CARPA
Standard Treatment Manual

8th edition

CARPA
Standard Treatment Manual
for remote and rural practice

Supporting clinical practice in the bush

8th edition

Alice Springs, 2022

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

Publication details
ISBN: 978-0-6455848-0-6 (hardcopy)

Published by Flinders University
PO Box 4066, Alice Springs, NT, 0871, Australia
E-mail: remotephcmanuals@flinders.edu.au
Website: www.remotephcmanuals.com.au

First edition 1992
Second edition 1994
Third edition 1997
Fourth edition 2003, Reprinted 2006
Fifth edition 2009, Reprinted 2011
Sixth edition 2014
Seventh edition 2017
Eighth edition 2022

Suggested citation

Remote Primary Health Care Manuals. (2022). *CARPA Standard Treatment Manual (8th edition)*. Alice Springs, NT: Flinders University

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Preface

History of the Standard Treatment Manual

The Standard Treatment Manual was originally developed by the Central Australian Rural Practitioners Association (CARPA), 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. 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, as 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* continues to evolve, partly in response to these changes and as a leader and agent of change. We are pleased to bring you the eighth 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' (kurrunpa). They are being healed by Ngangkaris (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 Aboriginal 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 eighth 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, CRANA*plus*, and Flinders University. 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*).

The eighth 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 *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
- *Australian Immunisation Handbook*
- *Australian Medicines Handbook*, and *Therapeutic Guidelines.*

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

Protocols are largely in dot point form and are usually short directives without explanation. 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.

In any health interaction the rights of the person must be remembered. As a part of health care provision a person 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 the online feedback form at www.remotephcmanuals.com.au

Acknowledgements

This manual was produced with funding from the Australian Government Department of Health. The Remote Primary Health Care Manuals are a Joint Venture partnership between Central Australian Rural Practitioners Association, Central Australian Aboriginal Congress, CRANA*plus*, and Flinders University, representatives of each organisation provided governance oversight of the project. As the agent of the Joint Venture agreement between these partners, project management for the revision was provided by Flinders University. Oversight of the review process was provided by the Remote Primary Health Care Manuals Editorial Committee.

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 and a list of the editorial committee members, project team members and the primary and secondary reviewers who contributed to the review of this edition can be found at http://www.remotephcmanuals.com.au/home.html

Using the Remote Primary Health Care Manuals (RPHCM)

The Remote Primary Health Care Manuals (RPHCM) are intended for use by trained health professionals including ATSIHPs, nurses and doctors. This manual is not intended to be a layperson's manual.

The manuals are designed to be used primarily in remote (largely Aboriginal and Torres Strait Islander) communities. The RPHCM support a cycle of care that incorporates collaborative practice, shared care, and patient recall and follow-up. Use of the manual also facilitates standardised pharmacy imprest lists and quality assurance.

Use of the RPHCM are not intended to replace clinical judgement, expertise or appropriate referral. They do not support practitioners to work beyond their level of competence or confidence, or outside their scope of practice or health service policies.

The supply of medicines recommended in the manual must occur within the constraints of organisational polices 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 RPHCM 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 not acceptable to person or their carer.

Where appropriate, practitioners should discuss with the person the impact of a diagnosis on their ability to hold an unconditional driver's license.

Terms

Aboriginal

Due to space restrictions in this manual the term Aboriginal is used to mean both Aboriginal and Torres Strait Islander Australians. We use this term respectfully in recognition of the preferred terminology of people within the footprint area of the manuals and apologise for any offence it may cause.

Abbreviations

Abbreviations and acronyms may be used without explanation. There is an abbreviation list which includes acronyms.

Urgent medical consult

Medical advice must be sought as soon as possible.

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 and may be in person or by telehealth, eg phone, radio, videoconference.

Medical follow-up

A medical follow-up is an assessment of the patient by a doctor, appropriately qualified nurse practitioner, midwife, or specialist. It would usually involve making an appointment for the person to return to the clinic or 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.

The 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.

Supporting resources

- Remote Area Health Corps Introduction to remote nursing scope of practice e-learning module
- Austroads Assessing fitness to drive resources

Cultural tips

To be effective, health care must occur in a culturally safe and secure environment, with practitioners who are culturally aware and competent. See Cultural safety for more information. Learn all you can about the local culture.

Always be respectful, and carefully consider the following information.

Cultural beliefs

- Traditional concepts and understandings around health and healing remain strong in Aboriginal communities
- Use of traditional healers and traditional medicine is common. It is very important to acknowledge, respect, and listen to community members regarding their practices

Effective communication

- English can be a second or third language for Aboriginal Australians
  - Always ask if person would like an interpreter to assist
- Don't assume that conversations conducted in English have the same meaning for the practitioner and the 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

When asking questions

- 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

Loss and grief

- Aboriginal 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

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4. Chronic Conditions

5. Mental health and drug problems

6. Sexual health

7. General topics

8. Reference Section

1. Acute assessment (gateway) protocols

Early recognition of sepsis

Risk Factors for Sepsis

- Previous sepsis
- Re-presentation unwell within 48 hours
- Chronic illness especially diabetes
- Immunocompromised (weak immune system)
- Alcohol misuse
- Recent surgery or implantable device/valve

Red Flags — Urgent Medical Consult

- **Sepsis — signs and symptoms can include**
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation

Do not assume no chest pain means no heart problems

Early use of antibiotics is critical in sepsis — early medical consult

- Where available follow local sepsis pathway
- Antibiotic choice based on regional sensitivities and likely body system
- Take blood and urine for culture before giving antibiotics where possible — for adults collect 2 sets of cultures from 2 different sites
- If allergy to penicillin — **medical consult** before giving antibiotics
- If unknown or undifferentiated sepsis — give IV **gentamicin**, **flucloxacillin**, **ceftriaxone** first *AND* if available **vancomycin** as a single slow infusion — dose and infusion rate (page 501)
- After treatment — re-assess for response
- Repeat Remote Early Warning Signs (REWS) observations often to detect deterioration
  - Every 30 minutes if medium risk
  - Every 15 minutes if high risk

Adult assessment

- Person looks unwell or presents with acute problem
- Calculate Remote Early Warning Score (REWS) using appropriate table — Table 1.1

OR if woman more than 20 weeks pregnant — Table 1.2

- Score each line individually. Then add scores for REWS

THEN follow Flowchart 1.1 for management

Beta-blockers reduce heart rate and can confuse REWS score

Table 1.1 Adult REWS (13 years and over)

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	34.1–35.0	35.1–36.0	36.1–37.9	38.0–38.5	38.6–39.5	39.6 or more

Table 1.2 Obstetric REWS (more than 20 weeks pregnant)

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			9–20	21-24	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	34.1–35.0	35.1–36	36.1–37.9	38–38.5	38.6–39.5	39.6 or more

Paediatric assessment

Do

- Assess appearance, work of breathing and circulation
- Assess level of respiratory distress — Table 1.3
  - Assess each category individually
  - Use the highest grade in any category when calculating REWS
- Calculate REWS by age — use age appropriate table below
- Score each line individually

THEN add scores for REWS

THEN follow Flowchart 1.1 for management

Table 1.3 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 irritability 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 cyanosis (blue) Increasingly frequent or prolonged apnoeas

Table 1.4 Paediatric REWS — 0–3 months

Paediatric 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
0_2 sats (%)	90 or less		91–94	95 or more			
0_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	33.5–35.0	35.1–35.5	35.6–38.0	38.1–38.5	38.6–39.0	39.1 or more

*If using mask — 4L/min

Table 1.5 Paediatric REWS — 4–11 months

Paediatric 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
0_2 sats (%)	90 or less		91–94	95 or more			
0_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	33.5–35.0	35.1–35.5	35.6–38.0	38.1–38.5	38.6–39.0	39.1 or more

*If using mask — 4L/min

Table 1.6 Paediatric REWS — 1–4 years

Paediatric 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
0_2 sats (%)	90 or less		91–94	95 or more			
0_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	33.5–35.0	35.1–35.5	35.6–38.0	38.1–38.5	38.6–39.0	39.1 or more

