-style-type: none"> • Diabetes (confirmation needed) • Increased absolute cardiovascular risk • Will need blood glucose control treatment (p257) 	<ul style="list-style-type: none"> • Repeat venous BGL or do HbA1c to confirm <ul style="list-style-type: none"> ◦ No need for OGTT • Do first assessment — see <i>Combined checks for chronic diseases</i> (p239) • Medical review within 2 weeks

*Risk factors for diabetes

- Smoking
- Overweight/obese
- High BP
- Abnormal blood fats (lipids)
- Gestational diabetes
- Family history — heart attack or diabetes

Oral glucose tolerance tests

Table 4.5: Interpreting 75g OGTT*

Result (mmol/L)	What it means
Fasting glucose less than 7.0 <i>AND</i> fasting 2 hour glucose 5.5–7.7 <i>OR</i> non-fasting** 2 hour glucose 5.5–7.7	Normal range
Fasting glucose less than 7.0 <i>AND</i> fasting 2 hour glucose 7.8–11.0 <i>OR</i> non-fasting** 2 hour glucose 7.8–11.0	Impaired glucose tolerance
Fasting glucose 7.0 or more <i>OR</i> fasting 2 hour glucose 11.1 or more <i>OR</i> non-fasting** 2 hour glucose 11.1 or more	Diabetes

* **Do not** use OGTT to diagnose diabetes until at least 6 weeks after giving birth.

** Non-fasting OGTT doesn't need baseline BGL level. Just give 75mg OGTT solution to drink and test BGL after 2 hours. Must not eat or smoke during 2 hours of test, can only drink water. **Do not** use if under 18 years.

HbA1c

Table 4.6: Interpreting HbA1c*

HbA1c result	What it means
Less than 39mmol/mol (5.7%)	Normal
39–47mmol/mol (5.7–6.4%)	At risk of diabetes
48mmol/mol (6.5%) or more	Diabetes

* **Do not** use HbA1c to diagnose diabetes if under 18 years, more than 12 weeks pregnant, less than 4 months after giving birth.

Testing for abnormal blood fats (lipids)

- Fasting lipid tests best
- If measured blood fats different to target — medical review, see *Blood fats* (p242)

Table 4.7: Target levels for blood fats

Blood fat type	Target level (mmol/L)
TC — total cholesterol	Less than 4
HDL-C — high density lipoprotein cholesterol	More than 1
LDL-C — low density lipoprotein cholesterol	Less than 2 <i>OR</i> if known cardiovascular disease — less than 1.8
TG — triglycerides	Less than 2

Testing for kidney disease

Diagnosis of chronic kidney disease needs 2 abnormal urine ACR at least 3 months apart *OR* 2 reduced eGFR at least 3 months apart.

Urine testing for kidney disease

- At 2 yearly Adult Health Check
 - U/A
 - *OR* if Indigenous adult 30 years or over — ACR
- If positive protein (1+ or more) on U/A —
 - Send urine for ACR
 - Collect urine for MC&S
 - Standard STI check to exclude active infection — man ([p272](#)), woman ([WBM p238](#))
- If ACR 2.5 or more for males or 3.5 or more for females
 - *AND* no UTI or STI — repeat urine ACR in 3 months to confirm **chronic** kidney disease
 - *AND* active UTI or STI — treat infection, repeat U/A in 3 months
 - If positive protein — repeat ACR
- At least one ACR should be first morning void urine (first time to toilet that day)
- If raised urine ACR results — medical review

Note: ACR useful for diagnosis, but once treatment started use eGFR to check progress of kidney disease.

Table 4.8: Interpreting ACR results — 2 results at least 3 months apart

ACR result (mg/mmol)	Interpretation	What to do
Male: 0–2.4 Female: 0–3.4	Normal	Repeat ACR in 2 years
Male: 2.5–25 Female: 3.5–35	Microalbuminuria	CKD risk assessment (p244)
Male: More than 25 Female: More than 35	Macroalbuminuria	

Testing for high BP (hypertension)

- Diagnosis of high BP needs BP to be high on 4 separate measurements (check BP twice on at least 2 different visits)
- Check file notes for
 - Previous records of high BP
 - Existing high BP management plan

Table 4.9: BP result and action, if not already on a BP management plan

BP (mmHg)*	Action		
	No diabetes or CKD	Diabetes	CKD
Less than 130/80	Check BP in 2 years, give healthy lifestyle advice (CPM p143)	Check BP as per usual Combined checks for chronic diseases (p239)	
130/80 or more but less than 140/90	Check BP in 1 year, give healthy lifestyle advice (CPM p143)	Check BP twice in next 4 weeks	
		• If still above 130/80 — see <i>High BP (hypertension)</i> (p268)	• If still above 130/80 — see <i>Chronic kidney disease</i> (p244)
140/90 or more but less than 160/110	Check BP twice in next 4 weeks	• See <i>High BP (hypertension)</i> (p268) • Medical review within 1 month	• See <i>Chronic kidney disease</i> (p244) • Medical review within 1 month
	• If still above 140/90 — see <i>High BP (hypertension)</i> (p268)		
160/110 or more but less than 180/120	• See <i>High BP (hypertension)</i> (p268) • Medical review within 1 month		
180/120 or more	Medical consult straight away		

* If systolic and diastolic readings in different categories — follow action for higher reading.

Combined checks for chronic diseases

Many chronic diseases are closely related, and lead to the same serious complications — heart attack, stroke. Monitoring and management is very similar and most people have more than one chronic condition. Schizophrenia, bipolar affective disorder and antipsychotic use increase risk of metabolic syndrome.

- Combined checks (Table 4.10) are for all people with one or more of
 - Coronary artery disease (CAD)
 - High BP
 - Abnormal blood fats (lipids)
 - Chronic kidney disease (CKD, calculated risk level [p244] – mod = moderate)
 - Diabetes (DM)
 - Heart failure (HF)
 - Schizophrenia, bipolar affective disorder, antipsychotic use (MH)
 - Chronic obstructive pulmonary disease, bronchiectasis (CLD)
- Checks with a tick (✓) are for everyone
 - If check only applies to one disease, the condition is shown (eg DM)
 - If check is needed less often than recall schedule, the frequency is shown (eg 6 monthly)

When to do checks

- Complete assessment at diagnosis, then every year
- Timing of ongoing recall cycle between yearly reviews (3 or 6 monthly) is based on person's level of absolute cardiovascular risk (p230)

Weekly recall cycle (use monthly recall items)

- For first 4 weeks following heart attack, cardiac surgery, acute heart failure
 - Medical review at 4 weeks (can be case discussion)
 - Talk with cardiac rehabilitation team about advice to give person

Monthly recall cycle

- For first 3 months for everyone with **new** diagnosis of CAD, CKD, diabetes, heart failure — to achieve good control

3 monthly recall cycle

- For people with 1 or more of these conditions *AND* absolute cardiovascular risk more than 15% (high)
- For people with high CKD risk regardless of absolute cardiovascular risk

6 monthly recall cycle

- For people with 1 or more of these conditions *AND* absolute cardiovascular risk 15% or less (low or moderate)

Note: Tools for completing chronic disease checks may be available on your clinic patient information system.

Table 4.10: Combined checks for chronic diseases

Checks	First assessment AND Yearly recall	Person on monthly recall cycle	Person on 3 monthly recall cycle	Person on 6 monthly recall cycle
Ask about				
Chest pain, shortness of breath, ankle or leg swelling	✓	✓	✓	✓
Smoking, Nutrition, Alcohol, Physical activity, Emotional and social wellbeing — SNAPE (p243)	✓			
Medicines, any problems	✓	✓	✓	✓
Problems in feet	• DM	• DM	• DM	• DM
Problems with sex	✓	–	–	–
Contraception (WBM p335)	✓	–	–	–
Check				
Height	✓ once	–	–	–
Weight, waist circumference	✓	✓	✓	✓
BMI	✓		✓ 6 monthly	✓
BP, pulse rate and rhythm	✓	✓	✓	✓
FBC	✓	–	• CKD high • MH 6 monthly (valproate)	• CKD mod • MH (valproate)
LFT	✓	–	• CKD high 6 monthly • MH 6 monthly	• CKD mod • MH
UEC	✓	–	• CKD high • MH 6 monthly	• CKD mod • MH
GFR/eGFR	✓	–	• CKD high	• CKD mod
BGL	✓	–	• CKD high	• CKD mod
HbA1c	• DM • MH	• DM at 3 months	• DM • MH 6 monthly	• DM 3 monthly • MH
TSH	✓ once • Type 1 DM • CKD mod, high	–	• MH 6 monthly (lithium carbonate)	• MH (lithium carbonate)
Lipids	✓	–	✓ 6 monthly	✓
Iron studies, CRP	• CKD high	–	• CKD high	–

Checks	First assessment AND Yearly recall	Person on monthly recall cycle	Person on 3 monthly recall cycle	Person on 6 monthly recall cycle
ALP, Ca, Mg, PO ₄ , PTH, Vitamin D	• CKD – see Table 4.11 for testing frequency by eGFR			
Hepatitis B status* (p368)	✓	–	–	–
Urine ACR	✓	–	–	–
PHQ9 (p202)	✓	–	–	–
CVS complications	✓	–	–	–
Vision	✓	–	–	–
Foot check (CPM p259), self-care education (CPM p262)	• DM	• High risk foot at 3 months	• High risk foot	• High risk foot 3 monthly
Teeth and mouth	✓	–	–	–
ECG	✓ once • MH	–	–	–
Echocardiogram	• HF once	–	–	–
X-ray, O ₂ sats, spirometry	• CLD	–	–	–
Retinal eye check (fundal camera)	• DM • High BP	–	–	–
Pneumococcal immunisation status	✓	–	–	–
Do				
Cardiovascular risk assessment	✓			
Brief interventions – SNAPE, healthy lifestyle	✓	✓	✓	✓
Flu immunisation	✓	–	–	–
Yearly care plan	✓	–	–	–
ATSIHP/nurse review	✓	✓	✓	✓
Medical review	✓	✓ at 3 months	✓ 6 monthly	✓
Specialist review	• Complex cases	–	–	–
Dentist review	✓	–	–	–
Optometrist review	• DM	–	–	–

*If hepatitis B immunisation needed and GFR less than 30 — give double dose.

Table 4.11: Pathology for CKD, frequency of testing by eGFR

eGFR (mL/min/1.73m ²)	Ca, PO ₄ , Mg	ALP, PTH	25-hydroxyvitamin D
45–59	6–12 months	First assessment	First assessment
Less than 45	3–6 months	6–12 months	First assessment

Blood fats

Abnormal blood fats (lipids) are a risk factor for cardiovascular disease, not a separate disease.

Management based on level of absolute cardiovascular risk not blood fat levels.

• Check for abnormal blood fats

- As per scheduled Combined checks for chronic diseases ([p239](#))
- *OR* every year if moderate absolute cardiovascular risk (10–15%) *AND* family history of heart attack or stroke before 60 years
- *OR* every 2 years in Adult Health Check ([CPM p123](#))

Check

- Fasting lipids best — request ‘Fasting lipids full profile’ (TC, HDL-C, LDL-C, TG)
- Random (non-fasting) test still useful — request ‘Random TC and HDL-C’
- See *Testing for abnormal blood fats (lipids)* for target levels ([p236](#))

Do

- Cardiovascular risk assessment ([p230](#))
- If abnormal blood fats —
 - Take blood for TFT, LFT, CK, BGL
 - Urine ACR
- If diabetes — good blood glucose control will improve abnormal blood fats
- Manage according to risk factors — see Table 4.12
- Statins best medicines for lowering TC and LDL-C, have some effect on raising HDL-C
 - If statins not tolerated or not controlling blood lipids — medical review

Remember: Any lowering of TC or LDL-C, or increase in HDL-C is good even if target not reached.

Follow-up

- If LFT or CK abnormal at start — monitor on a regular basis, medical review
- Check if taking medicine
- Ask about side effects
 - If muscle pain (myalgia) — check LFT and CK, medical review

Table 4.12: Managing blood fats (lipids)

Risk factors	Management
<ul style="list-style-type: none"> Existing cardiovascular disease High absolute cardiovascular risk (more than 15%) 	<ul style="list-style-type: none"> Active lifestyle management[†] Give high dose statin even if blood fats normal Combined checks for chronic diseases (p239)
<ul style="list-style-type: none"> Moderate absolute cardiovascular risk (10–15%) 	<ul style="list-style-type: none"> Active lifestyle management[†] May need statin even if blood fats normal Manage other risk factors Combined checks for chronic diseases (p239)
<ul style="list-style-type: none"> Low absolute cardiovascular risk (less than 10%) 	<ul style="list-style-type: none"> Active lifestyle management[†] May not need statin even if blood fats abnormal Combined checks for chronic diseases (p239)

† Lifestyle risk factors (SNAPE)

- S** moking — ask how much, how long, tried to stop, want to stop
Remember: Quitting is the most important lifestyle change
- N** utrition — ask about fruit and vegetables, takeaways, sugary/soft drinks. Give information on healthy diet
- A** lcohol — work out how much alcohol (grog) person drinks, provide information on safe drinking and cutting down. Ask about other drugs — cannabis (gunja), inhalants/sniffing, kava, party drugs
- P** hysical activity — ask how much physical activity/exercise they get, give advice on recommended levels of physical activity
- E** motional and social wellbeing — ask how they are feeling, how they are coping with everyday activities, loss and grief issues

See *Tobacco* (p223), *Healthy lifestyle choices* (CPM p143), *Brief interventions* (CPM p138).

Do a full review at least once a year. At other visits make relevant to person's behaviour — focus on agreed changes or highest risk.

Chronic kidney disease

Very common in Indigenous people. Often with other chronic diseases (eg diabetes, high BP). Finding kidney disease early and treating high BP can slow progress of CKD and give person a better life.

- Usually no symptoms — diagnosed by blood or urine tests
- Tests can be abnormal for short periods for other reasons
- Need 2 abnormal tests to diagnose chronic kidney disease
 - 2 abnormal urine ACR at least 3 months apart ([p237](#))
 - OR 2 reduced eGFR at least 3 months apart

Table 4.13: Calculating CKD risk level

Kidney function stage	eGFR* (ml/min/1.73m ²)	Urine ACR (mg/mmol)			
		Male: less than 2.5 Female: less than 3.5	Male: 2.5–25 Female: 3.5–35	Male: 25–300 Female: 35–300	More than 300
		Normal	Micro-albuminuria	Macroalbuminuria	
1	90 or more	Normal	Low	Moderate	High
2	60–89	Normal	Low	Moderate	High
3a	45–59	Low	Moderate	High	Severe
3b	30–44	High	High	High	Severe
4	15–29	High	High	High	Severe
5	Less than 15 OR on dialysis	High	High	High	Severe

* Laboratory calculated eGFR recommended.

Normal
Low
Moderate
High
Severe

At diagnosis Check

- BP, BMI
- Take bloods for UEC, FBC, BGL, lipids, CRP
- Renal ultrasound (not essential to diagnose CKD)
 - Essential to exclude specific problems if person has
 - Recurrent UTIs
 - OR symptoms of urinary tract obstruction — frequency, incontinence
 - OR family history of polycystic kidney disease



- **Estimated glomerular filtration rate (eGFR)**
 - eGFR worked out using age, gender, serum creatinine level — useful estimate of true kidney function for everyday use
 - If using POC test to measure creatinine — calculate eGFR
 - GFR calculator (CKD-EPI formula) at <http://www.kidney.org.au/HealthProfessionals/GFRCalculatorCKDEPI/tabid/803/Default.aspx>

Do

- Work out CKD risk level using eGFR and urine ACR — see Table 4.13
 - Estimates risk of kidney failure or cardiovascular death
- Cardiovascular risk assessment ([p230](#))
- Medical review, include medicines review
- If female of childbearing age — talk about contraception ([WBM p335](#)). Pregnancy increases stress on kidneys
- Promote healthy lifestyle measures — diet, weight control ([CPM p145](#)), physical activity ([CPM p144](#)), stop smoking ([p223](#)), moderate alcohol intake
- Manage by CKD risk level — see Table 4.14

Table 4.14: Managing chronic kidney disease by CKD risk level

CKD risk level	Checks	Action
Normal	<ul style="list-style-type: none"> • 2 yearly Adult Health Check (CPM p123) 	—
Low	<ul style="list-style-type: none"> • Yearly Adult Health Check (CPM p123) • If diabetes — 6 monthly cycle Combined checks for chronic diseases (p239) 	<ul style="list-style-type: none"> • If diabetes — see <i>Medicines for CKD</i> (p246)
Moderate	<ul style="list-style-type: none"> • 6 monthly cycle Combined checks for chronic diseases (p239) • If diabetes — 3 monthly cycle Combined checks for chronic diseases (p239) 	<ul style="list-style-type: none"> • See <i>Medicines for CKD</i> (p246) • BP target — less than 130/80
High	<ul style="list-style-type: none"> • 3 monthly cycle Combined checks for chronic diseases (p239) 	<ul style="list-style-type: none"> • See <i>Medicines for CKD</i> (p246) • BP target — less than 130/80 • If eGFR less than 30 — stop metformin • Give statin even if blood fats normal (p243) • Shared care with kidney specialist team
Severe	<ul style="list-style-type: none"> • Individual care plan 	<ul style="list-style-type: none"> • Shared care with kidney specialist team

Medicines for CKD

- ACE inhibitor or ARB mainstay of treatment
 - Maximise dose to get best effect. BP target — less than 130/80
 - **Do not** use ACE inhibitor and ARB together. Increased risk of side effects
 - **Do not** use in pregnancy — both contraindicated
- Advise all women of childbearing age on ACE inhibitor or ARB of risks *AND*
 - To use reliable contraception
 - To come to clinic if planning pregnancy, may need to change medicines. See *Pre-pregnancy counselling* ([WBM p84](#))
 - To come to clinic to stop medicine as soon as they think they are pregnant. **Medical consult**, see *Kidney disease in pregnancy* ([WBM p143](#))

Step 1

- **ACE inhibitor** (eg ramipril, perindopril [doses [p270](#)])
- If can't take ACE inhibitor (cough, angioedema) — give **ARB** (eg irbesartan [doses [p270](#)])
- If elderly or heart failure — start with lower dose
- Check UEC 2 weeks after starting ACE inhibitor or ARB
- If eGFR decreases by more than 25% *OR* potassium is more than 5.5mmol/L —
 - Stop ACE inhibitor or ARB
 - **Kidney specialist consult**
- If no side effects — increase dose until target BP reached (less than 130/80mmHg)

Step 2

- If BP still above target after 3 months — add
 - **Calcium channel blocker** (eg diltiazem slow-release, amlodipine [doses [p270](#)]). **Medical consult** if pregnant
 - *OR* **beta-blocker** (eg atenolol [doses [p270](#)]). **Medical consult** if pregnant

Step 3

- If BP still above target after 3 months — change ACE inhibitor/ARB to combination medicine
 - **ACE inhibitor + thiazide diuretic** (eg perindopril-indapamide [doses [p270](#)])
 - *OR* **ARB + thiazide diuretic** (eg irbesartan-hydrochlorothiazide [doses [p270](#)])
- If BP not controlled with 3 drugs at maximum dose — **physician/ kidney specialist consult**

Kidney specialist

Kidney specialist consult straight away for anyone with

- High potassium level — more than 6mmol/L on pathology test
 - Recheck with POC test. If still more than 6mmol/L — ECG and consult
- Unwell with signs of acute nephritis — low urine output (oliguria), blood in urine, acute high BP, swelling
- 25% reduction in eGFR at any risk level



Shared care with kidney specialist

- Severe CKD risk level — routine referrals for planned care
 - Extra **kidney specialist consult** if
 - eGFR less than 15 for first time
 - Urine ACR more than 300mg/mmol (or 3+ protein on U/A) *AND* swollen legs — may be nephrotic syndrome
- High CKD risk level — routine referrals for planned care
 - Extra **kidney specialist consult** if eGFR less than 45 for first time

Consider referral to kidney specialist if

- More than 20% reduction in eGFR
- Ongoing protein and blood in urine

Check if further tests or results needed before appointment.

Renal biopsy rarely needed.

Follow-up appointments can be telehealth case conference.

Common problems — high or severe CKD risk level**Anaemia**

Causes fatigue, shortness of breath, difficulty thinking.

- Target Hb — 100–115g/L
 - If less than 100 or more than 115g/L — follow kidney specialist team management plan or talk with kidney specialist team at case conference
- Often need iron — IV infusion or oral
- May need regular subcut erythropoietin or darbepoetin. Prescribed by kidney specialist

Medicines

- **Do not** use NSAIDs (eg ibuprofen)
- **Do not** use metformin if eGFR less than 30
- Check all medicines with doctor or pharmacist
 - A lot of medicines cleared by kidneys can't be given or need smaller doses
- Be careful with radiology exams needing contrast injection

Patients on renal replacement therapy (RRT)

Peritoneal dialysis, community based haemodialysis, with kidney transplant.

Do

- Develop chronic disease care plan with shared care between primary care and kidney specialist team
 - See *Combined checks for chronic disease* (p239). Add extra tests if needed
- Develop action plan for acute illness or an emergency

Missed dialysis

Ask

- When was last dialysis treatment
- Shortness of breath, weakness, confusion
- Nausea, vomiting, chest pain

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Weight
- Coma scale score ([p74](#))
- POC test for potassium level
- Do ECG — send to doctor
 - Check for signs of high serum potassium level ([p249](#))

Remember: No ECG changes doesn't exclude high potassium levels

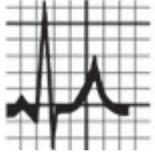
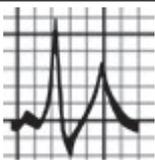
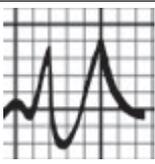
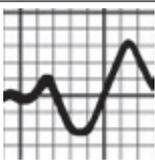
Do

Remember — Life support — DRS ABC ([p10](#)).

- Give
 - **Calcium polystyrene sulfonate** (eg *Resonium*) oral twice a day (bd) — adult 30g — check indications
 - **AND lactulose** oral twice a day (bd) — adult 30mL (reduces constipation)
- **Medical consult**, send to dialysis unit in major centre, **not** regional satellite
 - If stable (no high potassium levels and no severe shortness of breath) — could use commercial flight rather than medical retrieval
- **If serum potassium level high** — above 6mmol/L **OR** tall T wave on ECG or Lead II monitoring
 - **Medical consult** straight away
 - Give
 - **Calcium gluconate 10% IV bolus** — 10–20mL. Give slowly, can repeat every 5 minutes until improved
 - **OR** if person has used **digoxin** — **calcium gluconate 10% IV** — 10mL in 100mL **glucose 5%** over 20 minutes
 - Continuous nebulised **salbutamol**
 - Medical retrieval team may give **glucose 50% IV** — 25–50mL **AND short-acting insulin** subcut/IV — 6 units. If given — monitor for low BGL



Table 4.15: ECG changes with high serum potassium levels

ECG image	ECG findings	Potassium (mmol/L)
	Normal QRS and T wave	4
	Flattened and widened P wave, widened QRS, tall tented T wave	6
	Absent P, further QRS widening with notch, tall T wave	7
	Sinusoidal (sine wave) QRST (tall broad T wave merges into following wide QRS)	8
	AV dissociation, VT, VF	9 or more

Coronary artery disease

- CAD most common cause of death in Australia. Includes angina, ischaemic heart disease, heart attack
 - Consider heart disease in any person with chest pain
 - Heart attack or stroke common in people with diabetes
- Quitting smoking is the **most important action** to lessen risk of heart attack
 - Brief interventions (*CPM p138*)
 - NRT (*p225*) and urge reduction medicines (*p225*) can be used
 - If severe angina or less than 4 weeks since heart attack — talk with cardiologist about NRT
- Reduce cardiovascular risk across all risk factors

Ask

Danger signs

If any of these signs — **medical consult straight away**. See *Chest pain (p47)*.

- New chest pain — may be dull, tight or heavy. Usually central chest but may be anywhere, including left shoulder, arm, jaw, neck
- Pain at rest
- Change in pain pattern
- Pain more often than usual
- Pain occurring overnight

- Chest pain
 - How often they get chest pain — daily, weekly
 - How long does pain last
 - How bad is pain — rate out of 10 or use faces scale (*p377*)
 - Where do they get pain, does it spread anywhere
 - Does chest pain happen with activity, or what brings it on
- Shortness of breath, ankle swelling
- Palpitations, dizziness, nausea, vomiting
- Panic, fear of dying
- Smoking, alcohol (grog), physical activity, diet (eg fat, sugar, salt)
- Other health problems — diabetes, high BP, family history of heart problems
- Medicines for chest pain — do they stop pain, when does person take them
- Other medicines — are they taking them

Check

- Temp, pulse rate and rhythm, BP, weight, BMI, waist circumference
- Do heart and lung exam (*CPM p186*)
- Do ECG
- Take blood for FBC, UEC, BGL, fasting lipids, TSH
- Collect urine for ACR



Do

- Cardiovascular risk assessment ([p230](#))
- Risk assessment for chronic chest pain — see Table 4.16
 - If medium or high risk, or any concerns — **medical consult**
 - If low risk — medical review
 - Start immediate management
 - Organise referrals as needed
- See *Heart failure* ([p264](#))
- Give information on tobacco ([p223](#)), brief intervention for smoking ([CPM p138](#))

Table 4.16: Risk assessment and actions for chronic chest pain

Features	Low risk	Medium risk	High risk
Chest pain*	Non-typical	Non-typical or typical	Typical
Risk factors**	None	1–2	<ul style="list-style-type: none"> • More than 2 • <i>OR</i> recent heart attack • <i>OR</i> less than 6 months since heart surgery
ECG	Normal	Normal	Abnormal
Making diagnosis	Not heart (cardiac) pain, consider other causes	Exercise ECG (stress test) and/or specialist review	Urgent cardiologist/specialist review for tests and advice on treatment
Immediate management	<ul style="list-style-type: none"> • Treat as needed — no heart medicines • Tell person to return if pain changes 	<ul style="list-style-type: none"> • Aspirin once a day – 100mg • Angina medicine 	<ul style="list-style-type: none"> • Aspirin once a day – 100mg • 2 or 3 angina medicines

***Chest pain**

- **Typical chest pain (angina)**

- Includes all of
 - Central chest discomfort, feels ‘tight’ or ‘pressing’, lasts for minutes
 - *AND* brought on by exertion or emotional stress
 - *AND* relieved by rest or angina medicine

- **Non-typical chest pain**

- Only 1 or 2 features of ‘typical chest pain’

****Risk factors**

- Smoking ([p223](#))
- Diabetes ([p254](#))
- High BP ([p268](#))
- Kidney disease ([p244](#))
- Abnormal blood fats (lipids) ([p242](#))
- Family history of heart attack
- After menopause ([WBM p321](#))
- Previous cardiovascular events

Based on results of exercise ECG (stress test)

- **If it could be CAD**
 - **Medical consult**
 - Refer for **urgent specialist review**, may need angiogram
 - Continue **aspirin** 100mg once a day **AND angina medicines** as needed
 - Start **beta-blocker** if not contraindicated (eg slow heart rate, reversible airways disease, already on calcium channel blocker)
 - If chest pain overnight or at rest — use **calcium channel blocker** not beta-blocker
 - Do brief interventions for smoking ([CPM p138](#)), healthy diet ([CPM p143](#)), physical activity ([CPM p144](#))
- **If it is not CAD**
 - Consider other causes of chest pain ([p47](#))
 - Stop aspirin and angina medicine
 - Manage other risk factors
 - If chest pain continues — refer to specialist

Follow-up

- Combined checks for chronic diseases ([p239](#))

Medicines for CAD**To reduce risk of heart attack OR if person has ever had a heart attack**

- **Aspirin** once a day – 100mg
- **ACE inhibitor** (eg ramipril or perindopril once a day – 5–10mg)
- **Statin**
- **Beta-blocker** (eg atenolol once a day – 25–100mg)
 - Start at 25mg once a day, double dose every 2 weeks up to 100mg
- Can add **calcium channel blocker** (eg amlodipine or nifedipine slow-release once a day – 30–60mg)
- If recurrent stable angina while on **aspirin** OR after heart attack or stent — **clopidogrel** once a day for 1 year – 75mg



For chest pains (angina)

- Also see *Advice for using angina medicines at home (below)*
- **Treatment choices for acute angina pain**
 - **Glyceryl trinitrate** 1 spray under tongue – 400microgram
 - *OR* **isosorbide dinitrate** 1 tablet under tongue – 5mg
 - *OR* **glyceryl trinitrate** 1 tablet under tongue – 600microgram
 - Write date bottle opened on label, replace 3 months later
- **Management choices for chronic angina**
 - **Isosorbide mononitrate** oral once a day – 30–120mg/day
 - **Nitrate patch** – 5–10mg in 24 hours. On during day, off at night
 - **Nicorandil** oral twice a day (bd) – 5–20mg

Advice for using angina medicines at home

- Always carry medicine for acute angina pain with you
 - Keep it cool and air tight
 - Keep glyceryl trinitrate spray out of the light
- Take glyceryl trinitrate tablets back to clinic to get new ones 3 months after date on bottle, even if not finished. Tablets need to be fresh to work properly
- When angina heart pain starts
 - Sit or lie down straight away
 - Take 1 dose of medicine for acute angina pain — expect a headache
- If still chest pain or discomfort after 5 minutes — take another dose
- If still pain after another 10 minutes (total of 15 minutes) — take another dose, call ambulance or go straight to clinic or hospital
- If still pain in another 15 minutes (total of 30 minutes) — can take another dose
- **Do not** take more than 1 dose at a time (can make BP too low)
- If chest pain worse than usual — treat as a heart attack. Get help straight away
- **Do not** use nitrate therapy if drugs for impotence used recently
 - Sildenafil or vardenafil in past 24 hours
 - Tadalafil in past 2 days

Diabetes

- Type 1 diabetes (less common)
 - Usually diagnosed in children and young people
 - Body unable to produce enough insulin
- Type 2 diabetes
 - Initially increased insulin levels but body doesn't use it properly (insulin resistance), later less insulin made
 - More common in Indigenous people, increasing in children
- Heart attack at young age is a major cause of death for people with diabetes
 - May be atypical — happens with no chest pain, with symptoms like tiredness or problems breathing

Diagnosis and management of diabetes is important

- Common problems with diabetes, especially if poorly controlled
 - High BP, abnormal blood fats (lipids), heart attack, stroke
 - Kidney disease (nephropathy), kidney failure
 - Eye damage (retinopathy), loss of vision
 - Nerve damage (neuropathy) causing foot ulcers, nerve pain, amputations
 - Serious infections, poor wound healing
 - Dental/oral disease, tooth loss
 - Erectile dysfunction in men
 - Depression

Risk factors for diabetes

- Family history of diabetes (parents, sister, brother)
- Ethnicity
- Overweight or obese — calculate BMI (*CPM p108*)
- Waist circumference — women more than 80cm, men more than 94cm
- Women — history of gestational diabetes or polycystic ovary syndrome
- Impaired glucose tolerance
- Medicines (eg corticosteroids, antipsychotics)

Prevention

- To lessen risk of developing Type 2 diabetes or slow progress of disease — healthy diet, physical activity, weight loss if overweight/obese, oral hygiene
- To identify diabetes or risk of diabetes early —
 - Adult Health Check (*CPM p123*)
 - Targeted screening of at-risk children over 10 years (*CPM p121*)
 - Obese — calculate BMI (*CPM p108*)
 - Parent, sister or brother with diabetes
 - Dark patches of skin at folds or creases (eg neck, armpits) — acanthosis nigricans



Ask

- About symptoms of high blood glucose
- Type 1 diabetes — almost always symptoms (rapid onset), positive ketones, often slim build, may be no family history of Type 2 diabetes
- Type 2 diabetes — may be no symptoms until late in disease when complications develop

Symptoms and signs of high blood glucose

- Increased thirst or fluid intake
- Passing urine often, especially at night
- Weight loss
- Tiredness
- Frequent infections — thrush, balanitis, boils, UTIs
- Eyesight problems
- Acute dental/oral disease
- If ketosis — vomiting or abdominal pain

Check

- See *Testing for diabetes* for how to diagnose ([p234](#))
- Always check for diabetes if symptoms of high blood glucose (*above*)
- Early diagnosis of Type 2 diabetes through screening may prevent complications
 - Routine Adult Health Check ([CPM p123](#))
 - Targeted screening of at-risk children over 10 years ([CPM p121](#))
 - Obese
 - Parent, sister or brother with diabetes
 - Dark patches of skin at folds or creases (eg neck, armpit) — acanthosis nigricans
- If child/young person has high BGL — always test for ketones (urine or blood)
- **Medical consult** if
 - Person sick with anything else at time of diagnosis
 - BGL more than 15mmol/L
 - Ketones in urine/blood moderate or high
- Ketones in urine/blood can mean
 - Person has not eaten — will have normal or low BGL
 - Undiagnosed Type 1 diabetes — will have high BGL
 - Needs insulin urgently, **medical consult**
 - Diabetic ketoacidosis (rare in Type 2 diabetes) — will have high BGL
 - **Medical consult** straight away

Do

Good diabetes care looks after whole person, not just blood glucose.

- Develop joint care plan with specialist, diabetes educator, doctor, patient

- For females of childbearing age — talk about
 - Contraception ([WBM p335](#)) — aim for good BGL control before getting pregnant
 - Pre-pregnancy counselling ([WBM p84](#))

Type 1 diabetes

- Always need insulin
- **Specialist consult**
- Monitor BGL every day
- Monitor BGL more often and monitor ketones when unwell — increased need for insulin. Not getting enough insulin can lead to ketoacidosis
- Will still need basal insulin when fasting

Gestational diabetes

- See *Diabetes in pregnancy* ([WBM p118](#))

Impaired glucose tolerance

OR borderline high HbA1c — 39–47mmol/mol or 5.7–6.4%

- Do cardiovascular risk assessment ([p230](#))
- Medical review
- Management plan including yearly BGL, HbA1c, follow-up schedule. See *Combined checks for chronic diseases* ([p239](#))
- Give advice about healthy diet ([CPM p143](#)), physical activity ([CPM p144](#)), losing weight to lessen risk of diabetes, and health benefits of stopping smoking ([p223](#))
- Consider starting metformin

Type 2 diabetes

- Do cardiovascular risk assessment ([p230](#))
- See *Combined checks for chronic diseases* ([p239](#))
 - Monthly recall cycle for first 3 months — always include education and response to treatment
 - *THEN* 3 or 6 monthly recall cycle based on level of cardiovascular risk
- Yearly review — include medical review, updated care plan including allied health
- Give advice about healthy diet ([CPM p143](#)), physical activity ([CPM p144](#)), losing weight to lessen risk of diabetes, and health benefits of stopping smoking ([p223](#))

Management of Type 2 diabetes

- Comprehensive management of diabetes includes controlling blood glucose, BP ([p268](#)), blood fats (lipids) ([p242](#)), kidney disease ([p244](#)), cardiovascular risk ([p230](#))
- Good management reduces risk of complications — microvascular (eye and kidney disease) and macrovascular (heart attack, stroke, amputation)



Blood glucose control

- Offer enough medicine to achieve best BGL control — to lessen risk of complications and other problems
- Can get better BGL control by adding second medicine rather than using maximum dose of 1 medicine alone

HbA1c targets

- 53mmol/mol (7%) or less. Good average blood glucose over last 3 months
- *OR* if severe CAD, elderly person — HbA1c 64mmol/mol (8%) or less
- *OR* individual target as per care plan

- High HbA1c levels increase risk of complications
 - Any decrease in HbA1c is good

BGL targets

- BGL targets should be individualised in care plan
- Suggested targets
 - Morning fasting — 4–7mmol/L
 - Random/2 hours after meal — 4–10mmol/L

- BGL self-monitoring (*CPM p381*) helps person understand and manage diabetes
 - Most useful for younger people, people on insulin, during changes in drug treatment, if BGL control unstable
 - Children/young people need to monitor BGL, and ketones when unwell
 - If person on insulin can't self-monitor — do in clinic 2–3 times a week

Table 4.17: Medicines for blood glucose control in adults with Type 2 diabetes

Always	• Include lifestyle measures — diet, weight control, physical activity
Step 1	• Metformin
	• If metformin contraindicated — chose 1 medicine from Step 2 list If target not reached in 3–6 months — reassess*. Move to Step 2, if needed.
Step 2	• <i>ADD</i> second medicine (check PBS approved combinations) <ul style="list-style-type: none"> ◦ Sulfonylurea ◦ <i>OR</i> gliptin (DPP4 inhibitor) ◦ <i>OR</i> SGLT2 inhibitor ◦ <i>OR</i> pioglitazone (thiazolidinedione) ◦ <i>OR</i> exenatide (GLP1 agonist) ◦ <i>OR</i> insulin — continue oral medicine/s
	• If target not reached in 6 months — reassess*. Move to Step 3, if needed.
Step 3	• <i>ADD</i> third medicine from Step 2 list (check PBS approved combinations)

***Reassess oral medicines**

- Check person understands lifestyle measures and medicine use
- Check that medicine being taken as directed
- Check for underlying infection (eg thrush, UTI) or other medicines (eg steroids) that may make it hard to get good BGL control
- Consider a different diagnosis (eg latent autoimmune diabetes in adults)

Medicines for blood glucose control in children and young people (under 18 years) with Type 2 diabetes

- Start **metformin**
- **Diabetes specialist consult** as soon as possible
- Consider starting insulin early — rapidly progressive disease that is hard to control

Oral medicines

- Only take oral medicines when eating
 - If unwell and not eating — stop use until eating again

Metformin

- Slow, gradual increase in dose to lessen chance of upset stomach
- May take a few weeks to see full benefit
- If stopped for more than 2 weeks — restart again slowly
- If swallowing problems — use immediate-release or smaller slow-release tablets (500mg)

Table 4.18: Oral medicines for glucose control in Type 2 diabetes

Medicine	Starting dose	Maximum dose	Comments
Metformin			
Metformin Metformin XR	500mg once a day	Standard Usually 2g total daily dose. May use 3g daily if overweight or obese. Up to 1g/dose. Slow-release – XR 2g once a day	<ul style="list-style-type: none"> • If kidney disease — reduce dose <ul style="list-style-type: none"> ◦ eGFR less than 30 — do not use ◦ eGFR 30–59 — up to 1g daily ◦ eGFR 60–90 — up to 2g daily ◦ Monitor kidney function yearly • Caution in heart failure, liver disease, acute severe illness • Take with food to avoid upset stomach



Medicine	Starting dose	Maximum dose	Comments
Sulfonylureas			
Gliclazide MR	30mg once a day	120mg once a day	<ul style="list-style-type: none"> • Take with food to avoid hypos (low BGL) • Give advice on recognising and treating a hypo (low BGL)
Glimepiride	1mg once a day	4mg once a day	<ul style="list-style-type: none"> • Avoid use in pregnancy
Gliptins — DPP4 inhibitors			
Lingaglipitin	5mg once a day	5mg once a day	<ul style="list-style-type: none"> • No need to adjust dose for kidney disease or liver disease • Avoid use in pregnancy
Sitagliptin	50mg once a day	100mg once a day	<ul style="list-style-type: none"> • If kidney disease — reduce dose <ul style="list-style-type: none"> ◦ eGFR 30–50 — 50mg once a day ◦ eGFR less than 30 — 25mg once a day • Avoid use in pregnancy
SGLT2 inhibitors			
Empagliflozin	10mg once a day	25mg once a day	<ul style="list-style-type: none"> • Risk of genital fungal infections and dehydration • Do not use if <ul style="list-style-type: none"> ◦ Recurrent thrush in women, balanitis in men ◦ History of ketosis ◦ Severe liver damage/disease ◦ Kidney disease with eGFR less than 45 • Avoid use in pregnancy
Dapagliflozin	10mg once a day	10mg once a day	<ul style="list-style-type: none"> • Risk of genital fungal infections and dehydration • Do not use if <ul style="list-style-type: none"> ◦ Recurrent thrush (women), balanitis (men) ◦ History of ketosis ◦ Severe liver damage/disease ◦ Kidney disease with eGFR less than 60 • Avoid use in pregnancy
Thiazolidinediones			
Pioglitazone	15mg once a day	45mg once a day	<ul style="list-style-type: none"> • Do not use if <ul style="list-style-type: none"> ◦ Liver damage/disease ◦ Bladder cancer • May make heart failure worse • Monitor LFT every 2 months for first year



Injected medicines

Exenatide

- Twice a day (bd) dosing
 - Give within 1 hour of breakfast and evening meal
 - If nausea — best given 15 minutes before meal
 - Start at 5microgram subcut twice a day for at least 1 month
 - Increase to maximum dose 10microgram subcut twice a day
 - If using with basal insulin — metformin is only oral blood glucose control medicine that can also be used
- Once a week dosing
 - 2mg injection once a week
 - Get advice from diabetes educator about how to give injection
 - Not currently approved for use with insulin
- Risk of upset stomach, may settle over time
- If used with sulfonylurea — increased risk of hypo (low BGL)
- **Do not** use if severe kidney disease, pregnant, breastfeeding

Insulin

- Used for
 - All people with Type 1 diabetes
 - Type 2 diabetes
 - To improve blood glucose control at any time
 - Needed after having diabetes for a long time, due to reduced ability of pancreas to produce insulin
- Start insulin when
 - Taking maximum tolerated dose of 2–3 oral medicines
 - HbA1c more than 53mmol/mol (7%) on 2 or more occasions (for 3–6 months) *OR* fasting BGL always more than 8mmol/L
 - Symptoms of high blood glucose ([p255](#))
- Take time for patient education including injecting and monitoring, thinking it over, talking with another patient on insulin
 - Get help from diabetes educator — can be by telehealth
 - Talk with person about practical ways to store insulin
 - Explain symptoms of low blood glucose and what to do ([p91](#))
- Agree on plan for monitoring BGL and insulin dose
- Check technique for giving insulin at least once a year

Insulin dosing

- Must be prescribed by doctor or nurse practitioner
- Record insulin regime in joint care plan
- Start with once a day basal (intermediate/long-acting) insulin
 - Choose insulin (eg glargine) and injecting device (eg self-injecting pen)
 - Start with low dose and increase until good BGL control



- If fasting (before breakfast) BGL high — give at bedtime
- If fasting BGL on target but before evening meal BGL high — give in morning
- Change to mixed insulin or insulin used twice a day if
 - Fasting BGL in target *BUT* BGL 2 hours after meal or HbA1c high on once a day insulin and oral medicines
 - *AND* eating regular meals. Higher risk of hypo (low BGL) with mixed insulin
 - *AND* can manage more complex treatment routine and self-monitoring
- Continue oral medicines

Table 4.19: Glargine insulin treatment in Type 2 diabetes

Glargine insulin	
Use	<ul style="list-style-type: none"> • Once a day — same time each day
Starting dose	<ul style="list-style-type: none"> • BMI 25 or less — 12 units • BMI more than 25 — 15 units
Maximum dose	<ul style="list-style-type: none"> • When good BGL control — may be large dose
Adjust dose — if <ul style="list-style-type: none"> • No hypos or low BGL symptoms <ul style="list-style-type: none"> ◦ Do not increase dose if fasting BGL less than 4 mmol/L at any time in last week • <i>AND</i> most recent HbA1c outside target range • <i>AND</i> <ul style="list-style-type: none"> ◦ If daily monitoring — fasting BGL outside target range on 2 or more days in a row ◦ If not daily monitoring — 2 or more clinic readings outside target range in 1 week 	Use fasting (before breakfast) BGL <ul style="list-style-type: none"> • If BGL less than 4mmol/L — decrease by 2 units <i>OR</i> 10% if dose more than 20 units • If BGL 4–7mmol/L — same dose • If BGL 7.1–10mmol/L — increase by 2 units • If BGL more than 10mmol/L — increase by 4 units

Adjusting insulin doses

- **Criteria** — adjust dose once or twice a week if
 - No hypos or low BGL symptoms
 - **Do not** increase dose if fasting BGL less than 4 mmol/L at any time in last week
 - *AND* most recent HbA1c outside target range
 - *AND*
 - If daily monitoring — fasting BGL outside target range ([p257](#)) on 2 or more days in a row
 - If not daily monitoring — 2 or more clinic readings outside target range in 1 week
- If Type 1 diabetes — **diabetes educator/medical consult**
- If Type 2 diabetes —
 - Glargine insulin — see Table 4.19
 - Other types of insulin — **diabetes educator/medical consult**



- Record new dose on prescription each time it is changed
- Review oral medicines. Consider stopping any with side effects and adjusting insulin dose if needed

Complications

Foot problems

Most common complication of nerve damage (peripheral neuropathy) — may lead to infection, foot ulcers, nerve pain, amputation.