*If using mask — 4L/min

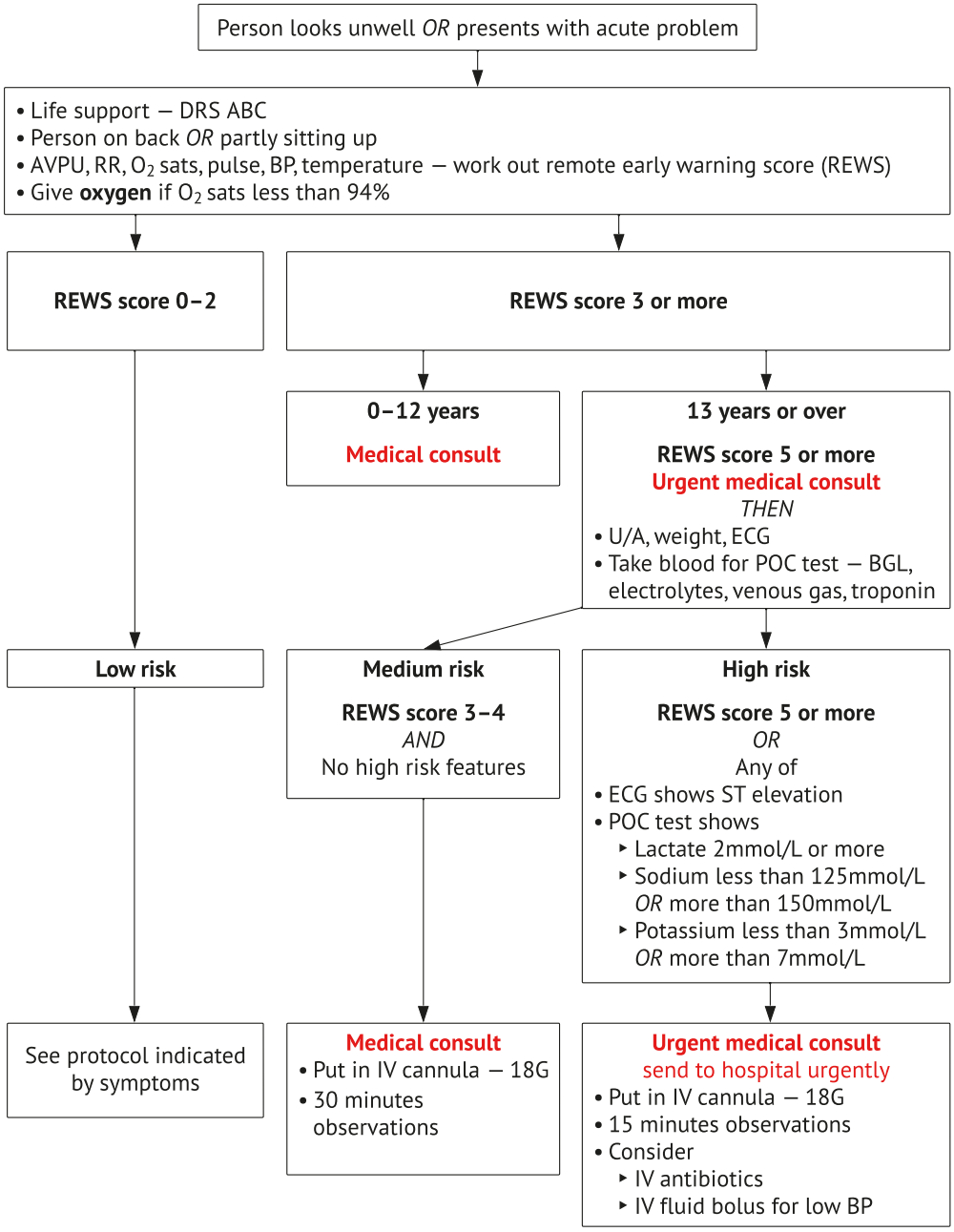
Table 1.7 Paediatric REWS — 5–12 years

Paediatric 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
0_2 sats (%)	90 or less		91–94	95 or more			
0_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	33.5–35.0	35.1–35.5	35.6–38.0	38.1–38.5	38.6–39.0	39.1 or more

*If using mask — 4L/min

Management

Flowchart 1.1 Management based on risk level



Acute assessment of unwell children under 5 years

A medical consult is recommended where there is no specific protocol for a condition

- **Always consider sepsis** — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation
- Small babies can get sick very quickly
- Behaviour and appearance are the best indicators of serious illness

Red Flags — Urgent Medical Consult

- Acute weight loss over 5%
- Less than 3 months of age with fever (Temp more than 38°C) — mandates empirical antibiotic therapy
- Second presentation to hospital or clinic with same illness or within 72 hours
- Underlying medical condition
- Under immunised child
- History of prematurity and age less than 2 years
- Caregiver concern

Look

Appearance — TICLS

- **T**one — child active, moving around or listless
- **I**nteractivity/mental status — alert, interacting with care giver
- **C**onsolability — can child be comforted by caregiver
- **L**ook/gaze — is child fixing gaze on a face or is there a glassy-eyed stare
- **S**peech/cry — child's speech or cry weak, high pitched or hoarse

Work of breathing — see Table 1.3 (page 4)

- Assess body position, visible movements of chest/abdomen and breathing pattern
- Listen for abnormal airway sounds — snoring, hoarse speech, grunting, wheezing or gasping
- Look for sniffing posture, tripod positioning, head bobbing, sternal or intercostal retractions, nasal flaring, tachypnoea
- Shortness of breath

Circulation

- Skin colour — pallor, mottling, cyanosis
- Capillary refill time, warmth of peripheries
- Non-blanching rash

Check

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- **If REWS score 3 or more or if any danger signs — urgent medical consult**
  - If doctor not available within 30 minutes — **contact paediatrician**
- If REWS (page 3) score 2 or less see — Table 1.8 to assist with differential diagnosis
  - if unsure **medical consult**
- If available POC Test — WBC, electrolytes
- History and immunisation status
- Head-to-toe exam

Table 1.8 Serious causes of fever in babies and children under 5 years

Sick child with fever *AND*	Possible cause
Reduced alertness *OR* floppiness *OR* poor feeding *OR* weak/high-pitched cry Seizures *OR* stiffening *OR* abnormal gaze Headache *OR* neck stiffness *OR* photophobia *OR* bulging fontanelle *OR* Non-blanching rash	**Meningitis** (page 126) — **medical consult**
Increased work of breathing — fast or slow, gasping, grunting, stridor, nasal flaring, head bob, chest indrawing *OR* Apnoea *OR* Hypoxia — oxygen saturation less than 94% or not improving with oxygen	**Chest infection** (page 193) *OR* Bronchiolitis — **medical consult**
Sore red throat *OR* enlarged tonsils *OR* enlarged lymph nodes	**Sore throat** (page 481)
Arthritis (painful, swollen joint/s) *OR* impaired/reluctant weight bearing or use of a limb +/- rash, +/- chorea (abnormal movements)	**Acute rheumatic fever** (page 342) **OR septic arthritis** (page 354) **OR osteomyelitis** (page 351) — **medical consult**
Bulging ear drum *OR* pain, irritability	**Acute otitis media** (page 399)
Redness *OR* mass *OR* discharge from skin	**Skin infection** (page 451) Abscess or cellulitis
Soft stridor *OR* unable to eat *OR* drink or talk *OR* drooling saliva Reluctant to move neck/head	**Epiglottitis — minimal handling — urgent medical consult**
New bed wetting/incontinence (small child) *OR* dysuria and frequency (older child)	**Urinary tract infection 2 months–12 years** (page 214) — **medical consult**
Blood in urine *OR* oedema *OR* raised BP	**Post-streptococcal glomerulonephritis (PSGN)** (page 217) — **medical consult**
Fever of unknown origin and REWS score 2 or less • Wipe forehead with tepid cloth • Maintain hydration • If miserable provide one dose paracetamol, observe for 1 hour — if no improvement — **medical consult**	

Acute assessment of new onset confusion (delirium)

A medical consult is recommended where there is no specific protocol for a condition

- **Always consider sepsis** — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation
- Acute confusion (delirium) is a medical emergency — increased mortality and injury — **urgent medical consult**
- Key features — rapid onset, fluctuating altered level of consciousness (drifting or unable to reliably follow commands), impaired communication, disorientation, altered vital signs
- **There are 3 types of delirium**
  - Hyperactive delirium — agitation
  - Hypoactive delirium — patient is withdrawn, mute and drowsy
  - Mixed delirium — periods of hyperactive delirium and hypoactive delirium
- Pre-existing dementia or psychosis can mask an acute delirium — careful assessment is required in these patients

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If REWS (page 3) score 3 or more — **urgent medical consult**
- If available POC Test — WBC, electrolytes
- U/A, pregnancy test
- History, especially medications — taking lots, the wrong way or new medicine
- Head-to-toe exam

Table 1.9 Some causes of acute confusion (delirium)

Signs and symptoms Delirium AND	Possible cause
Headache, trauma to head, bleeding from ear/scalp	**Head injury** (page 98)
Localised neurological symptoms — weakness, altered limb sensation, changes to vision or speech	**Intracranial bleed or clot (stroke)** — **medical consult**
Low BP, tachycardia (heart rate over 100), fever/low temperature, shortness of breath, cough, low oxygen Frequency and dysuria, urinary incontinence Pain in limbs, redness of skin Headache, stiff neck	**Infection** **Respiratory infection** — **medical consult** **Urinary tract infection** (page 486) **Skin/soft tissue infection** (page 451) **Central nervous system (CNS) infection** (eg meningitis) — **medical consult**
Low blood glucose levels High blood glucose with normal pH Acidosis (low pH on VBG or low HCO3) and elevated ketones with high blood glucose	**Hypoglycaemia** (page 118) **Hyperosmolar Syndrome** — **medical consult** **Diabetic ketoacidosis** (page 246)
Severe dehydration and/or electrolyte abnormality — low (less than 126mmol/L) or high sodium	**Medical consult**
Chest pain, sweating, anxiety Fast breathing or shortness of breath, crackles, ankle swelling, low oxygen saturation Rapid heart rate/very slow heart rate	**Heart attack** (page 20) **Heart failure** — **medical consult** **Respiratory failure** — **medical consult**
History of alcohol or other drug misuse New prescribed medicine with side effects decreasing alertness	**Alcohol withdrawal** (page 279) **Mental health and drug problems** (page 264) **Adverse drug reaction** — **medical consult**
Symptoms of depression	**Depression** (page 272) — can occur with or appear like dementia

Acute assessment of headaches

A medical consult is recommended where there is no specific protocol for a condition

- Always consider sepsis — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation
- Headaches can occur alone or as part of another illness

Red Flags — Urgent Medical Consult

- Sudden onset and very severe ('worst headache ever'), blackout
- Fever, stiff neck, photophobia (pain looking at light)
- Confusion, altered level of consciousness, one-sided weakness, facial droop, slurred speech
- Blurred/double vision *OR* painful red eye
- Temporal arteries tender, tongue or jaw ache on eating — over 60 years of age
- Worse with bending, coughing, sneezing
- History of recent head trauma *AND* on anticoagulant
- Pregnant or postpartum
- If new symptoms, reoccurring or person re-presents within 72 hours
- Not responding to usual measures

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If REWS (page 3) score 3 or more or if any danger signs — **urgent medical consult**
- If available POC Test — WBC
- History and head-to-toe exam
- Coma Scale — see Injuries — head (page 100)

Table 1.10 Some causes of headaches

Signs and symptoms or circumstances of headache	Possible cause
Following recent fall, hit to the head, car accident	**Concussion** — **medical consult** Intracranial bleeding eg subdural haemorrhage (haemorrhage can occur up to 7 days post-trauma)
Sudden or progressive neurological symptoms — weakness, clumsiness, loss of balance, altered sensation of limbs, vision or speech changes, depressed level of consciousness	**Suspected intracranial bleeding** *OR* **clot (stroke)** — **medical consult**
Fever, vomiting, photophobia (sensitivity to light) Non-blanching rash with flat red-purple blotches, neck stiffness, irritability in babies	**Meningitis** (page 126)
Abrupt and severe at onset +/- photophobia Neck stiffness, syncope (depressed level of consciousness if severe)	**Sub-arachnoid haemorrhage** — **medical consult**
Occurs in morning with vomiting, worsens over time	**Raised intracranial pressure** *OR* **tumour** — **medical consult**
In pregnancy or early postpartum — A new and/or severe headache with high BP, visual disturbances, +/- abdominal pain	**Severe preeclampsia** (WBM, page 41)
Sudden loss or blurring of vision Painful red eye, nausea/vomiting, recent bleeding in eye or drops to dilate pupil	**Acute glaucoma** (page 385)
After playing sport, walking or working in heat	**Heat illness** (page 81)
Other causes of headaches • Tension, migraine • Infection — dental or ear • Dehydration • Drug withdrawal, hangover • Shingles — one sided head/facial rash • Side effect of medications • Bites and stings — centipede or redback spider • High BP	

Acute assessment of breathing problems in adults

A medical consult is recommended where there is no specific protocol for a condition

- **Always consider sepsis** — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation

Red Flags — Urgent Medical Consult

- Severe, rapidly increasing shortness of breath
- Silent chest (may indicate severe asthma)
- Sharp chest pain on breathing
- Coughing up blood
- Drowsiness — may indicate CO_2 retention (slow breathing), severe hypoxia, low BP (shock)
- Painful swollen leg
- Immobility, confined to bed or chair
- Chest injury
- Pregnant or postnatal women, older person or person with cancer

Table 1.11 Causes of breathing problems in adults

Signs and symptoms	Possible cause
Cold and clammy skin Shallow, rapid breathing Anxious/restless Rapid or irregular heartbeat, weak pulse Hypotension Dizziness or light-headedness	**Shock** — may be from heart attack (page 20), sepsis (page 2), tension pneumothorax (page 92), large pulmonary embolus (PE), anaphylaxis (page 37), severe dehydration, internal haemorrhage (eg GIH, ectopic pregnancy) — **medical consult**
Fatigue/ weakness Dizziness or light-headedness Rapid heartbeat or pounding in the chest, may be chest pain	**Heart arrhythmias** — **medical consult**
Sudden onset of shortness of breath Chest pain (worse with breathing) Dizziness or light-headedness Sweating Racing or irregular heartbeat	**Pulmonary embolism** — **medical consult**
Chest pain Shortness of breath and worse lying flat Wheeze and/or crackles in lungs May have pink, frothy sputum High BP Swollen legs Anxious, fearful, exhausted Hard to get to sleep, wakes up at night, Missed dialysis History of heart trouble, RHD, CAD, CCF	**Pulmonary oedema** (page 134) — **medical consult**
Sharp pain on breathing Decreased air entry and chest expansion on affected side Worsens over minutes to an hour May have history of chronic lung disease — don't assume just COPD May be young healthy person May be after chest injury or after playing sport	**Pneumothorax** (page 92) — **medical consult**
Severe, rapidly increasing shortness of breath, anxiety Fast pulse, low BP Often after chest injury or in people with chronic lung disease	**Tension pneumothorax** (page 92) — **medical consult**
Fever, cough, looks unwell May have sharp chest pain, worse on deep breathing May have reduced breath sounds, crackles in lungs	**Pneumonia** (page 433) — **medical consult**

Table 1.11 Causes of breathing problems in adults (continued)

Signs and symptoms	Possible cause
History of chronic lung problems and/or long-term smoker Usually no fever Change in colour of sputum Anxious and breathing fast — emphysema Slow breathing and depressed level of consciousness — acute *OR* chronic bronchitis with CO_2 retention	**Exacerbation of chronic lung disease** (page 437) — **medical consult**
Cough with wheeze Tripod posture, restless, fearful if severe Drowsy or blue if peri-arrest Usually known to have asthma	**Acute asthma** (page 421) — **medical consult**
Swelling of the lips or tongue Wheeze and short of breath Stridor — harsh breaths Light-headed/collapse Hypotension Welts	**Anaphylaxis** (page 37) — **medical consult**
Anxious/fearful/upset Strong feeling of dread, danger, losing control Dizziness or light-headedness Trembling, shaking Tingling finger or lips Sweating or hot flushes Rapid/deep respiration Rapid heart rate	**Anxiety** (page 269)**/panic attack** — **medical consult**

–

Acute assessment of breathing problems in children

A medical consult is recommended where there is no specific protocol for a condition

- **Always consider sepsis** — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation

Red Flags — Urgent Medical Consult

- Baby under 2 months with a breathing problem
- Baby under 3 months with fever (Temp more than 38°C) — mandates empirical antibiotic therapy
- Apnoea — stops breathing for short periods (mainly infant)
- Increased work of breathing (any age)
- Oxygen saturation less than 90% on room air or less than 94% on oxygen and not improving
- Hyperglycaemia in children with rapid breathing
- Persisting tachycardia for age
- Not interested in what is happening, lethargic (drowsy)
- Not able to eat/feed
- Seizures (fits)

Check

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If REWS (page 5) score 3 or more — **urgent medical consult**
- If available POC Test — WBC, electrolytes
- History and head-to-toe exam
- Immunisation status

Table 1.12 Some causes of breathing problems in children

Signs and symptoms	Possible cause
Fast breathing, cough, tachycardia, fever (Temp more than 38°C), looks unwell	**Chest infection** (page 193)
Cough, fast breathing, wheeze, runny nose — age 2–11 months	**Bronchiolitis** (page 199)
Cough, fast breathing, wheeze, runny nose, fever — age 1 year and over	**Viral induced wheeze** — **medical consult**
Frequent night cough	**Asthma** (page 184)
Frequent chest infections, chronic moist or productive cough	**Chronic Suppurative Lung Disease** (page 201)
Coughing in spells, with or without whoop Vomiting, going red in face, cyanosis (blue lips), apnoea (stopping breathing) with coughing spells	**Whooping Cough** — **medical consult**
Noisy breathing, wheeze Story of choking on something	**Inhaled foreign body** — **medical consult** **Choking** (page 67)
Barking cough, stridor (noisy when breathing in)	**Croup** — **medical consult**
Fast breathing, tachycardia, pallor, cyanosis, sweating, difficulty feeding Known heart problems, thready pulse, fatigue, oedema Fever (infection elsewhere) may expose underlying heart problems	**Heart failure** — **medical consult**
Rapid breathing without signs of increased work of breathing Often with abdominal pain, vomiting and tachycardia	**Diabetic ketoacidosis** (page 246) — **medical consult**

Acute assessment of chest pain

A medical consult is recommended where there is no specific protocol for a condition

- **Always consider sepsis** — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation
- Treat as serious and call for help
- Always assume chest pain is cardiac in origin until medical officer is able to rule out
- Always do full assessment — many heart attacks are missed because symptoms not typical. Especially in young adults, women, people with diabetes
- Use defibrillator as a monitor

Red Flags — Urgent Medical Consult

- Pressure or pain in chest that may spread to shoulders, arms, neck, jaw or back
- Chest pain that lasts more than 10 minutes
- Dizziness, feeling faint, anxious or nauseous
- Short of breath, fast breathing, trouble breathing, pain on breathing
- Sweating
- Painful swollen leg
- Haemoptysis (coughing up blood)

Check

- Do 12 lead **ECG immediately — urgent medical consult within 10 minutes**
  - Leave leads on — will need to repeat
- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If available POC Test — Troponin
- History and head-to-toe exam

Table 1.13 Diagnosis of acute chest pain

Signs and symptoms	Possible cause
Pain can be dull, tight, heavy, squeezing Usually in centre of chest but can be in shoulders, arms, back, neck, jaw. May be felt on right side Cool and sweaty, nauseous, short of breath Pain often occurs with exercise or exertion of any kind (walking, arguing)	**Heart pain** — **medical consult** **Heart attack** (page 63) **OR Angina** (page 234) — **episodic chest pain**
Severe pain through to the back — may have neurological deficit. Older person with a history of hypertension —may be complicated by AMI	**Aortic dissection** — **medical consult**
Sudden onset of unilateral pain Pain sharp, mostly on deep breathing May have fast or shallow breathing or short of breath May have a history of cough or trauma Reduced breath sounds or chest movement on one side More common in men 20-40 years, COPD	**Pneumothorax** (page 92) — **medical consult**
Fever, cough, shortness of breath Pain sharp and mostly on deep breathing Reduced breath sounds, abnormal sounds in lungs — especially on one side Comes on gradually over hours to days	**Pneumonia/pleurisy** (page 433) — **medical consult**
Sudden sharp unilateral pain, mostly on deep breathing Shortness of breath 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 older person, confined to bed) long distance car/plane travel, previous blood clot	**Pulmonary embolus (blood clot in lung)** — **medical consult**
Burning or sharp pain Abdominal tenderness, chest or shoulder discomfort Pain behind breastbone after eating or when lying down Often in people who drink alcohol, who are obese or pregnant Always exclude AMI — relief with antacid +/- local anaesthetic does not rule out ischemic heart disease/cardiac	**Reflux** (page 336) — **medical consult** **Oesophageal spasm** — **medical consult** **Peptic ulcer** (page 336) — **medical consult**
History of injury Pain on moving shoulders or upper body and settles when still Local muscle tenderness	**Muscle pain** — **medical consult**
Tenderness to palpation of costochondral joints	**Costochondritis** — **medical consult**

Acute assessment of abdominal pain

A medical consult is recommended where there is no specific protocol for a condition

- **Always consider Sepsis** — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation

Red Flags — Urgent Medical Consult

- Severe pain with tenderness or guarding
- Pain goes through to back
- Strong point of pain when coughing — peritonitis
- Blood in faeces, melaena (black faeces)
- Large amount of blood in vomit
- Mass (lump) especially pulsating (throbbing) mass
- Over 55 years old — consider ruptured abdominal aortic aneurism

Check

- Calculate age appropriate REWS
  - Adult — AVPU, RR, O_2 sats, pulse, BP, Temp
  - Child (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If REWS score 3 or more (page 3) — **medical consult** straight away
- If available POC Test — WBC, electrolytes
- U/A, pregnancy test
- History and head-to-toe exam — abdominal pain assessment (page 332)

Do

- If severe pain and systolic BP greater than 100 — give pain relief (page 326) prior to abdominal palpation