- Do regular foot checks (*CPM p259*)
- Manage corns, calluses, acute injuries
- Refer to podiatrist as needed

High risk feet

- Person with identified high risk feet will need
 - More frequent foot checks (*CPM p259*)
 - Management plan
 - Education about foot care (*CPM p259*) and wearing socks and shoes

Foot ulcers and infections

- Diabetic foot ulcers are complex, chronic wounds. May be very little pain
- Every new ulcer or infection is serious
- **Medical consult**, may need to send to hospital
- Dress wound as needed (*CPM p280*)
- If **mild infection** with 2 or more of swelling, red, pus, warmth, pain —
 - Send swab for MC&S
 - Give **amoxicillin-clavulanic acid** oral twice a day (bd) for at least 5 days — adult 875+125mg, child 22.5+3.2mg/kg/dose up to 875+125mg (doses *p425*)
 - *OR* **cefalexin** oral 4 times a day (qid) for at least 5 days — adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p427*)
 - *AND* **metronidazole** oral twice a day (bd) for at least 5 days — adult 400mg, child 10mg/kg/dose up to 400mg (doses *p434*)
 - If anaphylaxis to penicillin — give **ciprofloxacin** oral twice a day (bd) for at least 5 days — adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p430*)
 - *AND* **clindamycin** oral 3 times a day (tds) for at least 5 days — adult 450mg, child 10mg/kg/dose up to 450mg (doses *p430*)
- If **moderate/severe infection**, or suspect bone or joint involvement — **medical consult**, send to hospital



Eye disease

Includes diabetic retinopathy, cataract. Any change in vision needs to be assessed **straight away** by ophthalmologist, especially if sudden onset.

- To lessen risk of blindness
 - Regular screening of vision, yearly funduscopy or retinal camera
 - If diabetic eye damage — more frequent eye specialist examination
 - Laser treatment, if needed
 - Good blood glucose control and good BP control ([p268](#))
 - Stop smoking ([p223](#))

Dental problems

Type 2 diabetes increases risk of more frequent and severe dental/oral disease. Risk also increased by poor dental hygiene, smoking, poor control of diabetes.

- Dental/oral disease also makes it harder to control diabetes
- Problems include infections, bone/tooth loss, loose/painful teeth
- Encourage good oral hygiene
- Need regular visits to dentist — every 3 months if possible
- Encourage and support stopping smoking ([p223](#))

Heart failure

Not a diagnosis — must still look for cause. Common causes — CAD, chronic kidney disease, diabetes, high BP, RHD, drinking too much alcohol. May not have obvious symptoms.

- If heart doesn't pump blood around body well enough — may get
 - Sudden shortness of breath from fluid in lungs (acute pulmonary oedema)
 - Weakness, shortness of breath and/or ankle swelling over days (chronic heart failure)
- If there is chest pain now or has been previously — see *Chest pain* (p47)
- Consider other causes of shortness of breath (p307)

Acute heart failure (acute pulmonary oedema)

- May have
 - Severe shortness of breath starting over minutes to hours — usually in person with known heart problems
 - Shortness of breath worse when lying flat, wakes person at night
 - Crackles (crepitations) and/or wheeze in lower chest
 - Pink frothy sputum — in severe cases
 - Swollen legs or ankles (peripheral oedema)

Check

- Weigh person if possible
- Temp, pulse, RR, BP, O₂ sats
- Full veins in neck (raised jugular venous pressure [JVP])
- Swollen legs or ankles (peripheral oedema)
- Listen to lower chest for crackles (crepitations) and/or wheeze (CPM p189)
- Do ECG — fax or scan to doctor

Do

- Sit person up
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 2–4L/min *OR* mask 5–10L/min
- Put in IV cannula (CPM p84)
 - Flush with 5mL **normal saline** every 4 hours
- Give **furosemide (frusemide)** IV – 40mg straight away — may need to repeat in 30 minutes
- If systolic BP more than 100mmHg — give nitrate therapy under tongue
 - **Isosorbide dinitrate** – 5mg *OR* **glyceryl trinitrate** – 300–600microgram
 - **Do not** give nitrate therapy if person has used drugs for impotence
 - Sildenafil or vardenafil in past 24 hours
 - Tadalafil in past 2 days
 - Always check BP before and after giving nitrate therapy
 - If shortness of breath doesn't improve — can repeat every 5 minutes



- Start monitoring urine output
- **Medical consult** about what else to do. Probably need to send to hospital

Chronic heart failure

- Many people with chronic heart failure won't be short of breath
- **Do this assessment**
 - If person complains of feeling short of breath or weak
 - Getting worse over few days or weeks
 - Developing during sleep
 - If person complains of worsening ankle swelling
 - **Every year** for people with known heart disease, chronic kidney disease, diabetes, high BP, RHD, or drinking too much alcohol

Ask

- Shortness of breath after only a little physical activity
- Waking up at night short of breath
- Problems breathing when lying flat — gets better when they sit up or sleep with several pillows (orthopnoea)
- Cough without fever — may look like asthma
- Swollen legs or ankles
- Tiredness, no energy
- Palpitations
- Loss of appetite

Check

- Weight gain (fluid) over days or weeks
- BP, pulse (more than 100/min), O₂ sats
- Full veins in neck (raised jugular venous pressure [JVP])
- Swollen ankles or legs (peripheral oedema)
- Cool, sweaty hands and feet
- Listen to lower chest for crackles (crepitations) and/or wheeze ([CPM p189](#))
- Do ECG — fax or scan to doctor

Do

- **Medical consult/review**

If diagnosis of chronic heart failure

- Start medicines — see *Medicines for chronic heart failure* ([p266](#))
- **Cardiac rehabilitation / education**
 - Education about condition and self-management — talk with cardiac educator by phone for advice on information to give person
 - Lifestyle changes for quality of life — may lessen times sent to hospital
 - Self-monitoring symptoms — shortness of breath, swelling of legs. Report changes to clinic



- Monitor weight — early sign of worsening heart failure
 - If weight gain — **medical consult**
- Develop shared care plan. Should include
 - Daily physical activity (eg walking) (*CPM p144*)
 - Healthy diet (*CPM p143*), low salt
 - Fluid management
 - Medicine reviews for dose, side effects, education, compliance

Follow-up

- Combined checks for chronic diseases (*p239*)

Medicines for chronic heart failure

- Start with low doses, increase slowly to maximum dose or maximum tolerated dose for all medicines except digoxin and thiamine
- Increase dose at 2 weekly intervals, see *AMH* for details on how much to increase dose by (titration rates)

Step 1

All people with chronic heart failure

- Start on low dose of **ACE inhibitor**
 - *Example:* Ramipril 1.25mg or perindopril arginine 2.5mg once a day
 - Increase up to 10mg a day if tolerated
 - Watch for low BP (with symptoms), decreased eGFR, high potassium
- If can't take ACE inhibitor — give **ARB**
 - *Example:* Candesartan 4mg once a day
 - Increase dose up to 32mg if tolerated
- Give
 - **Thiamine** oral – 100mg a day
 - **Multivitamin** oral – 1 a day
 - **Omega-3 fatty acid supplement** oral – **medical consult** about dose

Step 2

People with symptoms

- Start with low dose **furosemide (frusemide)** once a day – 20mg
 - Can increase up to 250mg twice a day (bd) — but keep at lowest dose that controls symptoms
 - If more than 80mg/day needed — seek specialist advice
 - Check for low potassium
- If ACE inhibitor at highest dose and taking furosemide (frusemide) and still has symptoms — add low dose **spironolactone** once a day – 12.5mg
 - Increase up to 25–50mg a day
 - **Do not** use spironolactone if eGFR less than 30 *OR* potassium more than 5mmol/L
 - Must be able to check potassium regularly



Step 3

All people with chronic heart failure

- Add **beta-blocker** if stable and able to take medicines regularly
 - **Metoprolol XL** once a day – 23.75mg increasing to 190mg
 - *OR* **carvedilol** twice a day (bd) – 3.125mg increasing to 25mg
 - *OR* **bisoprolol** once a day – 1.25mg increasing to 10mg
 - *OR* if elderly or other agents not well tolerated — **nebivolol** once a day – 1.25mg increasing to 10mg
- **Do not** give beta-blocker if
 - Asthma or severe lung disease (FEV1 less than 50% predicted)
 - Pulse less than 50/min
 - Systolic BP less than 90mmHg
- If heart failure and AF — give warfarin ([p299](#))
 - If warfarin contraindicated — give **aspirin**
- If AF or ongoing fast heart rate (tachycardia) or symptoms while taking ACE inhibitor and diuretic and beta-blocker — add **digoxin. Medical consult**

High BP (hypertension)

All Indigenous people over 15 years should be offered a BP check at least every 2 years as part of Adult Health Check (*CPM p123*).

- Treating high BP lessens risk of stroke, heart disease, kidney disease
 - If high BP — may also be other risk factors that need to be managed
- Person may not know they have high BP until BP checked
- **Diagnosis** — see *Testing for high BP (p237)*

Check

- If new diagnosis of high BP —
 - Take blood for FBC, BGL, LFT, lipids, UEC, eGFR
 - Urine ACR
 - Do ECG

Taking a BP

- Take BP while person sitting and rested (*CPM p105*)
 - Use correct-sized BP cuff — always use large cuff for thick arm
 - Use automatic BP machine when possible — person can see numbers
- Recent alcohol can make BP high for a few days
- Coffee or tobacco can make BP high for 1–2 hours

Do

- Cardiovascular risk assessment (*p230*)
- Person with mild high BP may be able to control it with lifestyle change
- Manage as per Table 4.20

Table 4.20: Management of high BP by cardiovascular risk

Risk factors	Action
<ul style="list-style-type: none"> • High cardiovascular risk (more than 15%) • Diabetes • Cardiovascular disease (CVD) • CKD 	<ul style="list-style-type: none"> • Active lifestyle management[†] • Start with 1 medicine (<i>p269</i>)
<ul style="list-style-type: none"> • Moderate cardiovascular risk (10–15%) • AND BP persistently 160/100 or more <ul style="list-style-type: none"> ◦ OR family history of early CVD 	<ul style="list-style-type: none"> • Active lifestyle management[†] • Start with 1 medicine (<i>p269</i>)
<ul style="list-style-type: none"> • Moderate cardiovascular risk (10–15%) 	<ul style="list-style-type: none"> • Active lifestyle management[†] • Review BP in 3 months
<ul style="list-style-type: none"> • Low cardiovascular risk (less than 10%) • AND BP persistently 160/100 or more 	<ul style="list-style-type: none"> • Active lifestyle management[†] • Start with 1 medicine (<i>p269</i>)
<ul style="list-style-type: none"> • Low cardiovascular risk (less than 10%) • AND systolic BP more than 140 	<ul style="list-style-type: none"> • Active lifestyle management[†] • Review BP in 3 months
Symptomatic	<ul style="list-style-type: none"> • If blurred vision, headache, short of breath — medical consult, send to hospital



† **Lifestyle risk factors (SNAPE)**

- **S** moking — ask how much, how long, tried to stop, want to stop
Remember: Quitting is the most important lifestyle change
- **N** utrition — ask about fruit and vegetables, takeaways, sugary/soft drinks. Give information on healthy diet
- **A** lcohol — work out how much alcohol (grog) person drinks, provide information on safe drinking and cutting down. Ask about other drugs — cannabis (gunja), inhalants/sniffing, kava, party drugs
- **P** hysical activity — ask how much physical activity/exercise they get, give advice on recommended levels of physical activity
- **E** motional and social wellbeing — ask how they are feeling, how they are coping with everyday activities, loss and grief issues

See *Tobacco* (p223), *Healthy lifestyle choices* (CPM p143), *Brief interventions* (CPM p138).

Do a full review at least once a year. At other visits make relevant to person's behaviour — focus on agreed changes or highest risk.

Target BP — less than 140/90 *OR* less than 130/80 if diabetes or CKD.

Medicines for high BP

- ACE inhibitor or ARB mainstay of treatment — maximise dose for best effect
 - **Do not** use in pregnancy — both contraindicated. Advise all women of childbearing age on ACE inhibitor or ARB of risks *AND to*
 - Use reliable contraception
 - Come to clinic straight away to stop medicine if they could be pregnant.
Medical consult, see *High BP (hypertension) in pregnancy* (WBM p127)
 - **Do not** use ACE inhibitor and ARB together. Increased risk of side effects
- May take 4 weeks to see full response to each medicine change

Step 1

- **ACE inhibitor** (eg ramipril, perindopril)
- If can't take ACE inhibitor (eg cough, angioedema) — give ARB (eg irbesartan)
- If elderly or heart failure — start with lower dose
- Check UEC 2 weeks after starting ACE inhibitor or ARB
- If eGFR decreases by more than 25% *OR* potassium is more than 5.5mmol —
 - Stop ACE inhibitor or ARB
 - **Specialist consult**
- If no side effects — increase dose until target BP reached

Step 2

- If BP still above target after 3 months —
 - Add **calcium channel blocker** (eg amlodipine, felodipine). **Medical consult** if pregnant
 - *OR* if CAD (p250), heart failure (p264) — add **beta-blocker** (eg atenolol, metoprolol). **Medical consult** if pregnant



Step 3

- If BP still above target after 3 months — change ACE inhibitor/ARB to combination medicine
 - **ACE inhibitor + thiazide diuretic** (eg perindopril + indapamide)
 - **OR ARB + thiazide diuretic** (eg irbesartan + hydrochlorothiazide)

Step 4

- If BP still above target — check if taking medicines
 - Make sure all medicines at maximum tolerated doses
- If still above target at maximum tolerated doses — see *Resistant high BP*

High BP medicine warnings

- If asthma — avoid beta-blockers (eg atenolol, metoprolol)
- If gout — avoid thiazide diuretics (eg indapamide, hydrochlorothiazide)
- If heart failure or heart block — **do not** use non-dihydropyridine calcium channel blocker (eg diltiazem, verapamil), except on specialist advice
- **Do not** use alpha-blocker as first line treatment
- **Do not** use short-acting nifedipine
- **Do not** use beta-blocker and non-dihydropyridine calcium channel blocker (eg diltiazem, verapamil) together
- **Do not** use ACE inhibitor/ARB and potassium-sparing diuretic (eg spironolactone) together, except on specialist advice

Table 4.21: Doses of BP control medicines

Medicines – selection only	Starting dose	Maximum dose
Ramipril	5mg a day	10mg a day
Perindopril arginine	5mg once a day	10mg once a day
Irbesartan	150mg once a day	300mg once a day
Hydrochlorothiazide	12.5mg once a day	25mg once a day
Indapamide SR	1.5mg once a day	1.5mg once a day
Amlodipine	2.5mg once a day	10mg once a day
Felodipine	5mg once a day	20mg once a day
Diltiazem CD	180mg once a day	360mg once a day
Atenolol	25mg once a day	100mg once a day
Metoprolol	50mg once a day	100mg twice a day

Resistant high BP

BP above target in person taking 3 or more medicines, including a diuretic.

- Make sure person
 - Taking medicines as directed
 - Following lifestyle advice, especially salt restriction
- Check they are on maximum dose of diuretic
- **Specialist consult**



5 Sexual health

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STI checks for men

- If woman — see *STI checks for women* ([WBM p238](#))
- If under 18 years — consent and child protection issues
 - If 14–18 years — first see *STI checks for young people* ([p276](#))
 - If under 14 years — see *STI testing in children* ([p150](#))
- STIs under-diagnosed — often missed as may have no symptoms or minor symptoms that clear quickly
- Times to do an STI check include
 - As part of another consultation (opportunistic), if 15–35 years
 - As part of Adult Health Check ([CPM p123](#))
 - Community-wide screening
 - If symptoms and risk factors suggest STI
 - If asked for by person — even if not long since last check
- Aim for 2 standard STI checks a year — use recall system
- STI checks are routinely recommended in 15–35 year age group

Risk factors for STIs

- Living in community with high STI rates
- Age
 - High risk — sexually active under 35 years
 - Highest risk — sexually active under 19 years
- STI in past 12 months
- New sexual partner in past 3 months, more than 1 partner in past 6 months
- Drug or alcohol use — increases high risk behaviours (eg multiple sexual partners, unsafe sex)
- Recent travel

Additional risk factors for HIV

- Existing STI
- Person or their partner is man who has sex with men, transgender/sistergirl, from overseas, person who injects drugs

Standard STI check

Full pathology testing, no detailed history or examination. Standard STI check replaces Brief STI check.

- Indications
 - Opportunistic
 - Adult Health Check ([CPM p123](#)), yearly STI check, community screening
 - 3 month re-test following a positive test result
- Ask about symptoms — discharge from penis or pain on passing urine ([p286](#)), sores/ulcers ([p288](#))
 - If symptoms — see relevant protocols



Sometimes there is not enough time or only some samples can be collected. It is still useful to do some tests from standard STI check.

Check

- First-void urine ([CPM p393](#)) — request
 - NAAT for chlamydia, gonorrhoea *AND* if in NT — trichomonas
 - Gonorrhoea culture
- Take blood for HIV serology, syphilis serology
- If hepatitis B status unknown or not immune (no evidence of previous infection or immunisation) — HBsAg, Anti-HBc, Anti-HBs

Do

- Tell man to come back for results

Follow-up

- If any positive result — do rest of full STI check (*below*) including history, examination, treatment, contact tracing
- When giving STI check results — be very clear about what has been tested for and what conditions the results relate to
 - **Do not** say things like “You have the all-clear” or “You don't have an STI”

Full STI check

- Symptoms — discharge, pain on passing urine, sores
- Asks for check
- If positive result from standard STI check ([p272](#)) — for additional assessment
- Contact (partner) of someone with an STI ([p283](#))

Check file notes

- Date and results of last STI check
- Treatment offered and completed
- Hepatitis B status

Ask

- Discharge from penis
- Pain on passing urine
- Sore/s, rash, lump/s on genitals
- Sexual partners
 - Regular/casual partners, do they have other partners
 - Other men
 - New partner in past 3 months
 - Number of partners in past 6 months

Check

- Rash (including hands and feet), hair loss
- Mouth for ulcers
- Groin for enlarged or tender lymph nodes
 - If present — check lymph nodes at other sites
- Penis, scrotum, anus for sores, other lesions, rashes
 - If present — see *Genital ulcers and lumps* (p288)

Collect

- All men
 - First-void urine (CPM p393)
 - AND if discharge — penile swabs x 2 (CPM p391)
 - Request
 - NAAT for chlamydia, gonorrhoea, trichomonas. If swab — *Aptima* or dry
 - Gonorrhoea culture. If swab — amies transport medium
- All men — take blood for HIV serology, syphilis serology
- If urinary symptoms and 45 years or over —
 - Mid-stream urine (CPM p393)
 - OR first catch urine if can't get second sample
 - Request — MC&S for UTI
- If genital sore — swab base of ulcer (sore, scab, lump) or fluid from blister (CPM p391)
 - Request — NAAT for herpes, syphilis, donovanosis
- If Hepatitis B status unknown or not immune (no evidence of previous infection or immunisation) — take blood for HBsAg, Anti-HBc, Anti-HBs
- If man has sex with men —
 - Anal swab x 2 (CPM p391) AND throat swab x 2 (CPM p390)
 - Request —
 - NAAT for chlamydia, gonorrhoea — *Aptima* or dry swab
 - Gonorrhoea culture — amies transport medium swab

Do

- If symptoms of STI — offer immediate syndromic treatment
 - If pain or discharge — see *Discharge from penis or pain on passing urine* (p286)
 - If sores, ulcer — see *Genital ulcers and lumps* (p288)
- In communities with high STI rates — consider immediate treatment even if no symptoms. Presumptive treatment. Treat for gonorrhoea (p279) (will also treat chlamydia) if
 - Man asks for treatment or thinks he has put himself at risk
 - 15–25 years with other risk factor/s (p272) and not treated in last 12 months
 - At high risk and unlikely to return for results



- 15–35 years with leukocytes 1+ or more in urine
- Offer STI and safer sex education ([p285](#))
- Tell man to come back for results
- Ask for name/s of partner/s, for contact tracing if pathology positive ([p283](#))

Follow-up

- If positive results — see *STI management* ([p278](#))
- When giving results for STI check be very clear about what has been tested for and what conditions the results relate to
 - **Do not** say things like “You have the all-clear” or “You don't have an STI”

STI checks for young people

Sexually-active young people are at high risk of STIs and generally under tested.

- Actively screen sexually active young people for STIs, even in consensual relationship with 1 partner
- If under 18 years — you must be aware of child protection reporting requirements in your state or territory before testing. See Flowchart 2.4 ([p149](#))

- If you suspect sexual abuse or reportable sexual activity, as defined by your state/territory legislation — **medical consult**
 - You **must** notify child protection
 - Doctor will advise about STI testing. Doctor may talk with child protection service or sexual assault referral centre

• Before testing

- If under 16 years — you must obtain consent from parent/carer or assess whether to treat as competent minor ([CPM p102](#))
- Explain importance of doing STI test
 - Most STIs are easily treatable
 - Health consequences of STIs
- Explain need to report to child protection service if
 - Under certain age (defined by state/territory legislation)
 - Positive result depending on age (defined by state/territory legislation)
 - Safety concerns
- Young person often presents with incomplete history
 - Sexual activity, consensual relationships, age of partner/s may not be revealed until later consults or as you build a relationship

Check

- If 14 years or over and issues of consent and child protection have been addressed — offer Standard STI check – men ([p272](#)), women ([WBM p238](#))
 - If not able to obtain consent, or unresolved child protection issues — **medical consult** before testing
- If under 14 years — **medical consult**

Do

- After doing STI check
 - Tell young person to come back for results
 - Discuss
 - Safer sex ([p285](#)) and offer condoms
 - Contraception ([WBM p335](#))
 - Treatment if positive result
- Report any identified issues to child protection service
 - **Do not** wait for STI results before you report



Follow-up

- If under 14 years and positive STI result —
 - Repeat notification to child protection service
 - **Medical consult** about
 - Contraception (*WBM p335*)
 - Treatment
 - Contact tracing — may find other young people at risk of STIs, child protection issues
- If 14 years or over and positive STI result —
 - May need to report depending on state/territory requirements — if not sure, talk with more experienced staff member, doctor or child protection service
 - Do full STI check – men (*p273*), women (*WBM p239*)
 - See *STI management* – men (*p278*), women (*WBM p245*)

STI management

- Get help and advice from local ATSIHPs, health council, respected community members about doing STI work in culturally sensitive way
- Offer treatment as soon as possible to prevent complications, stop spread
- If person has symptoms/syndromes likely to be caused by STI, or has put themselves at risk — treat straight away. **Do not** wait for laboratory or POC test results. See individual protocols
 - *Genital ulcers and lumps* (p288)
 - *Discharge from penis or pain on passing urine* (p286)
 - *Painful scrotum* (p384)
 - *Abnormal vaginal discharge* (WBM p253)
 - *Pelvic inflammatory disease* (WBM p260)
- Treat people with positive pathology and named partners/contacts as soon as possible
- If positive result on standard STI check or individual test — do remaining checks to complete full STI check – men (p273), women (WBM p239)
- If pregnant woman has positive STI test **AND** previous premature rupture of membranes, preterm labour, low birth weight baby (under 2.5kg) — refer to obstetrician as soon as possible
 - May need additional monitoring, tests, treatment

Positive pathology results

Chlamydia

- Notifiable disease. Follow local protocols, check with sexual health unit if more information needed
- If woman has positive test result — always ask about symptoms of PID (WBM p260)
 - Lower abdominal pain not a normal symptom of uncomplicated chlamydia

Do

- Give **azithromycin** oral single dose – adult 1g
- Contact trace (p283) and give partner/s same treatment
- Offer condoms but advise better not to have sex for 7 days after person and partner/s treated
- STI and safer sex education (p285)
- Consider talking about contraception (WBM p335)

Follow-up

- Re-test in 3 months — standard STI check – men (p272), women (WBM p238)
- Check HIV and syphilis serology done

Pregnancy considerations

- Re-test after 4 weeks — send urine or low vaginal swab for NAAT
- High priority for contact tracing and treatment of woman and partner/s



Gonorrhoea

- Notifiable disease. Follow local protocols, check with sexual health unit if more information needed
- If woman has positive test result/s — always ask about symptoms of PID ([WBM p260](#))
 - Lower abdominal pain not a normal symptom of uncomplicated gonorrhoea

Do

- If person and **all** partners for last 3 months from geographical area with penicillin sensitive gonorrhoea (Table 5.1) —
 - Give **azithromycin** oral single dose – adult 1g
 - **AND amoxicillin** oral single dose – adult 3g
 - **AND probenecid** oral single dose – adult 1g
 - If allergic to penicillin — **sexual health consult**
- If person and/or **any** partner for last 3 months from area with penicillin resistant gonorrhoea (Table 5.1) *OR* partners unknown —
 - Give **azithromycin** oral single dose – adult 1g
 - **AND ceftriaxone** IM single dose – adult 500mg mixed with 2mL **lidocaine (lignocaine) 1%**
- If oropharyngeal or anal gonorrhoea — regardless of geographical area
 - Give **azithromycin** oral single dose – adult 1g
 - **AND ceftriaxone** IM single dose – adult 500mg mixed with 2mL **lidocaine (lignocaine) 1%**
- Contact trace ([p283](#)) and give partner/s same treatment
- Offer condoms but advise better not to have sex for 7 days after person and partner/s treated
- STI and safer sex education ([p285](#))
- Consider talking about contraception ([WBM p335](#))

Table 5.1 Geographical treatment areas for gonorrhoea

Type of gonorrhoea	Geographical area
Penicillin sensitive	<ul style="list-style-type: none"> • All of the NT outside of Darwin • The Kimberley, Goldfields, Midwest and Pilbara regions of WA
Penicillin resistant	<ul style="list-style-type: none"> • Darwin • All other areas except those mentioned above
NT communicable disease bulletins will advise if changes to these areas.	

Follow-up

- Re-test in 3 months — standard STI check – men ([p272](#)), women ([WBM p238](#))
- Check HIV and syphilis serology done

Pregnancy considerations

- Re-test after 4 weeks — send urine or low vaginal swab for NAAT
- High priority for contact tracing and coordinated treatment of woman and partner/s

Genital herpes

- See *Genital ulcers and lumps* (p288)

Donovanosis

- Notifiable disease. Follow local protocols, check with sexual health unit if more information needed

Donovanosis sores

- Usually red, beefy, raised, raw, painless ulcer
- In early stages, small sore may look like primary syphilis
- Sores won't go away without treatment, will slowly get larger

Do

- Give **azithromycin** oral once a week for 4 weeks – adult 1g
- Check sore/s each week when giving medicine
 - If not healed after 4 weeks — **medical consult**
 - Continue **azithromycin** oral once a week until healed – adult 1g
 - If not improving — may need biopsy for cancer
- Contact trace (p283) and treat partner/s with same treatment
- Offer condoms but advise better not to have sex for 7 days after person and partner/s treated
- STI and safer sex education (p285)
- Consider talking about contraception (*WBM p335*)

Follow-up

- Check 3 months after sore/s completely healed — to make sure sore/s haven't come back

Pregnancy considerations

- **Medical consult**

Syphilis

- Notifiable disease. Follow local protocols, check with sexual health unit if more information needed
- If ever had syphilis — positive result for life. Check for reinfection by comparing new and past results
- Syphilis diagnosed by
 - Positive test with no history of previous treatment
 - OR 4-fold (2 titre) increase in RPR level (eg 1:4 to 1:16)



- Syphilis serology can be hard to understand. Talk with sexual health unit or syphilis register
- If pregnant — can cause miscarriage, stillbirth, congenital syphilis in baby

Primary syphilis

- 1 or 2 painless ulcers — called chancres
- Usually red, round with firm rolled edge, base clean
- Sore goes away in 4–6 weeks without treatment, but syphilis still in blood

Secondary syphilis

- Fleshy, moist, wart-like lesions in genital or perianal area — called condylomata lata
- May also have
 - Skin rashes, especially palms of hands, soles of feet
 - Hair loss including outer eyebrow, beard
 - Swollen lymph glands all over body

Tertiary syphilis

- Dementia, change in personality
- Shooting pain, numbness, pins and needles
- Weakness of hands, arms, legs, unusual way of walking (gait)
- Problems with nerves of head and face (cranial nerve palsy), abnormal pupil reactions
- Deafness that is new
- Eye problems (eg retinal disease, uveitis, iritis)
- Heart valve weakness (aortic incompetence)
- Widening (dilation) of ascending aorta on x-ray or echocardiogram

Check

- Take blood for syphilis serology just before starting treatment so accurate pre-treatment/baseline RPR level

Do

Syphilis treatment depends on how long person has been infected. Sexual health unit or syphilis register can give history and advice on management.

- If known to be less than 2 years —
 - Give **benzathine penicillin (penicillin G)** IM single dose – adult 1.8g (2 x 900mg vials)
 - If allergic to penicillin — **sexual health consult**
- If unknown or known to be more than 2 years —
 - Give **benzathine penicillin (penicillin G)** IM once a week for 3 weeks – adult 1.8g (2 x 900mg vials)
 - If more than 7 days between injections — talk with sexual health unit or syphilis register. May need to start course again
 - If allergic to penicillin — **sexual health consult**

- If neurosyphilis or cardiovascular syphilis —
 - Talk with specialist, sexual health unit, syphilis register
 - Usually needs to go to hospital for more tests
- Contact trace ([p283](#)) and give partner/s same treatment. Very important if newly infected, get advice from sexual health unit
- Offer condoms but advise better not to have sex for 7 days after person and partner/s treated
- STI and safer sex education ([p285](#))
- Consider talking about contraception ([WBM p335](#))

If recent syphilis — often harmless febrile reaction to treatment (Jarisch-Herxheimer). Starts in 3–4 hours, gets better within 24 hours.

- Give **paracetamol** up to 4 times a day (qid) – adult 1g ([p380](#))

Follow-up

- Check syphilis serology again 6 months and 12 months after base line RPR and first treatment
- Advise syphilis register of treatment given — ask local PHU for number

Pregnancy considerations

Medical consult. This is an STI emergency.

- If woman has had syphilis for less than 2 years — high risk of transmission to baby. Must treat woman as soon as possible.
- High priority for contact tracing ([p283](#)) and coordinated treatment of woman and her contact/s

Trichomonas

- Notifiable disease in the NT. Follow local protocols, check with sexual health unit if more information needed

Do

- Give **metronidazole** oral single dose – adult 2g
- *OR* **metronidazole** oral twice a day (bd) for 5 days – adult 400mg. Best for breastfeeding, take after baby fed
- *OR* **tinidazole** oral single dose – adult 2g. Not if pregnant or breastfeeding
- Contact trace ([p283](#)) and give partner/s same treatment
- Advise no sex or use condoms for 7 days after person and partner/s treated
- STI and safer sex education ([p285](#))
- Consider talking about contraception ([WBM p335](#))

Follow-up

- Re-test in 3 months — standard STI check – men ([p272](#)), women ([WBM p238](#))
- Check HIV and syphilis serology done



Pregnancy considerations

- If asymptomatic — consider delaying treatment until after first trimester
- Treatment same as for non-pregnant women

HIV

- Notifiable disease. HIV management always directed by sexual health or infectious diseases unit
- HIV treatment can now keep people healthy and prevent transmission to others — especially if started as soon as possible

Do

- Follow advice from sexual health unit and local protocols where appropriate
- Continued involvement of primary care services is important — usually involves
 - Managing and monitoring antiretroviral medicines
 - Contact tracing and management of contacts ([p283](#))
 - STI and safer sex education ([p285](#))

Pregnancy considerations

- Anti-HIV treatment can
 - Keep woman healthy during pregnancy, and afterwards
 - Reduce risk of transmission to baby almost completely if started early enough
- If woman HIV positive —
 - **Medical consult** straight away. **Urgent referral** to HIV/AIDS specialist
 - Maintain confidentiality
 - Develop comprehensive management plan
 - Provide education and support about lifestyle factors such as diet, exercise, and stopping smoking, alcohol and use of other substances
- Elective Caesarean section may be recommended
- Talk with HIV/AIDS specialist at CDC/PHU about individual breastfeeding plan

Non STI results

- If MC&S results report thrush (candida) or BV — see *Abnormal vaginal discharge* ([WBM p253](#))

Contact tracing

- Person initially diagnosed with infection is referred to as the index case
- All sexual partners are referred to as contacts
- If contact has a positive result they will then become an index case
- All index cases need contact tracing

- Contacts have the right to STI check and treatment
- Untreated contacts can re-infect the index and also infect other people

- Give yourself enough time to talk with person about issues
- Ensure process is kept confidential (private)
 - Contact must never be made aware of name of index
 - **Do not** write name of contact in index file notes
- No sex or use condoms for 7 days after index and contact/s treated
- If contact treated more than 7 days after index and reinfection possible — retreat index if possible
- While contact tracing is important to manage all STIs, it is critical for syphilis, HIV, and any infection during pregnancy

Contact tracing — asking about partners

- Ask about all sexual partners in last 3 months
- Explain if partner/s not treated they may get infected again and there can be serious effects of ongoing infection — miscarriages, infertility, ectopic pregnancy, babies can become sick or die
- If person prefers they can write down name/s of sexual contact/s
- Make sure you know how to find the person again if needed

Do

- Document details of contact/s (DOB or approximate age, address) using appropriate confidential process for your area
- Hand over contact information confidentially to staff member who can begin treatment of contact, as this needs to occur quickly

Contact tracing — follow-up of partners

- Talk with ATSIHPs about best way/s in your community
- Tell person they have been in contact with someone who has an infection and it is best that they have both a check and treatment today
- Advise that most people with STIs don't know they have one

Check

- Do full STI check – men ([p273](#)), women ([WBM p239](#))

Do

- Treat straight away as per Table 5.2 without waiting for laboratory or POC test results — even if STI check declined
- STI and safer sex education ([p285](#))

Table 5.2: Treatment of contacts

Index case infection/syndrome	Contact treatment
Gonorrhoea, chlamydia, trichomonas, syphilis	Same treatment as index
PID	Treat for gonorrhoea and chlamydia
Painful scrotum	Treat for gonorrhoea and chlamydia
All other conditions	See protocols for contact treatment if needed



Education

- Not needed with every sexual health check-up
- Best for people asking for test, or with STI needing treatment

STIs

Tell person

- What STIs are, why they matter, how to protect themselves
- How you get one, signs and symptoms, asymptomatic infection
- Need to test for reinfection in 3 months
- Get STI check
 - If under 35 years — aim for 2 standard STI checks a year
 - Straight away if they have unsafe sex, symptoms of an STI
- Important to treat sexual partner/s from past 3 months
 - To prevent reinfection — no sex or use condoms for 7 days after person and partner/s treated
- Complications of STIs
 - Infertility
 - Increased risk of HIV
 - PID in women
 - Problems in pregnancy — ectopic pregnancy, miscarriage, preterm labour, infections in newborn baby

Safer sex

- If person has safer sex — less chance of an STI
 - Make sure they know what this means, don't just think they will know
- Safer sex is
 - Using a condom properly every time
 - *OR* having sex with just 1 partner after both have 'clear' STI check-up

Condoms

- Only contraceptive method that protects against STIs
- Show them how to use a condom ([CPM p209](#))
- Offer condoms to take away, talk about where they can get more

Discharge from penis or pain on passing urine

- Urethral discharge is almost always caused by STI
- Pain on passing urine is most likely due to STI in young men and often in older men, especially if a recent new partner
- Could be gonorrhoea, chlamydia, trichomonas or less commonly mycoplasma genitalium, herpes or other viral infections

Ask

- How long has he had problem, has he had it before
- Pain when passing urine, discharge from penis
- Sores, blisters, lumps, rashes in private parts (genitals) (p288)
- Scrotum painful (p384) or swollen
- Other STI symptoms — swollen lymph nodes, sore throat, rash, hair loss
- About sexual partners — any from geographical area with penicillin resistant gonorrhoea (Table 5.1 p279)

Check

- If sores, blisters, lumps, painful or swollen scrotum — check genitals, back passage (anal area)
- Skin, mouth
- Lymph nodes in neck, armpits, groin
- Do full STI check (p273)

Do

- Treat for both gonorrhoea and chlamydia. Presentations very similar — syndromic management. **Do not** wait for laboratory or POC test results if not immediately available
 - If man and **all** partners in last 3 months from geographical area with penicillin sensitive gonorrhoea (Table 5.1 p279) —
 - Give **azithromycin** oral single dose – adult 1g
 - **AND amoxicillin** oral single dose – adult 3g
 - **AND probenecid** oral single dose – adult 1g
 - If man and/or **any** partner in last 3 months from geographical area with penicillin resistant gonorrhoea (Table 5.1 p279) **OR** partners unknown —
 - Give **azithromycin** oral single dose – adult 1g
 - **AND ceftriaxone** IM single dose – adult 500mg mixed with 2mL **lidocaine (lignocaine) 1%**
 - If allergic to penicillin — **sexual health consult**
- Contact tracing (p283)
- STI and safer sex education (p285)



Follow-up

- If positive test result — re-test in 3 months – standard STI check ([p272](#))
- **If re-presents with ongoing symptoms** — check STI test results
 - If full STI check not done — collect remaining samples ([p273](#))
 - If another STI — see *STI management* ([p278](#))
 - If trichomonas not tested for ([p282](#)) — treat presumptively
 - Give **metronidazole** oral single dose – adult 2g
 - If no STI — do U/A and send urine for MC&S. **Medical consult**
 - If positive for gonorrhoea and/or chlamydia —
 - Was all first round of treatment taken. If not — repeat
 - Did symptoms get better and then come back (reinfection) or never get better at all (resistant)
 - Did sexual partner/s all get treated
 - If reinfection likely —
 - Repeat STI check ([p272](#)) and treatment for man and partner/s
- **Remember:** Can take up to a month for NAAT tests to become negative after successful treatment.
- If resistance likely —
 - Check test results for antibiotic sensitivities
 - Repeat STI check ([p272](#)). Make sure MC&S for gonorrhoea included
 - Give **ceftriaxone** IM single dose if not given in first treatment – adult 500mg mixed with 2mL **lidocaine (lignocaine) 1%**
- There are other causes of discharge or urine symptoms. If persisting symptoms despite all of the above — **medical consult**

Genital ulcers and lumps

Causes

- Herpes — most common
- Syphilis
- Donovanosis — rare
- Genital warts
- Bartholin's cyst ([WBM p306](#))
- Molluscum contagiosum ([p391](#))
- Local injury from scratching (eg scabies, lice, bad thrush)
- Cancer
 - If not better after 4 weeks — medical review, may need biopsy to exclude cancer

Ask

- How long have they had sores, are they getting worse
- Sores like these before
- Are sores painful
- Does sexual partner/s have sores

Check

- Do full STI check — men ([p273](#)), women ([WBM p239](#)), young person ([p276](#)). Must include syphilis serology
- If woman with no reliable contraception — do urine pregnancy test ([WBM p279](#))
- Swab sores ([CPM p391](#)) — NAAT for herpes, syphilis, donovanosis
- Type of sore

Do

- Treat straight away — **do not** wait for test results
 - If multiple, recent small painful blisters (vesicles) — treat as herpes ([p289](#))
 - All other genital sores or ulcers — treat as syphilis and donovanosis ([p289](#))
- STI and safer sex education at first visit ([p285](#))
- Consider discussing contraception ([WBM p335](#))
- Explain that having sex before sores healed completely may delay healing and give infection to partner/s
 - Offer condoms but advise better not to have sex

Follow-up

- Review at 1 week
 - Check if symptoms resolved
 - If sore/s not healed, no cause found — **medical consult**, add recall for 4 week review



Syphilis and donovanosis

Check

- Take blood for syphilis serology just before starting treatment so accurate pre-treatment/baseline RPR level

Do

- Give **benzathine penicillin (penicillin G)** IM single dose – adult 1.8g (2 x 900mg vials) — to start treatment for syphilis
 - If allergic to penicillin — **sexual health consult**
- **AND azithromycin** oral single dose – adult 1g — to start treatment for donovanosis
- Contact tracing ([p283](#)). Very important if you suspect new syphilis infection, get advice from sexual health unit
- STI and safer sex education ([p285](#))

If recent syphilis — often get harmless febrile reaction to treatment (Jarisch-Herxheimer). Starts in 3–4 hours, gets better within 24 hours.