Table 1.14 Possible causes of abdominal pain

Location of pain	Signs and Symptoms	Possible Cause
Upper abdominal or epigastric pain	Nausea, short of breath, cool and sweaty	**Heart attack** (page 63)
	Severe pain, tenderness below breastbone	**Pancreatitis** — **medical consult**
	Pain radiates to back or shoulder tip, vomiting blood or passing black faeces	**Bleeding ulcer** — **medical consult**
	Abdomen soft, mild tenderness	**Gastritis, reflux or indigestion** (page 336)
Right upper quadrant pain	Nausea, short of breath, cool and sweaty	**Heart attack** (page 63)
	Pain in waves, right-sided or central, may go through to back	**Gall bladder disease** (page 336)
	Fever, usually cough, pain with breathing	**Pneumonia** (page 432)
	Unwell, no appetite, dark urine	**Hepatitis** (page 407)
Lower abdominal pain	Central to right lower pain, nausea and vomiting	**Appendicitis** (page 337)
	Usually one side of groin, tender painful swelling	**Strangulated or stuck hernia** — **medical consult**
	Childbearing age, vaginal bleeding Early ectopic pregnancy or miscarriage may still occur with a negative pregnancy test	**Ectopic pregnancy** (WBM, page 33) **Miscarriage** (WBM, page 205)
	Fever, nausea, painful sex, common in non-pregnant women aged 15–35 years	**Pelvic Inflammatory Disease** (WBM, page 272)
	Swollen painful testicle	**Twisted testicle** (page 483) **Infected testes** (page 483)
	Burning when passing urine, no fever	**Bladder infection** (page 486)
	Crampy pain, not unwell	**Constipation** (page 340)
	Pain in waves, right-sided or central, may go through to back	**Gall bladder disease** (page 336)
	Older person, pain more on left side	**Diverticulitis** — **medical consult**
Generalised abdominal pain	Very unwell, severe pain, guarding, rigidity	**Generalised peritonitis** — **medical consult**
	Usually older person with high BP, very pale, fast pulse, falling BP, fast breathing	**Ruptured abdominal aortic aneurysm** (page 339)
	Usually older person with AF, severe pain, soft abdomen	**Intestinal ischaemia** — **medical consult**
	Nausea and vomiting, crampy pain, diarrhoea	**Gastroenteritis** (page 339)
	Nausea and vomiting, diarrhoea then nothing	**Bowel obstruction** (page 340)
	Crampy pain, not unwell	**Constipation** (page 340)
One-sided (flank/loin) pain	Mild to severe flank pain (may be both sides), unwell, fever, fast pulse	**Kidney infection (pyelonephritis)** (page 489)
	Severe one-sided pain, vomiting, no fever, blood in urine	**Renal colic (kidney stone)** (page 341)

Acute assessment of nausea and vomiting

A medical consult is recommended where there is no specific protocol for a condition

- **Always consider Sepsis** — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation
- Causes range from easily treatable to serious
- If pregnant — see Nausea and vomiting in pregnancy (WBM, page 132)

Red Flags — Urgent Medical Consult

- Children (can dehydrate quickly)
- Chest pain
- Head injury — especially if taking anticoagulants
- Severe prolonged vomiting blood or bile
- Abnormal electrolytes (potassium, sodium)
- Severe abdominal pain, rebound tenderness or distension
- Severe dehydration and weight loss

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If REWS (page 3) score 3 or more — **medical consult** straight away
- If available POC Test — WBC, electrolytes, ketones
- U/A, pregnancy test
- Head-to-toe exam

Table 1.15 Some causes of nausea and vomiting

Signs and symptoms	Possible cause
History suggesting head injury, bruising, decreased level of consciousness (coma scale) One-sided weakness, speech difficulties Ataxia (unsteadiness)	**Head injury** (page 98) **Intracranial bleed (stroke)** — **medical consult**
Problem swallowing Food/fluids stuck in gullet	**Uncoordinated swallowing, oesophageal blockage** — **medical consult**
Blood in vomit	**Oesophageal tear, oesophageal varices** (complicating cirrhosis), **penetrating peptic/ gastric ulcer** — **medical consult**
Right lower abdominal pain, mild fever	**Appendicitis** (page 337)
Severe abdominal pain, marked tenderness, rebound or percussion tenderness, fever	**Peritonitis** — **medical consult**
Severe upper abdominal pain that may radiate to back, epigastric tenderness	**Pancreatitis** — **medical consult**
Green bile, crampy abdominal pain, swollen belly, diarrhoea then no faeces	**Bowel obstruction** (page 339)
Undigested food in vomit	**High abdominal obstruction** — **medical consult**
Abdominal cramps, diarrhoea Abrupt onset within 4 hours of eating and others who ate the same meal affected	**Gastroenteritis** (page 339)**, food poisoning** — **medical consult** *If child with vomiting and significant pain, unlikely to be gastroenteritis — **medical consult**
Child with sweet odour of acetone and rapid breathing +/- abdominal pain (high BGL, elevated ketones, low pH and HCO3 on VBG)	**Diabetes ketoacidosis** (page 248)
Small child with unusual odour, agitated or sedated, rapid or slow heart rate, high temperature, flushed, dilated or constricted pupils, ataxia	**Toxic Ingestion** — **medical consult**
History of medicine consumption	**Prescription medicines (eg morphine)** — **medical consult**
History of drug use Alcohol — smell on breath, reduced inhibition, slurred speech, reduced motor control, bloodshot eyes Cannabis — gets relief from hot shower	**Drugs** **Alcohol** (page 279) **Cannabis** (page 287)
Pregnancy — usually first trimester	**Morning sickness** (WBM, page 132)
Feeling of motion — room spinning, sweating, abnormal eye movements	**Vertigo** — also a symptom, need to determine cause — **medical consult**

2. Emergencies and assessments

Life support — DRS ABC

- **Urgent medical consult** but do not delay starting resuscitation
- If newborn — see Newborn resuscitation (WBM, page 7)
- If unsure of pulse — don't delay compressions
- Person with narcotic overdose (page 291) 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
- If unresponsive and breathing normally — assess for causes and manage as unconscious person
- If deterioration or clinical change during assessment — return to start of this protocol
- If more than one of you — declare who is in charge
- Decision to stop CPR is very difficult — made by senior member of team **after medical consult**

Immediate defibrillation

- If collapse is witnessed and defibrillator immediately available/attached (eg in clinic) — defibrillate if indicated — see Defibrillation (page 29)

D – Danger

- Make sure that you, person and place are safe
- If outside — put on protective clothing (eg fluoro vest, sun protection, PPE)
- Check for hazards — chemicals, electrical sources, being trapped or burned
- Check surface person is lying on
  - If very hot — can cause burns (page 55)
  - If very cold — can cause hypothermia (page 84)

R – Response

- Does person respond to voice or gentle shake

S – Send for help

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

A – Airway

- Clear airway and **protect cervical spine** (neck) (page 115)
- **Adult or child**
  - Use head tilt/chin lift — place one hand on the forehead. The other hand is used to provide chin lift. The head (not the neck) is tilted backwards. Grip chin and gently lift it up — Figure 2.1

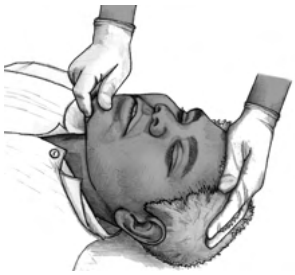


Figure 2.1

OR jaw thrust if head or neck injury suspected. Hold jaw at point under ears, push upward and forward until chin juts out and airway opens — Figure 2.2

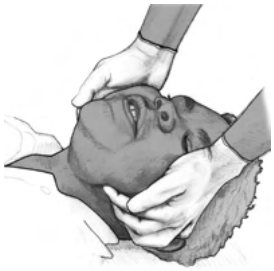


Figure 2.2

- **Infant (under 1 year)**
  - Put folded towel or nappy under shoulders and back — Figure 2.3
- If visible foreign body — use forceps to remove *OR* if no other option use 2 'hooked' fingers in downward sweeping motion
- If liquid (blood, vomit, water) — use suction if available *OR* gravity — roll onto side, open mouth and turn face downward
- **Keep airway open** — put in oropharyngeal or nasopharyngeal airway if needed

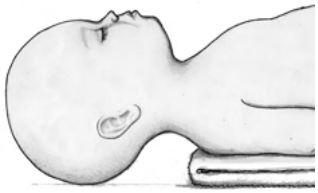


Figure 2.3

B – Breathing

- Assess — **look** for chest rise and fall, **listen** for breath sounds, **feel** for breath
- If person breathing but non-responsive — see Unconscious person (page 33)
- If not breathing — commence CPR
- **2 breaths per 30 compressions for all ages except newborns** — see newborn resuscitation (WBM, page 7)
  - 2 breaths, delivered over 1 second each with bag-valve-mask using **oxygen** if available *OR* mouth-to-mouth with droplet barrier/filter
- Watch chest rise and fall — don't overinflate
- If recovers and breathing normally
  - Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in recovery position — Figure 2.4 — unless possible head or spinal injury

Figure 2.4

C – Cardiopulmonary resuscitation - compressions (CPR)

- Start CPR on firm surface
  - Centre of chest, ⅓ depth of chest
  - Allow chest recoil, minimise interruptions
- **30 compressions then 2 breaths** for 1 or 2 responders
- **100 - 120 compressions/minute** (2 compressions/second)
- Pause compressions to allow for breaths — max pause 10 seconds

Defibrillation

- **Indications** — VF and Pulseless VT
- **As early as possible**. If immediately available and adult patient — defibrillate before compressions
- Infant or child less than 10kg
  - Use manual defibrillator if available
  - If no manual defibrillator — use AED

Pads

- Press adhesive pads on firmly for best shock and to avoid burns
- Do not place pad over ECG dots, leads or pacemakers
- Adult — Figure 2.5
  - One pad on right parasternal area over 2nd intercostal space
  - One pad on left midaxillary line over 6th intercostal space

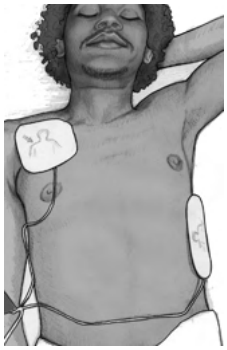


Figure 2.5

- Child — use largest pad that allows 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 — Figure 2.6

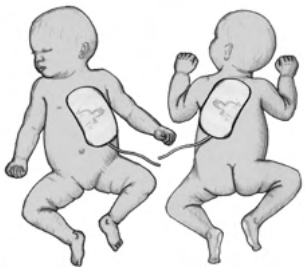


Figure 2.6

- **Defibrillator energy levels — Biphasic**
  - Adult — 200J
  - Child — 4J/kg doses (page 36)
- AED — once attached pause compressions for rhythm analysis
- Resume CPR immediately after shock delivered. Recheck rhythm after 2 minutes or return of responsiveness

Drugs (medicines)

Adrenaline (epinephrine)

- Give if asystole (no heartbeat), VF, pulseless VT or pulseless electrical activity (PEA)
- Adrenaline (epinephrine) dose
  - **Adrenaline (epinephrine)** IV/intraosseous — adult 1mg, child 0.01mg/kg/dose up to 1mg — doses (page 36) — 1mg = 1mL of 1:1,000 or 10mL of 1:10,000
  - Do not give if person already responding (breathing and moving)
  - Every 4 minutes during CPR

Amiodarone

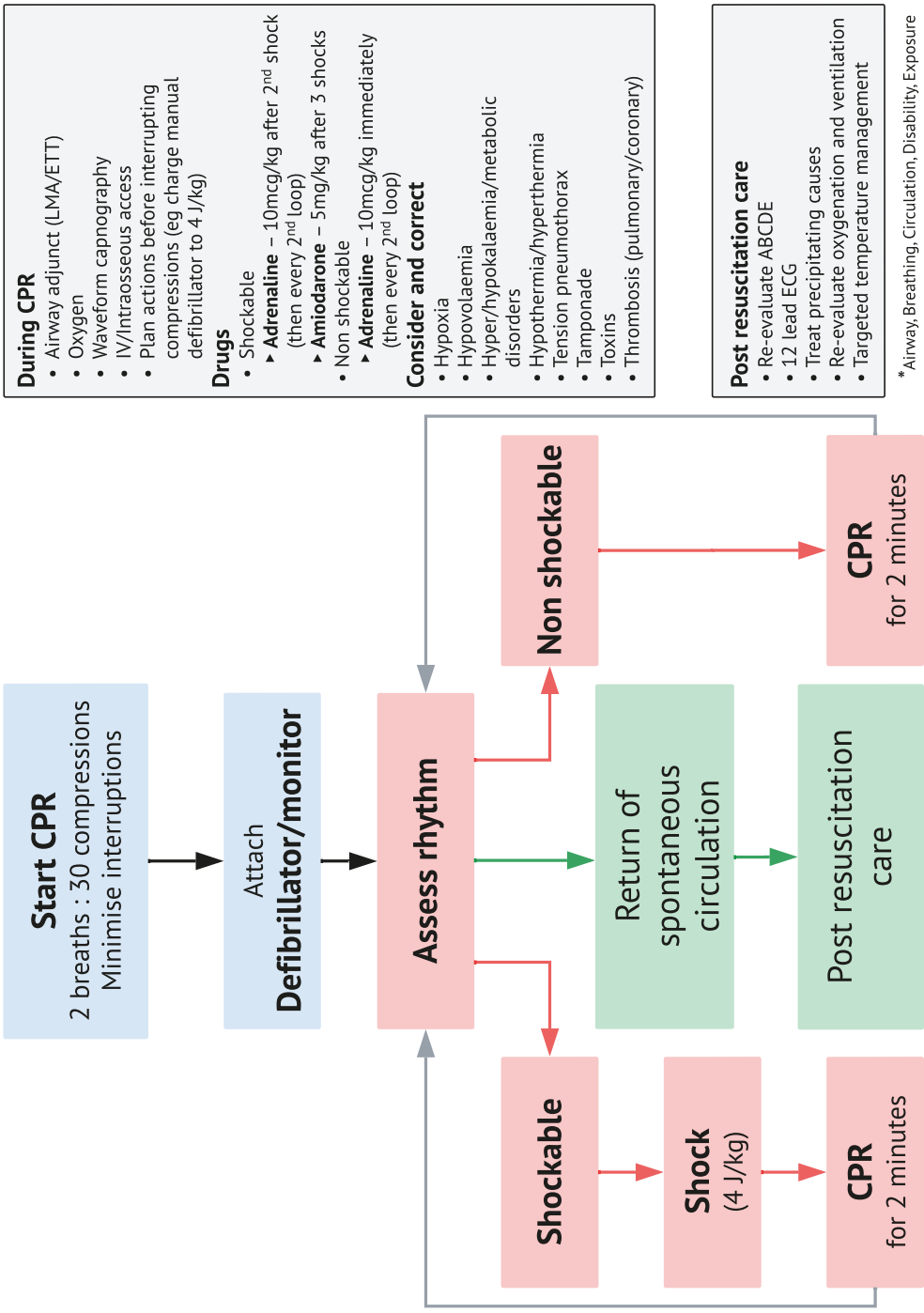
- If persistent VT or VF after 3 failed shocks — give **amiodarone** IV/intraosseous push as bolus — adult 300mg, child 5mg/kg up to 300mg — doses (page 36)
- If still persistent VT or VF — shock again
- If still persistent VT or VF after fourth shock — **medical consult** about
  - Second **amiodarone** IV/intraosseous bolus — adult 150mg, child 5mg/kg up to 150mg
  - *OR* **lidocaine (lignocaine)** IV/intraosseous bolus — 1mg/kg
- If normal rhythm restored — start **amiodarone** infusion 15mg/kg over 24 hours (usual adult dose 900mg), child 2.5mg/kg 6 hourly dose. Dilute in **glucose 5%**
- **Do not dilute amiodarone in normal saline**
- Diluting — **need concentration of more than 0.6mg/mL** for stable solution
  - Dose less than 225mg — use 100mL bag **glucose 5%**
  - Dose 225–449mg — use 250mL bag **glucose 5%**
  - Dose 450mg or more — use 500mL bag **glucose 5%**
- Use volumetric pump
- Do 12 lead ECG — look for evidence of ischaemia/infarct

Atropine

- For severe bradycardia (very slow heart rate), some poisons
- **Do not** give if asystole (no heartbeat)
- Dose
  - Adult — IV/intraosseous — 1mg boluses (up to 3mg in total)
  - Child — IV/intraosseous — 0.02mg/kg (doses (page 36)) *OR* ETT 0.03mg/kg

Flowchart 2.1 Advanced life support for adults

Flowchart 2.2 Advanced life support for infants and children



Unconscious person

Do first

- Breathing and unresponsive
  - Call for help — **medical consult**
  - Clear airway and **protect cervical spine (neck)** — see Immobilising the spine (page 115)
  - Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%
- If breathing normally and no risk of head, face or spinal injury — put in recovery position — Figure 2.7, Figure 2.8
- If suspected spinal injury and single responder — use Haines roll to protect the airway

Figure 2.7

Figure 2.8

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 alcohol
- 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
  - Diabetes
  - Lung problems — high CO_2 level, hypoxia (low oxygen)
  - 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 (page 84)
  - In the heat, working, walking, exercising hard — see Hyperthermia (heat illness) (page 81)

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- ECG and coma scale — pupils
- Head-to-toe exam
  - Stroke — asymmetry (one side of body or face looks, moves, has reflexes different to other)
  - Injury — cuts, head injury, pupils different sizes, blood or clear fluid (CSF) from ear or nose
  - Dilated pupils (very large) — overdose anticholinergics
  - Pinpoint pupils (very small) — overdose opioids
  - Rash, neck stiffness — meningitis
  - Bite marks, bleeding — snake bite
  - Medical alert bracelet

Do

- Put in IV cannula
- POC Test — electrolytes
- **Medical consult** — IV fluids
  - Correct hypotension (low BP) — **normal saline** IV bolus— adult 500mL, child 20mL/kg up to 500mL
- Assess/manage possible causes
  - 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** — see Hypoglycaemia (low blood glucose) (page 118)
  - Alcohol, drug overdose (page 291)
  - Unconscious after a fit (page 76)
  - Shock
  - Subarachnoid haemorrhage
  - Head injury (page 98)
  - Infections, especially meningitis (page 126)
  - If child — poisoning, infection, child abuse
  - Consider more than one cause — fit from low BGL *AND* being drunk/using drugs *AND* head injury from accident
- Pressure area care
- Consider IDC — U/A and pregnancy test

Resuscitation reference table

This table must be used with appropriate protocols and medical consults.
It is intended as a guide only

Age	Weight (kg)	Airway			Defibrillation	Fluid		Oxygen
		LMA size	ET tube size	ET tube depth of insertion	Biphasic	Bolus IV fluid Normal saline	Maintenance IV fluid Saline 0.45% with glucose 2.5%	Bag and mask
		1. Less than 5kg 2. 5–24kg 3. 25–49kg 4. 50–70kg 5. 71kg and over	(Age ÷ 4) + 4 OR width of fifth fingernail		Adult – 200J Child – 4J/kg and **medical consult**	Newborn – 10mL/kg Child – 20mL/kg Adult –1000mL	0–10kg – give 4mL/kg/hr Over 10kgs – add 2mL/kg/hr up to 20kg Over 20kg – add 1mL/kg/hr	
			ID (mm)	cm	Joules	mL	mL/hr	L/min
Under 3 months	2kg	1	2.5 uncuffed	9	8	20	8	8
	3.5kg	1	3 uncuffed	9	14	70	14	8
3 months	6kg	2	3.5 uncuffed	9	24	120	24	8
6 months	8kg	2	4 uncuffed	11.5	32	160	32	8
1 year	10kg	2	4 uncuffed	12	40	200	40	8
2 years	12kg	2	4 uncuffed	13	48	240	44	10
3 years	14kg	2	4 uncuffed	13.5	56	280	48	10
4 years	15kg	2	5 uncuffed	14	60	300	50	10
6 years	20kg	2	5 uncuffed	15	80	400	60	10
8 years	25kg	3	6 uncuffed	16	100	500	65	10
10 years	30kg	3	6 uncuffed	17	120	600	70	10
12 years	40kg	3	6 cuffed	18	160	800	80	10
14 years	50kg	4	7 cuffed	18	200	1000	90	10
Adult	65kg and over	4 71+kg 5	7 cuffed 90+kg 8 cuffed	18	200	1000	110	15