- Give **paracetamol** up to 4 times a day (qid) – adult 1g ([p380](#))

Do — if pregnant

- **Medical consult.** This is an STI emergency

Follow-up

- Review at 1 week
 - Check test results. If any positive — see *STI management* ([p278](#))
 - If ulcer not healing and tests negative — **medical consult**, add recall for 4 week review
 - If you suspect donovanosis but tests negative — **sexual health consult**

Genital herpes

- Herpes simplex virus (HSV) causes genital and oral herpes (cold sores)
- Antiviral treatment reduces risk of spreading infection, duration and severity of symptoms, but doesn't cure
- Lifelong risk of recurrent episodes and shedding of herpes virus

Do

- Keep sores clean with **normal saline** washes
- Give **pain relief** ([p377](#)), can put **lidocaine (lignocaine) gel** on sores
- If kidney disease — **medical consult**. May need lower doses of antivirals

First episode

Can be severe, last 2–3 weeks.

- Medicines most helpful if blisters present for 3 days or less
 - Give **valaciclovir** oral twice a day (bd) for 5–10 days – adult 500mg

- Review at 1 week
 - Positive herpes NAAT confirms genital herpes. Negative herpes NAAT doesn't exclude genital herpes — ask to return for another swab if sores come back

Recurrent episodes

Usually less severe, last 1 week or less.

- Medicines most helpful if given before or on first day blisters appear
 - Give **valaciclovir** oral twice a day (bd) for 3 days – adult 500mg
 - *OR* **famciclovir** oral twice a day (bd) for 1 day – adult 1g
- If getting sores often and/or causing a lot of trouble — **medical consult** about having tablets at home to take as soon as sores start

Do — if pregnant

- **Medical/specialist consult** about management of pregnant woman if
 - First presentation of herpes in pregnancy
 - History of herpes, previously or in current pregnancy
 - Some women need prophylactic antiviral treatment
 - Woman or her partner had blood test in past showing positive herpes serology
- If first clinical episode —
 - Do herpes serology
 - Give **aciclovir** oral 3 times a day (tds) for 5–10 days – adult 400mg
- If recurrent episode — give **aciclovir** oral 3 times a day (tds) for 5 days – adult 400mg
- If severe episode — **medical consult**, send to hospital for aciclovir IV
- Advise woman with no history of herpes but whose partner has history of herpes to avoid sex in third trimester of pregnancy
- **At time of birth**
 - Women with herpes lesions need **obstetrician/gynaecology consult** about possible Caesarean section
 - If vaginal birth — avoid invasive fetal monitoring and instrument delivery

Genital warts

- Painless, solid lumps with hard smooth surface or cauliflower-like appearance. May look like secondary syphilis (condylomata lata)

Do not

- **Do not** treat as genital warts until secondary syphilis excluded
- **Do not** give podophyllotoxin if woman is or could be pregnant, is breastfeeding



Do

- Give **podophyllotoxin 0.5% solution** or **0.15% cream** to apply twice a day (bd) for 3 days — then no treatment for 4 days. Repeat cycle up to 4 times
 - **Do not** use if pregnant
 - Always show how to put on medicine
 - Use cotton swab or applicator for lotion
 - Glove best for cream but can use finger
 - Wash hands straight away
 - Only put on wart, can burn skin and cause ulcers
- *OR* give **imiquimod 5% cream** to apply once a day at night, 3 times a week for up to 16 weeks
 - OK to use if pregnant
 - Always show how to put on medicine
 - Use cotton swab or applicator
 - Wash hands straight away
 - Wash off with soap and water in morning or 6–10 hours after applying
 - Review weekly
- If not improving — **medical/sexual health consult** about other treatments
- If warts large, inside vagina, lot of warts — refer for freezing (cryotherapy)

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Acute rheumatic fever (ARF) and rheumatic heart disease (RHD)

- ARF occurs after throat (or possibly) skin infection with Group A *beta haemolytic streptococcus* (GAS)
- ARF/RHD common in northern and central Australia
 - ARF most common from 5–15 years. Rare under 4 and over 35 years
 - More common in females than males — preconception planning essential for all females of childbearing age
 - Indigenous Australians and Pacific Islanders at highest risk

- ARF damages heart valves (causes RHD)
- Risk of RHD starts with first episode of ARF
- Each episode of ARF increases risk of RHD developing or getting worse
- RHD is 100% preventable
 - Many people with RHD need heart surgery
 - Major outcomes include heart failure, stroke, sudden death

Always notify ARF and RHD where notifiable.

Two common presentations for ARF

- **Fever, sore joint/s, heart problems**
 - Fever, unwell
 - Painful, swollen joint/s (arthritis)
 - May be single joint — knee, ankle, elbow, wrist are common
 - May be several joints or move from 1 joint to another over days
 - Can be history of recent injury, but still need to exclude ARF
 - Also consider joint infection ([p369](#)), other arthritis, bone infection ([p306](#))
 - Heart problems (carditis)
 - New heart murmur
 - Signs of heart failure — shortness of breath, fast pulse ([p422](#))
 - Often no history of recent sore throat
- **Movement sickness (chorea)**
 - Fidgety movements that can't be controlled but go away when asleep
 - Usually one side of body, but can be both sides
 - Often mood swings
 - No fever
 - Sometimes heart problems (carditis) — often not obvious

Ask

- Any previous ARF or RHD
- Family history of RHD

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))



- Listen to heart (for murmur)
- Before giving benzathine penicillin (penicillin G) (BPG) injection
 - Collect throat swab for culture
 - Take blood for ASOT, Anti-DNAse B, C reactive protein, FBC, ESR, blood cultures
- Do ECG — prolonged P–R interval important diagnostic sign
 - Upper limit of normal P–R interval
 - 3–11 years — 0.16 seconds
 - 12–16 years — 0.18 seconds
 - 17 years and over — 0.20 seconds

Do not

- **Do not** give aspirin or NSAID (eg ibuprofen). Can make diagnosis harder

Do

- | |
|--|
| <ul style="list-style-type: none"> • If you suspect ARF — <ul style="list-style-type: none"> ◦ Medical consult ◦ Send to hospital <ul style="list-style-type: none"> ▪ Straight away if signs of heart failure (p264) ▪ Otherwise within 24 hours ◦ Need specialist diagnosis and treatment |
|--|
- Give **benzathine penicillin (penicillin G)** (BPG)
 - Child less than 20kg — 450mg (eg 1.15mL *Bicillin L-A*)
 - Child 20kg or more and adult — 900mg (eg 2.3mL *Bicillin L-A*)
 - If fever/pain — give **paracetamol** up to 4 times a day (qid) – adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
 - If delay in coming to clinic and fever and joint pain already settled —
 - **Medical consult**
 - Doctor should contact specialist about echocardiogram for diagnosis

Preventing first episode of ARF

- Reduce risk of GAS infection
 - Promote good nutrition and hygiene — includes brushing teeth every day
 - Support improved social determinants of health (eg housing, education)
- Treat throat ([p407](#)) and skin ([p387](#)) infections with antibiotics
- Treat scabies ([p394](#)) to reduce risk of skin infection

Preventing return of ARF and RHD

- ARF returning and RHD developing can be prevented with proper care
- **Everyone** with history of ARF or RHD needs BPG injection **every 21–28 days**
 - Oral penicillin doesn't work well and best not used
 - Every day missed after day 28 is **a day at risk**
- Some people use the full moon as a reminder to have their injection



- Doses of BPG
 - Child less than 20kg – 450mg (eg 1.15mL *Bicillin L-A*)
 - Child 20kg or more and adult – 900mg (eg 2.3mL *Bicillin L-A*)
- Allergy to penicillin is rare. If penicillin allergy — doctor should get advice from allergy specialist
- **Never miss a dose** of BPG
 - One person in clinic needs to be in charge of ARF/RHD prevention program and make sure all BPG injections are given on time
 - Injections
 - Give as soon as person comes to clinic — don't ask them to wait
 - Give opportunistically if person in clinic in week before their due date (days 21–28)
 - Consider offering an outreach/home visit service
 - Use recall system for all people on regular BPG — include mobile phones, SMS
 - Set recall reminder in person/carer's phone at each clinic visit
 - If person travelling away from community — send reminder that will reach them (eg by mobile phone) and contact that clinic
- Give education and support at every contact — person, family, carer and school teachers need to know importance of injections and being on time
- Give hand-held record of diagnosis and treatment to person/carer

Giving BPG injections

- Give as deep IM injection ([CPM p349](#))
 - Middle of outside (anterolateral) thigh
 - *OR* ventrogluteal
 - *OR* upper outer quadrant of buttock
- Mix well and warm by rolling syringe in your hands for at least 2 minutes before injecting
- Use needle provided with pre-loaded syringe
 - **Do not** change to smaller bore needle, more likely to get blocked
 - **Do not** pre-load needle — leave hollow of needle empty
- Draw back to check not IV (no blood in needle) — change site if needed
- Inject slowly (2–3 minutes)
- To lessen pain when giving injection
 - Give injection in different place to last time
 - Ice pack beforehand
 - Firm thumb pressure on injection site for 30–60 seconds before giving
 - Use diversion (eg Buzzy Bee — buzzy4shots.com.au)
 - RHD Australia website has an eLearning module on giving BPG — www.rhdaustralia.org.au



How long to give BPG

- Decision to continue or stop BPG injections **only** made by specialist, usually after echocardiogram
- If no valve damage — usually given for 10 years after last episode of ARF or until person is 21 years, whichever longer
- If RHD (valve damage) — usually given for 10 years after last episode or until person is 35 years, whichever longer
- If valve surgery or valve replacement, symptomatic RHD, or severe valve damage on echocardiogram — BPG injections given for life
 - Surgery **does not** cure RHD. BPG injections always continue after surgery

Other management issues

- Contraception and pre-pregnancy planning very important for all women of childbearing age with ARF/RHD
 - If pregnant — see *Rheumatic heart disease in pregnancy* ([WBM p136](#))

RHD management plan

- Yearly health check — adult ([CPM p123](#)), school-aged child ([CPM p121](#))
- Pneumococcal and flu immunisations, see *Australian Immunisation Handbook*
- Dental check within 3 months of diagnosis, then every 6 months
- If severe valve disease, symptoms, had valve surgery —
 - Medical review every 3–6 months
 - Specialist review and echocardiogram every 3–6 months
- If moderate valve disease, no symptoms —
 - Medical review every 6 months
 - Specialist review and echocardiogram every 12 months
- Need for preventive antibiotics for dental, surgical, invasive procedures (*below*)
- ARF but no valve damage
 - Medical review every 12 months
 - Echocardiogram every 2 years for children, every 2–3 years for adults
 - Dental check every 12 months

Prevention of endocarditis

- Highest risk of endocarditis (infection inside heart) in people with
 - RHD
 - Artificial heart valve
 - Heart transplant
 - History of bacterial endocarditis
 - Certain congenital heart problems
- May need preventive antibiotics before dental, surgical, invasive procedures
 - Check management plan
 - Always do **medical/dental consult**

Table 6.1: Preventive antibiotics (prophylaxis) for endocarditis

Procedure	Treatment
<ul style="list-style-type: none"> Dental 	<p>If not on penicillin prophylaxis —</p> <ul style="list-style-type: none"> Give amoxicillin oral single dose 1 hour before – adult 2g, child 50mg/kg/dose up to 2g (doses p424) OR amoxi/ampicillin IV single dose just before – adult 2g, child 50mg/kg/dose up to 2g (doses p425) <ul style="list-style-type: none"> Max rate 100mg/mL/min <p>If on penicillin prophylaxis* OR allergic to penicillin —</p> <ul style="list-style-type: none"> Give clindamycin oral single dose 1 hour before – adult 600mg, child 20mg/kg/dose up to 600mg (doses p430)
<ul style="list-style-type: none"> Genitourinary (catheter, sex organs, bladder, kidney, pregnancy related) Stomach or bowel 	<ul style="list-style-type: none"> Give amoxicillin oral single dose 1 hour before – adult 2g, child 50mg/kg/dose up to 2g (doses p424) OR amoxi/ampicillin IV single dose just before – adult 2g, child 50mg/kg/dose up to 2g (doses p425) <ul style="list-style-type: none"> Max rate 100mg/mL/min <p>If anaphylaxis to penicillin —</p> <ul style="list-style-type: none"> Give vancomycin IV 15mg/kg/dose (doses p438) <ul style="list-style-type: none"> Slow infusion (at least 1 hour) that ends just before procedure
<ul style="list-style-type: none"> Burns Surgical and skin wounds Draining an abscess Men's business or sorry business with cutting or scarring 	<ul style="list-style-type: none"> Give flucloxacillin oral single dose 1 hour before – adult 1g, child 25mg/kg/dose up to 1g (doses p432) <p>If allergic to penicillin —</p> <ul style="list-style-type: none"> Medical consult

* On long-term BPG and given at least once in past month



Warfarin

- Blood thinner (anticoagulant) used to stop blood clotting in people with mechanical heart valves, some clotting disorders, some heart disease (eg atrial fibrillation [AF])
- Can cause life-threatening bleeding — patient education important
- Women on warfarin should not become pregnant. Women of childbearing age need appropriate contraception ([WBM p335](#))

INR (international normalised ratio)

- Blood test used to monitor risk of blood clotting and indicate if warfarin needs adjusting. Shows average effect of warfarin over last 5 days
 - High INR usually means warfarin dose needs to be reduced
 - Low INR may mean person has not been taking their warfarin or dose may need to be increased

Target INR

- As recommended by physician, cardiologist, cardiothoracic surgeon
- Mechanical mitral valve, some older mechanical aortic valves — 2.5–3.5
- Newer mechanical aortic valve, other conditions (eg DVT, AF, PE) — 2.0–3.0

Starting warfarin

- **Only start on medical advice**
- Need to be able to monitor every day for first 5 days, then regularly as advised by doctor
- Follow Table 6.2
- If INR not more than 1.5 by day 5 — **specialist consult**

Monitoring INR

- Use previous INR readings and corresponding warfarin doses to guide what warfarin dose will give target INR
- After starting doses (first 6 days) — need twice weekly testing for 4 weeks or until stable
 - Stable = stays in therapeutic range for 2 weeks
 - If stable — weekly testing for 4 weeks, then monthly
- More frequent monitoring if
 - Warfarin dose adjusted or change in INR over short time
 - Stopped or started other medicine, especially if interacts with warfarin

Other medicines

- Warfarin interacts with many medicines, some increase bleeding, others increase clotting
- Check for possible interactions with warfarin before starting **any** new medicine — including over the counter, and alternative therapies
 - If starting a new medicine — watch INR levels closely. Warfarin dose may need to be adjusted

Table 6.2: Warfarin starting doses for adults

Day	INR	Dose for age (mg)			
		50 years or less	51–65 years	66–80 years	80 years or more
1	Less than 1.4	10	9	7.5	6
2	1.5 or less	10	9	7.5	6
	1.6 or more	0.5	0.5	0.5	0.5
3	1.7 or less	10	9	7.5	6
	1.8–2.3	5	4.5	4	3
	2.4–2.7	4	3.5	3	2
	2.8–3.1	3	2.5	2	1
	3.2–3.3	2	2	1.5	1
	3.4	1.5	1.5	1	1
	3.5	1	1	1	0.5
	3.6–4.0	0.5	0.5	0.5	0.5
	More than 4	0	0	0	0
4	1.5 or less	10–15	9–14	7.5–11	6–9
	1.6	8	7	6	5
	1.7–1.8	7	6	5	4
	1.9	6	5	4.5	3.5
	2.0–2.6	5	4.5	4	3
	2.7–3.0	4	3.5	3	2.5
	3.1–3.5	3.5	3	2.5	2
	3.6–4.0	3	2.5	2	1.5
	4.1–4.5	Omit next dose, then use			
		1–2	0.5–1.5	0.5–1.5	0.5–1
	More than 4.5	Withhold dose			

Adjusting warfarin

- **Only adjust with medical consult or in line with management plan**
 - Adjustments based on target range
 - See Table 6.3 for target range 2.0–3.0
 - See Table 6.4 for target range 2.5–3.5
- **Do not** ‘over-correct’ single borderline abnormal INR readings by changing warfarin dose
- **Do not** adjust if bleeding or embolic/thromboembolic complications — **medical consult**

Working out how to adjust the weekly warfarin dose

1. Work out the weekly dose

Add together the doses given over the last 7 days

Example: 6mg per day x 7 days = 42mg (weekly dose)

2. Work out the adjustment

Weekly dose x percentage to be adjusted

Example: 42mg x 10% = 4mg (round to nearest mg)

3. Add or subtract the adjustment to or from weekly dose

Example: If increasing dose by 10% — new weekly dose is 46mg (42 + 4)
(can give 6mg Mon, Wed, Fri, and 7mg Tues, Thurs, Sat, Sun)

If decreasing dose by 10% — new weekly dose is 38mg (42 – 4)
(can give 6mg Mon, Wed, Fri, and 5mg Tues, Thurs, Sat, Sun)

Table 6.3: Warfarin dose adjustment for target range of 2.0–3.0

INR	Adjustment	Next INR test
Less than 1.5	<ul style="list-style-type: none"> • Increase weekly dose by 20% • If metal heart valve — medical consult. May need enoxaparin/heparin 	<ul style="list-style-type: none"> • 3–5 days • If metallic valve — as advised
1.5–1.9	<ul style="list-style-type: none"> • Increase weekly dose by 10% 	<ul style="list-style-type: none"> • 1 week
2.0–3.0	<ul style="list-style-type: none"> • No change 	<ul style="list-style-type: none"> • If stable — 4 weeks • If not stable — 1 week
3.1–3.9	<ul style="list-style-type: none"> • No change — recheck in 1 week <ul style="list-style-type: none"> ◦ If the same — decrease weekly dose by 10–20% 	<ul style="list-style-type: none"> • 1 week
4.0–4.9	<ul style="list-style-type: none"> • Miss one dose • Decrease weekly dose by 10–20% 	<ul style="list-style-type: none"> • 2 days
5 or more	<ul style="list-style-type: none"> • See <i>Elevated INR — with or without bleeding (p302)</i> 	—

Lifestyle advice

- Appropriate contraception for women of childbearing age (*WBM p335*)
- Alcohol — safer drinking
- Some foods interact with warfarin. These can be safely eaten but avoid sudden changes in amounts of
 - Green vegetables
 - Prunes
- Avoid contact sports (eg football, rugby)
- Avoid practices that break the skin — piercings, some traditional practices
- Be aware of signs of bleeding — bleeding gums, pink urine, dark stools

Table 6.4: Warfarin dose adjustment for target range of 2.5–3.5

INR	Adjustment	Next INR test
Less than 2.0	<ul style="list-style-type: none"> • Increase weekly dose by 20% • If metal heart valve — medical consult <ul style="list-style-type: none"> ◦ May need enoxaparin/heparin 	<ul style="list-style-type: none"> • 3–5 days • If metallic valve — as advised
2.0–2.4	<ul style="list-style-type: none"> • Increase weekly dose by 10% 	<ul style="list-style-type: none"> • 1 week
2.5–3.5	<ul style="list-style-type: none"> • No change 	<ul style="list-style-type: none"> • If stable — 4 weeks • If not stable — 1 week
3.6–3.9	<ul style="list-style-type: none"> • No change — recheck in 1 week <ul style="list-style-type: none"> ◦ If the same — decrease weekly dose by 10–20% 	<ul style="list-style-type: none"> • 1 week
4.0–4.9	<ul style="list-style-type: none"> • Miss one dose • Decrease weekly dose by 10–20% 	<ul style="list-style-type: none"> • 2 days
5 or more	<ul style="list-style-type: none"> • See <i>Elevated INR — with or without bleeding (below)</i> 	

Elevated INR — with or without bleeding

Table 6.5: Management of elevated INR

INR	Less than 5	5 or more
Not bleeding	See <i>Adjusting warfarin (p300)</i>	<ul style="list-style-type: none"> • Stop warfarin • Medical consult — may suggest vitamin K <ul style="list-style-type: none"> ◦ If given — measure INR in 6–12 hours • Measure INR every 24 hours • Consider causes of high INR • Resume warfarin therapy at a reduced rate once INR is less than 5
Bleeding	<ul style="list-style-type: none"> • Medical consult straight away about <ul style="list-style-type: none"> ◦ Sending to hospital ◦ Best warfarin reversal therapy • Stop warfarin • Control bleeding (use compression if possible) 	

Note: Injectable form of vitamin K can be taken orally.

Anaemia (weak blood) in adults

- Common in all adults, more common in women
- Iron deficiency anaemia (IDA) most common cause
- Blood loss from gut most important cause of IDA in postmenopausal women and men of any age. Need to test for cancer in these groups

Check

- Take blood for FBC if
 - Very tired
 - Short of breath with exercise
 - Rectal bleeding
 - Heavy menstrual periods
 - Gut symptoms — chronic abdominal pain, recurrent loose faeces

Diagnosis

- Men — Hb less than 130g/L
- Women
 - Not pregnant and more than 6 weeks postnatal — Hb less than 120g/L
 - Up to 6 weeks postnatal — Hb less than 110g/L
 - Pregnant — Hb less than 110g/L. See *Anaemia (weak blood) in pregnancy* ([WBM p132](#))

To confirm diagnosis and cause

- Take blood for serum ferritin, CRP, serum B12, folate, TSH, LFT
- Take blood for UEC if not done in previous 12 months
- **Interpreting results**
 - Serum ferritin 30microgram/L or less — confirms IDA
 - Serum ferritin more than 30microgram/L but less than 100microgram/L — possible IDA, or anaemia of chronic disease (inflammation)
 - Serum ferritin 100microgram/L or more — IDA unlikely, consider other causes
- **If unclear if IDA or other cause of anaemia —**
 - **Medical consult**, talk with haematologist about other tests needed
- **If anaemia confirmed as B12 or folate deficiency —**
 - Treat with appropriate supplements. **Medical consult**

IDA confirmed on testing

Ask

- Iron in diet
- Gut symptoms — chronic abdominal pain, recurrent loose faeces
- Medicines — aspirin, NSAID, warfarin
- PR bleeding
- Ceremonial practices

- Menstrual periods
- Family history of bowel cancer

Do

- **Medical consult**
- Give iron replacement (*below*)
- If from area where hookworm is/has been common — give **albendazole** oral single dose – adult 400mg
- Talk about healthy food choices (*CPM p143*)
- If gut symptoms —
 - Rectal bleeding or family history of bowel cancer — consider colonoscopy
 - Upper gastrointestinal symptoms — consider gastroscopy
- If female of childbearing age — offer urine pregnancy test (*WBM p279*)
- If over 40 years or not responding to treatment — gastroscopy and colonoscopy to exclude cancer

Iron replacement

Oral iron

- Oral **iron** – 100–200mg elemental iron a day
- Need to continue to take **iron** for 3 months after Hb returns to normal
- Reduce gut side effects by taking with food or at night
- Repeat FBC in 4 weeks
 - If Hb not improving —
 - Consider reason — tablets not being taken, ongoing blood loss, inflammation
 - May need IV **iron** infusion
- Repeat FBC at 12 weeks
 - If Hb still low — medical review

- **Iron** medicine is dangerous in overdose
- Need to keep in childproof container, in a safe place

Iron IV infusion

- Use if oral iron doesn't work or can't be used. **Medical consult**
- **Do not** use if signs of infection
- **Ferric (iron) carboxymaltose** (eg *Ferinject*) IV infusion can be given if
 - Prescribed by doctor
 - Anaphylaxis kit and resuscitation equipment available
 - Clinician trained in life support stays with person during infusion
 - Infusion pump used
- See *Giving iron by IV infusion* (*CPM p353*)
- **Do not** restart oral iron until at least 5 days after infusion given



Table 6.6: Ferric carboxymaltose (eg Ferinject) IV infusion by weight and Hb level

Weight (kg)		Ferric carboxymaltose dose (50mg/mL strength)			Mix with normal saline	Infusion time
		Hb 70–89g/L	Hb 90–99g/L	Hb 100–110g/L		
36–69	Week 1*	20mL	20mL	20mL	250mL	15 min
	Week 2*	10mL	10mL	–	250mL	15 min
70 and over	Week 1*	20mL	20mL	20mL	250mL	15 min
	Week 2*	20mL	10mL	10mL	250mL	15 min

* **Do not** give more than 20mL (1000mg) in a single dose. Give second dose at least 1 week after first.

Bone infection

Bone infection (osteomyelitis) can occur with or without earlier injury.

Consider bone infection if

- Cut/sore still has pus coming out after 7–14 days of standard treatment
- Skin infection (cellulitis) over bone that is close to the surface (eg hands, fingers, toes, front of shin) still there after 7–14 days of standard treatment
- Skin infection for long/unknown time
- Child under 6 years has cellulitis — **always do medical consult**
- Broken jaw with **pus** or bleeding around **tooth**
- Person with diabetes has slow-healing wound or ulcer, especially on feet

Check

- Usually (but not always) looks unwell
- Temp
- Painful, hot, tender bone — usually limb or backbone
 - Tenderness at one point (not general)
- Can be hard to tell apart from cellulitis ([p389](#)), especially in children
- Tap on bone away from sore area. If painful — may be bone infection
- If sore or ulcer — bone visible at the base means bone infection

Do

- **Medical consult, send to hospital urgently**
- If waiting for evacuation —
 - Give **pain relief** ([p377](#))
 - Collect and send with person — blood for cultures ([CPM p375](#)), pus swab ([CPM p388](#))
 - Best not to give antibiotics before cultures collected — blood culture, bone aspiration for MC&S done in hospital
 - If very sick or delay in sending to hospital — give **cefazolin** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p428](#))

Consider melioidosis ([p375](#))

- Especially in tropical northern Australia
- In wet season or after floods
- For people
 - With diabetes, chronic kidney disease, chronic lung disease
 - Who drink too much alcohol or kava
 - Who are run down (debilitated) or have history of melioidosis



Breathing problems in adults

If a lot of trouble breathing (acute shortness of breath), looks very unwell — sit person up *AND*

- Continuous monitoring O₂ sats
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 2–4L/min *OR* mask 5–10L/min
- Watch out for drowsiness. May indicate slowed breathing (CO₂ retention) — **medical consult** straight away
- Put in IV cannula (*CPM p84*)
 - Flush with 5mL **normal saline** every 4 hours
- Check temp, pulse, RR, BP — work out REWS (*p6*). Repeat every 15 minutes
- Ask about symptoms
- **Medical consult**

Table 6.7: Things that can cause shortness of breath

Signs and symptoms	Likely problem
<ul style="list-style-type: none"> • Worse when lying down flat • Hard to get to sleep, wake up at night short of breath • May have wheeze, crackles in lungs • May have pink, frothy sputum • Usually history of heart trouble — RHD, CAD, heart attack • May have chest pain 	Pulmonary oedema (<i>p264</i>)
<ul style="list-style-type: none"> • Fever, cough, looks unwell • May have sharp chest pain, worse on deep breathing • May have reduced breath sounds, crackles in lungs 	Chest infection (<i>p309</i>)
<ul style="list-style-type: none"> • Cough with wheeze • Usually known to have asthma 	Asthma attack (<i>p323</i>)
<ul style="list-style-type: none"> • Had cough for long time • Usually no fever • Chronic chest problems • More coloured sputum than usual 	Chronic lung disease (<i>p314</i>)
<ul style="list-style-type: none"> • Severe, rapidly increasing shortness of breath • Fast pulse (<i>p422</i>), high BP (<i>p422</i>) • Often after chest injury, or in people with chronic lung disease (<i>p314</i>) 	Tension pneumothorax (<i>p68</i>)

Signs and symptoms	Likely problem
<ul style="list-style-type: none"> • Sharp pain, trouble breathing • Decreased air entry and chest expansion on affected side • May start suddenly • May have history of chronic lung disease (p314) • May be young healthy person • May be after chest injury, after playing sport 	<p>Pneumothorax (p68)</p>
<ul style="list-style-type: none"> • Sharp chest pain, mostly on deep breathing • May cough up blood • Fast pulse (p422), high BP (p422) • May have painful swollen leg • High risk <ul style="list-style-type: none"> ◦ Pregnant or postnatal ◦ Operation in past 2 months ◦ Cancer ◦ Leg in plaster ◦ Previous blood clot ◦ Long time spent sitting or lying <ul style="list-style-type: none"> ▪ Older people ▪ Confined to bed ▪ Long distance car/plane travel 	<p>Pulmonary embolus (blood clot in lung)</p> <ul style="list-style-type: none"> • Medical consult



Chest infections — over 5 years

Remember: Cough doesn't always mean chest infection. Consider other causes — especially if shortness of breath main problem ([p307](#)).

Risk factors for severe pneumonia

- Frail, elderly, chronic lung disease, weakened immune system, diabetes, kidney problems, liver disease, heart failure, cancer
- Volatile substance misuse, alcohol misuse

In tropical northern Australia

- If moderate/severe pneumonia and risk factors — treat as melioidosis ([p375](#))
 - Risk factors — diabetes, drinking too much alcohol or kava, chronic kidney disease, chronic lung disease, medicines that suppress immune system, underlying cancer

Ask

- Symptoms — cough, fever, wheeze, chest pain, shortness of breath, sputum
- How long have they had symptoms
- History of previous chest infections — consider chronic lung disease ([p314](#))
- Other medical conditions — see *Risk factors for severe pneumonia (above)*
- Smoking — how many, how long, tried to stop, want to stop

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Listen to chest ([CPM p189](#))

Do

- Check for respiratory management plan
- Pneumonia, bronchitis ([p312](#)), exacerbations of bronchiectasis ([p316](#)), COPD ([p318](#)) can look the same but treatment is different
 - If history of positive *Pseudomonas* — will need treatment with antipseudomonal antibiotics ([p317](#))
- **Medical consult**

Severe pneumonia

- Fever, usually cough
- **AND** any of
 - Looks very unwell
 - Short of breath
 - Fast breathing, RR 26/min or more
 - O₂ sats less than 94% on room air, when settled with good oximeter trace
 - If known chronic lung disease — check what O₂ sats are when well
 - T less than 35°C **OR** T 40°C or more
 - Low systolic BP for age ([p422](#)) or compared to previous measurement

- Confused, altered mental state
- Pain with breathing or tapping on chest (percussion)
- Rib recession
- Risk factors for severe pneumonia ([p309](#))

Check

- Ideally before giving antibiotics, but don't delay treatment — send in with person
 - Take blood for blood cultures ([CPM p375](#))
 - Collect urine for MC&S
 - Sputum for MC&S, if possible ([CPM p385](#))
- If adult — do ECG

Do

- **Medical consult, send to hospital urgently**
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult *OR* mask 5–10L/min
- Put in IV cannula ([CPM p84](#))
 - Flush with 5mL **normal saline** every 4 hours
- Give **ceftriaxone** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
- **AND gentamicin** IV single dose (doses [p433](#))
 - If IV not possible — give both IM
- If very unwell and likely to be transferred to ICU — retrieval team will give meropenem or vancomycin if needed
- If low systolic BP for age ([p422](#)) — give **normal saline** bolus as directed by doctor

Mild or moderate pneumonia

- Fever, usually cough
- **AND**
 - Looks unwell
 - Fast breathing, RR 21–25/min
 - O₂ sats 94% or more on room air, when settled with good oximeter trace
 - If known chronic lung disease — check what O₂ sats are when well
 - **No** other features of severe pneumonia

Check

- If sputum — collect sample for MC&S ([CPM p385](#))
- If T less than 35°C or more than 38°C — take blood for blood cultures ([CPM p375](#))



Do

- Start treatment in community
- Give **procaine benzylpenicillin (procaine penicillin)** IM every 24 hours for 3 days – adult 1.5g, child 50mg/kg/dose up to 1.5g (doses [p435](#))
 - If allergic to penicillin — give **roxithromycin** oral twice a day (bd) for 5 days – adult 150mg [or 300mg once a day], child 4mg/kg/dose up to 150mg (doses [p436](#))
- If getting better after 3 days (no fever, normal RR) — change procaine benzylpenicillin (procaine penicillin) to
 - **Amoxicillin** oral 3 times a day (tds) for 2 more days – adult 1g, child 25mg/kg/dose up to 1g (doses [p424](#))
 - **OR amoxicillin** oral twice a day (bd) for 2 more days – adult 1.5g, child 35mg/kg/dose up to 1.5g (doses [p424](#))
- If not getting better after 3 days — give **procaine benzylpenicillin (procaine penicillin)** IM every 24 hours for another 2 days – adult 1.5g, child 50mg/kg/dose up to 1.5g (doses [p435](#))
- Give **paracetamol** up to 4 times a day (qid) for pain if needed – adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
- Tell person to get lots of fluids and rest
- **Medical consult** if
 - Not improving after 3 days or getting worse at any time
 - May need to send to hospital for investigation and treatment
 - If staying in community — doctor may suggest changing to **ceftriaxone** IV/IM once a day – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
 - Lot of sputum, blood in sputum, ongoing cough (after 4 weeks)
 - Needs chest x-ray
- **Review daily**

Cold (URTI) or influenza

- Fever, aches and pains, sore throat ([p407](#)), blocked or runny nose
 - **BUT no** other features of pneumonia
- Sputum clear or white, small amounts

Do

- For fever, aches and pains — give **paracetamol** up to 4 times a day (qid) – adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
- Tell person to
 - Get lots of fluids and rest
 - Come back if not getting better, develops new symptoms
- If known influenza activity in community **AND** fever, shakes, muscle aches **AND** risk factors for severe pneumonia ([p309](#)) or advanced pregnancy — **medical consult** about need for viral swabs and antivirals for influenza

Sinusitis

- Fever, aches and pains, sore throat ([p407](#)), blocked or runny nose
 - **BUT no** other features of pneumonia
- Nasal discharge coloured
- Tender over cheeks/eyebrows
- Headaches, facial pain

Do

- For fever, aches and pains — give **paracetamol** up to 4 times a day (qid) — adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
- Give decongestant for 4–5 days — nasal spray or oral
 - **Do not** give to children under 6 years
 - **Medical consult** before giving to children 6–11 years
- If T more than 38°C or symptoms for more than 5 days
 - Give **amoxicillin** oral 3 times a day (tds) for 5 days — adult 500mg, child 15mg/kg/dose up to 500mg (doses [p424](#))
 - **OR amoxicillin** oral twice a day (bd) for 5 days — adult 1g, child 25mg/kg/dose up to 1g (doses [p424](#))
 - If allergic to penicillin — give **roxithromycin** oral twice a day (bd) for 5 days — adult 150mg (or 300mg once a day), child 4mg/kg/dose up to 150mg (doses [p436](#))
- Tell person
 - Get lots of fluids and rest
 - Come back if not getting better, develops new symptoms. Often need medical review

Bronchitis

- Fever, aches and pains, sore throat ([p407](#)), blocked or runny nose
 - **BUT no** other features of pneumonia
 - **AND no** history of chronic lung disease
- Sputum coloured, thick, large amounts
- Nasal discharge coloured or bloody

Do

- For fever, aches — give **paracetamol** up to 4 times a day (qid) — adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
- Tell person
 - Get lots of fluids and rest
 - Come back if not getting better, or develops new symptoms
- If history of or you suspect chronic lung disease — see
 - *Chronic suppurative lung disease and bronchiectasis in children* ([p131](#))
 - *Chronic lung disease in adults* ([p314](#))



Follow-up — all chest infections

- Check pneumococcal and flu immunisation status, see *Australian Immunisation Handbook*. If needed — give after infection settled
- Give advice and help to stop smoking ([p223](#)), alcohol use, volatile substance misuse ([p226](#)). See *Brief interventions (CPM p138)*
- Consider chronic lung disease ([p314](#))
- If still not well or still has cough after 4 weeks — follow-up chest x-ray

Table 6.8: Looking for signs of a chronic problem

Feature	Possible reason — what to do
<p>Any or all of</p> <ul style="list-style-type: none"> • Persistent cough for more than 4 weeks, especially if producing sputum • Short of breath on activity • 3 or more chest infections in last 2 years • 2 or more episodes of pneumonia in last 5 years • Always has signs when listening with stethoscope — crackles, unequal air entry, bronchial breathing 	<p>Chronic lung disease (p314)</p> <ul style="list-style-type: none"> • Medical review • Chest x-ray
<ul style="list-style-type: none"> • Wheezing sickness 2 or more times in last year 	<p>Asthma (p323)</p> <ul style="list-style-type: none"> • Medical review • Asthma action plan (p329)
<ul style="list-style-type: none"> • Productive cough for more than 3 weeks • Weight loss, night sweats • Coughing up blood 	<p>TB (p408)</p> <p>Lung cancer</p> <ul style="list-style-type: none"> • Chest x-ray • Sputum for AFB (CPM p385) • Medical review

Chronic lung disease in adults

Includes COPD, bronchiectasis, some persistent asthma — can exist together in one person (overlap syndrome).

Diagnosis — clinical history, lung function tests (spirometry), x-ray, CT scan.

First assessment

Ask

- Smoking — how many, how long, tried to stop, want to stop
- Petrol sniffing, past or present (causes lung damage)
- Chronic cough, frequent chest infections
- Sputum — frequency, amount, colour, blood
- Shortness of breath — does it stop them doing usual physical activities or work
- Activities of daily living, quality of life
- Sleeping problems, snoring, stopping breathing, morning headaches, fatigue, daytime sleepiness. May have breathing related sleep disorder ([p330](#))

Check

- File notes for
 - Recorded diagnosis of chronic lung disease — COPD, bronchiectasis, asthma
 - Management plan, action plan for managing acute episodes
- Spirometry ([CPM p191](#)) — before and 15 minutes after **salbutamol** 100microgram/dose puffer with spacer – 2 puffs *OR* **salbutamol** nebulised – 5mg
 - Good response after reliever (FEV1 improves by more than 12% *AND* at least 200mL) usually means at least a component of asthma or reversibility
 - Airflow obstruction (FEV1/FVC ratio less than 0.7 or 70%)
 - Always present in COPD
 - May not be present at time of testing in asthma
 - In bronchiectasis — lung function may be normal *OR* may be reduced FEV1 and FVC together rather than airflow obstruction
 - Grade severity of airflow obstruction based on % of predicted FEV1
 - Mild — 60–80%, moderate — 40–59%, severe — less than 40%
- O₂ sats
 - If less than 94% on room air when well — **medical consult** about home oxygen, may need extra oxygen for air travel
- BMI ([CPM p108](#))
- Do ECG — look for old heart attacks or heart failure as cause of breathlessness
- Take blood for FBC — low Hb can make breathlessness worse, Hb can be high if O₂ sats low
- Chest x-ray — look for bronchiectasis, emphysema, over-inflated lung, heart enlargement, heart failure, scarring from lung disease or old infection



- Flu and pneumococcal immunisation status, see *Australian Immunisation Handbook*

Do

- Medical review for diagnosis if not known, or if blood in sputum
- Show person how to use puffer (*CPM p360*) and spacer (*CPM p364*), or other device as needed
- If you suspect bronchiectasis (*p316*) — refer for high resolution CT scan of chest. **Specialist consult** first
- If snoring, morning headache, daytime sleepiness, fatigue — consider referral to sleep/respiratory service for review (*p330*)
- If severe airflow obstruction *OR* shortness of breath worse than expected from spirometry — consider referral for echocardiogram to check for heart failure, pulmonary hypertension

Table 6.9: Comparison of chronic lung diseases

Sign	Bronchiectasis	COPD	Asthma
Young age of onset	Often	Almost never	Often
Sudden onset	Almost never	Almost never	Often
Smoking history	Sometimes	Almost always	Sometimes
Short of breath	Usually	Usually	Sometimes
Wheeze	Sometimes	Sometimes	Often
Cough	Chronic	Chronic	Sometimes
Sputum production	Daily, large volume	Almost always	Sometimes
Response to bronchodilators	Small	Small	Usually large but can be variable

Management of all chronic lung diseases

Aim is to improve symptoms, slow worsening of lung function.

- Do regular checks
- Make management/action plan with person. Give them a copy
 - Include self-management and when to have regular checks, allied health and physician referrals, follow-up, what to do for acute episodes

Regular checks

- If chronic lung disease — increased risk of coronary artery disease

Every six months

- Check symptom control — short of breath, exercise tolerance, acute episodes
- Pulse, BP, weight
- If puffer (*CPM p360*) and spacer (*CPM p364*) or other device used — check technique

Yearly

- Take blood for FBC
- O₂ sats, spirometry — FEV1 and FVC (*CPM p191*)
- Yearly sputum culture to help with management of acute episodes — include AFB/mycobacterial culture for atypical mycobacteria
- Check for signs of depression (*p201*)
- Assess cardiovascular risk (*p230*)
- Review and give person written copy of updated management/action plan

Do

- Encourage to **QUIT smoking** — proven to slow down lung damage *AND* has many other advantages
- Strongly encourage physical activity. Develop tailored exercise program with allied health support
- If bronchiectasis with productive cough or moderate-severe obstruction — consider referral to physiotherapy for techniques to help cough up sputum
- If unintended weight loss — medical review
- If planning to use oral corticosteroids/prednisolone for more than 2 weeks —
 - Test for strongyloides every 3 months while on steroids (*p417*). Treat if positive
 - Mantoux test to assess for previous or latent TB and risk of reactivation. Talk with CDC/PHU about interpretation of results and management
 - Hepatitis B serology — **medical consult** if HBsAg positive
 - If non-immune (*p368*) — immunise
 - Consider baseline and annual assessment of bone mineral density especially if expected to use for more than 3 months
- Give flu immunisation every year and pneumococcal immunisation as per schedule. See *Australian Immunisation Handbook*
- If Hb concentration increased and/or packed cell volume (PCV) on FBC consistently more than 0.55 (55%) — may need to reduce it by taking blood.

Specialist consult**Do — if severe**

- Specialist review about medical, surgical or palliative options
- Talk with person and family about treatment choices, going to hospital if they become unwell, developing an Advance Care Plan to reflect their wishes

Bronchiectasis

Widening of airways caused by severe or repeated infection. Airflow obstruction (FEV1/FVC ratio less than 0.7 or 70%) may not be present.

- Specialist review to check for underlying treatable cause

Diagnosis confirmed by HRCT scan.