Age	Weight (kg)	Adrenaline (epinephrine)	Adrenaline (epinephrine)	Amiodarone	Atropine	Glucose	Midazolam	Morphine
		IV/intraosseous	IM	IV/intraosseous	IV/intraosseous	IV	IV/intraosseous	IV
		1:10,000 (1mg/10mL) VF, pulseless VT, asytole	Under 1 yr – 1:10,000 (1mg/10mL) 1 yr and over – 1:1,000 (1mg/1mL) Anaphylaxis	150mg/3mL VF, pulseless VT If conscious – **medical consult**	0.6mg/mL Symptomatic slow heart rate (bradyarrythmia)	Under 10 yr – 10% 10 yr and over – 50% Low BGL	5mg/1mL Fits	10mg/1mL Pain relief
		Child – 0.01mg/kg Adult – 1mg	Child – 0.01mg/kg Adult – 0.5mg	Child – 5mg/kg Adult – 300mg	Child – 0.02mg/kg Adult – 1mg boluses (up to 3mg total)	Child – 5mL/kg 10% Over 10 yr – 50mL 50%.	Child – 0.15mg/kg. Adult – titrate to 5mg	Child – 0.1mg/kg Adult – 0.5–2.5mg
		Undiluted Not shockable – immediately Shockable – after 2nd shock. Then every 2nd loop	Undiluted Deep IM upper outer thigh. Give every 5 min until improves Use different injection sites	Undiluted After 3rd shock. Slow IV push *THEN* 20mL normal saline flush.	Undiluted Give every 5 minutes until desired heart rate *OR* max dose.	Undiluted Repeat if needed.	Diluted in normal saline to 1mg/1mL (5mL) Give slowly over 2 min Titrate to clinical response	Diluted in normal saline to 1mg/1mL (10mL) Give every 3–5 min Titrate to clinical response
		mL	mL	mL	mL	mL	mL at 1mg/mL	mL at 1mg/mL
Under 3 months	2kg	0.2	0.2 (1:10,000)	0.2	0.1	10 (10%)	0.3	0.2
	3.5kg	0.4	0.4 (1:10,000)	0.4	0.1	20 (10%)	0.5	0.4
3 months	6kg	0.6	0.6 (1:10,000)	0.6	0.2	30 (10%)	1	0.6
6 months	8kg	0.8	0.8 (1:10,000)	0.8	0.3	40 (10%)	1.2	0.8
1 year	10kg	1	0.1 (1:1,000)	1	0.3	50 (10%)	1.5	1
2 years	12kg	1.2	0.12 (1:1,000)	1.2	0.4	60 (10%)	1.8	1.2
3 years	14kg	1.4	0.14 (1:1,000)	1.4	0.5	70 (10%)	2.1	1.4
4 years	15kg	1.5	0.15 (1:1,000)	1.5	0.5	75 (10%)	2.25	1.5
6 years	20kg	2	0.2 (1:1,000)	2	0.7	100 (10%)	3	2
8 years	25kg	2.5	0.25 (1:1,000)	2.5	0.8	125 (10%)	3.75	2.5
10 years	30kg	3	0.3 (1:1,000)	3	1	50 (50%)	4.5	3
12 years	40kg	4	0.4 (1:1,000)	4	1.3	50 (50%)	5	4
14 years	50kg	5	0.5 (1:1,000)	5	1.7	50 (50%)	5	5
Adult	65kg and over	10	0.5 (1:1,000)	6	1.7	50 (50%)	5	up to 10

Anaphylaxis — severe allergic reaction

Medical emergency — life threatening allergic reaction

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

Anaphylaxis kit

- Make sure anaphylaxis kit is in designated box and clearly labelled
- Use-by/expiry date of adrenaline (epinephrine) on the front

Table 2.1

3 ×	Adrenaline (epinephrine) ampoules 1:1,000 (1mg/mL) — 1mL ampoules
3 ×	Alcohol swabs
3 ×	Syringes — 1mL
3 ×	Drawing up needles — 18G or 19G blunt
3 ×	22–25G needles (25mm length) suitable for most IM injections*
1 ×	Adrenaline (epinephrine) doses card (laminated)
*Exceptions are preterm or very small infants — 23–25G needles (length 16mm) and very large adults — 22–25G needle (length up to 38mm)	

Do not

- **Do not** use antihistamines or hydrocortisone for immediate management of anaphylaxis

Do first

- **Immediately** when you suspect moderate or severe anaphylaxis
  - Get anaphylaxis kit and give **adrenaline (epinephrine) by deep IM**
  - 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
- Light-headedness

Check

If any of **signs in bold** — **severe anaphylaxis**

- **Abdominal pain, vomiting — severe symptoms for insect or injected medicine allergy**
- **Tongue or throat swelling**
- **Difficult breathing, stridor (noisy breathing), difficulty talking or hoarse voice, wheeze or persistent cough**
- **Low BP, weak fast pulse, pale, persistent dizziness**
- **Pale and floppy (young children)**
- **Collapse — shock or respiratory arrest**
- Lumpy or red rash (welts, hives)
- Swelling of lips, face or eyes

Do

- Remove allergen if still present (eg anaphylaxis caused by injection/infusion — **stop giving medicine straight away**)
  - For insect allergy, flick out bee stinger
- Lay person flat
- Stay with person and call for help — get someone to **bring anaphylaxis kit**
- If severe anaphylaxis (any sign in bold) — give **adrenaline (epinephrine)** by deep IM injection preferably into lateral thigh
- **Repeat dose every 5 minutes until person improves** — **always IM**
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Lay on back if needing to have airway opened *OR* put in recovery position to keep airway clear
  - If unconscious place in recovery position to keep airway clear — lay on left side if pregnant — Figure 2.9
  - If breathing is difficult allow them to sit up with legs outstretched
  - Hold young children flat, not upright

Figure 2.9

Giving adrenaline (epinephrine) for anaphylaxis — deep IM injection

- Get 1 ampoule of **adrenaline (epinephrine)** (1:1,000) and draw up correct dose — Table 2.2
- Give **adrenaline (epinephrine)** by deep IM injection preferably into lateral thigh
- **Repeat dose every 5 minutes until person improves** — **always IM**

- Consider nebulised adrenaline (epinephrine) if noisy breathing — 5 × 1mg ampoule in nebuliser
  - Nebulisers have high risk of transmitting infection and should only be used if absolutely necessary — wear full PPE

Table 2.2 Adrenaline (epinephrine) 1:1000 IM doses by age

Age (years)	Approximate weight (kg)	Dose of adrenaline (epinephrine) (mL of 1:1,000)	Adrenaline (epinephrine) injector
Under 2	5–10	0.1	Not available
2–3	15	0.15	Under 5 years (7.5–20kg) 150microgram device
4–6	20	0.2	
7–10	30	0.3	Over 5 years (over 20kg) 300microgram device
11–12	40	0.4	
Over 12	50+	0.5	Over 12 years (over 50kg) 300 or 500microgram device

- Put in IV cannula (largest possible)
- If condition severe and can't get cannula in within 1 minute — put in intraosseous needle
- Run **normal saline** or **Hartmann's solution** fast
- When person starts to improve — slow to maintenance IV fluid
  - Be careful with large amounts of fluid in children, elderly, people with heart or kidney disease
- **Medical consult**
- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- 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
- 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 what caused anaphylaxis, record in file notes
- Doctor must talk with everyone involved and decide if it was true anaphylactic reaction
- If it was true anaphylactic reaction
  - Carefully explain to person what this means — must not take that medicine, eat that food
  - Record what caused allergic reaction (if known) in large red letters as alert in clinical record *Example:* ALLERGIC TO PENICILLIN ALLERGIC TO PEANUTS
- Must tell local hospital and other places with medical records for person
- Consider reporting to Therapeutic Goods Administration — online portal
- 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) *OR* the cause is unclear/unknown — doctor needs to arrange access to self-injecting adrenaline (epinephrine) pen, educate in storage and use
- Doctor should also provide an Action Plan for anaphylaxis

Procaine reactions

Cause not known. Also called pseudo-anaphylaxis or procaine psychosis
Number of possible reactions to procaine benzylpenicillin (procaine penicillin) injections — Table 2.3

Table 2.3 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 perspiring (sweaty)
Pulse	Slow	Weak, fast	Strong, fast
BP	Normal or slightly low	Low – shock	Normal or high
Breathing	May groan	Wheeze or stridor (noisy breathing)	May be fast
Other signs	May go stiff with twitching limbs	Irregular heartbeat, may collapse	Metallic taste, twitching limbs or fit

Do

- Stop giving injection straight away
- Protect person from injury
- Call for help, ask someone to get anaphylaxis kit
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Check pulse, RR, BP
  - If weak fast pulse, low BP — anaphylaxis
  - If slow pulse, normal BP — faint
  - If fast pulse, normal or high BP — procaine reaction
- **Medical consult** to confirm type of reaction
- Reassure person, try to keep them comfortable
- Understand that reaction is harmless and will stop in 15–30 minutes

Follow-up

- Reactions can be stressful for person, relatives and clinic staff. Important for clinic staff and community to understand what happened and that no-one was to blame
- Talk with person and relatives about 'procaine reactions'. Explain that reactions do not usually happen again
- Person can still have procaine benzylpenicillin (procaine penicillin) but may not want to
- Record in health record — PROCAINE REACTION (NOT PENICILLIN ALLERGY)

Supporting resources

- Australasian Society of Clinical Immunology and Allergy (ASCIA) anaphylaxis action plan

Bites — animal or human

- Human or animal bites carry a high risk of infection
  - Includes fists cut by teeth in fight — treat as a human bite
- High risk of infection if
  - Delayed presentation (8 hours or more)
  - Puncture wounds that can't be debrided adequately (eg cat, crocodile bites)
  - Wounds on hands, feet or face
  - Tendon, joint or bone involvement
  - People with weakened immune system — dialysis, diabetes

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam with attention to
  - Embedded foreign bodies (eg teeth)
  - Bone, joint or tendon involvement
  - Wounds over knuckles that may connect with tendon or joint
- Immunisation status — tetanus

Do not

- Do not suture or tightly close a wound bite — will trap infection inside

Do

All bites

- Swab wound for MC&S
- Clean and dress
- If small, clean, uncomplicated wound — antibiotics not needed

Severe bite or established infection — medical consult

- Consider sepsis — signs and symptoms can include
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation

All other bites

- Give antibiotics
  - **Amoxicillin-clavulanic acid** oral — adult 875+125mg, child 22.5+3.2mg/kg/dose up to 875+125mg — doses (page 501) — twice a day (bd) for 5 days
- If unable to give oral antibiotics — **medical consult** for
  - **Cefazolin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — twice a day (bd)
  - *AND* **Metronidazole** IV — adult 500 mg, child 12.5 mg/kg up to 500 mg — twice a day (bd)
- If allergy to penicillin — **medical consult** for
  - **Metronidazole** oral — adult 400mg, child 10mg/kg/dose up to 400mg — doses (page 501) — every 12 hours (bd)
  - *AND* **Trimethoprim-sulfamethoxazole** oral — adult 160+800mg, child 4+20mg/kg up to 160+800mg — doses (page 501) — twice a day (bd) for 5 days
- Review daily

Bites and stings — snake, spider, centipede and scorpion

For animal and human bites — see Animal or human bites (page 42)

Snakebites — land and sea

Only effective antivenom is CSL land or sea snake antivenom

Red Flags — Urgent Medical Consult

- Collapse, coma
- Low BP within 1 hour of bite
- Bleeding from IV puncture site or bite site
- Any other unexplained bleeding
- Haematuria (blood in urine)
- Abdominal pain, vomiting, headache
- Evidence of paralysis — signs of muscle weakness may take up to 24 hours to develop after a bite

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 not give antivenom out bush — unless advised by doctor

Do first

Most important thing — stop spread of venom from bite site

- **If unconscious or collapsed** — DRS ABC
- **Medical consult**
- Lie person down, keep as calm and still as possible
- Apply pressure bandage and immobilisation
  - Start at toes or fingers and work up. If bite on trunk or head — just bandage bite site
  - Use firmest bandage you have. Elastic is much better than crepe
  - **Apply bandage as firmly as possible to the limb**. You should not be able to easily slide a finger between the bandage and the skin
  - Use 15cm wide bandage for leg
  - Splint bitten arm or leg to stop it moving
  - Immobilise whole person — use stretcher if available

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A for blood and protein — save urine for venom identification
- Coma scale score, ptosis (drooping eyelid), lack of ophthalmoplegia (eye movement)
  - Repeat every hour — more often if person getting worse
- Immunisation status — tetanus

Do

- Put in IV cannula — oozing around site may indicate envenoming
- Take blood for UEC, CK

Redback spider bite

Not life threatening but can cause significant pain

Red Flags — Urgent Medical Consult

- Severe local pain
- Significant signs of envenoming (eg swelling, headache, neurotoxicity)

Do not

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

Ask

- Pain at bite site
  - Increasing 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
- Priapism (painful erection) in boys
- May present as intractable crying in an infant

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — signs and symptoms usually obvious in 1–6 hours if going to happen
- Bite site may not be obvious
- 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
- Immunisation status — tetanus

Do

- Cold pack (**do not** put ice directly on bite) *OR* hot pack/water may help with pain
- Give pain relief (page 326)
- If still pain or severe pain — **medical consult** including possible role for antivenom especially in children

Centipede or scorpion sting

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

- Centipede bites — may be a lot of redness and swelling, allergic reactions can occur
- Scorpion bite/sting — may be no mark

Check

- Immunisation status — tetanus

Do

- Wash bite and apply antiseptic
- Cold pack (do not put ice directly on bite) *OR* hot pack/water may help with pain
- Give pain relief (page 326), if needed
- Monitor for 4 hours for systemic toxicity, rare (eg vomiting, headache, sweating, hypertension)

Bites, stings and poisonings — marine

Box jellyfish sting

There are a number of species of box jellyfish. Major box jellyfish (*Chironex fleckeri*) sting most likely to be fatal. Symptoms usually obvious straight away. Really really hurts

Red Flags — Urgent Medical Consult

- All cases involving collapse
- Stings to face, genitals (private parts), hand or multiple stings
- Child, unless minor sting not needing morphine
- Adult with pain not relieved by ice and 1 injection of morphine
- Antivenom given
- Seizures
- Trouble swallowing, breathing, talking

Table 2.4

Signs and Symptoms	
Will have	**May have**
• Strong pain from time of sting • Marks on skin • Been in contact with tropical waters — includes tidal rivers and creeks	• Sting lines on skin — whip weals, may be frosted ladder pattern • Fast pulse, high BP or low BP • Trouble swallowing, breathing, talking • Seizures • Loss of consciousness

Do not

- **Do not** use pressure bandage

Do first

- 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 — see DRS ABC (page 27)

- **Give box jellyfish antivenom straight away**
  - 1 ampoule IV/intraosseous — mixed in 10mL **normal saline**
- Anaphylaxis (page 37) due to antivenom rare, but can happen
- If no immediate response — give more **antivenom**
- If doesn't get better *OR* breathing or circulation get worse — continue CPR with ventilation (people can survive hours with supported ventilation)
- *AND* **urgent medical consult** — to consider
  - More **box jellyfish antivenom** (up to 6 ampoules if available)
  - **Adrenaline (epinephrine)** IV/intraosseous — adult 1mg, child 0.01mg/kg/dose up to 1mg — doses (page 36)
  - Morphine for pain relief

Mild to moderate box jellyfish sting

Conscious, normal breathing and circulation

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Repeat every 15 minutes
- Immunisation status — tetanus

Do

- Keep person still
- Use ice packs *OR* hot pack for pain. If pain not relieved — pain relief
- If pain relief ineffective — **medical consult**

Stonefish and Catfish sting

- No known antidote for catfish sting

Red Flags — Urgent Medical Consult

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

Do not

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

Symptoms

- Collapse
- Low heart rate
- Low BP
- Strong pain from time of sting
- Swelling of sting site and limb

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Immunisation status — tetanus

Do

- Put stung area into hot water — 40–45°C (not burning)
  - Test water first with unaffected limb
  - **Do not** use for longer than 90 minutes
- If pain continues
  - Inject **lidocaine (lignocaine)** 1% along sting track — up to 2mg/kg/dose
  - **Medical consult** — opioid may be needed
- **Medical consult** if
  - Stonefish — may need to go to hospital for antivenom
  - Catfish — may need x-ray or ultrasound sting site — piece of barb often breaks off in wound (no antidote)

Stingray barb injury

- No known antidote

Red Flags — Urgent Medical Consult

- Chest or abdomen injuries from barb
- Stabbing or penetrating stingray barb injuries
- Arrhythmia
- Fits

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 — consider IV fluids

Symptoms

- 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 saliva (spit), diarrhoea, sweating, fainting, muscle cramps, arrhythmia (irregular heartbeat), fits

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Immunisation status — tetanus

Do

- Control any obvious bleeding
- Wash wound with soap and 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
  - **Medical consult** — opioid may be needed, regional nerve block may be useful

- **Medical consult**
  - May suggest antibiotics if wound more than 6 hours old
  - May consider x-ray or ultrasound if penetrating injury
  - May need surgery to look for pieces of barb, remove dead tissue

Irukandji syndrome

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

Red Flags — Urgent Medical Consult

- High BP not relieved by adequate analgesia or pain relief
- Low BP
- Shortness of breath, low O_2 sats (from pulmonary oedema)
- Pain not relieved by 1 injection of morphine

Do not

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

Symptoms

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 and pale
  - Feel anxious, restless, like they are going to die
  - Have headache, nausea, vomiting
  - Have fast pulse, high BP

After 2–12 hours

- Rarely — develop acute cardiac-related pulmonary oedema
- Shortness of breath, BP drops, O_2 sats low
- Symptoms can last 1–2 days

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Do

- Pour vinegar over sting area (if seen) for at least 30 seconds
- Put in IV cannula
- Give **pain relief** — pain may be severe
- **Medical consult** if pain not relieved
- 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

Blue ringed octopus bite

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

Red Flags — Urgent Medical Consult

- Any breathing difficulties
- Definite blue ringed octopus bite
- Developing paralysis

Symptoms

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

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Do

- Remove person from water
- **Medical consult**
- Support respiration if needed — may need prolonged ventilation (eg mouth-to-mouth, bag-valve-mask, mechanical ventilator)
  - Must follow all doctor's instructions before stopping CPR and ventilation
  - People can survive for hours with supported ventilation
- Put in IV cannula
- Apply pressure bandage to the bite site

Fish poisoning — ciguatera

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

Red Flags — Urgent Medical Consult

- Severe gastrointestinal symptoms — dehydration
- Neurological effects
- Respiratory compromise

Symptoms

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

Do

- Treat symptoms — NSAID may be useful (if no contraindications)
- Put in IV cannula
- Give IV fluids if severe diarrhoea — **medical consult**

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

Red Flags — Urgent Medical Consult

- Tingling lips, progressive weakness, ataxia (unsteadiness)
- Respiratory failure
- Paralysis

Symptoms

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

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to muscle weakness

Do

- **Medical consult**
- 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
- If developing paralysis — send to hospital

Burns

Remember — Life support — DRS ABC (page 27) **then treat the burn**

Red Flags — Urgent Medical Consult

- 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
- 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 16 years
  - 10% of body surface area for person 16 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
- **Be alert** for sudden onset severe sepsis in young children with small burns — can present 2–4 days after burn

Do not

- **Do not** use ice, ice packs, or refrigerated water — can cause more damage
- **Do not** wash chemicals over unaffected skin/eye or let water collect in shoes
- **Do not** try to remove clothing if stuck to burn
- **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
- **Do not** use any creams or medicated dressings until after burns unit consult

Do first

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 wash eye while double everting eyelid. Lie person on side with affected eye lowermost to protect good eye

Cool the burn

- Cool burned area with cool water (aim for 15°C) — up to 3 hours after burn
- Thermal burns — continue cooling if providing pain relief
  - Run or pour cool water over burn (best)
  - *OR* if no suitable water available — wrap burn in towels/cloths soaked in water or **normal saline**, change towels/cloths as needed
  - *OR* submerge in water. Change water as needed
- 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

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 (page 84) from cooling
  - Risk highest for babies and small children
- Continue assessment while cooling the burn