- Consider bronchiectasis if
 - Chronic cough and sputum in person under 35 years
 - Diagnosis of COPD and less than 10 years of smoking
 - 2 or more hospital admissions with pneumonia in past year, especially if under 35 years
 - Chest x-ray changes suggest dilated airways or scarring
 - Persisting crackles in lungs and no heart failure
 - Diagnosis of CSLD as child ([p131](#))
 - Clubbing of ends of fingers
 - Unusual organisms on sputum culture — *Pseudomonas*, aspergillus, *Mycobacterium avium* complex
 - Spirometry may be normal or have reduced FEV1 and FVC together

Symptoms

- Chronic cough with daily sputum, not responding to standard treatment
- May have shortness of breath, wheeze, chest pain
- May cough up blood (haemoptysis)
- May have sinus/nasal inflammation, tiredness, weight loss

Do

- First assessment for chronic lung disease ([p314](#))

Acute episode (exacerbation)

- Increased cough, amount and colour of sputum (darker yellow or green)
- Often wheezing, more short of breath, fever
- May cough up blood (haemoptysis), have chest pain
- Spirometry may get worse

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Assess level of respiratory distress (eg talking in single words or sentences)
- Sputum for MC&S ([CPM p385](#)), check for blood
- If chest pain or history of heart disease — do ECG

Do

- Check results of last sputum culture — use antibiotic advised
- If no recent results — give **amoxicillin** oral twice a day (bd) for 14 days – adult 1g
 - If allergic to penicillin — give **doxycycline** oral single dose – adult 200mg
 - **THEN doxycycline** once a day for 13 days – adult 100mg
 - If pregnant — **medical consult**
- Check sputum results as soon as possible
 - If not improving — change antibiotics
 - If positive *Pseudomonas* — give **ciprofloxacin** oral twice a day (bd) for 14 days – adult 750mg



- Chest physiotherapy ([CPM p194](#))
 - If history or symptoms of reflux — avoid head down postural drainage
- Reliever (eg salbutamol) may be helpful
- **Medical consult** if
 - Very unwell — may need to send to hospital
 - Coughing up blood (haemoptysis)
 - Marked wheeze or previous diagnosis of co-existing asthma — may need prednisolone
 - New onset of O₂ sats less than 94% on room air
 - Can't look after themselves at home — washing, toileting, dressing, eating

Ongoing management

- Regular checks ([p315](#))
- Refer to physio for coughing techniques and aids (eg PEP valve, flutter valve) to help removal of sputum
- Inhaled corticosteroids may help if a component of
 - Asthma
 - *OR* COPD
 - *OR* marked wheeze
- At least one review by physician (preferably respiratory) recommended to exclude secondary causes of bronchiectasis and develop management plan
- If 3 or more acute episodes, or 2 or more needing hospitalisation in last year — **medical/physician consult** about 12–24 month trial of preventive oral or inhaled antibiotics
- If *Pseudomonas aeruginosa* isolated in sputum for first time — **medical/physician consult** about sending to hospital for eradication therapy

COPD — chronic obstructive pulmonary disease

Airway obstruction not fully reversible. Consider COPD if over 35 years and current or ex-smoker, even if no symptoms. **Long history of smoking most common cause of COPD** *BUT* can have COPD if never smoked, especially if long exposure to second-hand smoke or environmental/occupational dust.

Diagnosis based on spirometry

- Poor response (FEV₁ improves by less than 12% or 200mL) to inhaled salbutamol
- FEV₁/FVC ratio less than 0.7 or 70% ([CPM p192](#))

Symptoms

- Cough with sputum most days for several months at a time over 2 or more years. Often worse in morning, amount of sputum can be small
- May have wheeze
- Short of breath — often late sign of lung damage or obstruction



Do

- First assessment for chronic lung disease ([p314](#))
- Assess severity. See Table 6.10

Table 6.10: Grading severity of COPD

Grade	FEV1	Symptoms/signs	Impact
Mild	60–80% of predicted	<ul style="list-style-type: none"> • Chronic bronchitis • May be short of breath 	<ul style="list-style-type: none"> • May be minimal ongoing symptoms • Acute episodes may affect work
Moderate	40–59% of predicted	<ul style="list-style-type: none"> • Breathless, wheezing with moderate physical activity (eg walking up hills/stairs) 	<ul style="list-style-type: none"> • Breathlessness may affect work and physical activity • Acute episodes may be more severe and need hospitalisation
Severe	Less than 40% of predicted	<ul style="list-style-type: none"> • Breathless with minor activity (eg walking on flat, getting dressed) • Can develop complications — pulmonary hypertension/right heart failure, high Hb 	<ul style="list-style-type: none"> • Quality of life very poor • Acute episodes may be life-threatening

Acute episode (exacerbation)

- Looks and feels worse than usual
- At least 2 of
 - Increased shortness of breath
 - Increased sputum production or cough
 - Change in colour of sputum (clear/white to yellow *OR* yellow to green)

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- If chest pain or history of heart disease — do ECG

Do

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%. Monitor every 15 minutes
 - Nasal cannula 2–4L/min *OR* air-entrainment (venturi) mask
- Give **salbutamol** 100microgram/dose puffer with spacer every 1–4 hours until responding – 8–10 puffs
 - If symptoms not well controlled or severe — add **ipratropium** 21microgram/dose puffer with spacer as needed – 4–6 puffs

- Give **prednisolone** oral once a day for 5 days – adult 50mg – then review
 - If person also has diabetes – may need extra blood glucose control medicine when taking **prednisolone**
- If signs of infection (eg fever, change in colour of sputum) –
 - Check last sputum culture result – give antibiotic advised
 - *OR* if no sputum culture results – give **amoxicillin** oral twice a day (bd) for 5 days – adult 1g
 - If allergic to penicillin –
 - Give **doxycycline** oral twice a day (bd) for 5 days – adult 100mg
 - *OR* **medical consult**
- Encourage fluid intake to prevent dehydration

Medical consult if

- New onset of O₂ sats less than 94% on room air
- Person needs more oxygen than by 28% air-entrainment (venturi) mask or 4L/min by nasal cannula, or becoming sleepy – often needs to go to hospital
- RR less than 12/min or more than 26/min after first dose of salbutamol
- Not improving with treatment
- Other medical problems – diabetes, heart disease, kidney disease
- COPD is moderate or severe based on earlier spirometry
- Using home oxygen
- **History of being in ICU** for acute episodes, especially if non-invasive ventilation or intubation needed

Severe exacerbation and/or waiting for evacuation

- Check pulse, RR, BP every 15 minutes
- Monitor O₂ sats continuously by oximeter
- Continue **oxygen**. Aim to **keep levels at 92–94%** *OR* if moderate/severe COPD – 88–92%
- Watch for drowsiness, may indicate slowing of breathing (CO₂ retention).

Medical consult straight away

- Sit person up – use wheelchair to move them
- Give **salbutamol** nebulised as needed – 5mg
- Give **ipratropium** nebulised as needed – 500microgram – can mix with salbutamol
- Give **hydrocortisone** IV every 6 hours (qid) – 100mg

Ongoing management

- Education and self-management including stopping smoking ([p223](#)), pulmonary rehabilitation (physiotherapy/allied health referral)
- Regular checks ([p315](#))
- Stepwise progression of medicines – see Table 6.11



Severe disease

- If O₂ sats less than 94% on room air when well — refer to specialist for blood gases, echocardiogram, assessment for home **oxygen**
- **May need oxygen if flying in plane or being transported in ambulance** — include in management plan
 - If on home oxygen — increase flow rate by 2L/min when flying
- Refer to allied health and palliative care for home assessment and support — bedding, wheelchair, respiratory education, advice on Advance Health Directive

Note: May also have heart failure ([p264](#)), ischaemic heart disease ([p250](#)), RHD ([p294](#)), asthma ([p323](#)) — consider these when person with chronic lung disease very short of breath.

Table 6.11: Progression of medicines for COPD

Step 1	Step 2	Step 3
<ul style="list-style-type: none"> • Short-acting reliever for symptoms (SABA or SAMA) 	<ul style="list-style-type: none"> • Short-acting reliever as for Step 1 • <i>AND</i> regular long-acting controller (LAMA, LABA, or LABA + LAMA) <p>Do not use SAMA and LAMA together.</p>	<ul style="list-style-type: none"> • Short-acting reliever and regular long-acting controller as for Step 2 • <i>AND</i> if 2 or more acute episodes a year — combined preventer and controller (ICS + LABA) • <i>AND</i> if ongoing symptoms — consider low dose theophylline <p>Do not use ICS + LABA <i>with</i> LABA or LABA + LAMA.</p>
<p>Go to Step 2 if</p> <ul style="list-style-type: none"> • No change in symptoms 	<p>Go to step 3 if</p> <ul style="list-style-type: none"> • No improvement after 4 weeks with both regular reliever and regular controller • FEV1 less than 50% predicted • 2 or more acute episodes in past year 	<ul style="list-style-type: none"> • If no change in symptoms, frequency of acute episodes, or FEV1 after 6 months — consider stopping ICS + LABA combination

Medicine types and examples

- SABA — short-acting beta₂ agonist
 - Salbutamol, terbutaline
- SAMA — short-acting muscarinic antagonist
 - Ipratropium
- LABA — long-acting beta₂ agonist
 - Salmeterol, eformoterol, indacaterol
- LAMA — long-acting muscarinic antagonist
 - Tiotropium, glycopyrronium, aclidinium, umeclidinium
- LABA + LAMA
 - Tiotropium + olodaterol, umeclidinium + vilanterol, indacaterol + glycopyrronium, aclidinium + eformoterol
- ICS – inhaled corticosteroid + LABA
 - Fluticasone propionate + salmeterol, budesonide + eformoterol, fluticasone furoate + vilanterol



Asthma in adults

Chronic, often allergic inflammation of airway walls causes tightening of airway wall muscles (bronchospasm) and increased mucus production inside airways. Symptoms come and go.

Consider asthma if

- Variable shortness of breath with exercise or physical activity
- Cough or wheeze (whistling sound on breathing out), usually with respiratory infection
- Sensitive to irritants, allergic symptoms (eg sneezing, watery eyes)

Remember: Not all wheeze or shortness of breath is asthma.

- Consider other chronic lung disease ([p314](#)), chest infection or pneumonia ([p309](#)), heart failure ([p264](#)), RHD ([p294](#)), strongyloides ([p417](#)).

Diagnosis

- Confirmed by response to inhaled bronchodilator (eg salbutamol) — if spirometry FEV1 ([CPM p191](#)) or PEFr improve by more than 12% **AND** at least 200mL

Managing an asthma attack

Do first

- If person can't talk easily due to shortness of breath — give **salbutamol** by nebuliser with **oxygen** 8L/min straight away
- If person looks very unwell (eg drowsy, collapsed, exhausted, O₂ sats less than 90% on air) — see *Severe and life-threatening asthma* straight away ([p325](#))

Ask

- Shortness of breath getting worse
- Wheeze or cough
- What medicines they have already used to manage attack
- Possible triggers — dust, smoke, pollen, grass, recent cold or flu

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Look at how they are breathing — note rib recession, accessory muscle use
- Listen to front and back of chest for wheeze and air entry ([CPM p189](#))
- Check FEV1 or PEFr

Do

- **Assess how bad the attack is — mild, moderate, severe.** See Table 6.12
- Treat accordingly
- If temp more than 38.5°C — **medical consult**

Table 6.12: How bad is the asthma now

Sign	Mild*	Moderate*	Severe
Talking	Easily	Phrases only	Single words, drowsy
Pulse	Less than 100/min	100–120/min	More than 120/min
RR	Less than 30/min	30/min or more	
Chest recession	No	Mild	Moderate or marked
Wheeze	Variable	Moderately loud	May be soft due to small amount of air movement
PEFR	More than 75% of predicted (or personal best)	50–75% predicted (or personal best)	Less than 50% predicted (or personal best) or less than 100L/min
O ₂ sats on room air	94% or more	90–93%	Less than 90% — may be cyanosis

* If not sure if mild or moderate — treat as moderate.

Mild asthma

- Give reliever
 - **Salbutamol** 100microgram/dose puffer with spacer – 8 puffs
 - *OR* **terbutaline** 500microgram/dose inhaler – 4 puffs
- If person has been sick for a few days or on regular preventer treatment — give **prednisolone** oral single dose – adult 50mg
- Check response to treatment after 20 minutes
 - **If not better** — treat as moderate asthma (*below*)
 - **If better** — keep in clinic for 1 hour. If condition stable — send home
 - Advise to use reliever every 4 hours. **Salbutamol** 100microgram/dose puffer with spacer – 2 puffs *OR* **terbutaline** 500microgram/dose inhaler – 1 puff *OR* usual reliever
 - Advise what to do if symptoms get worse. Record in asthma action plan ([p142](#)), give copy to person
 - Review next day
- If more than 1 attack in last year — medical review, check and revise asthma action plan ([p142](#))

Moderate asthma

- Give reliever
 - **Salbutamol** 100microgram/dose puffer with spacer – 12 puffs
 - *OR* **terbutaline** 500microgram/dose inhaler – 6 puffs
 - Repeat every 20 minutes for 1 hour (total of 3 doses) if needed
- May need **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 2–4L/min *OR* mask 5–10L/min



- **Medical consult**
- Give **prednisolone** oral single dose – adult 50mg
- Check response 10–20 minutes after third dose of reliever
 - **If not better** — may need to
 - Send to hospital
 - *AND/OR* give **hydrocortisone** IV – adult 100mg — can repeat after 6 hours
 - **If better** — keep in clinic for 1 hour. If stable — send home
 - Advise to use reliever every 4 hours — **salbutamol** 100microgram/dose puffer with spacer – 2–4 puffs *OR* **terbutaline** 500microgram/dose inhaler – 1–2 puffs *OR* usual reliever
 - Give **prednisolone** oral once a day for 4 more days – adult 50mg
 - Make management plan with doctor. Update asthma action plan ([p142](#)), give copy to patient
 - Review every day
 - Medical review at next visit

Severe and life-threatening asthma

- Give **oxygen** by mask 8L/min and continuous nebulised **salbutamol**
 - Put 5mg in nebuliser, refill every time it empties
- **Urgent medical consult, send to hospital urgently**
- Give **hydrocortisone** IV – adult 100mg — can repeat after 6 hours
- Give nebulised **ipratropium** every 20 minutes for first hour then every 4 hours as needed – 500microgram
 - Add to **salbutamol** already in nebuliser
- Check pulse, RR, O₂ sats every 15 minutes
- **If getting better** — consider reducing **salbutamol** to 5mg every 30 minutes

Asthma medicines

Table 6.13: Asthma medicines

Used as	Medicine type	Examples
Reliever — relief of symptoms	Bronchodilator	<ul style="list-style-type: none"> • Salbutamol • Ipratropium • Terbutaline
Preventer — prevents symptoms happening	Inhaled corticosteroid (ICS)	<ul style="list-style-type: none"> • Beclometasone • Budesonide • Ciclesonide • Fluticasone propionate
Preventer — prevents symptoms happening	Oral	<ul style="list-style-type: none"> • Montelukast
Combined therapy — preventer and long-acting reliever together	ICS + long-acting beta ₂ agonist (LABA)	<ul style="list-style-type: none"> • Budesonide + formoterol (eformoterol) • Fluticasone furoate + vilanterol • Fluticasone propionate + formoterol (eformoterol) • Fluticasone propionate + salmeterol

Table 6.14: Total daily doses of inhaled corticosteroids (ICS) for adults

Inhaled corticosteroid	Low dose (microgram)	Medium dose (microgram)	High dose (microgram)
Beclometasone	100–200	250–400	More than 400
Budesonide	200–400	500–800	More than 800
Ciclesonide	80–160	240–320	More than 320
Fluticasone fuorate	N/A	100	200
Fluticasone propionate	100–200	250–500	More than 500

Inhaled therapy devices

- All puffers (metered dose inhalers/MDIs) work best with a spacer
 - Have person show you their puffer ([CPM p360](#)) and spacer ([CPM p364](#)) technique
 - Check they know how to make a bush spacer ([CPM p365](#))
- Relievers (bronchodilators) work as well with puffer and spacer as with nebuliser — except in severe or life-threatening attacks
 - Salbutamol 100microgram/dose puffer 8–12 puffs = salbutamol 5mg nebulised
- Other devices available — find device person prefers or works best for them



- Dry powder inhalers (DPIs) — turbuhaler, accuhaler, *Ellipta*
 - Can get blocked in very humid climates
 - Need to be able to take a big enough breath to make work
 - *Ellipta* doesn't need as big a breath to activate as the others

Managing ongoing asthma

Goals in asthma management

- Confirm diagnosis of asthma — symptoms, medicines used, spirometry
 - If diagnosis made elsewhere — get results
- Educate person — ensure person understands and can manage asthma, including how to use devices and make a bush spacer (*CPM p365*)
- Assess asthma symptoms and control — base management on this
 - Reassess asthma control regularly — increase or decrease preventive therapy based on this
- Monitor (PEFR or spirometry), achieve and maintain best lung function
- Triggers identified and avoided, including fire and tobacco smoke
- **Asthma action plan** (*p142*) developed, reviewed regularly

Table 6.15: Levels of asthma symptom control

Level of control	Features — over 4 week period
Good control	All of <ul style="list-style-type: none"> • Daytime symptoms — 0–2 days/week • Need to use reliever — 0–2 days/week* • Able to carry out all activities • No symptoms during night or on waking
Partial control	1 or 2 of <ul style="list-style-type: none"> • Daytime symptoms — 3–7 days/week • Need to use reliever — 3–7 days/week* • Any limitation of activities • Any symptoms during night or on waking
Poor control	3 or 4 of <ul style="list-style-type: none"> • Daytime symptoms — 3–7 days/week • Need to use reliever — 3–7 days/week* • Any limitation of activities • Any symptoms during night or on waking

* Not including reliever used for prevention before physical activity.

Management — key points

- Manage by level of symptom control — see Table 6.15 and Table 6.16
- Most important medicines for asthma control are relievers (eg salbutamol) and ICS
 - Other long-term asthma medicines less effective than the right dose of ICS



- **Regular review** important to assess control and adjust (increase or decrease) treatment
 - Effect of change in ICS dose usually reached in 4 weeks
 - If ICS started at high dose for acute attack with newly diagnosed asthma — reduce after 2 weeks if now good control
 - If partial or poor control — adjust ICS dose every 4 weeks until good control
- If partial or poor control despite high dose ICS — may need LABA (eg salmeterol)
- **Do not** use LABA without ICS — always use combination LABA/ICS device
- Check inhaler technique regularly

Table 6.16: Management by level of control

Level of control (see Table 6.15)	Management
All	<ul style="list-style-type: none"> • Use reliever for symptoms, and before physical activity if needed
Newly diagnosed (irrespective of control)	<ul style="list-style-type: none"> • If stable — start low dose ICS — see Table 6.14 • If acute attack/poor control at diagnosis with or without prednisolone (see <i>Managing an asthma attack p323</i>) — consider short course of high dose ICS
Good control	<ul style="list-style-type: none"> • Reduce ICS to lower dose — see Table 6.14
Partial control	<ul style="list-style-type: none"> • Increase ICS to higher dose — see Table 6.14 If on maximum dose ICS — change from ICS alone to combined ICS/LABA • Check for and address causes and triggers • Review inhaler technique • If ongoing partial control on maximum dose ICS/LABA — medical/specialist review
Poor control	<ul style="list-style-type: none"> • Review inhaler technique and talk with person about when they use it (adherence) • Reconsider asthma diagnosis and confirm symptoms not due to something else — bronchiectasis, COPD, heart failure, RHD • Increase ICS to higher dose — see Table 6.14 • If on maximum dose ICS — add combination ICS/LABA • If ongoing poor control on maximum dose ICS/LABA — medical/specialist review

Regular reviews — once stable control

- Good control — review once a year
- Partial or poor control — review every 4 weeks
- Frequent or persistent asthma — 3 monthly until symptoms well controlled
- Medical review after any hospital admission



Ask

- How often do they get symptoms — cough, wheeze, waking at night
- Does asthma stop them doing usual physical activities or work
- How often do they use their reliever
- Are there any problems with medicines
- About causes (eg smoke exposure, dust, allergies)

Check

- Spirometry (*CPM p191*) *OR* peak flow rate if spirometer not available (*CPM p190*)
- Check use of puffer (*CPM p360*) and spacer (*CPM p364*), or other device
- Flu and pneumococcal immunisation status, see *Australian Immunisation Handbook*

Do

- Assess level of control, adjust treatment if needed
- Review and update **asthma action plan** (*below*)
- Give advice on avoiding triggers (eg avoid exposure to smoke)

Asthma action plan

Every person needs **written asthma action plan** (*p142*). Make sure they understand it.

- Keep copy at home, as well as in file notes
- Includes
 - What to do when
 - Person well
 - Asthma bit worse, they get a cold or chest infection
 - Asthma severe
 - How often they need regular reviews, medical reviews, specialist reviews
 - When to collect medicines, have immunisations
 - Illustrated Indigenous asthma action plans available online

Breathing related sleep disorders

- Independent risk factor for high BP and diabetes
- Associated with heart attack, stroke, unexplained pulmonary hypertension
- Most common
 - Obstructive sleep apnoea (OSA) — repeated episodes of throat blockage during sleep
 - Periodic breathing, especially in heart failure
- May also be non-breathing related sleep disorder — sleep walking, restless legs etc (parasomnias), can't get to or stay asleep (insomnia), central sleep apnoea (problem with underlying drive to breathe)

Risk factors

- Obesity
- Enlarged tonsils
- Regressed chin
- Alcohol use
- Chronic diseases, especially high BP, heart failure

No perfect screening tool for sleep related breathing disorders or OSA.

- One simple tool is STOP–BANG questionnaire
 - Score 1 point for each of the criteria met

Ask

- STOP — person and someone who has watched them sleeping (eg partner)
 - **S** noring
 - **T**ired during day
 - **O**bserved stopping breathing (apnoea)
 - **P**ressure — high BP ([p422](#))
- Trouble sleeping
- Abnormal movements or activities during sleep
- Suddenly falling asleep at inappropriate times
- Alcohol use

Check

- BANG
 - **B**MI — more than 35 ([CPM p108](#))
 - **A**ge — over 50 years
 - **N**eck size — circumference more than 40cm
 - **G**ender — male
- Temp, pulse, RR, BP, O₂ sats
- Look for masses or blockages — nose, mouth, back of throat, tonsils, tongue
- Heart exam, lung exam ([CPM p186](#)), ECG
- Take blood for FBC, BGL, TFT
- Urine ACR



Do

- Work out if willing or able to undertake treatment if needed
- For OSA/periodic breathing — often use nasal CPAP with mask worn over face when sleeping. May use upper airway splints, surgery
 - Talk about cost of buying device, ongoing treatment costs, power supply and power bill, housing, mobility, person's lifestyle (eg alcohol use)
- If STOP-BANG score **3 or more AND able** to manage treatment — refer for sleep/respiratory service review
- If STOP-BANG score **3 or more AND not able** to manage treatment —
 - Weight and alcohol management
 - If doesn't get better — talk with sleep/respiratory service
- If STOP-BANG score **less than 3** —
 - Weight and alcohol management
 - Consider other diagnoses. If non-breathing related sleep disorder suspected — talk with sleep/respiratory service

Referral and management

- **Respiratory nurse consult** to plan and coordinate referral
- After sleep specialist review — will usually do sleep study at home (not remote) or in hostel (if remote)
- If study abnormal and person willing/able — 1–2 month trial of CPAP
 - If trial successful — long-term treatment
 - Develop management plan
- May suggest other treatments — splints, surgery, lifestyle changes

Follow-up

If using CPAP

- **Review at clinic** — every 2 weeks during trial *THEN* every 3 months
 - Remind person to always bring CPAP machine and mask with them
- Check
 - How many hours a day and days a week machine used
 - Is OSA being controlled — machine records this
 - Can person set up equipment and fit own mask
 - Machine generating airflow
 - Check face mask for
 - Damage to seal against skin
 - Blockage to expiratory vent opening. Usually at joint between face mask and tube going to machine
 - Major leaks — feel for escape of air with mask fitted and machine on
 - Check skin under face mask for irritation or damage
- If problems with equipment or management — **respiratory nurse consult**
- **Specialist review** — at least once a year *OR* as per management plan
 - If person has equipment — must take machine and mask to appointment

Chickenpox and shingles

Chickenpox can be mild sickness in children — but can cause shingles later in life.

- Notifiable disease
- Prevented by immunisation
- Chickenpox in first 28 weeks of pregnancy can cause problems with baby (fetal varicella syndrome). Refer to obstetrician

People at high risk — medical consult or talk with CDC/PHU about them

- Pregnant women who are not immune
- Newborn babies if mother has chickenpox just before or after childbirth
- Babies under 1 month if mother not immune
- People with HIV or other conditions that weaken the immune system
- People taking medicines that weaken the immune system — chemotherapy for cancer, ciclosporin for kidney transplants, high doses of prednisone

Do — for contacts exposed to chickenpox or shingles

- If over 12 months *AND* not immunised or not had chickenpox before — give varicella vaccine
- If person at high risk (*above*) and had significant contact in last 4 days — **medical consult**
 - If less than 4 days since exposure — consider varicella zoster immunoglobulin (VZIG). If not available on site — may need to send to hospital
 - If more than 4 days since exposure — may need antiviral prophylaxis especially if in second half of pregnancy or pregnant and
 - Underlying lung disease, weakened immune system
 - Smoker

Chickenpox (varicella)

Ask

- Any contact with person at high risk (*above*) in last 4 days
- Is person at high risk of severe infection

Check

- Rash
 - Goes from spots to small blisters to dry scabs — all 3 stages can happen together
 - Usually itchy
 - Takes 5–7 days for blisters to dry out
- Signs of severe illness — fast breathing, confusion, fit
- Child — any significant pre-existing skin disease (eg eczema)



Do

- **Medical consult** for
 - Anyone with severe illness
 - People at high risk ([p332](#)) — may need **antiviral treatment**
 - Child with significant pre-existing skin disease
- Antivirals
 - Adult — treat if 36 hours or less since rash started. If pregnant — treat if 72 hours or less since rash started
 - Give **valaciclovir** oral 3 times a day (tds) for 7 days – 1g
 - *OR* **aciclovir** oral 5 times a day for 7 days – 800mg
 - *OR* **famciclovir** oral 3 times a day (tds) for 7 days – 250mg. **Not** if pregnant
 - Child — only treat if significant pre-existing skin disease, regardless of when rash started
 - Give **aciclovir** oral 5 times a day for 7 days – 20mg/kg/dose up to 800mg (doses [p423](#))
- For itch
 - Cool bath with bicarbonate of soda
 - **Crotamiton 10%** cream but only once a day
 - Keep skin moisturised (eg sorbolene cream)
 - Can give **loratadine** oral once a day – over 12 years 10mg, 2–12 years 5mg
- Keep fingernails cut short — less damage from scratching
- If secondary infection of rash — give **benzathine penicillin (penicillin G)** IM single dose – adult 900mg, child see [p426](#) for dose
- Give **paracetamol** up to 4 times a day (qid) – adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
- Advise to avoid contact with people at high risk until rash completely scabbed over

Shingles (zoster)

Ask

- Any contact with people at high risk ([p332](#)) in last 4 days
- Is person at high risk of severe infection

Check

- Rash
 - Starts with burning pain, then redness and blistering rash
 - Usually only on 1 area on 1 side of body
- Check if eyes involved — can cause serious complications

Do

- **Medical consult**
 - About pain relief ([p377](#)) and antiviral treatment
 - If more than 1 area, or both sides of body, or person at high risk — may need to send to hospital
 - If eyes involved — organise review by eye doctor
 - If under 50 years with shingles — may have weakened immune system
- Antiviral treatment
 - Can lessen pain and other symptoms
 - Best if started within 72 hours of rash appearing
 - May still be useful after 72 hours for person who
 - Has weakened immune system
 - Is over 50 years
 - Has severe pain
 - Has rash around eyes, private parts (genitals), limb, neck
 - Give **valaciclovir** oral 3 times a day (tds) for 7 days – adult 1g, child 20mg/kg/dose up to 1g (doses [p437](#))
 - *OR* **famciclovir** oral 3 times a day (tds) for 7 days – adult 250mg, child 5mg/kg/dose up to 250mg (doses [p431](#))
 - *OR* **aciclovir** oral 5 times a day for 7 days – adult 800mg, child 20mg/kg/dose up to 800mg (doses [p423](#)) — not as good at reducing pain, but better for children or if pregnant
- Give pain relief
 - **Paracetamol** up to 4 times a day (qid) – adult 1g, child 15mg/kg/dose up to 1g ([p380](#))
 - If pain severe — **paracetamol-codeine** – over 12 years 500+30mg
 - Ice packs and/or protective dressings may help



Dental and oral problems

For assessment see *Mouth, throat, teeth and gums examination* (CPM p172).

Oral health messages

- Clean teeth and gums morning and night with soft toothbrush, fluoride toothpaste. Spit, don't rinse, after brushing
- Eat healthy foods — avoid sweet food and drink, especially between meals
 - Don't drink fruit juices, soft drinks, cordial, sports drinks, flavoured milk, or anything fizzy even if sugar free
- Drink plenty of water, milk
- Chew sugar free gum
- Control diabetes — will lower risk of bad gums and tooth loss
- **Do not** smoke (tobacco or cannabis) — increases risk of dental, gum, mouth disease
- Avoid regular use of mouthwash containing alcohol (short-term use OK)

Everyone should have yearly dental and oral health check.

Pain in teeth or gums

Table 6.17: Pain in teeth or gums

Type of pain	Likely problem/causes	Management
Brief, sharp pain <ul style="list-style-type: none"> • Sensitive to cold, heat, sweet • Stops quickly when stimuli removed 	Reversible inflammation of tooth nerve <ul style="list-style-type: none"> • Caused by <ul style="list-style-type: none"> ◦ Decay/hole/crack in tooth ◦ Broken filling ◦ Root sensitivity or decay 	<ul style="list-style-type: none"> • Avoid painful stimuli • If hole in tooth — put on protective cover (CPM p177), oil of cloves (eugenol) • Do not give pain relief • Do not give antibiotics • Dental consult
Severe, sharp pain then dull throb <ul style="list-style-type: none"> • Remains after stimuli (eg cold, heat) removed • Can be spontaneous • Can wake person 	Irreversible inflammation of tooth nerve <ul style="list-style-type: none"> • Caused as above, or by trauma • Can lead to death of nerve +/- abscess 	<ul style="list-style-type: none"> • Avoid painful stimuli • Give dental pain relief (p337) • Do not give antibiotics • Put on protective cover (CPM p177), oil of cloves (eugenol) • Urgent dental consult
Throbbing ache <ul style="list-style-type: none"> • Sore when biting (usually) • Not sensitive to stimuli 	Nerve death without abscess	<ul style="list-style-type: none"> • Give dental pain relief (p337) • Do not give antibiotics • Urgent dental consult

Type of pain	Likely problem/causes	Management
<p>Intense, severe pain when biting and chewing</p> <ul style="list-style-type: none"> • Pus under tooth +/- swelling in mouth • May have fever 	<p>Nerve death with acute dental abscess</p>	<ul style="list-style-type: none"> • Give dental pain relief (p337) • Drain pus if possible • May need antibiotics. See <i>Facial swelling</i> (p340) • Urgent dental consult
<p>Pain when biting and chewing</p> <ul style="list-style-type: none"> • Debris (plaque, calculus) on teeth at gum line • Loose teeth/gum recession +/- pus • No hole in tooth or decay seen 	<p>Gum (periodontal) disease and/or gum abscess</p> <ul style="list-style-type: none"> • Associated with diabetes • Food jammed between teeth can cause similar symptoms 	<ul style="list-style-type: none"> • See <ul style="list-style-type: none"> ◦ <i>Acute ulcerative gingivitis</i> (p339) ◦ <i>OR Periodontal abscess</i> (p339) • Urgent dental consult
<p>Pain at back of mouth, can be severe</p> <ul style="list-style-type: none"> • Very tender, sore when biting • Localised swelling of gum around crown of tooth, usually bottom jaw • Usually young adult with erupting wisdom tooth 	<p>Infection around crown of a partially erupted tooth</p> <ul style="list-style-type: none"> • Risk factors <ul style="list-style-type: none"> ◦ Smoking ◦ Poor oral hygiene 	<ul style="list-style-type: none"> • Salt water and/or chlorhexidine 0.2% mouthwash – 10mL. Rinse for 1 minute, 3 times a day (tds) • Dental consult • If systemic symptoms or infection spread beyond jaw, may need antibiotics — see <i>Facial swelling</i> (p340)
<p>Pain increasing 1–4 days after tooth extracted with no signs of infection</p>	<p>Dry socket</p> <ul style="list-style-type: none"> • Poor healing, blood clot in socket breaks down exposing bone • Not an infection • Should get better by itself in 2–3 weeks 	<ul style="list-style-type: none"> • Give dental pain relief (p337) • Do not give antibiotics • Flush socket with warm normal saline until all debris removed • Put in dressing if available (eg <i>Alvogyl</i>) <ul style="list-style-type: none"> ◦ See <i>Dressing a dry socket</i> (CPM p178) • Dental consult
<p>Some pain or swelling after an extraction</p>	<ul style="list-style-type: none"> • Normal discomfort caused by extraction • May be caused by tooth or bone left in socket 	<p>See <i>Minor swelling or soreness after extraction</i> (CPM p181)</p>
<ul style="list-style-type: none"> • Aching upper teeth • Pain that increases when the head is tilted forward 	<p>Pain from maxillary sinus as pus/exudate moves forward</p>	<ul style="list-style-type: none"> • See <i>Sinusitis</i> (p312)



Dental pain relief

Regular pain relief better, but only use as much as needed to manage pain.

Child

- **Paracetamol** up to 4 times a day (qid) – 15mg/kg/dose up to 1g ([p380](#))
- **OR ibuprofen** (if no contraindications) oral up to 3 times a day (tds) – 10mg/kg/dose up to 400mg (doses [p440](#))

Adult

- **Mild pain**
 - **Paracetamol** up to 4 times a day (qid) – 1g
 - **OR ibuprofen** (if no contraindications) oral every 4 hours – 400mg
- **Moderate pain**
 - Alternate **paracetamol** and **ibuprofen**
 - **Paracetamol** up to 4 times a day (qid) – 1g
 - **AND 2 hours later give ibuprofen** (if no contraindications) oral every 4 hours – 400mg
 - **OR paracetamol-codeine** oral up to 4 times a day (qid) – 1000+60mg
- **Severe pain**
 - Alternate **ibuprofen** and **paracetamol-codeine**
 - **Ibuprofen** (if no contraindications) oral every 4 hours – 400mg
 - **AND 2 hours later give paracetamol-codeine** oral up to 4 times a day (qid) – 1000+60mg

Contraindications for NSAIDs

- eGFR less than 60 or unknown
- Chronic kidney disease ([p244](#)) or heart failure ([p264](#)) **AND** taking diuretic and ACE inhibitor or ARB — triple whammy
- Severe asthma ([p323](#))
- Stomach ulcers
- High cardiovascular risk ([p230](#))
- Severe bleeding (eg suspected ruptured organ)
- If pregnant — **medical consult** before giving

Gums and soft tissue

Dry mouth

- Reduced saliva increases risk of dental decay and severity of gum disease, reduces health and comfort of mouth.
 - Main causes — mouth breathing, smoking, medicines, dehydration, infections, cancer treatments

Do

- Try to find cause — **medical** or **dental consult** if needed
- See *Oral health messages* (p335)
- Also tell person
 - Stimulate salivary glands by chewing food well, chewing sugar-free gum or sugar free sweets (non-fruit flavours are less acidic)
 - Use bicarbonate soda mouthwash (½ teaspoon of bicarbonate soda in a glass of water). Rinse as soon as you get up, any time during day

Mouth ulcers

Common causes include minor physical trauma (eg from food burn, sharp food, broken tooth), chemical trauma (eg from prolonged exposure to chewing tobacco, aspirin burn), infection (eg herpes), immune response, autoimmune disease (eg Crohn's disease)

Do

- **Paracetamol** (p380) and **lidocaine (lignocaine) gel** for pain
- Use **chlorhexidine 0.2%** mouthwash – 10mL
 - Rinse for 1 minute, 3 times a day (tds)
 - Will help stop infection, keep mouth clean
- Adults with ulcers not healed within 3 weeks, potential tumour — **medical consult**, send to hospital for biopsy
- Young child with severe ulcers
 - **Medical consult**, consider antiviral treatment
 - Check for dehydration (p166) — may not be drinking if mouth sore
 - If child not eating — send to hospital

Chronic gum disease

Ongoing inflammation of gums without pain

- Chronic gingivitis — red, swollen gums that bleed easily
- Chronic periodontitis — can result from gingivitis
 - Inflammation affects supporting bone and tissues of the teeth. May cause gum recession and bone loss, teeth loose or fall out
 - Risk factors include smoking and poorly controlled diabetes

If child has **periodontitis** — **urgent dental consult**.

Do

- See *Oral health messages* (p335)
- If brushing difficult — use **chlorhexidine 0.2%** mouthwash – 10mL
 - Rinse for 1 minute, 3 times a day (tds) for 5–10 days
- Control diabetes
- **Dental consult**



Acute gum disease

- Acute ulcerative gingivitis — painful, red, swollen gums that bleed easily
- Periodontal abscess — painful local gum abscess

Acute ulcerative gingivitis

Risk factors — poor oral hygiene, smoking, stress, weakened immune system.

- Intense pain
- Ulcerated tissue in gums between teeth
- Sudden (spontaneous) bleeding of gums
- Very bad breath
- May also have fever, general discomfort, inflammation of lymph nodes

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))

Do

- Give **dental pain relief** ([p337](#))
- Give **metronidazole** oral twice a day (bd) for 5 days – adult 400mg, child 10mg/kg/dose up to 400mg (doses [p434](#))
- *OR* **tinidazole** oral single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p437](#))
- Use **chlorhexidine 0.2%** mouthwash – 10mL
 - Rinse for 1 minute, 3 times a day (tds) for at least 3 days
- Good oral hygiene. Brushing ulcerated area may not be possible due to pain
- **Urgent dental consult**

Periodontal abscess

Risk factors — existing gum disease, uncontrolled diabetes, poor oral hygiene.

- Pain, discomfort. Can be difficult to localise
- Swollen gum next to tooth/teeth, without hole or decay
 - Can be on palate, difficult to see

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- BGL

Do

- Give dental pain relief ([p337](#)) if needed
- If BGL 5.5mL/L or more — see *Testing for diabetes* ([p234](#))
- If weakened immune system — consider antibiotics
 - **Amoxicillin** oral 3 times a day (tds) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p424](#))
 - *OR* **phenoxymethylpenicillin** oral 4 times a day (qid) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p435](#))
- **Dental consult** about lancing ([CPM p180](#)), debriding, extracting

Facial swelling due to spreading infection

- Localised tooth-related infections are caused by
 - Death of tooth nerve (pulp necrosis) due to decay or trauma
 - Gum infections (periodontal disease)
 - Infection around crown of erupting tooth (eg wisdom tooth)
- Facial swelling may be
 - **Superficial** — upper face
 - **Deep** — spreading from lower jaw to upper neck
- **Do not** treat with antibiotics alone. Must do **dental/medical consult** about treating underlying cause

Spreading odontogenic infection can have rapid onset and be **potentially life threatening**.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS (*p6*)
- Mouth, throat, teeth and gums examination (*CPM p172*)
- If **deep** infection of upper neck — **must assess for limited mouth opening**
 - If mouth opens less than 2cm — **must assess for airway problems**
 - Difficulty, noisy breathing
 - Difficulty swallowing
 - Tongue raised and rigid

Do — if airway compromised

- Life support — DRS ABC (*p10*)
- **Medical consult, send to hospital urgently**

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Put in IV cannula, 2 if you can (*CPM p84*)
- Give **metronidazole** IV every 12 hours (bd) — adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p434*)
 - **AND benzylpenicillin** IV every 6 hours (qid) — adult 1.2g, child 30mg/kg/dose up to 1.2g (doses *p427*)
 - *OR amoxi/ampicillin* IV every 6 hours (qid) — adult 2g, child 50mg/kg/dose up to 2g (doses *p425*)
- If anaphylaxis to penicillin —
 - Give **metronidazole** IV every 12 hours (bd) — adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p434*)
 - **AND clindamycin** IV every 8 hours (tds) — adult 450mg, child 10mg/kg/dose up to 450mg (doses *p430*)

Do — if airway satisfactory

- Make sure person is hydrated



- Give **dental pain relief** ([p337](#))
- Give **amoxicillin** oral 3 times a day (tds) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p424](#))
- *OR* **phenoxymethylpenicillin** oral 4 times a day (qid) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p435](#))
- If allergic to penicillin — give **clindamycin** oral 3 times a day (tds) for 5 days – adult 300mg, child 7.5mg/kg/dose up to 300mg (doses [p430](#))
- If skilled and abscess pointing — lance ([CPM p180](#))
- **Urgent medical/dental consult** to drain pus and remove cause (eg extract tooth/teeth)

Follow-up

- Review in 2–3 days. If not improving — **medical consult**. May need to
 - *ADD* **metronidazole** oral twice a day (bd) for 5 days – adult 400mg, child 10mg/kg/dose up to 400mg (doses [p434](#))
 - *OR* change to **amoxicillin-clavulanic acid** oral twice a day (bd) for 5 days – adult 875+125mg, child 22.5mg + 3.2mg/kg/dose up to 875mg + 125mg (doses [p425](#))

Dental trauma

Knocked out adult tooth

Check

- Check tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** touch root of tooth, only crown
- **Do not** allow tooth to dry out — store in milk or saline (**not** water), or wrap in cling wrap

Do

- If RHD, artificial heart valve, heart transplant, history of bacterial endocarditis, congenital heart problem — give IV preventive antibiotics before replacing tooth ([p297](#))
- Replace and splint tooth in place as quickly as possible — see *Replacing knocked out adult tooth* ([CPM p183](#))
- Give **doxycycline** oral single dose – adult 200mg, child over 8 years 4mg/kg/dose up to 200mg (doses [p431](#))
 - *THEN* **doxycycline** oral once a day for 7 days – adult 100mg, child over 8 years 2mg/kg/dose up to 100mg (doses [p431](#))
- *OR* **amoxicillin** oral single dose – adult 1g, child 25mg/kg/dose up to 1g (doses [p424](#))
 - *THEN* **amoxicillin** oral 3 times a day (tds) for 7 days – adult 500mg, child 12.5mg up to 500mg (doses [p424](#))
- **Dental/medical consult** straight away

Broken or loose tooth

- See
 - *Broken tooth (fractured tooth crown)* (CPM p182)
 - *Loose or displaced tooth — adult or child* (CPM p182)

Broken jaw

If unconscious with jaw injury — secure airway, do jaw thrust (p11).
See *Life support — DRS ABC* (p10), *Injuries — head* (p72), *Unconscious person* (p113).

- Treat any serious injury to face below cheek bones as broken jaw. Can lead to bone infection if not treated
- If mechanism or injuries suggest neck injury — put on semi-rigid collar. May make jaw more painful. Assess situation

Ask

- About pain, especially when moving jaw
- If teeth meet properly when mouth closed
- Any trouble swallowing or eating

Check

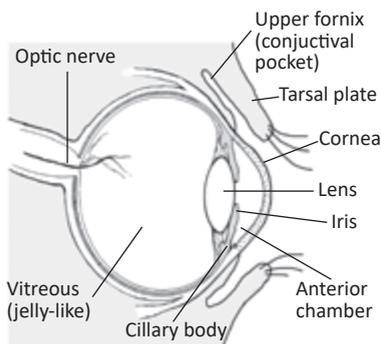
- Temp, pulse, RR, BP, O₂ sats — work out REWS (p6)
- BGL
- Bony tenderness or numbness on any part of jaw
- Look in mouth
 - Swelling, bleeding, bleeding in floor of mouth, wounds — most jaw fractures are compound
 - Do upper and lower teeth meet together properly (ask person to bite on spatula)
 - Do teeth line up properly along each jaw
- Look for difference in outline between one side of jaw/face and other side
- Feel for step in line of teeth or jaw
- Tetanus status, see *Australian Immunisation Handbook*

Do

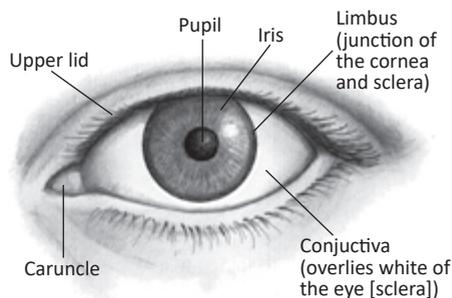
- **Medical consult**, send to hospital
- Sit person up, lean them forward to let blood and saliva drain
- Give **metronidazole** oral single dose — adult 400mg, child 10mg/kg/dose up to 400mg (doses p434)
- **AND amoxicillin** oral single dose — adult 500mg, child 15mg/kg/dose up to 500mg (doses p424)
- If allergic to penicillin — **medical consult**
- Give **antiemetic** to stop vomiting (p105)
- Give **pain relief** (p377)



Eye assessment



6.1



6.2

Do first

- If chemical burn — wash out (irrigate) eye before starting examination (*CPM p151*)

Ask

- History of problem — what happened and when
 - *Examples:* Trauma/injury, fast or slow onset, one or both eyes
- Problems with vision (near and distant) — loss of sight, double or blurred vision, flashes of light, small moving objects in vision (floaters), fuzzy lights around objects (haloes)
- Sore, scratchy, itchy, watery, pussy eye/s
- Hammering, grinding, welding, using air compressor or chemicals in last few days
- Eye problems in past — injury, cataracts, eye surgery
- Do they have glasses, contact lenses

Check — both eyes

- Use good light during examination and magnification if available — 2.5 magnification head loupes, ophthalmoscope, slit lamp, ear torch (auroscope)
- **Medical consult** if
 - You can't examine eye properly — may need to send to hospital
 - Examination reveals abnormalities not covered by eye protocols (eg uncommon single red eye *p346*)
- **Do not** put drops in eye with suspected or actual penetrating eye injury

- Check near and distance vision (*CPM p148*)
- Check for trichiasis. See Table 6.18 (*p352*)
- Do eyes look straight or is one turned (squint, strabismus)
- Look at outside of eyelids and eyeball — swollen (oedema), red (erythema), sunken, pussy, teary, cuts and bruises

- If eye too painful to examine properly — use 2 drops of **topical local anaesthetic** (eg tetracaine [amethocaine] or oxybuprocaine)
 - Warn it will sting for few seconds before numbing eye
 - Put on eye pads (*CPM p156*) until local anaesthetic drops have worn off — try to leave on for 1–2 hours, but at least 20 minutes

Never give anaesthetic eye drops to take home

- Numb eyes are easily damaged without person knowing it
- Healing is slower and can lead to corneal ulcers

Cornea (eye surface)

- From about 30cm, shine a bright light all over cornea, watch for light reflection off the surface. Note if cornea clear or cloudy
 - If defect — light reflex will be broken up and uneven
- If you suspect cut (abrasion) or defect, or not sure — use fluorescein stain (*CPM p154*)
 - Damage to eye surface shows up as green patch
 - Serious injury to cornea may just look like heavy fluorescein layer (green stain). May need to put fluorescein stain in good eye to compare
 - Works best with blue light

Anterior eye

- Check covering over white of eye (conjunctiva) for redness, inflammation, foreign bodies
- Check lower eyelid for any redness or pus (discharge)
- Check white of eye for redness or bleeding — subconjunctival haemorrhage
 - If you can't see **back edge** of blood — F 6.3 — may be skull fracture
 - If history suggests significant trauma — **medical/specialist consult**



6.3

Anterior chamber

- Check for layer of blood (hyphema) or pus (hypopyon)
 - Where blood or pus settles depends on position head has been in
 - If person has been sitting, standing — settles on bottom of iris — F 6.4
 - If person has been lying down, sleeping — settles on side of iris — F 6.5



6.4



6.5

Pupil tests

- Ask person to look straight ahead into distance. Shine bright test light into eye from below line of sight. Move between eyes
 - Discourage person looking at light as this will cause pupil constriction and confuse the results



- Check size, shape, reaction to light
 - Check for direct response — pupil with light shining in it quickly shrinks (constricts)
 - Check for consensual (involuntary) response — pupil **without** light shining in it shrinks same amount, at same time
- **Relative afferent pupillary defect (RAPD)**
 - Shine light repeatedly from one eye to the other (swinging flashlight test). Count to 3 for each swing between eyes
 - Look at pupil response as light moves onto each eye. Should be same for each pupil
 - If one pupil gets bigger rather than staying small — relative afferent pupil defect (RAPD). Optic nerve on this side not working properly
 - If RAPD not noted before — **medical consult** to find cause

Eye movements

- Ask person to look up, down, left and right
- Difficulty looking up may mean cracks or breaks in bone around eye (orbital blow-out fracture)
- Watch to see if both eyes move in the same direction
- Ask person if they get double vision while doing this

Under upper eyelid

- **Evert eyelid** (*CPM p152*) — unless something penetrating eye
 - Look for anything stuck to inside of eyelid or surface of eye (subtarsal and non-penetrating foreign bodies)
 - Check for trachoma follicles or scarring (*p351*)

Eye conditions

Single red eye

- Usually due to foreign body or trauma
- Can be due to conjunctivitis (*below*), corneal ulcer ([p349](#)), inflammation of the eye (iritis) ([p350](#)), acute glaucoma ([p353](#))
- Rarely due to inflamed cornea (keratitis), inflamed episclera (episcleritis), bleeding into white of eye (subconjunctival haemorrhage)

Dry eye

Not enough tears produced or tears evaporate quickly.

- Common cause of eye discomfort and/or visual symptoms
- Usually not curable, often due to an underlying chronic condition

Ask

- Eyes burning, dry, stinging, gritty, feel like foreign body in them
- Excess tearing
- Mild decrease or changes in vision with blinking
- Medicines used (eg antihistamines, diuretics, beta blockers, antidepressants)

Check

- Eye assessment ([p343](#))
 - Use fluorescein stain ([CPM p154](#))
 - Mild–moderate dry eye — a few small spots
 - Severe dry eye — lots of spots over large areas

Do

- If mild–moderate — manage symptoms with **lubricating eye drops** (artificial tears) 4 times a day (qid) – 1 drop
- If severe, or symptoms don't improve with lubricating eye drops — **medical consult**

Follow-up

- Consider **medical consult** to determine cause

Conjunctivitis

Inflammation due to infection or allergic reaction. Usually benign and self-limiting.

- Usually both eyes affected — if only 1 eye consider other causes
 - Viral conjunctivitis tends to involve other eye within 24–48 hours
 - Bacterial conjunctivitis often one sided but can spread to other eye
 - Allergic conjunctivitis is usually in both eyes



Check

- Eye assessment ([p343](#))
 - Widespread redness, swollen, weeping. If only red in part of eye or around limbus — consider other conditions
 - **Viral conjunctivitis** — watery discharge, stringy mucus. May also be general viral illness
 - **Bacterial conjunctivitis** — discharge usually sticky pus that comes back after wiping away
 - **Allergic conjunctivitis** — itch (tell-tale symptom), watery discharge, stringy mucus. History of allergy, hayfever
- Before treating as conjunctivitis — make sure it is not
 - Glaucoma ([p353](#))
 - Corneal ulcer ([p349](#))
 - Inflammation of eye (iritis) ([p350](#))
 - Something in eye ([p354](#))
 - Trauma

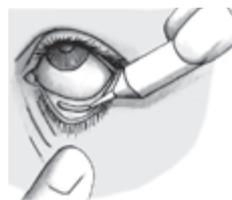
Do not

- **Do not** put pad on infected eye — makes infection worse
- **Do not** use vasoconstrictor eye drops (eg *Naphcon-A*, *Visine*) for more than 2 weeks — can cause rebound redness

Do

- Cultures are only needed if
 - Several patients present within a short time, to look for epidemic cause — contact CDC/PHU
 - No response to treatment
 - Atypical features
- Both viral and bacterial conjunctivitis highly contagious. To stop spread to others tell person
 - **Not** to rub eyes
 - To wash face and hands several times a day
 - Not to share towels, pillows, food etc
 - Use own box of tissues to wipe eyes, put used tissues in bin straight away
- **Viral conjunctivitis** — treatment only reduces symptoms
 - Give **lubricating eye drops** (artificial tears) 4 times a day (qid) — 1 drop
 - Suggest cold compress several times a day — clean, cool towel against closed eyes
 - Tell person symptoms will get worse for 3–5 days, then slowly get better over next 1–2 weeks
 - If no improvement in 2 weeks — consider other causes

- **Bacterial conjunctivitis** — antibiotics most effective if given in first week
 - Give **chloramphenicol 1%** eye ointment 4 times a day (qid) for 5 days
 - **Do not** touch eye with tube — F 6.6
 - *OR* **chloramphenicol 1%** eye drops every 2–4 hours for 2 days – 1 drop
 - *THEN* **chloramphenicol 1%** eye drops 4 times a day (qid) for another 3 days – 1 drop
 - Review in 5 days
 - If no improvement — consider other causes
 - If improved — use **chloramphenicol 1%** eye ointment or drops at night only until better *OR* for up to 7 nights, whichever sooner
- **Allergic conjunctivitis** — treatment only reduces symptoms
 - Give over the counter antihistamine eye drops
 - *Example:* **Ketotifen 0.025%** eye drops twice a day (bd) for at least 2 weeks –1 drop
 - Give **lubricating eye drops** (artificial tears) for symptoms at other times – 1 drop. Flushes out allergen
 - Suggest cold compress — clean, cool towel against closed eyes
 - Tell person to avoid things that makes their eyes itchy (allergens), and not to rub eyes
 - If symptoms not relieved — **medical consult**
 - May need stronger antihistamine eye drops (eg olopatadine 0.1% eye drops)



6.6

Gonococcal conjunctivitis

- Consider gonococcal conjunctivitis
 - In babies under 6 weeks with lots of pus from eyes
 - In person with very swollen eyelids, lots of pus
 - If a lot of people have conjunctivitis within a short time

Check

- Eye assessment ([p343](#))
 - For babies — do they follow lights and respond normally
- Swab both eyes ([CPM p389](#)) — MC&S and NAAT for gonorrhoea and chlamydia

Do

- Wash out eyes with **normal saline** to remove all discharge
 - May need to bathe eyes to remove crusting
- **Medical consult** if
 - Damage to eye surface (cornea)
 - Eyelids too swollen to examine eye — may need to send to hospital
- Give **ceftriaxone** IM/IV single dose – adult 1g, child 50mg/kg/dose up to 1g (doses [p429](#))



- If baby under 2 weeks — **medical consult, send to hospital urgently**
- If baby 2–6 weeks — **medical consult** about need for further treatment
- If school-aged child — keep child home from school for 24 hours

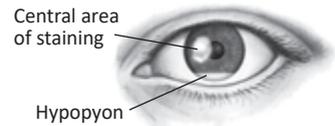
Follow-up

- If you suspect gonococcal conjunctivitis or swab confirms it — talk with CDC/PHU for advice. Will spread very quickly to other people
- Household and school contacts need to be treated straight away

Eye surface (cornea) ulcers or infection

Ask

- May have painful, scratchy, watery eye
- Recent scratch on eye, something in eye



6.7

Check

- Eye assessment ([p343](#))
 - Use fluorescein stain to look for eye surface (cornea) damage ([CPM p154](#))
 - May be lots of small dots, scratches, larger area of staining
 - Large central area of staining could be severe ulcer — F 6.7
 - Branching pattern of staining could be dendritic ulcer from a viral infection — F 6.8
 - Fluid level of pus inside front of eye (hypopyon) — F 6.7



6.8

Do

- If ulcer, eye surface clouding or damage, pus inside eye (hypopyon) — **medical consult** straight away
- If any possibility ulcer infected — send to eye specialist as soon as possible
 - **Do not** put pad over eye
 - If can't be seen by specialist within 12 hours — give **chloramphenicol 1% eye ointment** 4 times a day (qid) until seen
 - **Do not** touch eye with tube — F 6.6
- If damage has clean edges, no clouding (simple epithelial defect) —
 - Give **chloramphenicol 1% eye ointment** 4 times a day (qid) until healed
 - **Do not** touch eye with tube — F 6.6
 - Check every day until healed
 - Use fluorescein stain to see if damage smaller ([CPM p154](#))
 - If damage not smaller after 1 day, not healed after 3 days — **medical consult**

Follow-up

- Check vision again after healed ([CPM p148](#))

Inflammation of eye (iritis)

Ask

- About pain
- Light hurting eye (photophobia)
- Loss of vision
- Having had same thing before

Check

- Eye assessment ([p343](#))
 - Limbal redness — 360° redness, mostly around coloured part of eye (iris)
 - No discharge or pus
 - Pupil small and irregular, still reacts to light (can be hard to assess)

Do

- **Medical consult**, send to hospital. Need slit lamp examination to confirm iritis
- Repeated attacks need further investigation. Can be treated in community if person has management plan developed by doctor and eye specialist

Cellulitis around eye

Infection around or behind eyeball (orbital cellulitis). Can be life-threatening — **medical consult, send to hospital urgently.**

Ask

- Feeling hot or unwell

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Eye assessment ([p343](#)) — consider cellulitis if
 - Eyeball red and swollen
 - Eye movements limited
 - Double vision, vision getting worse, visual field restricted
 - Relative afferent pupil defect (RAPD) ([p345](#))
- Collect eye swabs ([CPM p389](#))
- Take blood for blood cultures ([CPM p375](#))

Do

- **Medical consult, send to hospital urgently**
- Give **ceftriaxone** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
- **AND flucloxacillin** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p432](#))
- Give **pain relief** ([p377](#))
- Give **antiemetic** to stop vomiting before transport ([p105](#))



Fly bite

Acute allergic reaction, usually due to contact with plant or insect matter, occasionally due to insect bite. Usually seasonal, often after rain.

Ask

- History of allergic reaction or bite
 - If not — consider cellulitis around eye (orbital cellulitis) ([p350](#))

Check

- Eye assessment ([p343](#))
 - Very swollen eyelids
 - Watery discharge

Do

- Suggest cold compress — clean, cool towel against closed eyes
- Give **olopatadine 0.1%** eye drops twice a day (bd) for 2 days – 1 drop
 - *OR* **ketotifen 0.025%** eye drops twice a day (bd) for 2 days – 1 drop
- If antihistamine eye drops not available — give
 - **Loratadine** oral single dose – over 12 years 10mg, 2–12 years 5mg, 1–2 years 2.5mg
 - *OR* **promethazine** oral single dose (at night – sedating) – adult 25mg, 2–12 years 0.5mg/kg/dose up to 25mg (doses [p442](#))
- Give **lubricating eye drops** (artificial tears) for symptoms at other times – 1 drop. Flushes out allergen
- Tell person to avoid things that makes their eyes itchy (allergens)
- If not improving within 24 hours — **medical consult**

Trachoma

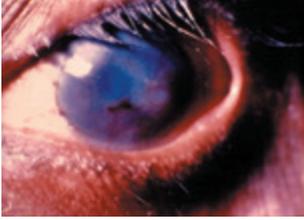
Often causes few or no symptoms.

- Trachoma control needs
 - Treatment of person with symptoms and their household contacts
 - Community screening of children (eg school-aged screening)
 - Community program promoting personal and community hygiene
 - Blow nose with tissue
 - Wash hands with soap and water
 - Wash face with water whenever dirty
 - Don't share towels

Check

- Eye assessment ([p343](#))
 - Eyes may be red and irritated with watery or pussy discharge
 - Evert eyelids so you can look under them ([CPM p152](#))
- Look for signs of trachoma — see Table 6.18. Assess each eye separately

Table 6.18: Trachoma signs and grading

Grading score	Signs*	
		<p>Normal conjunctiva</p> <ul style="list-style-type: none"> • Pink, smooth, thin, transparent • Large, deep-lying blood vessels running up and down
TF		<p>Inflammation – follicles</p> <ul style="list-style-type: none"> • 5 or more small (0.5mm or more) white/grey/yellow spots under upper lid
TI		<p>Inflammation – intense</p> <ul style="list-style-type: none"> • Conjunctiva rough and thickened, velvety redness hides normal blood vessels • Lots of follicles partially or totally covered by thickened conjunctiva
TS		<p>Scarring</p> <ul style="list-style-type: none"> • Scarring following inflammation • White lines, bands or sheets of scar tissue • May not be able to see deep-lying blood vessels
TT		<p>Trichiasis</p> <ul style="list-style-type: none"> • 1 or more eyelashes turned in to touch eye surface (cornea), or plucked eyelashes
CO		<p>Opacity</p> <ul style="list-style-type: none"> • White/grey scarring opacity in eye surface (cornea) with sheet of blood vessels (pannus)

* Signs can occur alone or together. Grade each sign separately.



Do

- Encourage face and hand washing to stop spread — a clean face is the key to stopping trachoma

Do — if follicles (TF) or intense inflammation (TI)

- Give **azithromycin** oral single dose – adult 1g, child see doses ([p426](#))
- Treat all household contacts within 1 week to stop person getting infected again. Check with CDC/PHU for who else needs treatment

Do — if eyelashes touching eyeball (TT) or damage to eye surface (cornea) (CO)

- **Do not** pull out curled in-turned eyelashes — may cause worse damage when they regrow
- If person has plucked own eyelashes — pull out any stubble if regrowing
- Refer to eye specialist as soon as possible, may need surgery

Acute glaucoma**Ask**

- Sudden loss or blurring of vision, seeing coloured rings (halos) around lights
- Severe pain
- Nausea or vomiting
- Recent bleeding in eye, or drops to dilate pupil

Check

- Eye assessment ([p343](#))
 - Pupil — mid-dilated (4–6mm), reacting poorly to light, or fixed
 - Single red eye
 - Eye surface (cornea) cloudy

Do not

- **Do not** put pad over eye

Do

- Lay person on back
- **Urgent medical consult**, send to hospital within 4–6 hours
- Give **pain relief** ([p377](#))
- Give **antiemetic** to stop vomiting before transport ([p105](#))
- **Medical/specialist consult** about reducing eye pressure. Doctor may suggest
 - **Acetazolamide** oral (IV if vomiting) single dose – adult 500mg
 - **Medical consult** if further doses needed
 - **Timolol 0.5% eye drops** to affected eye – 1 drop, wait 1 minute
 - **THEN apraclonidine 0.5% eye drops** to affected eye – 1 drop, wait 1 minute
 - **THEN prednisolone 1% + phenylephrine 0.12% eye drops** 1–2 drops. Repeat every 1–2 hours
 - **OR dexamethasone 0.1% eye drops** 1–2 drops. Repeat every 1–2 hours

Eye injuries

Penetrating eye injuries

Eyeball punctured. Object may or may not still be in eye.

Check

- Eye assessment ([p343](#)) — **do not** do lid eversion. Only do what is needed to confirm
- Tetanus status, see *Australian Immunisation Handbook*

Do not

- **Do not** try to remove object if it is still in eye — may cause more damage
- **Do not** let person eat or drink anything — may need operation

Do

- **Medical consult**, send to hospital
- Keep person calm — advise them not to cough, sneeze, strain
- Give **antiemetic** to stop vomiting before transport ([p105](#))
- Give **pain relief** ([p377](#))
- Give **ceftriaxone** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
- If person upset or agitated — give sedation
 - If promethazine used as antiemetic — this should be enough
 - If promethazine not already used and 2 years or over — give
 - **Promethazine** oral single dose – adult 25mg, child 0.5mg/kg/dose up to 25mg (doses [p442](#))
 - **OR promethazine** IM single dose – adult 12.5mg, child 0.25mg/kg/dose up to 12.5mg (doses [p442](#))
 - If not enough or under 2 years — **medical consult**
- Give **oxygen** to target O₂ sats 94–98% **OR** if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult **OR** mask 5–10L/min — cut away mask if needed, so no pressure on eye
- Put loose fitting shield over eye to prevent eye contents being pushed out ([CPM p156](#)). **Do not** use eye pad under shield
- If person still very agitated or distressed — **medical consult** about giving midazolam

Something in eye (foreign body)

Something stuck on surface of eyeball (eg sand, seed, metal).

Check

- Eye assessment ([p343](#))
 - Always look under eyelid ([CPM p152](#))



Do

- If thing in eye is stuck over pupil, or if rust ring visible after it is removed — **medical consult**
- Wash eye out with water (*CPM p151*). May remove object/s, especially if lots of small foreign bodies (eg sand)
- Try to remove object/s with sterile cotton bud wet with **normal saline** or **anaesthetic drops** (*CPM p154*)
 - If this doesn't work — put in **topical local anaesthetic** (*p344*), try again
 - If still doesn't work — try to remove with 23G needle (*CPM p156*) mounted on 2mL syringe as handle, if skilled
- Give **chloramphenicol 1% eye ointment** 4 times a day (qid) for up to 5 days
 - **Do not** touch eye with tube — F 6.9
- If eye surface (cornea) damage — see *Eye surface ulcers or infection* (*p349*)



6.9

Blunt eye injury

Commonly caused by fist, elbow, finger, ball, rock.

- Can be hard to see into eye if eyelids swollen. Gentle, steady pressure will usually allow you to open eyelids
 - If not, consider using analgesia and emergency eye lid retractor (*CPM p153*)
- If you can't get eyelids open — **medical consult**, send to hospital to be properly examined
 - **Do not** wait for swelling to go down

Check

- Eye assessment if possible (*p343*)

Do

- If double vision, reduced eye movements, numbness around eye or upper gum (signs of 'blowout' fracture of eye socket) — **medical consult**, send to hospital, specialist will arrange scan
- If pupil shape or responses irregular, ruptured globe, bleeding inside eye, no red reflex seen — **medical consult**, send to hospital
- If none of the above — treat as uncomplicated black eye with ice and rest
- After acute care, refer to optometrist to monitor for post-traumatic complications

Bleeding inside eye

Check

- Bleeding into front of eye (hyphaema) — look for fluid level at bottom of iris while sitting up — F 6.10
- Bleeding into back of eye (retinal or vitreous haemorrhage)



6.10



- Will be hard to see — red reflex may be dull
- May have developed very poor vision since being hit

Do not

- **Do not** give aspirin, heparin or NSAIDs — may cause more bleeding

Do

- **Medical consult**, send to hospital
- Keep person calm and lying down
- Put pad over both eyes, using 2 pads for each eye (*CPM p156*)
 - If this upsets person too much — let them sometimes uncover good eye

Bleeding into white of eye (subconjunctival haemorrhage)

Check

- BP — may be high (*p422*)
- Medicines — bleeding may be due to overdose of anticoagulant
- Try to see back edge of patch of blood (bleed)
 - If you can see back edge — F 6.11 — not serious, should get better by itself in a week or so
 - If you can't see back edge — F 6.12 — could be skull fracture
 - If history suggests significant trauma — **medical/ specialist consult**



6.11



6.12

Chemicals in eye

Do first

Immediately wash out (irrigate) eye with water or normal saline only (*CPM p151*) — for at least 30 minutes.

- **In clinic** — use IV-giving set to run **normal saline** steadily over eye while holding lids open
- **Outside clinic** — use any available clean water, plenty of it. Put eye under tap or hose, have person put face in bowl of water, blink vigorously

Do not

- **Do not** waste time
- **Do not** stop washing out too soon
- **Do not** wash out with anything except water or normal saline

Ask

- Try to find out type of chemical

Check

- Eye assessment (*p343*)



Alkalis like concrete, lime, plaster, bleach are more dangerous than **acids** like car battery fluid, toilet cleaner, rust removers.

- Wash out (irrigate) eye for at least 30 minutes (*CPM p151*)
- 5 minutes after stopping wash out, test pH of eyeball (conjunctiva) with litmus paper or pH pad on urine dipstick
- If pH is not 7 — keep washing out until pH 7 or same as unaffected eye
- Alkalis may need to be washed out for 2–3 hours
- **Medical consult** straight away

Do

- Make sure whole surface of eye, under eyelids, in corners all washed and completely clean — double evert lid (*CPM p153*)
 - Local anaesthetic drops will make this easier
- If large patch of damage to eye surface (cornea) — **medical consult**, send to hospital

Flash burns

Red sore eyes caused by sudden bright light (eg from arc welder). May not be aware of it until several hours later.

Check

- Make sure there is not something in eye
- Eye assessment (*p343*)

Do

- If anaesthetic needed to examine eye — put in 2 drops of **topical local anaesthetic**. See *Eye assessment (p343)*
- Put **chloramphenicol 1% eye ointment** in both eyes straight away
 - **THEN chloramphenicol 1% eye ointment** 3 times a day (tds) for 2–3 days
 - **Do not** touch eye with tube — F 6.9
- Give **pain relief** (*p377*)
- Cool compresses (eg clean cool towel) or ice packs may help
- Remind person to use appropriate eye protection next time

Follow-up

- If not getting better after 1 day — **medical consult**

Headaches

- Occur alone or as part of another illness. Most are not serious
- **Do not** assume headache is due to dehydration without very good evidence and until everything else has been adequately excluded

Important not to miss

- Intracranial bleeding or clot
- Intracranial mass
- Severe infections
- Acute glaucoma (*p353*)
- Meningitis (*p101*)

- Consider **serious headache** if any of these signs or symptoms
 - Sudden onset
 - Severe and debilitating (worst ever) pain
 - Associated with
 - Altered level of consciousness, confusion
 - Fever
 - Vomiting
 - Focal neurological signs — unsteady, slurred speech, limb weakness
 - Visual signs — blurred or double vision, pain looking at light (photophobia)
 - Neck stiffness (meningism)
 - Worse with bending, coughing, sneezing — suggests raised intracranial pressure
 - Morning headaches with vomiting, getting worse over time — suggests intracranial tumour or other lesion
 - Temporal arteries tender, reduced pulsation — suggests temporal arteritis
 - New headaches in people over 50 years — need to exclude intracranial lesion

Ask

- Headache — onset, how often, when, is it the same as usual
- Pain — type, how severe, how long
- Nausea or vomiting
- Sensitive to light, sound
- Recent accidents — fall, hit head, car accident
- Fever*
- Stiff neck*
- Confusion*, altered level of consciousness*, weakness*
- Taking anticoagulants (eg warfarin, dabigatran)
- If taking blood pressure medicine — any missed doses

If symptoms marked with asterisk (*) or description of sudden severe headache or 'worst headache of life' — suspect serious cause.



Check

- Temp, pulse, BP, RR, O₂ sats — work out REWS ([p6](#))
 - If abnormal pulse or BP —
 - Do ECG — may be intracranial haemorrhage
 - POC test for venous gases
- Pupil reactions
- Rash
- Turning head left and right, chin to chest
- Neurological examination
- Local cause — dental infection, sinusitis, ear infection
- Temporal arteries — tender, reduced palpations

Do

- **Medical consult** straight away if
 - Severe headache not relieved by simple pain relief
 - Head injury or concussion
 - Fever and stiff neck
 - BP or pulse high or low
 - Neurological signs — confusion, altered level of consciousness, weakness, tingling, changes in vision
 - Person taking anticoagulants
 - Other reason for concern
- If **no** signs or symptoms of serious headache — give simple pain relief ([p377](#)), encourage to drink more water
- If recurrent — must have **medical consult** for treatment plan

Heat illness

- May present as heat stroke (severe), heat exhaustion (moderate) or heat cramps (mild)
 - Heat stroke is a medical emergency requiring rapid cooling — risk of sudden deterioration and death
 - Heat cramps and exhaustion can progress to heat stroke if not managed properly
- Children, elderly, sick, people playing sport or working in heat at most risk

Severity of illness may not be apparent straight away.

Table 6.19: Features of heat illness

Feature	Heat stroke	Heat exhaustion
Temp	More than 40°C	Less than 40°C
Skin	<ul style="list-style-type: none"> • Flushed, hot • Classic — no sweat • Exertional — may be sweaty 	Cold/clammy, sweating
BP	Usually normal. Low in 20%	Normal or low
Nausea/vomiting	Bad nausea and vomiting	Nausea, may be vomiting
Headache	Severe, throbbing	Mild
Response	Drowsy, confusion, fits, delirium, unconscious	Normal, drowsy, irritable, fainting
Breathing	Short of breath	Fast (hyperventilating)
Other	<ul style="list-style-type: none"> • Acute kidney failure • Acute liver failure • Muscle breakdown • BP may be low 	Low BGL

Heat stroke or heat exhaustion

Do — if collapsed

Remember — Life support — DRS ABC ([p10](#)).

- Check BGL
- Use continuous ECG to monitor for abnormal heart rhythms (arrhythmias)
- If unconscious — see *Unconscious person* ([p113](#))
- If fitting — see *Fits — seizures* ([p57](#))
- Could collapse be due to other cause — infection (sepsis), injury, snake bite, sting, poisoning

Do first

- **Start cooling person as soon as possible**
 - Remove outer clothing
 - Sponge with cool water



- Cover person with wet towels and fan them
- Put cold packs under arms, on sides of neck, in groin
- Stop actively cooling person when T 39°C

The longer temperature is raised the more dangerous it is for the person.

Do not

- **Do not** use ice bath
 - Shuts down blood flow to skin and slows cooling
 - Makes monitoring and treatment harder
- **Do not** give medicines to lower temp — antipyretics (eg paracetamol)

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- BGL
- Do ECG
- POC test for lactate, pH, sodium, urea/creatinine
- Take blood for blood cultures
- Urine for MC&S

Do

- **Medical consult**
- Put in IV cannula ([CPM p84](#)). If not possible — put in IO needle ([CPM p88](#))
- If BGL less than 4mmol/L — see *Low blood glucose (hypoglycaemia)* ([p91](#))
- If systolic BP less than 100mmHg — give **normal saline** bolus
 - Adult or child over 12 years — 250–500mL
 - Child under 12 years — 20mL/kg
- If systolic BP more than 100mmHg — run **normal saline** infusion
 - Adult or child over 12 years — 1L over 2 hours
 - Children and elderly — **medical consult**
- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Nasal cannula 1–2L/min child, 2–4L/min adult *OR* mask 5–10L/min
- If sepsis likely (eg elderly, alcoholic, chronic illness) —
 - Give **ceftriaxone** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
- Put in indwelling urinary catheter – male ([CPM p205](#)), female ([WBM p281](#))

Heat cramps

Brief severe muscle cramps that come on suddenly.

Do

- Cool person
- Give ORS
- Rub muscles to ease pain

When stabilised

Ask

- Headache, weakness, nausea or vomiting, abdominal pain, confusion or strange behaviour, dizziness
- Amount and type of recent physical activity
- Exposure to hot air, high temps
- Medical problems — recent sickness, infection, fever
- Any medicines (eg fluid tablets), recreational drugs
- Fluid intake

Send to hospital if any of

- Heat stroke
- Temp still more than 38°C after 1 hour
- Person hasn't fully recovered after 1 hour
- Other medical problems
- No urine being passed, urine looks like strong tea (rhabdomyolysis)
- More than 3+ protein or 3+ blood on U/A (rhabdomyolysis)



Hepatitis

If pregnant — see *Hepatitis in pregnancy* ([WBM p144](#)).

Liver inflammation. Can be acute or chronic. Measured by raised ALT (liver function test).

• Causes of hepatitis

- Viral hepatitis (A, B, C) — see Table 6.20
- Alcohol or kava
- Fatty liver — from alcohol, high blood fats, diabetes, obesity
- Medicines — oral contraceptives, TB medicines, epilepsy medicines, paracetamol overdose, statins
- Plants or herbal medicines (eg St John's wort, echinacea, mushrooms)
- Other — autoimmune, too much iron or too much copper in body

Table 6.20: Main types of viral hepatitis

	Hepatitis A	Hepatitis B	Hepatitis C
How it spreads	<ul style="list-style-type: none"> • From faeces to hand to mouth • Contaminated food or water 	<ul style="list-style-type: none"> • Contact with blood* or other body fluids • Infected mother to her child (eg during birth) • Sex without a condom • Between young children 	<ul style="list-style-type: none"> • Contact with blood* • Blood transfusions before 1990 • Infected mother to her child (eg during birth) • Sex without a condom only if blood involved
Time from infection to sickness**	2–6 weeks	6 weeks–6 months	2 weeks–6 months
Risk of chronic infection	No	Yes	Yes
Immunisation recommended — if not already immune or infected	<ul style="list-style-type: none"> • Child – routine schedule (for Aboriginal and Torres Strait Islander children in NT, QLD, SA, WA) • Anyone living in Indigenous community 	<ul style="list-style-type: none"> • Child – routine schedule • People with STI, chronic kidney or liver disease • Household contacts, sexual partners • Clinic staff 	<ul style="list-style-type: none"> • None available

* Contact with blood includes — sharing needles, razors, toothbrushes *OR* knives, sticks, stones for ‘sorry cuts’, ceremonial business *OR* backyard tattoos, piercings

** Many people who acquire viral hepatitis remain asymptomatic



Symptoms

- Caused by new acute hepatitis or worsening of chronic hepatitis
 - Children may not be sick at all
 - Feel unwell, no appetite
 - Confusion, drowsiness
 - Dark urine (colour of tea)
 - Pale faeces
 - Nausea and/or vomiting
 - Yellow skin or eyes (jaundice)
 - Upper abdominal pain, tender liver
 - Smokers go off their cigarettes
- If underlying chronic liver disease, may also have signs of chronic liver disease — see *Cirrhosis* (p367)

Note: Common to have abnormal LFT without being sick or having any significant liver disease.

Ask

- About symptoms (*above*)
- Alcohol use — recent binge
- IV drug use, unprotected sex
- Medicines — prescribed or over the counter

Check

- Temp, pulse, BP, RR, O₂ sats — work out REWS (p6)
- Weight
- Yellow skin or eyes, bruising or bleeding
- Tender, enlarged or hard liver, swollen abdomen (ascites) and legs (oedema)
- Faeces — pale *OR* blood, black and tarry (melena)
- U/A for bilirubin
- Pregnancy test
- Take blood for LFT, INR, FBC, UEC
- File notes for hepatitis status — see *Classification of Hepatitis B status* (p368). If unknown or not immune — test as needed
 - Hepatitis A — HAV IgG, HAV IgM
 - Hepatitis B — HBsAg, anti-HBc IgG, anti-HBc IgM, anti-HBs
 - Hepatitis C — anti-HCV

Do

- **Medical consult**
- Advise person — careful hand washing, separate eating utensils, safer sex (p285), blood precautions (eg don't share razors, toothbrush, needles)
- Food and fluids as tolerated
- No alcohol until fully well and LFT normal — several months



- May need further blood tests to monitor — LFTs, INR
- If hepatitis A or hepatitis B — close contacts may need immunisation

Send to hospital if any of

- Dehydrated, not able to drink and keep down fluids
- Persistent vomiting
- Confused, unusual behaviour, drowsy, reversal of sleep/wake cycle, tremor — signs of brain involvement (encephalopathy)
- Unusual bruising or bleeding
- Swollen abdomen and legs (ascites and oedema)
- Fever with abdominal pain — may be bacterial peritonitis
- INR greater than 1.3 *OR* ALT greater than 1000 units/L

Follow-up

- Review regularly — based on symptoms and blood test results. Doctor will advise frequency
- Check serology results — may show viral cause of hepatitis
- Work out if person already has chronic viral hepatitis (*below*)
- Put on recall for 6 month review — to see if problem has become chronic (*below*)

Chronic hepatitis

- Hepatitis (inflamed liver), for more than 6 months
- ALT is raised if more than 30 units/L in men or 19 units/L in women

Note: Alcohol, fatty liver and hepatitis B infection most common causes of chronic liver disease in remote Indigenous communities. Hepatitis C is an increasing problem.

Person has chronic viral hepatitis if

- HBsAg positive for more than 6 months — chronic hepatitis B
- Anti-HCV positive and hepatitis C PCR positive for more than 6 months — chronic hepatitis C

Check file notes

- Pathology results — HBsAg, anti-HCV
 - If previously positive HBsAg — manage as chronic hepatitis B ([p367](#))
 - If previously positive anti-HCV — manage as chronic hepatitis C ([p367](#))
 - If no previous pathology results — do 6 month recall for chronic hepatitis check (*below*)

Chronic hepatitis check

6 months after first acute presentation or if reoccurrence of symptoms.

- Take blood for FBC, UEC, LFT, coagulation studies, HIV

- If hepatitis B
 - Take blood for HBsAg, hepatitis B viral load, HBeAg, anti-HBe
 - HAV IgG, Anti-HCV (if results not known)
 - Write on pathology form — ‘If HBsAg positive, please do hepatitis B viral load, HBeAg, anti-HBe’
 - If hepatitis C
 - Take blood for HCV genotype and viral load
 - HBsAg, anti-HBs, anti-HBc, HAV IgG (if results not known)

Do

- **Medical consult** about results, care plan, follow up
- Discuss preventive measures — see Table 6.21
- For all new diagnoses of chronic liver disease
 - Liver ultrasound
 - Manage hepatitis B ([p367](#)) and hepatitis C ([p367](#))
- If not hepatitis B or hepatitis C
 - May also need tests for antinuclear, anti-smooth muscle, anti-mitochondrial, anti-LKM antibodies, alpha1 anti-trypsin, copper studies, iron studies, fasting BGL and lipids, caeruloplasmin

Table 6.21: Preventive measures for chronic viral hepatitis

Chronic infection	If no record of immunisation* or no immunity on testing – immunise person against	If no record of immunisation* or no immunity on testing – immunise contacts	Precautions
Hepatitis B	Hepatitis A	Hepatitis B for household contacts	<ul style="list-style-type: none"> • Do not share razors, needles, toothbrushes • Safer sex (p285)
Hepatitis C	Hepatitis A and hepatitis B	No	<ul style="list-style-type: none"> • Do not share razors, needles, toothbrushes • Avoid sex if blood present

* Check file notes, immunisation registers.

Management of chronic viral hepatitis

Aim to

- Prevent further liver damage — scarred liver (cirrhosis), liver cancer
- Prevent passing infection to others
- Minimise alcohol use — see *Brief interventions* ([CPM p138](#))
 - Shouldn't drink alcohol at all
 - If drinking — less than 7 standard drinks/week ([p209](#)), at least 3 alcohol-free days/week



Chronic hepatitis B infection

HBsAg positive for more than 6 months.

- Adult Health Check (*CPM p123*)
- If at high risk of liver cancer (*p368*) offer 6 monthly AFP, LFT, liver ultrasound
- 12 monthly hepatitis B viral load, HBsAg, HBeAg
 - May need antiviral treatment if ALT is raised (more than 30 units/L for men, more than 19 units/L for women) and viral load greater than 2000 international units/mL
 - Oral antiviral treatment for hepatitis B can prevent or reverse cirrhosis and prevent cancer. Treatment for most people will be lifelong
- **Specialist consult** if
 - Cirrhosis (*below*)
 - Hepatitis C or HIV infection
 - Under 16 years of age
 - Previous treatment for hepatitis B

Chronic hepatitis C infection

Anti-HCV and HCV PCR positive for more than 6 months.

- Oral antiviral treatment can cure hepatitis C infection
- Most people can be treated with 3–6 months of once a day oral medicine
- All patients should have treatment and monitoring discussed with **specialist**
 - If evidence of cirrhosis — urgent referral

Chronic non-viral hepatitis

Continuing abnormal LFTs where no cause identified and serology negative for hepatitis B and hepatitis C.

- **Medical consult** to discuss other blood tests before referral to specialist

Cirrhosis

Liver scarring (fibrosis).

- More likely if abnormal findings on any of the following
 - Clinical signs of chronic liver disease
 - Altered mental state (encephalopathy), red spots on chest wall that go pale with pressure (spider naevi), palmar erythema (red palms), breast enlargement in males (gynaecomastia), palpable spleen, swollen abdomen (ascites), swollen legs (oedema)
 - Blood tests — low platelets, low albumin, high bilirubin, high INR
 - APRI score more than 1 may indicate fibrosis
 - APRI calculator (AST to platelet ratio) at [www.hepatitisc.uw.edu/ page/clinical-calculators/apri](http://www.hepatitisc.uw.edu/page/clinical-calculators/apri)
 - Imaging — liver ultrasound and *Fibroscan*
- If any of the above — **medical/specialist consult**



Monitoring for liver cancer

Liver cancer can be treated and possibly cured if diagnosed early, when tumour small and no symptoms.

People at high risk

- All Indigenous people over 50 years with hepatitis B or hepatitis C
 - Chronic hepatitis B or hepatitis C *AND* family history of liver cancer
 - All persons with proven or suspected cirrhosis
- Explain screening and treatment so person can decide if they want screening
 - People at high risk should be screened every 6 months with
 - Blood for alpha-fetoprotein (AFP)
 - Liver ultrasound

Classification of hepatitis B status

Table 6.22: Classification of hepatitis B status

Classification	HBsAg	Anti-HBs	Anti-HBc
Not immune, not infected (and no record of immunisation)	Negative	Negative	Negative
Immune by exposure	Negative	Positive or negative	Positive
Immune by immunisation	Negative	Positive	Negative
Active infection	Positive	Negative	Positive

- If person has had 3 documented immunisations starting at birth and complying with the recommended schedule — no further testing for hepatitis B needed unless
 - Clinical reason to think they have active hepatitis
 - Part of routine antenatal testing in pregnancy — see *Hepatitis in pregnancy* ([WBM p144](#))

Note: Understanding hepatitis blood tests (serology) is hard. Contact CDC/PHU if you need help.



Joint problems

Use this protocol for swollen, painful joints or limp **not due** to accident, injury or trauma. If accident, injury, trauma — see *Joint sprains* (p373).

If unclear that problem is in joint — also see *Bone infection* (p306).

Always assess for possibility of acute rheumatic fever, especially in child or young person — see *ARF* (p294).

Investigate thoroughly all joint pain, swelling and/or limp without injury. If fever, unwell, or child with unexplained limp or limp not getting better — investigate straight away.

Ask

- Trauma, accident or injury
- Pain and swelling — where is it, when did it start, how bad is it
- Movement and stiffness
- Same sort of problems in past
- Which joint/s affected
- Any other problems (eg skin infections, sore throat, fever)

Check file notes

- Recent history of joint problems
- Signs and symptoms of ARF (p294)

Do

- Temp, pulse, RR, BP, O₂ sats — work out REWS (p6)
- Signs and symptoms — see Table 6.23

Acute rheumatic fever (ARF)

- See *Acute rheumatic fever and rheumatic heart disease* (p294)

Joint infection (septic arthritis)

Joint infection can occur with punch injury or without any visible injury.

Do

- Blood cultures (*CPM* p375)
- Put limb in splint (*CPM* p229)
- Give **pain relief** (p377)
- **Medical consult, send to hospital urgently**
- Antibiotics usually not started before transfer as joint aspiration for MC&S done in hospital
 - *BUT* if very sick or transport time will be more than 4 hours — **medical/specialist consult** about giving antibiotics

Table 6.23: Signs and symptoms of common joint problems.

Joint condition	Acute rheumatic fever (ARF)	Joint infection (septic arthritis)	Gout	Rheumatoid arthritis	Osteoarthritis
Usual timing	Swelling begins to settle in days, gone in 2–3 weeks	Onset over 0–3 days	Onset overnight or 0–1 days	Chronic – recurring, swelling lasts many weeks	Chronic, variable, more common in older people
Joint red and hot	Usually	Yes	Yes	Usually warm	No
Joint painful	Yes	<ul style="list-style-type: none"> • Very • Worse with small movement 	Very	Yes	Yes
Joint tender to touch	Often	Yes	Very	Yes	Not usually
Moving joint	Painful to move	<ul style="list-style-type: none"> • Very painful • Holds still 	<ul style="list-style-type: none"> • Stiff • Too painful to move 	Morning stiffness for more than 30 minutes	Stiff after rest, in morning – better with movement
Fever	Usually	Usual – but may be none in early stages	Usually no fever, but may have fever or chills	Not common. Possible when joints acutely inflamed	No
Other	<ul style="list-style-type: none"> • Unwell • Other features of ARF (p294) 	<ul style="list-style-type: none"> • Painful limp • Unwell 	May have had before – lasting days	<ul style="list-style-type: none"> • Tired • Unwell – flu-like symptoms • May have had before 	<ul style="list-style-type: none"> • Weakness • Limp
Joints most often affected	<ul style="list-style-type: none"> • Knee, ankle, elbow, wrist • Often moves from joint to joint, but may be single joint 	Single joint	Big toe, foot, ankle, knee, hand, wrist	<ul style="list-style-type: none"> • Same on both sides of body (symmetrical) • Multiple joints – hand, foot, knee 	Hand, spine, hip, knee



Gout

Caused by too much uric acid in the blood. Usually gets better over a few days without treatment, but often comes back. Treatment can shorten time and lessen chance of it coming back.

Do

- Rest joint, ice packs, give **pain relief** ([p377](#))
- If **no** contraindications to NSAIDs ([p381](#)) —
 - **Indometacin** oral 3 times a day (tds) until pain improved – adult 50mg
 - *THEN* **indometacin** oral 3 times a day (tds) until pain stops – adult 25mg
- If contraindications to NSAIDs ([p381](#)) — give other **pain relief** ([p377](#)) and **prednisolone** oral once a day for 3–5 days – adult 20mg
- **Medical consult** — may need **allopurinol** to prevent further attacks

Rheumatoid arthritis

Chronic inflammatory disease, causes joint damage. Early diagnosis important to manage pain, improve function, prevent permanent joint damage.

Do

- Take blood for FBC, kidney function, fasting BGL, fasting lipids, LFT, CRP, ESR, RF
- Medical review
 - Early medicines — give **pain relief** ([p377](#))
 - Rheumatologist consult or review — diagnosis, other medicines, joint surgery
 - X-ray — chest, hands, feet
- Ice and/or heat can help pain
- If ongoing — refer to physio/OT

Osteoarthritis

Most common form of arthritis. Due to wear and tear of joint cartilage with age, significant injury, repetitive use, obesity.

Do

- Give **pain relief** ([p377](#))
 - *AND/OR* methyl salicylate rubbing cream
- Medical review
 - Accurate diagnosis
 - X-ray affected joint/s — weight bearing for hips and knees
 - Review **pain relief** ([p377](#))
 - Physio/OT referral
 - Talk about nutrition and weight loss ([CPM p143](#))
 - In later stages — joint replacement

Ongoing management of chronic arthritis

Includes osteoarthritis, rheumatoid arthritis, gout.

- Check file notes for management plan, specialist letters. If no management plan — develop one including
 - Regular reviews, specialist referrals
 - Self-management — physical activity ([CPM p144](#)), rest, relaxation, healthy diet ([CPM p143](#)), weight loss ([CPM p145](#)) if needed, education, support group
- Encourage physical activity — for mobility and muscle strength, **medical/physio consult**
- Refer to allied health team as needed
 - OT — aids, equipment
 - Physio — exercises for mobility, muscle strength
 - Pharmacist — medicines review, education



Joint sprains

Swollen, painful joint caused by **accident, injury, trauma**.

If no clear accident, injury, trauma — see *Joint problems* (p369).

- Sprain is stretching or tearing of muscle or tendon
- Soft tissue injury usually caused by sprain — also consider dislocation, fracture, ligament/tendon rupture

Ask

- What, how, when it happened
- Location, type, amount of pain
- Which way did it twist, was it hit, did they fall
- Could they use limb straight afterwards (eg walk, hold things)

Check

- **Always compare sides**
- How person is holding or supporting joint
- Do joint assessment
 - Swelling, bruising, pain, redness, feels hot
 - Abnormal joint shape (deformity), open wound
 - Extra or unusual movement
 - Some — consider sprain, strain
 - Lot — consider dislocation, tendon/ligament rupture
- If you suspect fracture — do fracture assessment (*CPM p218*)

Do

Medical consult if

- Pins and needles, numbness, loss of muscle strength
- Severe pain on passive movement
- Medium to large joint swelling (effusion)
- You suspect dislocation, fracture, ligament/tendon rupture

Do not

Do not use/do these things in first 2 days — make soft tissue injuries worse.

- **HARM**
 - **H**eat
 - **A**lcohol (grog), aspirin, anti-inflammatory (eg NSAID)
 - **R**unning, strong exercise
 - **M**assage

Do — for sprain

- **For first 2 days** to let bleeding settle, lessen swelling — **RICE**

- **R**est
 - If unable to bear weight — give crutches (*CPM p242*)
 - Use collar and cuff or simple sling to support arm
 - Splint or back slab if needed
 - Gentle movement within limits of pain
- **I**ce
 - Put on for 15–20 minutes every 2 hours — reduce over second day
 - **Do not** put frozen material directly on skin
- **C**ompression
 - Use tubigrip or bandage — firm but not tight enough to cause pain
 - Put on after ice
- **E**levation
 - Ankle or knee — at least to hip level
 - Arm in sling (*CPM p227*) or on pillows
- Give **pain relief** (*p377*)
 - Use regular doses rather than waiting for pain to get bad
 - Back slab may help (*CPM p234*)

Review after 2 days

- If large amount of swelling and/or pain — recheck for extra movement (instability) of joint. Could be ligament or tendon rupture
- Stop use of crutches or sling if pain allows
- Encourage normal walking pattern
- As swelling gets better, stop using tubigrip or bandage
- Start active movement, then strengthening exercises as soon as possible
- Start using heat instead of ice
- Encourage massage if tolerated

Medical review if

- Still not able to walk or has severe pain with movement after 2 days
- Still moderate swelling after 5 days

Follow-up

- Examine person's walking pattern, encourage them to walk as normally as possible — consider physio referral
- Recovery times
 - Grade 1 sprain (ligament stretched but not torn) — return to normal activity after 1 week
 - Grade 2 sprain (ligament fibres torn) — return to sporting activities after 6 weeks
- **Do not** return to sport until they can
 - Move joint normally and without pain
 - Balance normally (if lower limb)
 - Do full training session without pain or swelling



Melioidosis

Caused by bacteria found in soil and water. More common in tropical northern Australia during wet season, but can happen any time. Has occurred in Central Australia after heavy rains and flooding.

Acute or chronic. Usually affects adults with risk factors, but can affect healthy adults and children.

Risk factors

- Diabetes
- Drinking too much alcohol or kava
- Chronic kidney disease
- Chronic lung disease
- Weakened immune system
- Underlying cancer

Note: People with melioidosis can go from a bit sick to very unwell very quickly — all need to go to hospital

Consider melioidosis in person with

- Pneumonia
- Fever and unwell
- Ulcers or boils on skin that take longer than usual to heal
- Lower abdominal pain, trouble passing urine in men (prostate melioidosis)

Ask

- Take good history of symptoms and when they started

Check

- Temp, pulse, RR, BP, O₂ sats, BGL — work out REWS ([p6](#))
- Full head-to-toe examination
- Collect samples
 - Blood for cultures, FBC, melioidosis serology
 - Urine for MC&S, melioidosis culture
 - If coughing — sputum for MC&S ([CPM p385](#)), melioidosis culture
 - Swabs — throat swabs ([CPM p389](#)) and rectal swabs for all suspected cases. If unhealed lesion — wound swabs ([CPM p388](#)). If cough — extra sputum
 - Put in Ashdown's medium, label 'cultures for melioidosis', keep at room temperature
 - Ashdown's is special melioidosis culture medium. Keep in fridge before use. If none available — use ordinary transport medium

Do

- If you suspect melioidosis — **medical consult**
- If risk factors (*above*) and moderate/severe pneumonia — send to hospital
- If other symptoms but not very unwell — do tests, give usual treatment, wait for results
 - If melioidosis confirmed by culture — send to hospital
 - If melioidosis serology positive — **infectious diseases unit consult**
- If very unwell and need treatment before going to hospital —
 - Take blood for blood cultures before giving antibiotics
 - Give **ceftriaxone** IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
 - **AND gentamicin** IV single dose (doses [p433](#))
 - If likely to be transferred to ICU — retrieval team will give meropenem if needed
 - Hospital treatment will be IV antibiotics for a minimum of 2 weeks but often longer is needed

Follow-up

- Melioidosis can come back, so need further treatment for at least 3 months after IV antibiotics completed. Give
 - **Trimethoprim-sulfamethoxazole** oral twice a day (bd) – adult 240+1200mg, child 6+30mg/kg/dose up to 240+1200mg (doses [p437](#))
 - **Folic acid** oral once a day – 5mg
- Weekly follow-up, check if taking medicine
- Monthly medical review including FBC, LFT, UEC to check for medicine side effects
- Record clearly in file notes that person has had melioidosis



Pain management

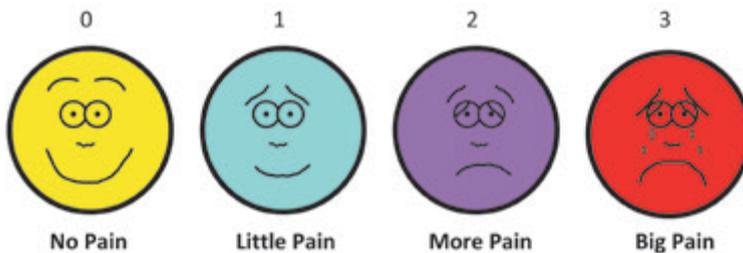
Pain may take one or more of the following forms

- Acute (nociceptive pain) — caused by injury or damage to body tissue (eg burn, impact, appendicitis)
- Nerve (neuropathic pain) — caused by compromised or damaged nerves, which affect how messages are sent to and from the nervous system
- Chronic (pain for more than 3–6 months, associated with central sensitisation) — caused by changes within the central nervous system, resulting in increased pain response to stimuli. Can be affected by psychosocial issues (eg mood, stress, beliefs)

Be aware: Certain risk factors increase the chance of person progressing from acute to chronic pain. Important to diagnose underlying cause of pain, treat appropriately and review person regularly to see if treatment is working.

Assessing pain

- Remember silence doesn't mean no pain
- **Psychosocial issues** — ask about impact of pain on quality of life. Does pain
 - Stop you from spending time with your family, friends
 - Affect your personality, mood, thoughts, emotions
 - Affect how much you can work
 - Stop you from sleeping, do you wake in the night
 - Affect how much you can exercise, walk, play sport
 - Stop you from doing daily activities — shopping, house work, dressing, showering, going to toilet
- **Take history**
 - When did it start
 - Where does it hurt, more than one place, does it move
 - How long, had it before, what happened then
 - Dull, sharp, cramping, squeezing, pain or discomfort. All the time, coming and going, if ever completely comfortable
 - Level of pain — F 6.13. What they think causes pain
 - What makes it worse (eg movement, rest, time of day)
 - What makes it better (eg rest, medicine, ice, heat, activity)



6.13

- Do clinical examination to identify causes of pain (*CPM p94*)
- If serious pain — always do **medical consult**

Types of pain

Table 6.24: Different types of pain and management

Type of pain	Symptoms and issues	Management
Acute (nociceptive)	<ul style="list-style-type: none"> • Pain felt in small area where there may be signs of injury • Pain made worse or better by certain movements • No peripheral neuropathic (nerve) symptoms 	<ul style="list-style-type: none"> • Treat underlying condition/injury • Give pain relief — see Table 6.25
Nerve (neuropathic)	<ul style="list-style-type: none"> • Pain in different body regions — appear to be related (eg arm pain and neck stiffness) • Pain described as ‘burning’, pins and needles, numbness, muscle weakness • Pain associated with recent trauma, especially to hand/wrist, foot/ankle • Diabetes • End stage renal failure 	<ul style="list-style-type: none"> • Medical consult • Give pain relief — see <i>Neuropathic pain (p379)</i>
Chronic (central sensitisation)	<ul style="list-style-type: none"> • Ongoing pain with no ongoing injury • May lead to emotional stress, anxiety, depression, avoiding daily activities, social isolation 	<ul style="list-style-type: none"> • Ask about psychosocial issues (<i>p377</i>) • Medical consult — may need to go to hospital for assessment by pain specialist

Treating pain

Aim to treat cause of pain. Includes reassuring person, managing anxiety about pain, encouraging active self-management, physical activity (if safe) and appropriate medicine.

- Use simplest effective route for pain relief — oral, rectal, subcut, IM, IV
- Analgesics are usually prescribed ‘as required’
 - Use higher doses when pain causing most trouble (eg to sleep at night) and lower doses at other times
- Consider co-morbidities, side effects, interactions with other medicines
- Check regularly if treatment is working
 - Adjust dose if needed
 - If treatment not working well — reassess person and diagnosis
 - Consider specialised input

Be aware of opioid misuse and drug seeking behaviour — see *Opioids (p221)*.



Acute pain relief (nociceptive pain)

Table 6.25: Acute pain relief (nociceptive pain)

Pain level	Treatment
Mild	<ul style="list-style-type: none"> • Paracetamol (p380) • Ibuprofen if needed (doses p440) <ul style="list-style-type: none"> ◦ AND not contraindicated ◦ AND recommended in individual protocol
Moderate	<ul style="list-style-type: none"> • Paracetamol-codeine* 500mg+30mg, 1 tablet up to 4 times a day (qid) • ADD if needed <ul style="list-style-type: none"> ◦ Paracetamol — half the regular dose up to 4 times a day (qid) (p380) ◦ OR second paracetamol-codeine* 500mg+30mg, total 2 tablets up to 4 times a day (qid)
Severe	Morphine (p381). Can use with paracetamol — not with codeine

* Not for children under 12 years.

Nerve pain relief (neuropathic pain)

- Medical consult
- Trial anti-neuropathic medicines
 - Low dose tricyclic antidepressants (eg amitriptyline)
 - If more pain relief needed — trial anti-convulsants (eg pregabalin or gabapentin)
 - Third option SNRI antidepressants (eg duloxetine or venlafaxine)
- Trial treatment regime for 4 weeks
 - Discuss and agree on what to expect — plan what to do if expectations not met
 - Medical consult for advice to change treatment

Chronic pain relief (central sensitisation)

- Medical consult
 - Further clinical assessment
 - Psychosocial issues (p377)
 - Medicine
 - Trial analgesics — **do not** give strong opioids
 - Trial exercise, behavioural changes
 - May need to go to hospital for assessment by pain specialists

Pain medicines

Paracetamol

- Give for pain or discomfort
- **Do not** give for fever if no pain or discomfort, child not miserable — can make some viral sicknesses last longer
- Good response doesn't mean person doesn't have a serious infection
- If ongoing pain — regular doses better than waiting for pain to get very bad. Consider using slow-release paracetamol
- Double dose can be given at night — then no more for next 8 hours
- Adult — **do not** give more than 8 tablets in 24 hours
 - If fasting, known liver disease, regular or heavy user of alcohol — reduce dose to 4–6 tablets in 24 hours
- Child — 15mg/kg/dose every 4 hours (doses *below*)
 - If dose for weight is more than the dose for age, use the dose for age
 - Syrups comes in different strengths — always check your bottle
 - No more than 6 doses in 24 hours for first 2 days, then 4 doses a day
- Suppositories can be used if adult or child can't or won't take oral paracetamol
 - Come in 125mg, 250mg, 500mg strengths
 - Use 1 or combination for right dose — see Table 6.26
- If suppositories not available — paracetamol syrup can be given in bottom (rectum) using lubricated 2mL syringe. Same dose as oral (Table 6.26)
- If person comes to clinic often for paracetamol — medical review to check for underlying cause

Table 6.26: Paracetamol doses

Age	Weight (kg)	Syrup* (mL) (24mg/mL or 120mg/5mL)	Syrup (mL) (48mg/mL or 240mg/5mL)	Tablet (500mg)	Suppository (mg)
Newborn	3.3	2.2	1.1	–	–
3 months	6.2	4	2	–	–
6 months	7.6	4.8	2.4	–	125
1 year	9	5.8	3	–	125
2 years	12	7.6	3.8	–	125
4 years	16	–	5	½	250
6 years	20	–	6.4	½	250
8 years	25	–	8	1	500
10 years	32	–	10	1	500
12 years	40	–	12.5	1	500
14 years and over	50 or more	–	–	2	1000 (1g)

* If 15kg or over — better to use smaller dose of stronger syrup



Oral non-steroidal anti-inflammatory drugs (NSAIDs)

Do not give NSAIDs to person with contraindications.

Contraindications for NSAIDs

- eGFR less than 60 or unknown
- Chronic kidney disease (p244) or heart failure (p264) AND taking diuretic and ACE inhibitor or ARB — triple whammy
- Severe asthma (p323)
- Stomach ulcers
- High cardiovascular risk (p230)
- Severe bleeding (eg suspected ruptured organ)
- If pregnant — **medical consult** before giving

Paracetamol-codeine (500mg+30mg)

- **Do not** use for children under 12 years
- **Do not** give more than maximum daily dose of paracetamol (paracetamol alone and/or paracetamol-codeine) in 24 hour period (adults 4g)
- Codeine (opioid) may make person drowsy, constipated
 - Encourage person to drink extra fluids and eat high fibre foods (eg fruit and vegetables) to help stop constipation
- If recent/acute pain — **do not** give for more than 2 days without medical consult/review
- If ongoing/chronic pain — **do not** give for more than 1 week without clear management plan

Opioids by injection

Aim of opioid injection treatment is to stop severe pain as quickly as possible without sedating person. Some discomfort may remain.

- Morphine is first choice
- **Always** have naloxone available when you give an opioid injection

- Opioid medicines must be locked away safely
- Any opioid used must be recorded in drug register and signed for correctly

Do

- Treat **severe pain** with **morphine** until pain controlled (doses Table 6.27)
- Always do **medical consult** before giving **opioid** injection
 - If this will cause serious delay in treatment — give, then **do medical consult as soon as possible**
- Tell person what to expect, including side effects
- Check pulse, RR, BP, sedation score (p382) for 1 hour after injection
 - IV — observations every 15 minutes
 - IM/subcut — observations every 30 minutes

- Treat cause of pain as well
 - **Example:** RICE ([p373](#)) and/or splint ([CPM p229](#)) injured part

Table 6.27: Morphine doses

Route	How	Dose*
IV	<ul style="list-style-type: none"> • To make 1mg/mL — mix 1 ampule (10mg/1mL) in 9mL normal saline or WFI • Give dose slowly over 1 minute 	<p>Adult</p> <ul style="list-style-type: none"> • 0.5–2mg (0.5–2mL mixed) every 3–5 minutes as needed • Use lower dose if over 70 years <p>Child</p> <ul style="list-style-type: none"> • 0.05–0.1mg/kg every 4 hours as needed
IM	<ul style="list-style-type: none"> • Give straight from ampoule 	<ul style="list-style-type: none"> • Under 39 years <i>AND</i> over 50kg — 7.5–12.5mg • 40–59 years — 5–10mg • 60–69 years — 2.5–7.5mg • 70–85 years — 2.5–5mg • Over 85 years — 2–3mg • Every 2 hours as needed
Subcut	<ul style="list-style-type: none"> • Put 22G subcut cannula into fat in outer aspect of upper arm, front of thigh, or side of belly (CPM p347) • Tape well 	

* Person who already uses opioids may need higher doses — **medical consult**.

Complications with opioid injections

Table 6.28: Sedation score

Symptoms	Score	Level	Action
A bit sleepy, easy to rouse	1	Mild	• Do not give any more opioids
Easy to rouse but can't stay awake	2	Moderate	<ul style="list-style-type: none"> • Observe very closely • 15 minute observations
Hard to rouse	3	Severe	• Give naloxone (see <i>Do</i>)

Do — if sedation score of 3

Remember — Life support — DRS ABC ([p10](#)).

- Give **oxygen** to target O₂ sats 94–98% *OR* if moderate/severe COPD 88–92%
 - Non-rebreather mask 10–15L/min
- Give **naloxone** IV – adult 0.2mg, child 0.01mg/kg/dose up to 0.2mg (doses [p440](#))
 - Repeat dose every 2 minutes until awake and responsive
- **Medical consult** straight away
- **May need to repeat naloxone** — effects of opioid may return as naloxone wears off
 - **Watch person for 2 hours after last dose**



- **Do not** give opioids for 1 hour after using naloxone — may need lower dose or given less often

Vomiting after opioid injections

- If patient reports past vomiting with opioid and dose can be delayed — pre-dose with antiemetic ([p105](#))
- Give antiemetic if needed (eg if being transported by air or road) ([p105](#))
- **Be aware** of oculogyric crisis ([p106](#))

Painful scrotum

Can be serious problem but hard to diagnose. **Always do medical consult.**

- Lots of things can cause painful scrotum (ball bag)
- 2 main causes — can be hard to tell which it is
 - **Twisted testis/testicle** (ball) — testicular torsion
 - **Infected testes** (balls) — epididymo-orchitis
- If painless swelling of scrotum — take history, **medical consult**. Cancer can present this way

Table 6.29: Assessing a painful scrotum

	Twisted testicle	Infected testes
Age	<ul style="list-style-type: none"> • Any age • Most common 12–18 years 	<ul style="list-style-type: none"> • Any age • Unusual under 14 years — except with mumps
How it started	<ul style="list-style-type: none"> • Usually starts suddenly — few seconds or minutes • May start more slowly 	<ul style="list-style-type: none"> • Usually starts gradually — over several hours/days
Pain	<ul style="list-style-type: none"> • Always painful — can be severe • If pain stops in 4–6 hours — testicle may be dying not getting better 	<ul style="list-style-type: none"> • Usually mild to moderate pain
Temp	<ul style="list-style-type: none"> • Usually less than 37.5°C 	<ul style="list-style-type: none"> • May be over 37.5°C
Scrotum	<ul style="list-style-type: none"> • Only one testicle involved • Very tender, hot, swollen • Testicle often higher, lying on its side — examine man standing up 	<ul style="list-style-type: none"> • One or both testicles involved • Tender, hot, swollen
When you lift testicle	<ul style="list-style-type: none"> • Pain may get worse 	<ul style="list-style-type: none"> • Pain may get better
U/A	<ul style="list-style-type: none"> • Usually normal 	<ul style="list-style-type: none"> • Almost always leukocytes and/or blood and/or protein
Other problems or symptoms	<ul style="list-style-type: none"> • Nausea, vomiting • Sometimes lower abdominal pain (p23) 	<ul style="list-style-type: none"> • Discharge from penis (p286) • Pain when passing urine (dysuria) (p23) • May be lower abdominal pain (p23), flank/loin pain (p28)

- Twisted testicle — **medical emergency** because testicle can die (necrosis)
 - If you can't exclude twisted testicle — **send to hospital urgently**



- Infected testes
 - In younger men — usually due to STI
 - In older men, or men with recent urinary tract procedure or catheter — may be due to UTI bacteria
 - Can be due to mumps virus

Decision to manage as infected testes is based on clinical assessment regardless of POC test or laboratory results.

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Abdominal assessment ([p18](#)), consider hernia
- Examine scrotum and testes
- Urine U/A and MC&S
- Do full STI check ([p273](#)). If under 15 years — **medical consult**

Do — if twisted testicle

- Give **pain relief** ([p377](#)) — usually moderate–severe pain
- **Medical consult, send to hospital urgently**
- **Do not** let him eat or drink anything — may need operation
- If delay in getting to hospital — **medical consult**

Do — if infected testes

- Give **pain relief** ([p377](#))
 - Advise wearing firm underpants, may help pain
- **Medical consult**

All men with discharge from penis AND men under 45 years with no discharge

- Treat as STI related
 - Give **ceftriaxone** IM single dose – adult 500mg mixed with 2mL **lidocaine (lignocaine) 1%**
 - **AND azithromycin** oral single dose – adult 1g
 - **THEN doxycycline** oral twice a day (bd) for 14 days – adult 100mg
 - **OR azithromycin** oral single dose – adult 1g — second dose 1 week later

Men 45 years or over with no discharge

- Treat as UTI related —
 - Give **trimethoprim** oral once a day for 7 days – 12+ years 300mg
 - **OR cefalexin** oral twice a day (bd) for 7 days – 12+ years 500mg

Follow-up

- Tell man to come back straight away if getting worse
- If likely to be STI related — offer STI check ([p272](#)) and treatment to sexual partner/s

At 3 days

- Check results of STI check and urine MC&S if available
 - If results show different infection — **medical consult** about changing antibiotic
 - If positive STI result —
 - Contact trace ([p283](#)) and treat partner/s for gonorrhoea and chlamydia ([p278](#))
 - STI and safer sex education ([p285](#))
 - If UTI — see *UTI follow-up* ([p413](#))
- If getting better — continue antibiotics and review at 1 week
- If not getting better — **medical consult**, send to hospital

At 1 week

- Check results if not available earlier — follow-up as above
- Check antibiotics taken properly
- If using azithromycin or if all doxycycline not taken — give **azithromycin** oral single dose – adult 1g



Skin infections

Skin infections — prevention

- In community — wash children every day preferably with soap (eg bath, shower, swimming), wash clothes and bedding regularly, eat a healthy diet
- In clinic — use good infection control practices

School sores (impetigo)

Yellow/brown crusted sores, often surrounding redness, may be pus under crust. Common, very infectious, must treat as can cause serious problems like PSGN.

Check

- Look for scabies as well ([p394](#))

Do not

- **Do not** use topical mupirocin — resistance develops quickly
- **Do not** send wound swab unless not responding to treatment

Do

- If both school sores and scabies — treat at same time
- If clearly infected sores —
 - Clean sores with soap and water, sponge off crusts
 - Give **benzathine penicillin (penicillin G)** IM single dose – adult 900mg, child see doses ([p426](#))
 - *OR* **trimethoprim-sulfamethoxazole** oral twice a day (bd) for 3 days – adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg (doses [p437](#))

Follow-up

- Make sure sores covered and kept clean
- If not getting better — send swab for MC&S, check swab results
 - **Medical consult** about antibiotic to use
- If non-healing sores/ulcers — consider melioidosis ([p375](#)), especially in tropical northern Australia

Head lice (nits)

Problems include infected sores, distress from scratching.

- Good ways to keep numbers low include
 - Regular combing with fine-tooth comb with conditioner in hair
 - Keeping hair short or tied back

Ask

- Any previous treatment/s
 - If insecticide-based product — could be treatment failure
 - Could be reinfection
- Are other members of family affected

Check

- Look for live lice. Use a good light
 - If live lice seen — infestation confirmed, start treatment
 - If no live lice seen —
 - Comb or brush hair to remove tangles
 - Put conditioner through dry hair, comb with fine-tooth comb
 - Wipe comb on tissue after each stroke, check for live lice
 - If live lice found — infestation confirmed. Stop combing, start treatment
- Look for nits (eggs) stuck on hairs near scalp. Common above ears, around hairline
- Look for infected sores
- Encourage person/carer to check other children and adults in family/ household. Treat if needed

Do

- Treat infestation
 - Completely cover clean dry hair with **dimeticone 4%**
 - If using lotion — allow to dry, leave on for at least 8 hours
 - If using fast-acting gel spray — leave on for at least 15 minutes
 - *OR* check product instructions as new products becoming available
 - Wash out of hair
- Put conditioner in dry hair and use fine-tooth comb to remove lice, if needed
- If infected sores — treat as for school sores (impetigo) ([p387](#))

Follow-up

- Encourage family to continue fine-tooth combing
- Repeat **dimeticone 4%** treatment after 1 week

Boils, carbuncles, abscesses

Check

- Swollen, tender, red lump. Feel if soft or hard
- If severe or several boils — swab pus for MC&S ([CPM p388](#))
- BGL

Do

- Give **pain relief** ([p377](#))
- If large boils/abscesses — send to hospital to be drained
- Use good hand hygiene ([CPM p313](#)) — boils can spread
 - Use alcohol-based hand rub after every contact
 - Give person bottle of alcohol-based hand rub, show how to use



- Keep boils covered with occlusive dressings
 - Important to prevent cross-infection to other parts of body
 - Change dressing every day until healed
- Tell people **never** to touch own boils
 - Have someone else dress boils, using good hand hygiene
- If fever, tender lymph nodes, redness spreading from boil, or lots of boils —
 - Give **di/flucloxacillin** oral 4 times a day (qid) for 5 days – adult 500mg, child 6 years/20kg or more 12.5mg/kg/dose up to 500mg (doses [p431/p432](#))
 - *OR* **di/flucloxacillin** oral twice a day (bd) for 5 days – adult 500mg, child 6 years/20kg or more 12.5mg/kg/dose up to 500mg (doses [p431/p432](#)) **WITH probenecid** oral twice a day (bd) for 5 days – adult 1g, child 25mg/kg/dose up to 1g (doses [p435](#))
 - *OR* **cefalexin** oral 4 times a day (qid) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p427](#))
 - If anaphylaxis to penicillin — give **trimethoprim-sulfamethoxazole** oral twice a day (bd) for 5 days – adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg (doses [p437](#))
- If person unwell — **medical consult**. May need IV antibiotics
- Ask family to wash all clothes and bedding with laundry detergent, dry in the sun

Follow-up

- If not getting better or keeps getting boils —
 - Usually caused by touching boils, spreading germs on hands
 - Remind them about hand hygiene, give more alcohol-based hand rub
 - Make sure boils kept covered
 - Wash whole body with aqueous chlorhexidine soap once every day
 - Check swab result
 - Give antibiotic according to sensitivities
 - *OR* **trimethoprim-sulfamethoxazole** oral twice a day (bd) for 5 days – adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg (doses [p437](#))
 - Consider melioidosis ([p375](#))
 - **Medical consult** — may need different approach (eg decolonisation)

Cellulitis

Acute inflammation of skin and soft tissues.

Check

- Area of skin will be very sore, red, hot
- Local lymph nodes may be swollen, tender
- Look for cracks/infection between toes, insect bites etc (start of infection)
- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))

Do

- **Medical consult** if
 - Child under 6 years — could be bone infection ([p306](#))
 - On face — could be *Haemophilus influenzae* type b (Hib)
 - Joint involved — could be joint infection ([p369](#))
 - Involves most of hand, arm or leg
 - Happened after contact with water (eg fishing, swimming)
 - Person unwell, fever, poorly controlled diabetes — treat as severe cellulitis ([below](#))
- Give **pain relief** ([p377](#))
- Give **procaine benzylpenicillin (procaine penicillin)** IM every 24 hours for 3–5 days – adult 1.5g, child 50mg/kg/dose up to 1.5g (doses [p435](#))
- **OR phenoxymethylpenicillin** oral 4 times a day for 5–10 days – adult 500mg, child 12.5mg/kg up to 500mg (doses [p435](#))
- If allergic or anaphylaxis to penicillin — give **clindamycin** oral 3 times a day (tds) for 7–10 days – adult 450mg, child 10mg/kg/dose up to 450mg (doses [p430](#))

Follow-up

- If not improving after 2 days —
 - Treat as severe cellulitis ([below](#))
 - Medical review

Severe cellulitis

- If unwell, fever, poorly controlled diabetes — **medical consult**
- Give **cefazolin** IV every 12 hours (bd) for 3–5 days – adult 2g, child 50mg/kg/dose up to 2g (doses [p428](#))
- If allergic to penicillin or cephalosporins — **medical consult**
- If not improving after 1 day — **medical consult**, send to hospital

Cold sores (herpes simplex)

Small watery blisters, often on mouth or face. First infection may be severe.

Check

- Make sure not school sores (impetigo) ([p387](#)) or hand, foot and mouth disease ([p405](#))

Do

- Give topical pain relief — **lidocaine (lignocaine) gel**, ice
- Make sure they get enough fluids — may need IV fluids if severe
- Clean with **normal saline** to prevent secondary infection
- Can use **aciclovir 5%** cold sore cream 5 times a day for 5 days
 - Use as soon as symptoms start (before blister forms)
- If severe or recurrent — **medical consult**, may need antiviral treatment



Molluscum contagiosum

Small round skin lumps caused by *Molluscum contagiosum* virus.

Check

- One or more smooth firm pearl-coloured lumps
 - Hard central core of waxy material
 - Hole or dimple in centre

Do

- Reassure that
 - Lesions harmless and will get better by themselves
 - Treatment not needed, it will go away in a few months
- Advise to avoid scratching or picking lumps as this can make them spread

Water-related skin infections

Cuts, abrasions, wounds often get infected after being in water, or if they happen in water (eg injuries from coral or fish spines).

Can be severe in people with weakened immune system, liver failure, kidney failure. Always do **medical consult** about these people.

Do first

- Thoroughly clean wound (*CPM p287*), remove embedded material if needed
 - May need local anaesthetic

Do not

- **Do not** close puncture wounds

Do — if mild infection

Redness, pain, swelling, enlarged lymph nodes, mild fever, small amount of pus.

- If mainly cellulitis — see *Cellulitis (p389)*
- If pustule or infected cut — treat as for boils (*p388*)
- Review in 48 hours. If not getting better —
 - **Medical consult**
 - Send swab for MC&S — specify ‘marine infection’

Do — if moderate or severe infection after exposure to fresh water, brackish water, or mud

- **Medical consult**
- Send swab for MC&S — specify ‘marine infection’
- Give **ceftriaxone** IM/IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses *p429*)
 - **AND ciprofloxacin** oral twice a day (bd) until review – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p430*)
- Review next day
 - **If not getting better or getting worse** —
 - **Medical consult**, send to hospital
 - Give second dose of **ceftriaxone** IM/IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses *p429*)
 - Continue **ciprofloxacin** oral twice a day (bd) until evacuation – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p430*)
 - **If getting better** —
 - Give **cefalexin** oral twice a day (bd) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p427*)
 - **AND ciprofloxacin** oral twice a day (bd) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses *p430*)
- Review again with swab result



Do — if moderate or severe infection after exposure to salt water

- **Medical consult**
- Send swab for MC&S — specify ‘marine infection’
- Give **ceftriaxone** IM/IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
- If under 8 years — also give **ciprofloxacin** oral twice a day (bd) until review – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p430](#))
- If 8 years or over — also give **doxycycline** oral single dose – adult 200mg, child 4mg/kg/dose up to 200mg (doses [p431](#))
- Review next day
 - **If not getting better or getting worse** —
 - **Medical consult**, send to hospital
 - Give second dose of **ceftriaxone** IM/IV single dose – adult 2g, child 50mg/kg/dose up to 2g (doses [p429](#))
 - If 8 years or over — give second dose of **doxycycline** oral single dose – adult 200mg, child 4mg/kg/dose up to 200mg (doses [p431](#))
 - If under 8 years — continue **ciprofloxacin** oral twice a day (bd) until evacuation – child 12.5mg/kg/dose up to 500mg (doses [p430](#))
 - **If getting better** —
 - Give **cefalexin** oral twice a day (bd) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p427](#))
 - If 8 years or over — also give **doxycycline** oral twice a day (bd) for 5 days – adult 100mg, child 2mg/kg/dose up to 100mg (doses [p431](#))
 - If under 8 years — also continue **ciprofloxacin** oral twice a day (bd) for 5 days – adult 500mg, child 12.5mg/kg/dose up to 500mg (doses [p430](#))
- Review again with swab result

Scabies

Due to tiny mite living in the skin. Itching and scratching cause sores that can get infected with bacteria that lead to kidney and heart problems.

- Spread by physical contact. Mites only live 2–3 days off the body
- To stop spread, treating scabies means treating person and all close contacts

Ask

- Itching, scratching
- Other family members with scabies
- Anyone in family or community with crusted scabies ([p396](#)) — possible source of infection
 - Always consider this for children with frequent presentations

Check

- Look for scratches and sores between fingers, on wrists, elbows, knees, ankles, under arms, around groin and bottom
- Babies often have blisters and pustules on palms of hands, soles of feet

Applying scabies creams or lotions

- Put on clean, dry skin
- Start with head including scalp and face — avoid eyes, lips, mouth
 - If hair very thick or infestation very bad — may need to shave head. Always get permission from person/carer
- Work carefully down whole body. Always include
 - Between fingers and toes, soles of feet, under nails
 - Body creases — behind ears, under jaw, neck, armpits, groin, bottom, under breasts
 - Joints and joints creases — elbows, knees, heels
- Advise to put on hands again after washing, put on child's hands again before bed

Do

- Infected babies, children, adults
 - In clinic do whole-body application of thin layer of **permethrin 5%** cream — see *Applying scabies creams and lotions (above)*
 - Adults and children — leave on for at least 8 hours (overnight)
 - Babies under 6 months — leave on for 6–8 hours
 - Repeat treatment in 1 week
- Treat all close contacts with **permethrin 5%** cream
 - Household members
 - Other people with close physical contact (eg holding infected child)
- Tell person itching may last for 2 or more weeks after treatment
- Encourage hand washing and short finger nails



- Ask family to wash clothes and sheets with laundry detergent and dry in sun, air blankets and mattresses in full sun
- Home visit to look for and treat other people with scabies or crusted scabies — may be source of infection
- If infected sores — treat as for school sores (impetigo) ([p394](#)) at same time as treating scabies

Do — if difficult case or treatment failure

- 2 or more presentations of scabies where
 - **Permethrin 5%** cream has not worked
 - *AND* reinfection unlikely because child treated properly/in clinic, repeat application of cream applied, all contacts treated
- If severe scabies affecting a lot of skin and person sick — **medical consult**

Step 1

- Whole-body application of **benzyl benzoate 25%** lotion — see *Applying scabies creams and lotions* ([p394](#))
 - **Child under 6 months** — **do not** use
 - **Child 6–23 months** — dilute with 3 parts water
 - **Child 2–12 years and sensitive adults** — dilute with equal part water
 - Occasionally causes severe skin irritation, usually resolves in 15 minutes
 - Test on small area of skin first — wait for 10 minutes
 - If severe reaction — dilute with equal part water for adults, **do not** use for children
 - Leave on for 24 hours

Step 2

Repeat topical treatment in 1 week.

- Whole body application of **benzyl benzoate 25%** lotion as in Step 1
- *OR* if not expected improvement for adults — use **benzyl benzoate 25%** lotion mixed with **tea tree oil**
 - **Do not** use tea tree oil on children
 - Test tea tree oil on small patch of skin and leave for 24 hours
 - If no reaction — do whole-body application in clinic of **benzyl benzoate 25%** lotion mixed with **tea tree oil**
 - Leave on for 24 hours
- See *Follow-up* ([p396](#))

Step 3

- If topical treatment and antibiotic for infected sores haven't worked — **medical consult**. May suggest
 - **Ivermectin** oral single dose with food on day 1 (doses [p434](#))
 - Repeat once in 7–14 days to kill any new mites that hatch
 - **Do not** give to children under 5 years or less than 15kg, women who are or could be pregnant
 - Combine with topical treatment unless skin sores present — see *Step 2*

Note: Ivermectin licensed in Australia for use in scabies when topical treatments fail or contraindicated. Must be prescribed by doctor familiar with ivermectin and its effects. If not experienced in use — **infectious diseases specialist consult.**

Follow-up

- Return to clinic 3 weeks after treatment completed to check response
- If person has scabies often — consider
 - Was cream/lotion applied properly
 - Did whole family/household get treated
 - Did everyone get second treatment after 1 week
 - Is there someone with crusted scabies
 - Is it hard to maintain good hygiene at home — washing facilities and household cleaning
 - Less common skin conditions that need review (eg infantile acropustulosis)
- Make sure anyone in community with crusted scabies gets treatment as a high priority. Unless they are treated, contacts will keep getting scabies
- If a lot of scabies in community — consider community program. Talk with CDC/PHU to help plan

Crusted scabies

Severe type of scabies caused by same mite — not sores from infected scabies. Person's immune system can't control number of mites, so thousands of mites, and very infectious.

High risk of serious bacterial infection in more severe cases. Lifelong risk of recurrence, reduced life expectancy. Manage as a chronic disease.

Can involve 'shame' and social isolation — take care to be culturally sensitive.

Check

- Look for thickened, scaly skin patches — may be 1–2 areas (eg bottom, hands, feet, shoulders) or may cover whole body with thick/flaky crust
 - Scale may have distinctive creamy colour, even in dark skinned people
 - Can look like tinea, psoriasis, eczema, dermatitis, school sores (impetigo) with a crust
- Often not itchy
- For each episode
 - Take blood for FBC, UEC, LFT, CRP, BGL
 - Collect skin scrapings (*CPM p386*) — scabies microscopy, fungal culture
 - Used to confirm diagnosis and for notification
 - Collect swab for MC&S
- If not done previously, take blood for HIV (repeat if ongoing risk), HTLV1, ANA, T-cell subsets
 - If ANA positive take blood for dsDNA, ENA



Do not

- **Do not** confuse with severe scabies with/without crusted skin sores

Do

- Diagnosis can be difficult. Must discuss with specialist
- Must notify confirmed cases — based on laboratory finding of scabies mites on scraping *AND* infectious disease specialist or dermatologist review of patient in person, via photos (with consent), or videoconference
- If crusted scabies suspected — medical review as soon as possible
- **Always** talk with CDC/PHU. Confirmed cases get public health response with contact tracing and treatment of household and close contacts
- Most people with crusted scabies need to be sent to hospital
 - People with Grade 2 or Grade 3 always sent to hospital
 - Some people with mild Grade 1 can be managed in community in consult with infectious diseases unit or specialist scabies service

Grade severity

Chose best option in each category and add numbers to get score.

A — Distribution and extent of crusting

1. Wrists, web spaces, feet only. Less than 10% TBSA
2. As above plus forearms, lower legs, buttocks, trunk
OR 10–30% TBSA
3. As above plus scalp *OR* more than 30% TBSA

B — Crusting/shedding

1. Mild crusting (less than 5mm deep), minimal skin shedding
2. Moderate crusting (5–10mm deep), moderate skin shedding
3. Severe crusting (more than 10mm deep), profuse skin shedding

C — Past episodes

1. Never had it before
2. Already been in hospital 1–3 times for crusted scabies
OR depigmentation of elbows, knees
3. Already been in hospital 4 or more times for crusted scabies
OR depigmentation of elbows, knees, legs/back
OR residual skin thickening or scaly skin

D — Skin conditions

1. No cracking or pus in skin (pyoderma)
2. Any of — multiple pustule/s, weeping sore/s, superficial skin cracking
3. Deep skin cracking with bleeding, widespread purulent exudates

Score

4–6 = Grade 1	7–9 = Grade 2	10–12 = Grade 3
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Grade 1

Can trial community management in consult with infectious diseases unit or specialist scabies service. Frequent clinical supervision needed.

- Give **ivermectin** oral once a day on days 0, 1, 7 (doses [p434](#))
 - **Do not** give to children under 5 years or less than 15kg *OR* women who are or could be pregnant — urine pregnancy test if not sure ([WBM p279](#))
- Whole-body application of topical agent — see *Applying scabies creams and lotions* ([p394](#))
 - Put on dry skin after soaking and scrubbing skin in bath or shower
 - Apply every second day for first week *THEN* twice a week until cured
- **Benzyl benzoate 25% lotion**
 - **Child under 6 months — do not** use
 - **Child 6–23 months** — dilute with 3 parts water
 - **Child 2–12 years and sensitive adults** — dilute with equal part water
 - Occasionally causes severe skin irritation, usually resolves in 15 minutes
 - Test on small area of skin first — leave for 10 minutes
 - If severe reaction — dilute with equal part water for adults, **do not** use for children
 - Leave on for 24 hours
- *OR* **benzyl benzoate 25% lotion mixed with tea tree oil**
 - **Do not** use on children
 - Test both benzyl benzoate and tea tree oil on small patches of skin — leave on for 24 hours
 - If sensitive to benzyl benzoate 25% — dilute with same amount of water
 - If sensitive to tea tree oil — **do not** use
 - Leave on for 24 hours
- *OR* **permethrin 5% cream** — if benzyl benzoate not available or not tolerated
 - Leave on for at least 8 hours (overnight)
- Use lactic acid and urea cream, every second day to soften skin. Use on different day to scabies cream

Long-term follow-up

- **Develop chronic care management plan**
 - High risk of reinfection
 - Need good communication between acute and primary care providers
 - Provide ongoing education. Important that person and family understand
 - About crusted scabies
 - What they can do to self-manage
 - Importance of a 'scabies-free zone'



- Review at 2 weeks and 4 weeks after discharge, then every 4 weeks to check skin for signs of reinfection, especially hands, shoulders, bottom
 - Regular reviews and early treatment if reinfected important to break cycle of scabies transmission and community outbreaks
 - **Lifelong follow-up needed while living in scabies endemic area**
- Chronic disease care involves skin checks and
 - **Lactic acid and urea cream** to soften crusted areas of skin. Use daily or as needed, but not on days when using topical scabies treatment
 - Moisturiser used daily to keep skin soft (eg sorbolene, hamilton oil)
 - If high risk of re-exposure (eg living in house with young children) — supervised whole-body application of topical treatment every 2–4 weeks for 6 months, then review
 - If reinfection — **infectious disease specialist consult** about management
- Educate person, family and community about scabies

Treating family and house

- Aim to make household a ‘scabies-free zone’ to protect person from reinfection after treatment
 - Educate person and family about what this means — includes treatment for visitors so person who gets crusted scabies can avoid reinfection
- Treat all household members and close contacts for scabies ([p394](#))
 - Work with hospital to ensure person not discharged home before all contacts treated
- Ask family to
 - Wash clothes and sheets with laundry detergent and dry in sun, air blankets and mattresses in full sun
 - Vacuum/sweep floor and soft furnishings to remove skin particles
- Sensitive management of household needed due to stigma and chronic nature of disease
- Consider permethrin treatment of house where person being treated for crusted scabies if
 - Crusted scabies severe or keeps coming back
 - Lots of children under 5 years with scabies
 - Ceremonies, festivals etc with increased number of visitors

Tinea

Common fungal infection, especially in hot climates. May get secondary bacterial infection. Usually spreads between people but can spread from animals.

- To help stop spread of infection (by reducing fungal spores) ask family to
 - Wash clothes and sheets with laundry detergent and dry in sun
 - Vacuum/sweep and mop floors, wipe over surfaces. Use disinfectant if available

Tinea of body skin (ringworm, jock itch, athlete's foot)

Often lasts a long time. In tropical northern Australia it can affect any area and be very widespread. In other places it is most common on warm, moist skin — between toes, under breasts, armpits, groin, around waist and spreading down.

Check

- Look for ring-like rash
 - Itchy, scaly
 - Raised spreading edge — silver on dark skin, reddish on pale skin
- May have weeping/crusty bacterial infection as well
- Consider crusted scabies ([p396](#)), kava dermatitis ([p220](#)), pityriasis versicolor ([p402](#)), leprosy (uncommon)
 - If you suspect leprosy — must refer to CDC/PHU for specialist review and treatment plan
- Collect skin scrapings from scaly edge of ring ([CPM p386](#)) — MC&S, fungal culture
- Email photo (with consent) to doctor to confirm diagnosis

Do — for small patches of rash (ringworm)

- **Terbinafine 1%** cream or gel once a day for 1 week
 - *OR* **miconazole 2%** cream twice a day (bd) for 4–6 weeks — including 2 weeks after rash gone
- If treatment doesn't work *OR* small patches in hairy areas, palms, or soles of feet — **medical consult**

Do — for widespread rash

- Give **terbinafine** oral once a day for 2 weeks — see Table 6.30 for doses
 - See *Precautions with oral terbinafine* ([p401](#))
 - If rash remains — **medical consult** about another 2 weeks of treatment

Table 6.30: Doses of oral terbinafine

Weight (kg)	Age (years)	Daily dose (mg)
10–20	1–6	62.5
21–40	7–12	125
41 or more	13 and over	250



Precautions with oral terbinafine

- Rare but serious side effects can develop after about 4 weeks of treatment — liver toxicity, blood abnormalities, skin rashes
- If treatment lasts more than 2 weeks — medical supervision
- If person has acute or chronic liver disease, kidney disease, is over 40 years, drinks too much alcohol — check LFT and FBC **before** treatment
 - If LFT abnormal — retest after 2 weeks of treatment
 - If LFT get worse — consider giving half the usual dose
 - Retest LFT and FBC again after another 2 weeks
- If adult with no risk factors — check LFT and FBC after every 4 weeks of treatment
- If child to be on treatment longer than 6 weeks — check LFT and FBC at 4 weeks. Make sure results followed up
- If symptoms of low white cell count or liver toxicity (eg fever, nausea) — check LFT and FBC again
- Terbinafine is Category B1 and present in breast milk — wait until after pregnancy and breastfeeding before treating, if possible

Tinea of the scalp (tinea capitis)

Usually a combination of mild scale and broken hairs, often with hair loss. Hairs can be broken off at different lengths *OR* all close to scalp, giving a black dot appearance.

Check

- Look for scaly rash or kerion (looks like boil but itchy), broken hairs
- Collect skin scrapings (*CPM p386*), pull some broken hairs with forceps (include root) — MC&S, fungal culture

Do

- Give **terbinafine** oral once a day for 4 weeks — see Table 6.30 for doses
 - See *Precautions with oral terbinafine (above)*
 - Medical supervision needed

Tinea of the nails

More common on toenails. Usually tinea on skin as well.

Check

- Nails thick, irregular, white, lifting up with chalky material under nail
- Collect nail clippings — MC&S, fungal culture
 - Cut nails as far back as comfortable
 - Scrape and collect chalky material from under nail

Do

If person high risk (eg recurrent cellulitis, diabetes) *OR* concerned about appearance after reassurance it is not dangerous —

- Give **terbinafine** oral once a day — 6 weeks for fingernails, 12 weeks for toenails. See Table 6.30 for doses
 - See *Precautions with oral terbinafine* (p401)
 - Medical supervision needed

Pityriasis versicolor (tinea versicolor, white spot)

Common in hot, humid areas in all age groups. Tends to be a chronic problem, but only important because of how it looks.

Check

- Round or oval patches — pale on dark skin, tan on light skin
 - Wood's lamp (black light)
 - Pale areas of skin show more clearly
 - Pityriasis versicolor may appear pale greenish-yellow
- Fine scaly rash — may be slightly itchy. Scale may only be noticed when scraping skin surface
 - Most common on upper trunk, shoulders, upper arms, neck — occasionally on face
- Could it be ringworm — pityriasis versicolor has finer scale, no raised edge, usually not itchy
- Collect skin scrapings (*CPM p386*) for microscopy

Do

- Use **selenium sulfide 2.5%** shampoo
 - Rub on affected skin, leave on for 10 minutes. Do every day for 2 weeks
 - *AND* shampoo hair every second day for 2 weeks
- *OR* use **ketoconazole 2%** shampoo
 - Rub on affected skin, leave on overnight. Repeat after 1 week
 - *AND* shampoo hair every day for 1 week
- No scale means treatment worked
- May take several months for colour to return to skin

Follow-up

- Often comes back even after successful treatment
- If not improving — consider dermatitis or leprosy (uncommon)
 - If you suspect leprosy — must refer to CDC/PHU for specialist review and treatment plan



Rashes

- If young baby unwell with rash — see *Babies under 2 months who are sick or have a fever* (p121)
- Be aware of
 - Purpuric or petechial rash with fever — see *Meningitis* (p101)
 - Itchy rash with breathing problems — see *Anaphylaxis* (p30)
- Assess the whole person not just the rash

Ask about

- The rash
 - How long have they had it
 - Where it started, where is it now
 - Is it itchy
 - Is it painful
- Associated features — fever, cough, runny nose, sore eyes, shortness of breath, eating and drinking
- Medicine used or immunisation given recently
- Any contacts who also have a rash

Check

- Look at person's skin from head to toe. Remove clothing. Make sure there is good light. Also look at nails, hair, inside mouth and throat
- Take photo of rash in sunlight (with consent) — can help with diagnosis
- Describe rash
 - Colour (eg red, purple, pale)
 - Evidence of scratching — has this affected appearance
 - Type of lesions
 - **Purpuric or petechial** — flat red-purple blotches/spots that don't blanch (p404)
 - **Maculopapular** — red spots with raised lesions you can feel (p404)
 - **Pustular** — raised lesions more than 0.5cm across, contain clear fluid or pus (p404)
 - **Vesicular** — small raised lesions less than 0.5cm across, contain fluid (p405)
 - **Itchy** (p405)
 - Size of lesions, distribution over body
 - Blanching — rash fades with pressure
 - Press skin with piece of glass (eg slide) or acrylic (eg clear plastic ruler) and note if rash fades
 - Bleeding into skin doesn't blanch — pinpoint lesions are **petechiae** and larger lesions are **purpura**
- Full head-to-toe examination for other problems

Table 6.31: Diagnosis of a rash and what to do

Purpuric or petechial rash <i>AND</i> other features	Possible diagnosis	What to do
<ul style="list-style-type: none"> • Fever • +/- confusion • +/- neck stiffness • +/- low BP 	<ul style="list-style-type: none"> • Meningococcal infection • Septicaemia 	<ul style="list-style-type: none"> • Medical consult straight away • See <i>Meningitis</i> (p101)
Note: Other causes — Henoch-Shönlein purpura, enteroviral infection, thrombocytopenia.		
Maculopapular rash <i>AND</i> other features	Possible diagnosis	What to do
<ul style="list-style-type: none"> • Cough • Conjunctivitis • Rash spreads down from head to body • Fever 	Measles	<ul style="list-style-type: none"> • Medical consult • Notify CDC/PHU • Take blood for measles and rubella antibodies • Throat swab for measles • Check if any non-immune pregnant women may have been exposed • Infectious until 4 days after rash appears
<ul style="list-style-type: none"> • Mildly unwell • Swollen lymph nodes, especially behind ears and back of head • Fever 	Rubella	<ul style="list-style-type: none"> • Medical consult • Notify CDC/PHU • Take blood for measles and rubella antibodies • Check if any non-immune pregnant women may have been exposed • Infectious until 4 days after rash appears
Note: Other causes — Scarlet fever, Kawasaki disease, drug reactions.		
Pustular rash <i>AND</i> other features	Possible diagnosis	What to do
	School sores (impetigo)	<ul style="list-style-type: none"> • See <i>School sores (impetigo)</i> (p387)
	Scabies	<ul style="list-style-type: none"> • See <i>Scabies</i> (p394)



Vesicular rash <i>AND</i> other features	Possible diagnosis	What to do
<ul style="list-style-type: none"> • Rash starts on head or trunk, then spreads to limbs • Lesions start as raised red spots then form vesicles, then crust — all 3 stages are present • Fever 	Chickenpox (p332)	<ul style="list-style-type: none"> • Check if people with weakened immune system have been exposed — chickenpox very serious for them • Check if any non-immune pregnant women may have been exposed • Infectious until all lesions have crusted
<ul style="list-style-type: none"> • Small vesicles in mouth and on hands and feet • Fever 	Hand, foot and mouth disease	<ul style="list-style-type: none"> • Simple pain relief (p377) • Keep up fluid intake
<ul style="list-style-type: none"> • Vesicles and ulcers on lips, gums, tongue, palate • Fever 	Oral cold sore (herpes simplex)	<ul style="list-style-type: none"> • See <i>Cold sores</i> (p390)
<ul style="list-style-type: none"> • Single or few painless lesions • Small, round, pearl-coloured lump/s 	Molluscum contagiosum virus	<ul style="list-style-type: none"> • See <i>Molluscum contagiosum</i> (p391)
Itchy rash <i>AND</i> other features	Possible diagnosis	What to do
<ul style="list-style-type: none"> • Papules or plaques • Small to large raised, solid lesions (welts) • May have pale centre • Usually itchy • Can appear and move about body very quickly 	Urticaria (hives)	<ul style="list-style-type: none"> • Always check for anaphylaxis (p30) • Need to check for cause (eg medicines, immunisations, bites, food allergy) • Medical consult
<ul style="list-style-type: none"> • Missing skin (excoriation), red, weeping, crusting • Face and scalp in infants • In bends of joints in older children 	Eczema Check for scabies (p394)	<ul style="list-style-type: none"> • Avoid soap, hot water • Moisturisers to skin • Medical consult about corticosteroid creams
<ul style="list-style-type: none"> • Scaly, raised, spreading edge • Often area of warm, moist skin (eg groin, armpit) 	Tinea	<ul style="list-style-type: none"> • See <i>Tinea</i> (p400)

Nappy rash

Rash in baby's nappy area. Usually due to skin irritation from prolonged contact with urine and/or faeces. Keeping skin in nappy area dry and free from irritation are most important parts of treatment.

Do

- Use absorbent, disposable nappies
- Change nappies often
- Let baby go without a nappy for a few hours each day — unless diarrhoea
- Use barrier cream (eg zinc and castor oil cream) with each nappy change to keep skin dry
- Wipe baby's bottom with damp cloth only
 - **Do not** use wipes with scent or alcohol — can irritate skin
- If rash not improving or moderately severe — use **hydrocortisone 1%** and **miconazole 2%** cream twice a day (bd) under barrier cream

Do not use topical corticosteroids stronger than **hydrocortisone 1%** on nappy area — stronger steroids may cause long-term skin damage.

Medical consult if

- Rash not improving
- Rash glazed with shiny red skin, rash painful, or baby has fever
 - May be streptococcal or staphylococcal cellulitis
 - Swab lesion for MC&S
 - Give **flucloxacillin** oral 4 times a day (qid) for 7 days – child 12.5mg/kg/dose up to 500mg (doses [p432](#))
 - *OR* if vomiting or won't take oral medicine — start with **procaine benzylpenicillin (procaine penicillin)** IM every 24 hours for up to 7 days – child 50mg/kg/dose up to 1.5g (doses [p435](#)). Change to **flucloxacillin** (as above) to complete 7 day course if possible
 - If not improving — consider sending to hospital
- Vesicles and red painful rash
 - May be herpes simplex
 - Swab for viral culture
 - If severe — consider antiviral treatment, sending to hospital



Sore throat

Sore throats (pharyngitis or tonsillitis) can be viral or bacterial. Can't tell which by looking. Group A Streptococcus (GAS) is common cause and easily spread (highly contagious). GAS also causes ARF, PSGN. Treating sore throats in at-risk groups important to prevent ARF, RHD, kidney failure.

Check

- Look for sore, red throat
- May also be fever, swollen glands in neck, pus on tonsils
- No cough

Do

- If noisy breathing (stridor), problems breathing, can't swallow saliva — **medical consult** straight away
- At-risk groups always given antibiotics for sore throat, even if it doesn't look red. Other people treated based on their symptoms

At-risk groups

- People aged 2–25 years in Indigenous communities
 - Anyone with existing RHD or history of ARF
- Give **benzathine penicillin (penicillin G)** IM single dose – adult 900mg, child see doses ([p426](#))
 - *OR* if injection not possible — give **phenoxymethylpenicillin** oral twice a day (bd) for 10 days – adult 500mg, child 15mg/kg/dose up to 500mg (doses [p435](#))
 - Very few people remember to take oral antibiotics for 10 days — think carefully before offering this option
 - If allergic to penicillin — give **cefalexin** oral twice a day (bd) for 10 days – adult 1g, child 25mg/kg/dose up to 1g (doses [p427](#))
 - If anaphylaxis to penicillin — give **azithromycin** oral once a day for 5 days – adult 500mg, child 12mg/kg/dose up to 500mg (doses [p426](#))
 - If severe case — **medical consult** straight away
 - Give **pain relief** if needed ([p377](#))
 - Tell them to gargle with salt water or dissolved **aspirin** (no aspirin for child under 12 years)
 - Encourage oral fluids
 - Advise to stay at home, away from others and not share bedroom for 24 hours after starting antibiotic to reduce spread to others

To prevent ARF, PSGN person must be given either

- Benzathine penicillin (penicillin G) single dose (long-acting)
- *OR full course* of oral antibiotics

Tuberculosis

Most people infected with TB develop immunity and don't get sick. Many only find out they were infected after having Mantoux (tuberculin) skin test. About 10% of people with TB infection (latent TB) go on to develop TB disease (active TB).

TB disease (active TB) usually affects the lungs, but can also affect glands (lymph nodes), kidneys, reproductive organs, bones, and other body parts.

People at high risk of TB infection (latent TB)

- People from areas with high rates of TB — Indigenous community with recent cases of TB, migrants from countries where TB is common
- Identified contacts of people known to have TB

People at high risk of developing TB disease (active TB) if infected

- Infants and children less than 5 years
- People within 2 years of being infected with TB
- Regular heavy drinkers of alcohol
- People with poor nutrition who are very thin
- Smokers
- People with diabetes
- People with weakened immune system (eg HIV, kidney disease)
- People on medicine that weakens immune system (eg corticosteroids)

Consider TB if any of

- Cough for more than 3 weeks that doesn't go away with treatment
- Cough with blood-stained sputum
- Unexplained weight loss, poor appetite
- Fever or night sweats
- Persistent, painless enlargement of lymph glands
- Close contact or relative with infectious TB
- Other symptoms if from high-risk group
- CSLD ([p314](#)) or bronchiectasis ([p316](#))

Ask

- Take history including
 - Contact with TB
 - Cough
 - Weight loss
 - Fever, night sweats

Check

- Temp, weight, lymph nodes, any part of body with symptoms
- Lung sounds (*CPM p189*) especially
 - Over apices
 - Dullness from pleural fluid collection in bases
- Collect 3 sputum specimens within 24 hours for MC&S and AFB (*CPM p385*)
 - Best to collect one early morning specimen — try for 1 straight away, 1 early next morning, 1 afternoon of second day
 - Collect sputum outside, away from other people
 - For child — fasting gastric aspirates can be collected instead of sputum.

TB unit consult

- Always arrange chest x-ray — even if TB suspected outside lungs
 - TB unit at CDC/PHU can help arrange travel and x-rays
 - Make sure x-ray reviewed by radiologist before person leaves
- Mantoux test not usually used to diagnose TB disease (active TB). Talk with TB unit about options

Do

- **TB unit consult** about past TB history and management
- If TB diagnosed or highly suspected — talk with CDC/PHU about sending to hospital
 - If diagnosed early and person not infectious and getting treatment — may not need to go to hospital
- **If infectious TB of lungs suspected (cough and sputum production)**
 - Tell retrieval team, send to hospital with infection control precautions
 - Person wears surgical mask, clinic staff caring for person wear duck bill (P2/N95) masks to prevent spread of infection until person isolated in hospital

Treatment of TB disease (active TB)

- TB can be cured by completing all treatment — takes at least 6 months
 - Treatment must be directly observed therapy (DOT) — where tablets are seen to be swallowed to ensure compliance. Document this
- If diagnosed in hospital
 - Person should receive education about TB before discharge
 - Will be sent home when no longer infectious, medically well, able to take medicine without side effects — may take weeks
- After discharge TB treatment may be given as DOT daily or at higher doses DOT 3 times a week
 - For TB without drug resistance, 4 medicines are given for 2 months, then 2 medicines for rest of treatment time
 - First line TB medicines are rifampicin, isoniazid, pyrazinamide, ethambutol
 - Pyridoxine (vitamin B6) given to prevent side effects from isoniazid



- Person with TB and family/carer need good support and education to successfully complete treatment. Person will feel well but must still complete all treatment. Community education can also help
- Person needs to understand side effects of medicines and come to clinic straight away if any occur
 - If new symptoms — **CDC/PHU consult** straight away
- Monthly reviews — reinforce about side effects, check medicine doses, ask if household contacts or friends have symptoms

Prevention of TB

- All close contacts of person with active TB should be checked for TB — contact tracing. Talk with TB unit about this
 - Contacts who have TB infection (latent TB) but not TB disease (active TB) may be offered preventive treatment
- BCG immunisation
 - Recommended for Indigenous newborns to prevent severe TB in childhood
 - Not recommended for adults — less effective, doesn't prevent spread of TB

Urine problems — over 12 years

If pregnant — very important to diagnose and manage UTIs. Management different, see *Urine problems in pregnancy* ([WBM p149](#)).

- Problems include
 - Bladder infection (cystitis)
 - Kidney infection (pyelonephritis)
 - Blood in urine (haematuria)
- Also consider
 - STI as cause of pain on passing urine, especially if 15–35 years — see *STI checks* – men ([p272](#)), women ([WBM p238](#)), young people ([p276](#))
 - Kidney stone pain ([p29](#)) (renal colic)
 - Chronic kidney disease ([p244](#))

Risk factors for complicated UTIs

- Adult males
- Kidney stones
- Chronic kidney disease
- Long-term urinary catheter
- Spinal cord problems (eg paraplegia)
- Weakened immune system — taking prednisolone, cancer chemotherapy, organ transplant
- Residents of an aged care facility
- Recent urinary tract procedure (eg surgery, catheter)
- UTI caused by bacteria other than E-coli

Ask

- UTI symptoms, upper (*below*) and lower ([p412](#))
 - Can have upper and lower UTIs at same time
- Always ask about STI symptoms — discharge, ulcers, sores, pain when having sex (dyspareunia)
- Ask and check file notes for risk factors for complicated UTIs (*above*)
- If female with lower abdominal pain — see *Pelvic inflammatory disease* ([WBM p260](#))
- If male with pain, discomfort, swelling in testes — see *Painful scrotum* ([p384](#))

Upper UTI symptoms

- Flank/loin pain — pain in back or side between ribs and pelvis
- Fever, shakes (rigors)
- Nausea, vomiting

If present — see *Kidney infections (pyelonephritis)* ([p414](#)).

Lower UTI symptoms

- Burning, discomfort, pain when passing urine (dysuria)
- Passing urine more often than usual (frequency)
- Lower abdominal pain
- Blood in urine (haematuria) ([p415](#))

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- U/A — mid-stream urine
- Check abdomen if lower abdominal pain ([p23](#)), flank/loin pain ([p28](#))
 - If female with lower abdominal pain — always consider PID ([WBM p260](#))

Interpreting U/A

- Positive nitrites usually means UTI — but negative nitrites doesn't mean no UTI
- Positive leukocytes common in well women *AND* in men and women with UTIs or STIs
- If blood — can be UTI, also see *Blood in urine (haematuria)* ([p415](#))
- If protein — can be UTI, also see *Testing for kidney disease* ([p237](#))

Do

- If risk factors ([p411](#)) — always do **medical consult**
- If lower UTI symptoms — see *Possible cystitis – males (below)*, *Possible cystitis – non-pregnant females* ([p413](#))
- If upper UTI symptoms — see *Kidney infections* ([p414](#))

Bladder infections

Possible cystitis — males

- Pain when passing urine in men usually STI

Check

- Send urine for MC&S
- Standard STI check ([p272](#))

Do

- Treat as STI ([p278](#)) straight away
- If UTI confirmed —
 - Give **trimethoprim** oral once a day for 7 days – 12+ years 300mg
 - *OR* **cefalexin** oral twice a day (bd) for 7 days – 12+ years 500mg
- Encourage oral fluids
- Offer practical advice on how to remember to take medicine (eg dose aid)

Note: Urinary alkalinisers may help relieve symptoms but don't treat infection.



Follow-up

- All men with confirmed UTI need
 - Medical review
 - Renal tract ultrasound for stones and abnormalities
- If symptoms return within 2 weeks of treatment — **medical consult** about more/different antibiotics, other tests

Possible cystitis — non-pregnant females

- Pain when passing urine in females can be UTI *OR* STI especially if 15–35 years

Check

- Send urine for MC&S
- If could be pregnant — offer urine pregnancy test ([WBM p279](#))
 - If positive — see *Urine problems in pregnancy* ([WBM p149](#))
- If 15–35 years — standard STI check ([WBM p238](#))

Do — for non-pregnant females

- If pain on passing urine and frequency *OR* positive nitrites on U/A —
 - Give **trimethoprim** oral once a day for 3 days – 12+ years 300mg
 - *OR* **cefalexin** oral twice a day (bd) for 5 days – 12+ years 500mg
- Encourage oral fluids

Note: Urinary alkalinisers may help relieve symptoms but don't treat infection.

Resistant UTI (doesn't get better)

UTI that doesn't get better with treatment *OR* comes back within 2 weeks of finishing treatment (relapses) *AND* is not PID.

- If urine not sent for MC&S — send
- If urine sent for MC&S — treat for 7 days according to antibiotic sensitivities
- **Medical consult**
- Offer practical advice on how to remember to take medicine (eg dose aid)

Recurrent UTI (comes back)

3 or more UTIs in 1 year.

- Always send urine for MC&S
- Arrange renal tract ultrasound
- Medical review, consider preventive antibiotics

Kidney infections (pyelonephritis)

- Work out level of kidney infection and manage accordingly — see Table 6.32

Table 6.32: Levels of kidney infection

Mild kidney infection	Moderate/severe kidney infection
<ul style="list-style-type: none"> • One sided (flank/loin) pain (p28) • No vomiting • Looks mildly unwell • BP normal • Fever 	<ul style="list-style-type: none"> • One sided (flank/loin) pain (p28) • Nausea and vomiting • Looks very unwell • BP normal or low (p422) • Fever • May be fast pulse (p422)

Mild kidney infection

Check

- Collect urine for MC&S before giving antibiotics

Do

- Give **trimethoprim** oral once a day for 10 days – 12+ years 300mg
- *OR* **cefalexin** oral 4 times a day (qid) for 10 days – 12+ years 500mg
- Give **pain relief** ([p377](#))

Follow-up

- Review next day and after 3 days
- If getting better after 3 days — finish antibiotics
 - Repeat urine MC&S 2 weeks after antibiotics finished
- If not getting better after 3 days or keeps getting infections —
 - **Medical consult**
 - Take blood for UEC
 - Refer for renal ultrasound

Moderate/severe kidney infection

Check

- Before giving antibiotics
 - Collect urine for MC&S
 - Take blood for blood cultures

Do

- **Medical consult**, send to hospital
- Put in IV cannula ([CPM p84](#))
 - Run **normal saline** 125mL/hr. Give faster if vomiting, not eating/drinking, low BP



- Give **ceftriaxone** IV single dose – 12+ years 1g
 - If unable to give IV — give **ceftriaxone** IM 1g mixed with 3.6mL **lidocaine (lignocaine) 1%**
- Give **pain relief** ([p377](#))

Follow-up

- If renal ultrasound not done in hospital — arrange referral
- Repeat urine MC&S 2 weeks after antibiotics finished

Blood in urine (haematuria)

Can be caused by infection (bladder, prostate, kidney), glomerulonephritis (kidney problem), hard physical activity, injuries, severe dehydration, periods (menstruation) and other bleeding from uterus in women, cancer.

Ask

- UTI symptoms, upper ([p411](#)) and lower ([p412](#))
- Colour of urine
- Injury, trauma, physical activity

Check

- Temp, pulse, RR, BP, O₂ sats — work out REWS ([p6](#))
- Weight
- For swelling of face and feet (oedema)
- Feel (palpate) abdomen and flanks/loins
- U/A, send urine for MC&S

Do

- Medical review

Worms

Common worms and sickness due to worms

Hookworm (*Ancylostoma duodenale*, *Necator americanus*)

- Transparent worms 8–11mm long
- Can cause
 - Anaemia (weak blood)
 - Cough

Threadworm (*Enterobius vermicularis*)

- White thread-like worm 5–13mm long, often seen in faeces
- Can cause itchy backside that wakes child at night

Whipworm (*Trichuris trichiura*)

- Round worm 30–50mm long
- Can cause
 - Diarrhoea, abdominal pain, anaemia
 - Rectal prolapse if infection heavy (rare)
 - Weight loss or growth faltering in child

Dwarf tapeworm (*Hymenolepis nana*)

- Tapeworm 25–40mm long, lives in small intestine
- Can cause vague abdominal symptoms
- Treat if child has abdominal pains, diarrhoea, growth faltering
 - Also check for other reasons for these problems

Strongyloides (*Strongyloides stercoralis*)

- Up to 2mm long — can reproduce in body for many years, unless treated
- Strongyloidiasis — often no symptoms, but can cause
 - Smelly diarrhoea, abdominal pain, loss of appetite, constipation
 - Skin rash (especially one that moves along hour by hour), itchy sores (hives/urticaria) on lower back or buttocks
 - Cough, wheeze, coughing up blood (haemoptysis)
 - Low blood potassium, especially in young child
- Can rarely cause death due to
 - Severe secondary infection — blood infection, pneumonia, meningitis
 - Disseminated hyperinfection — massive worm infection spreads through body if person has weakened immune system (eg HTLV1 infection, using corticosteroids for more than 2 weeks, chemotherapy, transplant medicines)



Testing for worms

Faeces testing

Send faeces specimen (*CPM p398*) — as fresh as possible for

- OCP (ova, cysts, parasites)
- *AND* MC&S
- *AND* strongyloides culture

Keep specimens cool but not refrigerated. Heat and cold will kill the worms.

Strongyloides serology

Best for chronic strongyloidiasis — may not be positive in new cases or disseminated strongyloidiasis.

- Blood test — easiest way to test adults for chronic strongyloidiasis
- Faeces test usually best for children with symptoms — likely to have new infection that may not show up in blood test

Testing for strongyloides — faeces and/or serology

- Person with symptoms that suggest strongyloidiasis
- Person starting treatment that may weaken the immune system — test before starting treatment and every 3 months while on treatment
- Person starting corticosteroids — if treatment for at least 2 weeks
- Person with unexplained high eosinophil (type of white blood cell) count
- **Do not** test people who have no symptoms of strongyloides or don't fit one of the other categories in this list

Treatment

Hookworms, threadworms, whipworms, dwarf tapeworms

- If positive faeces test — see Table 6.33
- Threadworms — also treat household contacts and carers to reduce risk of reinfection

Strongyloides treatment

- If positive faeces test — see Table 6.33
- If positive serology
 - **Medical consult** before treating — blood test can be hard to interpret
 - Medical review — need to identify underlying or complicating factors
- If person from high prevalence area (check with CDC/PHU) is on or starting treatment that weakens immune system — treat for strongyloides even if blood and/or faeces test negative
 - Treat (as in Table 6.33) before starting treatment that weakens immune system and every 3 months while on treatment

Table 6.33: Worm treatment if positive faeces test

Worm	Medicine	Dose	Comments
Hookworm Threadworm	Albendazole*	Oral single dose – <ul style="list-style-type: none"> • 6–11 months 200mg • 1 year and over 400mg 	<ul style="list-style-type: none"> • Best with water on empty stomach • Tablets can be crushed or chewed
Hookworm	Pyrantel	Oral once a day for 3 days – <ul style="list-style-type: none"> • 10mg/kg/dose up to 1g (doses p436) 	<ul style="list-style-type: none"> • Use instead of albendazole for females who are or could be pregnant
Threadworm	Pyrantel	Oral single dose – <ul style="list-style-type: none"> • 10mg/kg/dose up to 1g (doses p436) 	<ul style="list-style-type: none"> • Use instead of albendazole for females who are or could be pregnant
Whipworm	Albendazole*	Oral once a day for 3 days – <ul style="list-style-type: none"> • 6–11 months 200mg • 1 year and over 400mg 	<ul style="list-style-type: none"> • Best with water on empty stomach • Tablets can be crushed or chewed
Dwarf tapeworm	Praziquantel	Oral single dose – <ul style="list-style-type: none"> • 25mg/kg/dose (doses p435) 	<ul style="list-style-type: none"> • Adults swallow whole • Children don't like taste
Strongyloides	Ivermectin**	Oral single dose – <ul style="list-style-type: none"> • 5 years+/15kg+ 200microgram/kg/dose (doses p434) Repeat in 1–2 weeks	<ul style="list-style-type: none"> • For adults and children 5 years and over and 15kg or more • Best with full cream milk, fatty food
Strongyloides	Albendazole*	Oral once a day for 3 days – <ul style="list-style-type: none"> • 6–11 months 200mg • 1–4 years/less than 15kg or pregnant 400mg Repeat in 1–2 weeks	<ul style="list-style-type: none"> • For children 6 months to 4 years • Best with breast milk (under 1 year), full cream milk, fatty food

* **Albendazole** — **do not give** to children under 6 months or females who are pregnant (urine pregnancy test if not sure [[WBM p279](#)]) without **medical consult**

** **Ivermectin** — **do not give** to children under 5 years, or less than 15kg or females who are pregnant (urine pregnancy test if not sure [[WBM p279](#)]) without **medical consult**



Follow-up — all worms

Follow-up all people who have been treated.

- If from high prevalence area (check with CDC/PHU) and on treatment that weakens immune system — test and treat if needed every 3 months
- Everyone else — do faeces test again after 6 months if
 - Symptoms continue
 - Person has weakened immune system
- If still positive — medical review

Community children's de-worming program

Done in areas where hookworm is/has been common. Best done just before or just after the wet season. Can be done with routine child or school-aged health checks.

- 6 months to 16 years — **albendazole** oral single dose once a year —
6–11 months 200mg, 1 year and over 400mg
 - Best taken with water on an empty stomach
- *OR* for girls who are pregnant (urine pregnancy test if not sure [[WBM p279](#)])
— **pyrantel** oral single dose once a year — 10mg/kg/dose up to 1g (doses [p436](#))

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Clinical observations

Approximate normal physiological ranges

Temperature (°C)

- Oral — 36.5–37.5 oral
- Under arm (axillary) — 36–37
- Rectal — 37–37.8
- In ear (tympanic) — 36.8–37.8

Age	Weight (kg)	Pulse (beats/min) Normal range	RR (breaths/min)	BP systolic (mmHg) Lower limit	BP systolic (mmHg) Upper limit	BP diastolic (mmHg) Upper limit
Newborn	3.3	110–160	30–60	–	–	–
3 months	6.2	110–150	30–50	–	–	–
6 months	7.6	110–150	30–50	–	–	–
1 year	9	110–150	20–40	–	–	–
2 years	12	95–140	20–30	–	–	–
4 years	16	95–140	20–25	78	111	69
6 years	20	80–120	20–25	82	112	74
8 years	25	80–120	20–25	86	114	76
10 years	32	80–120	20–25	90	116	80
12 years	40	60–100	16–20	90	122	81
14 years	50	60–100	16–20	90	127	83
17 years+	70+	60–100 Pregnant 80–110	16–20	90	136	83

Antibiotics doses table

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment.
 † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.

Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Aciclovir† Tab: 200mg, 200mg (disp), 800mg Susp: (4mg/mL) [#] Pregnancy: B3 – safe to use. Breastfeed: Safe to use.	Chickenpox Shingles	Oral 5 times a day	20mg/kg/dose	66mg (16.6mL)	124mg (31mL)	152mg (38mL)	180mg (45mL)	240mg (60mL)	320mg (80mL or 1½ tab – 200mg)	400mg (100mL or 2 tab – 200mg)	500mg (125mL or 2½ tab – 200mg)	640mg (160mL or 3½ tab – 200mg)	800mg (200mL or 1 tab – 800mg)	[#] Mix 200mg dispersible tablet in 50mL water to make 4mg/mL solution. Mix well and use straight away. If weakened immune system – increase dose. If kidney disease – reduce dose.
Albendazole Tab: 200mg, 400mg Pregnancy: D – do not use. Breastfeed: Appears safe.	Hookworm Threadworm Strongyloides Whipworm	Oral Single dose Oral Once a day		N/A	200mg (1 tab – 200mg)	400mg (2 tab – 200mg or 1 tab – 400mg)						Tablets can be chewed or crushed.		

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment. † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Amoxicillin† Susp: 50mg/mL Cap: 500mg Pregnancy: A – safe to use. Breastfeed: Safe to use.	Dental infection	Oral 3 times a day (tds)	12.5mg/kg/dose	41.25mg (0.9mL)	77.5mg (1.6mL)	95mg (1.9mL)	112.5mg (2.3mL)	150mg (3mL)	200mg (4mL)	250mg (5mL)	312.5mg (6.3mL)	400mg (8mL)	500mg (10mL or 1 cap)	
	Broken jaw	Oral Single dose	15mg/kg/dose	49.5mg (1mL)	93mg (2mL)	114mg (2.4mL)	135mg (2.8mL)	180mg (3.6mL)	240mg (4.8mL)	300mg (6mL)	375mg (7.6mL)	480mg (9.6mL)	500mg (10mL or 1 cap)	
	Nose bleed Sinusitis	Oral 3 times a day (tds)												
	Dental infection	Oral Single dose	25mg/kg/dose	82.5mg (1.8mL)	155mg (3.2mL)	190mg (3.8mL)	225mg (4.6mL)	300mg (6mL)	400mg (8mL)	500mg (10mL or 1 cap)	625mg (12.6mL)	800mg (16mL)	1g (20mL or 2 cap)	
	Otitis media Sinusitis	Oral Twice a day (bd)												
	Pneumonia	Oral 3 times a day (tds)												
	Pneumonia	Oral Twice a day (bd)	35mg/kg/dose	115.5mg (2.4mL)	217mg (4.4mL)	266mg (5.4mL)	315mg (6.4mL)	420mg (8.4mL)	560mg (11.2mL)	700mg (14mL)	875mg (17.6mL)	1g (20mL or 2 cap)	1.5g (30mL or 3 cap)	
	Endocarditis prevention	Oral Single dose	50mg/kg/dose	165mg (3.4mL)	310mg (6.2mL)	380mg (7.6mL)	450mg (9mL)	600mg (12mL)	800mg (16mL)	1g (20mL or 2 cap)	1.25g (25mL)	1.5g (30mL or 3 cap)	2g (40mL or 4 cap)	
	Otitis media	Oral Twice a day (bd)												

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment.
† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.

Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Amoxicillin-clavulanic acid† Susp: 80+11.4mg/mL Tab: 875+125mg Pregnancy: B1 – avoid if PROM. Breastfeed: Caution.	Bite injury Chronic cough CSLD Dental infection Diabetic ulcer Soft tissue injury UTI	Oral Twice a day (bd)	22.5mg/kg/dose	74.25mg (1mL)	139.5mg (1.8mL)	171mg (2.2mL)	202.5mg (2.6mL)	270mg (3.4mL)	360mg (4.6mL)	450mg (5.8mL)	562.5mg (7.2mL)	720mg (9mL)	875mg (11mL or 1 tab)	Doses worked out using amoxicillin component.
	Otitis media	Oral Twice a day (bd)	50mg/kg/dose	165mg (2.2mL)	310mg (4mL)	380mg (4.8mL)	450mg (5.8mL)	600mg (7.6mL)	800mg (10mL)	1g (12.6mL)	1.25g (15.8mL)	1.6g (20mL)	1.75g (22mL or 2 tab)	
Amoxicillin Inj#: 500mg Ampicillin Inj#: 500mg, 1g Pregnancy: A – safe to use. Breastfeed: Safe to use.	Endocarditis prevention Gall bladder	IV Single dose	50mg/kg/dose	165mg (1.8mL)	310mg (3.2mL)	380mg (3.8mL)	450mg (4.6mL)	600mg (6mL)	800mg (8mL)	1g (10mL)	1.25g (12.6mL)	1.6g (16mL)	2g (20mL)	# Mix with WFI to give 100mg/mL — 500mg + 4.7mL, 1g + 9.3mL.
	Dental infection Sepsis	IV Every 6 hours (qid)												

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment.														
† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Azithromycin † Susp: 40mg/mL Tab: 500mg Pregnancy: B1 – safe to use. Breastfeed: Safe to use.	Trachoma* – TF or TI	Oral Single dose		80mg (2mL)	160mg (4mL)			240mg (6mL)	400mg (10mL)	500mg (12.5mL or 1 tab)		750mg (18.8mL or 1½ tab)	1g (25mL or 2 tab)	* Trachoma doses taken from CDNA trachoma guidelines (2014).
	Shigella	Oral Once a day	5mg/kg/dose	16.5mg (0.4mL)	31mg (0.8mL)	38mg (1mL)	45mg (1.2mL)	60mg (1.6mL)	80mg (2mL)	100mg (2.6mL)	125mg (3.2mL)	160mg (4mL)	200mg (5mL) 50kg+ 250mg (6.4mL or ½ tab)	
		Oral Single dose	10mg/kg/dose	33mg (0.9mL)	62mg (1.6mL)	76mg (2mL)	90mg (2.4mL)	120mg (3mL)	160mg (4mL)	200mg (5mL)	250mg (6.4mL or ½ tab)	320mg (8mL)	400mg (10mL) 50kg+ 500mg (12.6mL or 1 tab)	
	Sore throat	Oral Once a day	12mg/kg/dose	39.6mg (1mL)	74.4mg (2mL)	91.2mg (2.4mL)	108mg (2.8mL)	144mg (3.6mL)	192mg (4.8mL)	240mg (6mL)	300mg (7.6mL)	384mg (9.6mL)	480mg (12mL or 1 tab)	
	CSLD	Oral Once a week	30mg/kg/dose	N/A	186mg (4.8mL)	228mg (5.8mL or ½ tab)	270mg (6.8mL)	360mg (9mL)	480mg (12mL or 1 tab)	600mg (15mL)	750mg (18.8mL or 1½ tab)	1g (25mL or 2 tab)		
Benzathine penicillin (penicillin G) Inj: 442mg/mL (2.3mL syringe) Pregnancy: A – safe to use. Breastfeed: Safe to use.	Chickenpox Skin sores Sore throat	Deep IM Single dose		225mg (0.5mL)	337.5mg (0.8mL)			450mg (1mL)	675mg (1.6mL)	900mg (2.3mL)				Long-lasting low levels of penicillin. Do not give for pneumonia.
	RHD	Deep IM Every 28 days		450mg (1.15mL)					900mg (2.3mL)					

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† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Benzylpenicillin† Inj [†] : 600mg, 1.2g Pregnancy: A – safe to use. Breastfeed: Safe to use.	Pneumonia	IV or IM Single dose	30mg/kg/dose (mixed)	99mg (0.3mL)	186mg (0.6mL)	228mg (0.8mL)	270mg (0.9mL)	360mg (1.2mL)	480mg (1.6mL)	600mg (2mL)	750mg (2.6mL)	960mg (3.2mL)	1.2g (4mL)	# Mix with WFI to give 300mg/mL – 600mg + 1.6mL, 1.2g + 3.2mL. Inject over 5 minutes. Infuse over 30 minutes.
	Pneumonia	IV or IM Every 6 hours (qid)												
	Dental infection	IV Every 6 hours (qid)												
	Meningitis	IV Single dose	60mg/kg/dose (mixed)	198mg (0.7mL)	372mg (1.3mL)	456mg (1.6mL)	540mg (1.8mL)	720mg (2.4mL)	960mg (3.2mL)	1.2g (4mL)	1.5g (5mL)	1.92g (6.4mL)	2.4g (8mL)	
Cefaclor† Susp: 50mg/mL Tab: 375mg Pregnancy: B1 – safe to use. Breastfeed: Safe to use.	CSLD	Oral Twice a day (bd)	25mg/kg/dose	82.5mg (1.8mL)	155mg (3.2mL)	190mg (3.8mL)	225mg (4.6mL)	300mg (6mL)	400mg (8mL or 1 tab)	500mg (10mL)	625mg (12.6mL)	800mg (16mL or 2 tab)		
Cefalexin† Susp: 50mg/mL Cap: 250mg, 500mg Pregnancy: A – safe to use. Breastfeed: Safe to use.	Water-related infection	Oral Twice a day (bd)	12.5mg/kg/dose	41.25mg (0.9mL)	77.5mg (1.6mL)	95mg (2mL)	112.5mg (2.4mL)	150mg (3mL)	200mg (4mL)	250mg (5mL or 1 cap – 250mg)	312.5mg (6.4mL)	400mg (8mL)	500mg (10mL or 1 cap – 500mg)	
	Boils Diabetic ulcer Soft tissue injury	Oral 4 times a day (qid)												
	Sore throat	Oral Twice a day (bd)	25mg/kg/dose	82.5mg (1.8mL)	155mg (3.2mL)	190mg (3.8mL)	225mg (4.6mL)	300mg (6mL)	400mg (8mL)	500mg (10mL or 1 cap – 500mg)	625mg (12.6mL)	800mg (16mL)	1g (20mL or 2 cap – 500mg)	

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment. † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Cefazolin Inj [†] : 500mg, 1g, 2g Pregnancy: B1 – safe to use. Breastfeed: Safe to use.	Bone infection	IV Single dose	50mg/kg/dose	N/A	310mg (3.2mL)	380mg (3.8mL)	450mg (4.6mL)	600mg (6mL)	800mg (8mL)	1g (10mL)	1.25g (12.6mL)	1.6g (16mL)	2g (20mL)	# Mix with normal saline to give 100mg/mL — 500mg + 4.8mL, 1g + 9.6mL, 2g + 19mL. Inject over 3 minutes. Infuse over 30 minutes.
	Cellulitis, skin Soft tissue injury	IV Every 8 hours (tds)												
	Compound fracture Head injury	IV or IO Every 8 hours (tds)												
Cefotaxime Inj [†] : 1g, 2g Pregnancy: B1 – safe to use. Breastfeed: Safe to use.	Sepsis	IV Single dose	50mg/kg/dose	165mg (1.8mL)	310mg (3.2mL)	380mg (3.8mL)	450mg (4.6mL)	600mg (6mL)	800mg (8mL)	1g (10mL)	1.25g (12.6mL)	1.6g (16mL)	2g (20mL)	# Mix with WFI to give 100mg/mL 1g + 9.6mL, 2g + 19mL. Inject over 3–5 minutes.

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment.														
† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Ceftriaxone Inj [†] : 500mg, 1g, 2g Pregnancy: B1 – safe to use. Breastfeed: Safe to use.	Bowel obstruction Cellulitis, eye Meliodosis Penetrating eye injury Peritonitis Pneumonia Sepsis	IV Single dose	50mg/ kg/dose	165mg (0.7mL)	310mg (1.3mL)	380mg (1.6mL)	450mg (1.8mL)	600mg (2.4mL)	800mg (3.2mL)	1g (4mL)	1.25g (5mL)	1.6g (6.4mL)	2g (8mL)	# Mix to give 250mg/mL — 500mg + 2mL, 1g + 3.5mL, 2g + 7.2mL. IV mix with WFI. IM mix with lidocaine (lignocaine) 1% – not more than 1g in each buttock. Inject (up to 1g) over 3 minutes. Do not mix with Hartmann's solution.
	Chest injury Water-related infection	IV or IM Single dose												
	Pneumonia	IV or IM Once a Day												
	Gonococcal conjunctivitis	IV or IM Single dose	50mg/ kg/dose	125mg (0.5mL)	310mg (1.3mL)	380mg (1.6mL)	450mg (1.8mL)	600mg (2.4mL)	800mg (3.2mL)	1g (4mL)				
	Gall bladder	IV Single dose	50mg/ kg/dose	165mg (0.7mL)	310mg (1.3mL)	380mg (1.6mL)	450mg (1.8mL)	600mg (2.4mL)	800mg (3.2mL)	1g (4mL)				
	Abdominal wound	IV or IM Single dose												
	Bite injury	IV or IM Every 12 hours (bd)												
	Meningitis	IV Single dose	100mg/ kg/dose	N/A	620mg (2.6mL)	760mg (3.2mL)	900mg (3.6mL)	1.2g (4.8mL)	1.6g (6.4mL)	2g (8mL)	2.5g (10mL)	3.2g (12.8mL)	4g (16mL)	

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Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Ciprofloxacin Tab: 250mg, 500mg, 750mg Inj: 2mg/mL (50mL, 100mL, 200mL) Pregnancy: B3 – not recommended. Breastfeed: Caution.	Diabetic ulcer Soft tissue injury Water-related infection	Oral Twice a day (bd)	12.5mg/kg/dose	N/A			125mg (½ tab – 250mg)	187.5mg (¾ tab – 250mg)	250mg (1 tab – 250mg)	312.5mg (1¼ tab – 250mg)	375mg (1½ tab – 250mg)	500mg (1 tab – 500mg)	If kidney disease — reduce dose.	
Clindamycin Cap: 150mg Inj [†] : 150mg/mL (2mL, 4mL) Pregnancy: A – safe to use. Breastfeed: Safe to use.	Dental infection	Oral 3 times a day (tds)	7.5mg/kg/dose	N/A					150mg (1 cap)	300mg (2 cap)	# Mix measured dose with glucose 5% or normal saline to give concentration not more than 12.5mg/mL.			
	Bite injury Cellulitis, skin Diabetic ulcer Soft tissue injury	Oral 3 times a day (tds)	10mg/kg/dose	N/A					150mg (1 cap)	300mg (2 cap)	450mg (3 cap)	Infuse slowly – not more than 30mg/minute.		
	Endocarditis prevention	Oral Single dose	20mg/kg/dose	N/A		150mg (1 cap)			300mg (2 cap)	450mg (3 cap)	600mg (4 cap)			
	Bite injury Dental infection Soft tissue injury	IV Every 8 hours (tds)	10mg/kg/dose	N/A	62mg (0.4mL)	76mg (0.5mL)	90mg (0.6mL)	120mg (0.8mL)	160mg (1.1mL)	200mg (1.4mL)	250mg (1.8mL)	320mg (2.2mL)	400mg (2.8mL) 45kg+ 450mg (3mL)	
	Compound fracture Head injury Soft tissue injury	IV Every 8 hours (tds)	15mg/kg/dose	N/A	93mg (0.6mL)	114mg (0.8mL)	135mg (0.9mL)	180mg (1.2mL)	240mg (1.6mL)	300mg (2mL)	375mg (2.6mL)	480mg (3.2mL)	600mg (4mL)	

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment.														
† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Dicloxacillin Cap: 250mg, 500mg Pregnancy: B2 – safe to use. Breastfeed: Safe to use.	Boils	Oral 4 times a day (qid) OR Twice a day (bd) with probenecid	12.5mg/kg/dose	N/A						250mg (1 cap – 250mg)		500mg (1 cap – 500mg)		If giving with probenecid – give same treatment dose but only give twice a day (ie give half usual daily total dose).
Doxycycline Tab: 50mg, 100mg Cap: 50mg, 100mg Pregnancy: D – do not use . Breastfeed: Safe for 7–10 days.	Dental infection	Oral Once a day	2mg/kg/dose	N/A						50mg (1 tab or 1 cap – 50mg)		100mg (1 tab or 1 cap – 100mg)		
	Water-related infection	Oral Twice a day (bd)		N/A						100mg (1 tab or 1 cap – 100mg)		150mg (3 tab or 3 cap – 50mg)		
	Dental infection Water-related infection	Oral Single dose	4mg/kg/dose	N/A						100mg (1 tab or 1 cap – 100mg)		150mg (3 tab or 3 cap – 50mg) 50kg+ 200mg (2 tab or 2 cap – 100mg)		
Famciclovir Tab: 125mg, 250mg Pregnancy: B1 – aciclovir safer. Breastfeed: Safe to use.	Chickenpox Shingles	Oral 3 times a day (tds)	5mg/kg/dose	N/A						125mg (1 tab – 125mg)		250mg (1 tab – 250mg)		

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment. † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Flucloxacillin† Susp: 50mg/mL Cap: 500mg Inj [†] : 500mg, 1g Pregnancy: B1 – safe to use. Breastfeed: Safe to use.	Boils	Oral 4 times a day (qid) <i>OR</i> Twice a day (bd) with probenecid	12.5mg/kg/dose	N/A	77.5mg (1.6mL)	95mg (2mL)	112.5mg (2.4mL)	150mg (3mL)	200mg (4mL)	250mg (5mL)	312.5mg (6.4mL)	400mg (8mL)	500mg (10mL or 1 cap)	If giving with probenecid — give same treatment dose but only give twice a day (ie give half usual daily total dose).
	Nappy rash	Oral 4 times a day (qid)												
	Endocarditis prophylaxis	Oral Single dose	25mg/kg/dose	N/A	155mg (3.2mL)	190mg (3.8mL)	225mg (4.6mL)	300mg (6mL)	400mg (8mL)	500mg (10mL or 1 cap)	625mg (12.6mL)	800mg (16mL)	1g (20mL or 2 cap)	
	Cellulitis, eye Mastoiditis	IV Single dose	50mg/kg/dose	N/A	310mg (6.2mL)	380mg (7.6mL)	450mg (9mL)	600mg (12mL)	800mg (16mL)	1g (20mL)	1.25g (25mL)	1.6g (32mL)	2g (40mL)	# Mix with WFI to give 50mg/mL — 500mg + 9.6mL, 1g + 19.3mL. Inject over 3 minutes. Infuse over at least 30 minutes.

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment.														
† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Ivermectin Tab: 3mg Pregnancy: B3 – avoid use. Breastfeed: May be used.	Scabies Strongyloides	Oral Single dose	200micro-gram/ kg/dose	N/A						1 tab	2 tab		3 tab 60kg 4 tab 70kg 5 tab 80kg+ 6 tab	Do not give to children under 5 years, or less than 15kg. Best with full cream milk or fatty food.
	Crusted scabies	Oral Once a day												
Metronidazole [†] Susp: 40mg/mL Tab: 200mg, 400mg Inj: 5mg/mL Pregnancy: B2 – safe to use. Breastfeed: Safe to use.	Broken jaw	Oral Single dose	10mg/ kg/dose	33mg (0.8mL)	62mg (1.6mL)	76mg (2mL)	90mg (2.4mL)	120mg (3mL)	160mg (4mL)	200mg (5mL or 1 tab – 200mg)	250mg (6.4mL)	320mg (8mL or 1½ tab – 200mg)	400mg (10mL or 1 tab – 400mg)	Must not drink alcohol while taking and for 24 hours after. If pregnant or breastfeeding — give divided doses. If severe liver disease — reduce dose.
	Dental infection Diabetic ulcer Soft tissue injury	Oral Twice a day (bd)												
	<i>Giardia</i>	Oral Once a day	30mg/ kg/dose	99mg (2.6mL)	186mg (4.8mL)	228mg (5.8mL)	270mg (6.8mL)	360mg (9mL or 1 tab – 400mg)	480mg (12mL or 1 tab – 400mg)	600mg (15mL or 3 tab – 200mg)	750mg (18.8mL or 2 tab – 400mg)	960mg (24mL or 5 tab – 200mg)	1.2g (3 tab – 400mg) 50kg 1.6g (4 tab – 400mg) 60kg+ 2g (5 tab – 400mg)	
	Gall bladder	IV Single dose	12.5mg/ kg/dose	41.25mg (8.4mL)	77.5mg (15.6mL)	95mg (19mL)	112.5mg (22.6mL)	150mg (30mL)	200mg (40mL)	250mg (50mL)	312.5mg (62.6mL)	400mg (80mL)	500mg (100mL)	
	Bite injury Dental infection Soft tissue injury	IV Twice a day (bd)												

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment.														
† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Phenoxymethylpenicillin† Susp: 50mg/mL (250mg/5mL) Cap: 500mg Pregnancy: A – safe to use. Breastfeed: Safe to use.	Dental infection Cellulitis, skin	Oral 4 times a day (qid)	12.5mg/kg/dose	41.25mg (0.83mL)	77.5mg (1.6mL)	95mg (2mL)	112.5mg (2.4mL)	150mg (3mL)	200mg (4mL)	250mg (5mL)	312.5mg (6.4mL)	400mg (8mL)	500mg (10mL or 1 cap)	
	Sore throat	Oral Twice a day (bd)	15mg/kg/dose	49.5mg (1mL)	93mg (2mL)	114mg (2.4mL)	135mg (2.8mL)	180mg (3.6mL)	240mg (4.8mL)	300mg (6mL)	375mg (7.6mL)	480mg (9.6mL)	500mg (10mL or 1 cap)	
Praziquantel Tab: 600mg Pregnancy: B1 – appears safe. Breastfeed: Safe to use.	Dwarf tapeworms	Oral Single dose	25mg/kg/dose	N/A			300mg (½ tab)			450mg (¾ tab)	600mg (1 tab)	750mg (1½ tab)	900mg (1½ tab) 50kg+ 1.2g (2 tab)	Children don't like the taste.
Probenecid Tab: 500mg Pregnancy: B2 – specialist advice. Breastfeed: Specialist advice.	Boils	Oral Twice a day (bd)	25mg/kg/dose	N/A				250mg (½ tab)		500mg (1 tab)		750mg (1½ tab)	1g (2 tab)	Delays excretion of penicillin.
Procaine benzylpenicillin (procaine penicillin) Inj: 1.5g (3.4mL syringe) Pregnancy: A – safe to use. Breastfeed: Safe to use.	Bites	Deep IM Single dose	50mg/kg/dose	165mg (0.4mL)	310mg (0.7mL)	380mg (0.9mL)	450mg (1.1mL)	600mg (1.4mL)	800mg (2mL)	1g (2.4mL)	1.25g (3mL)	1.5g (3.4mL)	Shake well. Put into another syringe to measure small doses accurately.	
	Bites Cellulitis, skin Nappy rash Pneumonia	Deep IM Once a day												

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment. † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.															
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes	
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years		
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+		
Pyrantel Susp: 50mg/mL Tab: 125mg, 250mg Choc sq: 100mg Pregnancy: B2 – safe to use. Breastfeed: Safe to use.	Threadworm	Oral Single dose	10mg/kg/dose	N/A					120mg (2.4mL or 1 tab – 125mg)	160mg (3.2mL or 1½ sq or 1 tab – 125mg)	200mg (4mL or 2 sq or 1½ tab – 125mg)	250mg (5mL or 2½ sq or 1 tab – 250mg)	320mg (6.4mL or 3 sq)	400mg (4 sq or 3 tab – 125mg)	Tablet can be crushed. Can be given to children under 6 months, females who are or could be pregnant.
	Hookworm	Oral Once a day	10mg/kg/dose										60kg 600mg (6 sq or 5 tab – 125mg)	80kg 800mg (3 tab – 250mg)	
Roxithromycin Tab: 50mg (disp), 150mg, 300mg Susp: 10mg/mL# Pregnancy: B1 – safe to use. Breastfeed: Safe to use. <i>Use if penicillin allergy.</i>	Pneumonia Sinusitis	Oral Twice a day (bd)	4mg/kg/dose	N/A	24.8mg (2.6mL or ½ tab – 50mg)	30.4mg (3.2mL)	36mg (3.6mL)	48mg (4.8mL or 1 tab – 50mg)	64mg (6.4mL)	80mg (8mL)	100mg (2 tab – 50mg)	125mg (2½ tab – 50mg)	150mg* (1 tab – 150mg)	If severe liver disease – halve dose. # Mix 50mg dispersible tablet with 5mL water to make 10mg/mL solution. Mix well and use straight away. * Adults – 150mg twice a day or 300mg once a day.	

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† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Tinidazole Tab: 500mg Pregnancy: B3 – metronidazole safer. Breastfeed: Avoid – metronidazole safer.	<i>Giardia</i> Gingivitis	Oral Single dose	50mg/ kg/dose	125mg (¼ tab)	250mg (½ tab)	375mg (¾ tab)	500mg (1 tab)	625mg (1¼ tab)	750g (1½ tab)	1g (2 tab)	1.2g (2½ tab)	1.5g (3 tab)	2g (4 tab)	If pregnant – give divided doses. Tablet can be crushed. Can repeat in 24–48 hours. Children don't like the taste.
Trimethoprim-sulfamethoxazole† Susp: 8+40mg/mL (40+200mg/5mL) Tab: 160+800mg Pregnancy: C – avoid use. Breastfeed: Caution.	Otitis media Skin sores UTI	Oral Twice a day (bd)	4+20mg/ kg/dose	N/A	24.8mg (3.2mL)	30.4mg (3.8mL)	36mg (4.6mL)	48mg (6mL)	64mg (8mL)	80mg (10mL or ½ tab)	100mg (12.6mL)	128mg (16mL)	160mg (20mL or 1 tab)	Doses worked out using trimethoprim component.
	Melioidosis	Oral Twice a day (bd)	6+30mg/ kg/dose	N/A	37.2mg (4.8mL)	45.6mg (5.8mL)	54mg (6.8mL)	72mg (9mL)	96mg (12mL)	120mg (15mL)	150mg (18.8mL or 1 tab)	192mg (24mL or 1 tab)	240mg (30mL or 1½ tab)	
Valaciclovir Tab: 500mg, 1g Pregnancy: B3 – appears safe but aciclovir preferred. Breastfeed: Safe to use.	Chickenpox Shingles	Oral 3 times a day (tds)	20mg/ kg/dose	N/A				250mg (½ tab – 500mg)		375mg (¾ tab – 500mg)	500mg (1 tab – 500mg)	750mg (1½ tab – 500mg)	1g (1 tab – 1g)	

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate antibiotic treatment. † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.														
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Vancomycin† Inj*: 500mg, 1g Pregnancy: B2 – safe to use. Breastfeed: Safe to use. <i>Use if penicillin allergy.</i>	Endocarditis prevention	IV Single dose	15mg/kg/dose	49.5mg (1mL)	93mg (2mL)	114mg (2.4mL)	135mg (2.8mL)	180mg (3.6mL)	240mg (4.8mL)	300mg (6mL)	375mg (7.5mL)	480mg (9.6mL)	60g (12mL) 50kg 750mg (15mL) 60kg 900mg (18mL) 70kg 1.05g (21mL)	* Mix with WFI to make 50mg/mL — 500mg + 10mL, 1g + 20mL. Infuse over 1–2 hours. If kidney failure — specialist consult. No maximum dose — continue to calculate dose by weight.

For more information and details on giving antibiotics see *AMH, Therapeutic Guidelines, Medicines Book*.

Note: ‘Common uses’ provides examples only and doesn’t include all conditions the medicines can be used for.

Use in pregnancy and breastfeeding

For more information on using medicines when a woman is pregnant or breastfeeding, contact your closest Pregnancy Drug Information Centre.

Australian categories for use of medicines in pregnancy

‘Harm’ means birth defects or other direct or indirect harm to fetus. For more detail see *AMH* or *Therapeutic Guidelines*.

Category A: Have been taken by a large number of pregnant women and women of childbearing age without any known harm.

Category B1: Have been taken by a limited number of pregnant women and women of childbearing age without any known harm. Animal studies have not shown harm.

Category B2: Women as for B1. Animal studies are poor quality or lacking, but no evidence of harm in available data.

Category B3: Women as for B1. Animal studies shown some evidence of harm, but not clear if this is significant for humans.

Category C: Have caused or are suspected of causing harm but not malformations. Effects may be non–permanent.

Category D: Have caused or are suspected of causing permanent harm.

Category X: Have such a high risk of causing permanent harm that they should not be used in women who are or could be pregnant.

Note:

- Category D medicines are not always contraindicated for use in pregnant women. The risks and benefits need to be discussed
- The categories of medicine are not hierarchical, eg the allocation of B category does not imply greater safety than C category

Other medicines doses table

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate treatment.
 † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.

Presentation	Common uses	Route and frequency	Dosage	Doses											Notes	
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years	14+ years		
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg	50kg+		
Benzatropine† Inj: 1mg/mL (2mL) Pregnancy: B2 – safe to use. Breastfeed: Appears safe.	Oculogyric crisis	IM or IV Single dose	0.02mg/kg/dose	N/A						0.3mg (0.3mL)	0.4mg (0.4mL)	0.5mg (0.5mL)	0.6mg (0.6mL)	0.8mg (0.8mL)	1mg (1mL)	
Dexamethasone† Inj: 4mg/mL (1mL, 2mL) Pregnancy: A – safe, but use lowest dose for shortest time. Breastfeed: Use alternative if available.	Meningitis	IV IM if no IV access Single dose	0.15mg/kg/dose	0.5mg (0.1mL)	0.93mg (0.2mL)	1.14mg (0.3mL)	1.35mg (0.35mL)	1.8mg (0.5mL)	2.4mg (0.6mL)	3.0mg (0.8mL)	3.75mg (1mL)	4.8mg (1.2mL)	6.0mg (1.6mL)	7.5mg (2mL) 60kg 9mg (2.4mL) 70kg+ 10mg (2.5mL)	Inject over 1–3 minutes.	
Hydrocortisone Inj: 50mg/mL Pregnancy: A – safe, but use lowest dose for shortest time. Breastfeed: Safe to use, avoid high dose.	Meningitis	IV Single dose	4mg/kg/dose	13.2mg (0.26mL)	24.8mg (0.5mL)	30.4mg (0.6mL)	36mg (0.7mL)	48mg (1mL)	64mg (1.4mL)	80mg (1.6mL)	100mg (2mL)	128mg (2.6mL)	160mg (3.2mL)	200mg (4mL)	Inject over 1 minute.	
	Severe asthma	IV IM if no IV access Single dose	4mg/kg/dose	13.2mg (0.26mL)	24.8mg (0.5mL)	30.4mg (0.6mL)	36mg (0.7mL)	48mg (1mL)	64mg (1.4mL)	80mg (1.6mL)	100mg (2mL)					

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate treatment. † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.															
Presentation	Common uses	Route and frequency	Dosage	Doses										Notes	
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years		14+ years
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg		50kg+
Ibuprofen† Susp: 20mg/mL Tab: 400mg Pregnancy: C – avoid. Breastfeed: Safe to use.	Dental pain Redback spider	Oral 3 times a day (tds)	10mg/kg/dose	N/A		76mg (3.8mL)	90mg (4.6mL)	120mg (6mL)	160mg (8mL)	200mg (10mL)	250mg (12.6mL)	300mg (15mL)	400mg (1 tab)		
Iron Susp: 30mg/mL ferrous sulfate Tab: 80–105mg Pregnancy: A – safe to use Breastfeed: Safe to use	IDA	Oral Once a day		1mL	5mL		10mL		15mL		80–105mg (1 tab)			1mL of 30mg/mL ferrous sulfate susp gives 6mg elemental iron (20%).	
Levetiracetam† Inj [†] : 100mg/mL (5mL) Pregnancy: B3 – get advice Breastfeed: Safe to use	Head injury	IV Loading dose	20mg/kg/dose	66mg (0.66mL)	124mg (1.24mL)	152mg (1.6mL)	180mg (1.8mL)	240mg (2.4mL)	320mg (3.2mL)	400mg (4mL)	500mg (5mL)	640mg (6.4mL)	800mg (8mL)	1g (10mL)	# Mix measured dose with 100mL normal saline or glucose 5%. Infuse over 30 minutes.
Naloxone Inj [†] : 0.4mg/mL (1mL, 5mL) Pregnancy: B1 – do not use if woman opioid-dependent. Breastfeed: May be used.	Over-sedation (opioids)	IV	0.01mg/kg/dose	0.03mg (0.3mL)	0.06mg (0.6mL)	0.76mg (0.8mL)	0.09mg (0.9mL)	0.12mg (1.2mL)	0.16mg (1.6mL)	0.2mg (2mL)			# Mix with normal saline to give 0.1mg/mL — 1mL + 3mL, 5mL + 15mL.		

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate treatment.															
† = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.															
Presentation	Common uses	Route and frequency	Dosage	Doses											Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years	14+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg	50kg+	
Ondansetron† Wafer: 4mg, 8mg Pregnancy: B1 – safe after first trimester. Breastfeed: Caution.	Head injuries Nausea + vomiting	Oral		N/A		2mg (½ wafer – 4mg)			4mg (1 wafer – 4mg)			8mg (1 wafer – 8mg)		Best antiemetic when sedation not wanted. Always do medical consult for children.	
Paracetamol† Susp: 48mg/mL (240mg/5mL) Tab: 500mg Supp: 125mg, 250mg, 500mg Pregnancy: A – safe to use. Breastfeed: Safe to use.	Fever with pain Pain	Oral 4 times a day (qid)	15mg/kg/dose	49.5mg (1mL)	93mg (2mL)	114mg (2.4mL)	135mg (3mL)	180mg (3.8mL)	250mg (5.2mL or ½ tab)		500mg (1 tab)		1g (2 tab)	If child dose for weight is more than dose for age — use dose for age.	
		Supp 4 times a day (qid)		N/A		125mg			250mg		500mg		1g		
Prednisolone† Susp: 5mg/mL Tab: 5mg, 25mg Pregnancy: A – safe, but use lowest dose for shortest time. Breastfeed: Safe to use*.	Asthma	Oral Once a day	1mg/kg/dose	3.3mg (0.7mL)	6.2mg (1.3mL)	7.6mg (1.6mL)	9mg (1.8mL)	12mg (2.4mL)	16mg (3.2mL)	20mg (4mL)	25mg (5mL or 1 tab – 25mg)	32mg (6.4mL or 6 tab – 5mg)	40mg (8mL or 8 tab – 5mg)	50mg (10mL or 2 tab – 25mg)	*Take after breastfeed and wait 4 hours before next feed.

This table must be used with protocols from CARPA STM (7th ed) or WBM (6th ed) — it does not provide all the information needed for appropriate treatment. † = other strengths and forms available. Doses in brackets (mL, tab) only apply to forms and strengths listed. Doses (mL) rounded up to nearest 0.2mL unless this is more than 10% above recommended dose.															
Presentation	Common uses	Route and frequency	Dosage	Doses											Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years	14+ years	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg	50kg+	
Promethazine † Susp: 1mg/mL Tab: 25mg Inj: 25mg/mL (2mL) Pregnancy: C – safe to use. Breastfeed: Appears safe.	Fly bite	Oral Once a day	0.5mg/kg/dose	N/A				6mg (6mL)	8mg (8mL)	10mg (10mL)	12.5mg (12.5mL)	16mg (16mL)	20mg (20mL)	25mg (1 tab)	Best antiemetic if sedation needed. Always do medical consult for children.
	Nausea + vomiting Sedation	Oral		N/A				3mg (0.12mL)	4mg (0.16mL)	5mg (0.2mL)	6.25mg (0.25mL)	8mg (0.32mL)	10mg (0.4mL)	12.5mg (0.5mL)	
	Nausea + vomiting Sedation	Deep IM	0.25mg/kg/dose	N/A				3mg (0.12mL)	4mg (0.16mL)	5mg (0.2mL)	6.25mg (0.25mL)	8mg (0.32mL)	10mg (0.4mL)	12.5mg (0.5mL)	
Valproate † Inj [†] : 400mg Pregnancy: D – avoid if possible. Breastfeed: Appears safe.	Fits	IV or IO Single dose	20mg/kg/dose	N/A	124mg (1.4mL)	152mg (1.6mL)	180mg (2mL)	240mg (2.6mL)	320mg (3.4mL)	400mg (4.4mL)	500mg (5.4mL)	640mg (6.8mL)	800mg (8.6mL)	# Mix with solvent provided to give 95mg/mL — 400mg + 4mL . Inject over 3–5 minutes.	
		Infusion	1.6mg/kg/hr	N/A	9.92mg (2.6mL)	12mg (3mL)	14.4mg (3.6mL)	19.2mg (4.8mL)	25.6mg (6.4mL)	32mg (8mL)	40mg (10mL)	51.2mg (12.8mL)	64mg (16mL)	80mg (20mL) 60kg 96mg (24mL) 65kg+ 104mg (26mL)	# Mix with normal saline to give 4mg/mL — 400mg + 100mL .

For more information and details on giving antibiotics see *AMH, Therapeutic Guidelines, Medicines Book*.

Note: ‘Common uses’ provides examples only and doesn’t include all conditions the medicines can be used for.

Use in pregnancy and breastfeeding

For more information on using medicines when a woman is pregnant or breastfeeding, contact your closest Pregnancy Drug Information Centre.

Australian categories for use of medicines in pregnancy

‘Harm’ means birth defects or other direct or indirect harm to fetus. For more detail see *AMH* or *Therapeutic Guidelines*.

Category A: Have been taken by a large number of pregnant women and women of childbearing age without any known harm.

Category B1: Have been taken by a limited number of pregnant women and women of childbearing age without any known harm. Animal studies have not shown harm.

Category B2: Women as for B1. Animal studies are poor quality or lacking, but no evidence of harm in available data.

Category B3: Women as for B1. Animal studies shown some evidence of harm, but not clear if this is significant for humans.

Category C: Have caused or are suspected of causing harm but not malformations. Effects may be non-permanent.

Category D: Have caused or are suspected of causing permanent harm.

Category X: Have such a high risk of causing permanent harm that they should not be used in women who are or could be pregnant.

Note:

- Category D medicines are not always contraindicated for use in pregnant women. The risks and benefits need to be discussed
- The categories of medicine are not hierarchical, eg the allocation of B category does not imply greater safety than C category

Abbreviations

°	degree	AST	aspartate aminotransferase
%	percent	ATSIHP	Aboriginal and Torres Strait Islander health practitioner
ABC	airway, breathing, circulation	BCG	Bacille Calmette-Guérin
ACE	angiotensin-converting enzyme	bd	bis die – twice a day
ACR	albumin creatinine ratio	BGL	blood glucose level
ACS	acute coronary syndrome	BMI	body mass index [weight(kg)/height(m) ²]
AED	automated external defibrillator	BP	blood pressure
AF	atrial fibrillation	BPG	benzathine penicillin (penicillin G)
AFB	acid-fast bacillus	C	celsius
AIDS	acquired immunodeficiency syndrome	C3	third component of complement
AIMhi	Australian Integrated Mental Health Initiative	C4	fourth component of complement
Alb	albumin	C4	fourth cervical nerve
ALP	alkaline phosphatase	C6	sixth cervical nerve
ALS	advanced life support	C7	seventh cervical nerve
ALT	alanine aminotransferase	C8	eighth cervical nerve
AMH	<i>Australian Medicines Handbook</i>	Ca	calcium
AMI	acute myocardial infarction	CAD	coronary artery disease
ANA	antinuclear antibody	cap	capsule
Anti-DNAse B	antibodies against antideoxyribonuclease B	CARPA	Central Australian Rural Practitioners Association
Anti-HBc	hepatitis B core antibody	CARPA STM	CARPA Standard Treatment Manual
Anti-HBe	hepatitis B envelope antibody	CDC	Centre for Disease Control, Communicable Disease Control Branch, Communicable Disease Control Directorate
Anti-HBs	hepatitis B surface antibody	CDNA	Communicable Disease Network Australia
Anti-HCV	hepatitis C virus antibody	CFC	chlorofluorocarbon
Anti-LKM	liver kidney microsomal antibody	CFU	colony-forming units
AOD	alcohol and other drugs	CIWA	Clinical Institute Withdrawal Assessment
AOM	acute otitis media	CK	creatinine kinase
AOMwiP	acute otitis media with perforation	CKD	chronic kidney disease
AOMwoP	acute otitis media without perforation	CLD	chronic lung disease
AP	anteroposterior (front to back)	cm	centimetre
APRI	AST platelet ratio index		
ARB	angiotensin II receptor blocker		
ARF	acute rheumatic fever		
ASOT	anti-streptolysin O titre		

CNS	central nervous system	ETT	endotracheal tube
CO₂	carbon dioxide	F	figure
COPD	chronic obstructive pulmonary disease	FAS	fetal alcohol syndrome
CPAP	continuous positive airway pressure	FASD	fetal alcohol spectrum disorder
CPM	Clinical Procedures Manual	FBC	full blood count
CPR	cardiopulmonary resuscitation	FEV1	forced expiratory volume in 1 second
CRP	c-reactive protein	fL	femtoliter
CSF	cerebrospinal fluid	FOBT	faecal occult blood test
CSL	Commonwealth Serum Laboratory	FVC	forced vital capacity
CSLD	chronic suppurative lung disease	G	gauge
CSOM	chronic suppurative otitis media	g	gram
CT	computerised tomography	GAS	group A Streptococcus
CVD	cardiovascular disease	GFR	glomerular filtration rate
CVS	cardiovascular system	GGT	gamma glutamyl transferase
dB	decibel	GLP1	glucagon-like peptide-1
disp	dispersible	GTN	glyceryl trinitrate
DM	diabetes mellitus	HAV	hepatitis A virus
DNA	deoxyribonucleic acid	Hb	haemoglobin
DOT	directly observed therapy	HbA1c	glycated haemoglobin
DPI	dry powder inhaler	HBeAg	hepatitis B envelope antigen
DPP4	dipeptidyl peptidase-4	HBsAg	hepatitis B surface antigen
dsDNA	double stranded deoxyribonucleic acid	hCG	human chorionic gonadotrophin
DTs	delirium tremors	HDL-C	high density lipoprotein cholesterol
DVT	deep vein thrombosis	HF	heart failure
ECG	electrocardiogram	HFA	hydrofluoroalkanes
EDTA	ethylenediaminetetra-acetic acid	Hib	<i>Haemophilus influenzae</i> type b
eg	exempli gratia – for example	HIV	human immunodeficiency virus
eGFR	estimated glomerular filtration rate	hr	hour
EMD	electromechanical dissociation	HRCT	high resolution computerised tomography
ENA	extractable nuclear antigens	HSV	herpes simplex virus
ENT	ear, nose and throat	HTLV1	human T lymphotropic virus
EPSE	extra-pyramidal side effects	HTLV1-Ab	human T-lymphotrophic virus type I antibody
ESR	erythrocyte sedimentation rate	ICS	inhaled corticosteroids
etc	et cetera – and so forth	ICU	intensive care unit

Abbreviations

IDA	iron deficiency anaemia	MMSE	Mini Mental State Examination
IgG	immunoglobulin G	mod	moderate
IgM	immunoglobulin M	mol	mole
IM	intramuscular (in the muscle)	MRI	magnetic resonance imaging
inj	injection	N/A	not applicable
INR	international normalized ratio	NAAT	nucleic acid amplification test
IO	intraosseous (in the bone)	NMS	neuroleptic malignant syndrome
IUD	intrauterine device	NRT	nicotine replacement therapy
IV	intravenous (in the vein)	NSAID	non-steroidal anti-inflammatory drug
J	joule	NT	Northern Territory
JVP	jugular venous pressure	O₂	oxygen
kg	kilogram	O₂ sats	oxygen saturation
KICA	Kimberly Indigenous Cognitive Assessment	OCP	ova, cysts, parasites
km	kilometre	OGTT	oral glucose tolerance test
L	litre	OME	otitis media with effusion
LA	local anaesthetic	orgs	organisms
LABA	long-acting beta ₂ agonist	ORS	oral rehydration solution
LAMA	long-acting muscarinic antagonist	OSA	obstructive sleep apnoea
LDL-C	low density lipoprotein cholesterol	OT	occupational therapist
LFT	liver function test	p	page
m	meter	PBS	Pharmaceutical Benefits Scheme
MAOI	monoamine oxidase inhibitor	PCR	polymerase chain reaction
max	maximum	PCV	packed cell volume
MC&S	microscopy, culture and sensitivity	PE	pulmonary embolism
MCV	mean cell volume	PEA	pulseless electrical activity
MDI	metered dose inhaler	PEFR	peak expiratory flow rate
Mg	magnesium	PEP	positive expiratory pressure
mg	milligram	PHQ	Patient Health Questionnaire
MH	mental health	PHU	Public Health Unit
min	minute	physio	physiotherapist
mL	millilitre	PID	pelvic inflammatory disease
mm	millimetre	PO₄	phosphate
mmHg	millimetre of mercury	POC	point of care
mmol	millimole	PR	per rectum
MMS	multimedia messaging service	PSGN	post-streptococcal glomerulonephritis

PTH	parathyroid hormone	temp	temperature
qid	quater in die – 4 times a day	TFT	thyroid function test
QLD	Queensland	TG	triglycerides
raOM	recurrent acute otitis media	TSH	thyroid stimulating hormone
RAPD	relative afferent pupillary defect	TV	television
RDW	red cell volume distribution width	U/A	urinalysis (with dipstick)
REWS	remote early warning score	UEC	urea, electrolytes, creatinine
RF	rheumatoid factor	UHT	ultra-high temperature (pasturisation)
RHD	rheumatic heart disease	URTI	upper respiratory tract infection
RPR	rapid plasma reagin	UTI	urinary tract infection
RR	respiratory (breathing) rate	VF	ventricular fibrillation
S1	first sacral nerve	VT	ventricular tachycardia
SA	South Australia	VUR	vesico-ureteric reflux
SABA	short-acting beta ₂ agonist	VZIG	varicella zoster immune globulin
SAMA	short-acting muscarinic antagonist	WA	Western Australia
SGLT2	sodium-glucose co-transporter 2	WBM	<i>Women's Business Manual</i>
SIDS	sudden infant death syndrome	WFI	water for injection
SMS	short message service	WHO	World Health Organisation
SNRI	serotonin and norepinephrine reuptake inhibitor	XL, XR	extended (controlled) release
SR	sustained (controlled) release		
SSRI	selective serotonin reuptake inhibitor		
STI	sexually transmitted infection		
subcut	subcutaneous (under the skin)		
susp	suspension (liquid medicine)		
T	temperature		
T4	fourth thoracic nerve		
T10	tenth thoracic nerve		
T12	twelfth thoracic nerve		
tab	tablet		
TB	tuberculosis		
TBSA	total body surface area		
TC	total cholesterol		
TCA	tricyclic antidepressant		
tds	ter die sumendum – 3 times a day		

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