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

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Immunisation status — tetanus
- Head-to-toe check — with attention to
  - Lungs — hoarseness or stridor (noisy breathing), coughing black dust/soot, face burn — person may suddenly get worse and their airway will need to be protected, usually need intubation
  - Other injuries apart from burns
  - Pulses and capillary refill distal to injury (eg toes, fingers)

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
- Check again a couple of hours after first assessment unless burn has been dressed

Work out depth of burn — Table 2.5

- Difference important for deciding how to treat burn
- Always check again a couple of hours after first assessment unless burn has been dressed

Table 2.5 Working out depth of a burn

Burn characteristics	Superficial – epidermal	Superficial – dermal	Partial thickness – mid-dermal	Partial thickness – deep dermal	Full thickness
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	1–2	1–2	More than 2 seconds	More than 2 seconds or absent	Absent
Sensation	Painful	Painful	May be reduced	Reduced	Absent
Ooze	None	Lots	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

Photograph wound

- Take digital photo of uncovered burn (with consent) if possible. Send by phone text message, email, web camera, videoconference for **medical/ burns unit consult**
  - Phone first and they will tell you how to do this
- If unable to photograph the burn — use numbered body charts

Do

- Decide if major or minor burn, manage accordingly

Management of major burns

- **Send major (serious) burns to hospital urgently** — usually to burns unit
- **Urgent medical consult** — will work out fluids and pain relief
  - Person with major burns needs large amounts of fluids very early on
  - May also need direct burns unit consult

Do

- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
  - If inhalation burns — give high concentration
- Put in IV cannula, largest possible, 2 if you can — try for unburnt skin
- Give IV fluids — see Working out fluids needed (page 59)
- Keep person warm — person with major burns cannot control their temperature
- Give pain relief (page 331) — best given IV/intraosseous. Use morphine (page 331) in small doses
- Put in nasogastric tube, especially for child to avoid vomiting, aspiration
- Elevate burnt limb — keep in raised position
- If burns to 10% or more of body or extensive burns to perineal area — put in indwelling urinary catheter, measure urine hourly
- **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 towels. Change every 4 hours until sent to hospital
- If delay in sending to hospital or long travel time
  - Remove plastic wrap
  - Put on soft paraffin, non-medicated dressing, combine dressing, loose bandage

Working out fluids needed

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

- **Medical/burns unit consult about fluid resuscitation**
  - Fluid formula only a guide to fluid needs
  - Record accurately — time fluids started, amount given. Send in with person
  - If delay in sending to hospital — **medical/burns unit consult** to change fluids according to clinical response (eg urine output, pulse rate)
- 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, from when person was burnt
  - *THEN* give rest in next 16 hours
  - *THEN* maintenance fluid in next 24 hours
- Use Modified Parkland Formula for
  - **Over 20%** TBSA in adults
  - **Over 10%** TBSA in children
  - 3mL **Hartmann's solution** × weight (kg) × % total body surface area burnt (TBSA) = volume (mL) in 24 hours
- **For children (under 16 years) in addition give maintenance fluid normal saline with 5% glucose (4mL/kg/hour for the first 10kg + 2 mL/kg/hour for next 10kg + 1mL/kg/hr thereafter)**

Example — working out fluids needed

Child aged 8 years weighing 24kg with burns to 30% of their body, burnt at 0900hrs, arrives at clinic at 1130hrs

Replacement fluids

- Total = 3mL × 24(kg) × 30(%) = 2160mL over 24 hours
  - 1080mL to be given by 1700hrs — 8hrs after burn occurred.
  - If starting fluids at 1200hrs (30mins after arrival) then 1080mL needs to be given over the next 5hrs = 1080mL/5hrs = 216mL/hr
- Half in next 16 hours = 1080mL/16hrs = 67.5mL/hr

PLUS maintenance fluids for a child (under 16 years)

- 64mL/hr

Management of minor burns

Red Flags — Urgent Medical Consult

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 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 (page 153)

- Minor burns may still need consult with burns unit or hospitalisation — **medical consult** for advice

Do

- 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
- **Active muscle contraction and movement is very important** — helps remove swelling
- Reassure person that moving will help healing, will not harm burn or wound

Remember: Good early management is 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

Burns at risk of infection if

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

Check

- Depth of burn
- Risk of infection
- Immunisation status — tetanus

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 (page 326)
- 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
  - Change within 2 days
- If no ooze or when ooze has stopped — use
  - Protective dressing such as island dressing
  - *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-foam dressing** held in place with non-woven dressing
- Leave in place for up to 5 days, change if saturated

Healed burn wounds that need added protection

- If healed — moisturiser only
- If area may be rubbed (under friction) or knocked and fragile — continue dressing as previous

Burns care after hospitalisation

- Follow hospital discharge advice — especially for dressings and compression garments
- Person may need emotional support
- Watch for signs of infection
- **Advise person/carer**
  - Wash daily and 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 and 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
- Dress as partial thickness burns at risk of infection
- Check swab result, give antibiotic according to sensitivities

Chest pain

- **Treat as serious and call for help. For initial assessment — see Acute assessment of chest pain** (page 20)
- Get defibrillator, use as monitor
- Only test needed to assess for thrombolysis is
  - ECG
- Always do full assessment

Many heart attacks are missed because symptoms not typical — especially in young adults, women and people with diabetes

Refer to your local regional Acute Coronary Syndrome Flowcharts if available

Initial management — all chest pain

Do first

- Person on bed partly sitting up
- Record time they arrived
- If they look very sick or are very distressed — call for help
- **Do 12 lead ECG immediately — urgent medical consult** within 10 minutes
  - Leave leads on — will need to repeat
- POC Test — troponin

Ask

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

Do

- If short of breath, cyanosed (blue) or O_2 sats low — give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%. Avoid too much oxygen
- Give **aspirin** oral single dose — adult 300mg — unless allergic
- Put in IV cannula
  - Take 15mL blood (EDTA, coagulation studies and serum)
  - Flush with 5mL **normal saline**
- If systolic BP more than 100mmHg and no contraindications give
  - Nitrate therapy
  - 250mL bolus of **normal saline** and assess response
- If person still has pain — may need **morphine** (page 331) IV — doses (page 36)

Nitrate therapy

Do not

- **Do not** give nitrate therapy if systolic BP 100mmHg or less — check BP before each dose
- **Do not** give nitrate therapy if person has used drugs for impotence
  - Sildenafil or vardenafil in past 24 hours
  - Tadalafil in past 2 days

Do

- Give **nitrate therapy** sublingual (under tongue)
  - **GTN** spray — 1 puff
  - *OR* **isosorbide dinitrate** tablet — 5mg
- If still pain after 5 minutes — give second dose of **nitrate therapy**
  - **GTN** spray — 2 puffs
  - *OR* **isosorbide dinitrate** tablet — 5mg
- If still pain after 10 minutes — consider **morphine** (page 331) IV — doses (page 36)
  - If good effect and systolic BP still more than 100mmHg — can continue nitrate dosing every 5 minutes in addition to morphine

Assess for thrombolysis

For indications for thrombolysis — see Table 2.6
For contraindications for thrombolysis — see Table 2.7

Do first

- **Medical consult** before giving
- **Only give** thrombolysis therapy (tenecteplase) to people with ST elevation myocardial infarction (STEMI) — Table 2.6
- **Always** assess for contraindications
- Put in second IV cannula — 16G if possible

Obtaining consent

Explain to person there is no guarantee they are having a heart attack

- Benefits — 2 lives saved for every 100 people
  - Less damage to heart muscle
- Risks — for every 100 people treated
  - 3 people will have serious bleeding
  - 1 person will have stroke, due to bleeding inside head

Table 2.6 Indications for thrombolysis

Pain	Chest pain that could be a heart attack • Lasted at least 20 minutes • Not relieved by nitrate therapy • Started less than 12 hours ago
AND	
ECG	ST segment elevation • 1mm or more in 2 adjacent limb leads ▸ 2 of — II, III, aVF *OR* both I and aVL • *OR* 2mm or more in 2 adjacent chest leads ▸ 2 of — V1, V2, V3, V4, V5, V6

Table 2.7 Contraindications to thrombolysis

Always ask about these

Absolute	Relative
• Active internal bleeding — gastrointestinal or urinary • Head injury in past 3 months • Suspected aortic dissection (severe chest pain with stroke symptoms) • Known brain tumour or aneurysm	• Taking anticoagulant (eg warfarin) • Procedures involving internal blood vessels — central venous line • Major surgery in past 3 weeks • Prolonged CPR — more than 10 minutes • Internal bleeding in past 4 weeks • Chronic, poorly-controlled or severe high BP • BP more than 180mmHg systolic or 120mmHg diastolic on arrival • Stroke more than 3 months ago • Dementia • Pregnancy • Advanced liver disease • Transient ischemic attack (TIA) in preceding 6 month

Do

If ECG abnormal with ST elevation myocardial infarction (STEMI) *AND* positive troponin

If thrombolysis is indicated

- Give **enoxaparin** IV single dose — 30mg
  - **Do not** give if over 75 years
- *AND* give **tenecteplase** IV over 10 seconds — see Table 2.8 for doses

Monitor

- BP every 5 minutes during thrombolysis, then every 15 minutes until transfer
- ECG — 1 hour and 3 hours after thrombolysis or if arrhythmia

AND

For ALL ST elevation myocardial infarction (STEMI) *AND* ST depression *OR* T wave inversion with positive troponin (nonSTEMI)

- Give **enoxaparin** subcut 1mg/kg/dose
  - If more than 75 year give 0.75mg/kg/dose
- Give **clopidogrel** oral single dose — 300mg (4 tablets)
- Give **nitrate** therapy and **morphine** for pain if needed
- Check **aspirin** given

Monitor Pulse, O_2 sats, continuous cardiac rhythm

Table 2.8 Dose of tenecteplase IV

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

For ST depression *OR* T wave inversion with negative troponin — angina

- Give **nitrate** therapy and **morphine** for pain
- Check **aspirin** given

Monitor

- With heart monitor if available — continuous ECG, 15 minutes observations
- Repeat ECG after 30 minutes and send to doctor
- Repeat troponin test at 6 hours. If positive — **medical/specialist consult**

Follow-up

All people with angina or heart attack need careful follow-up to lessen risk of more heart disease

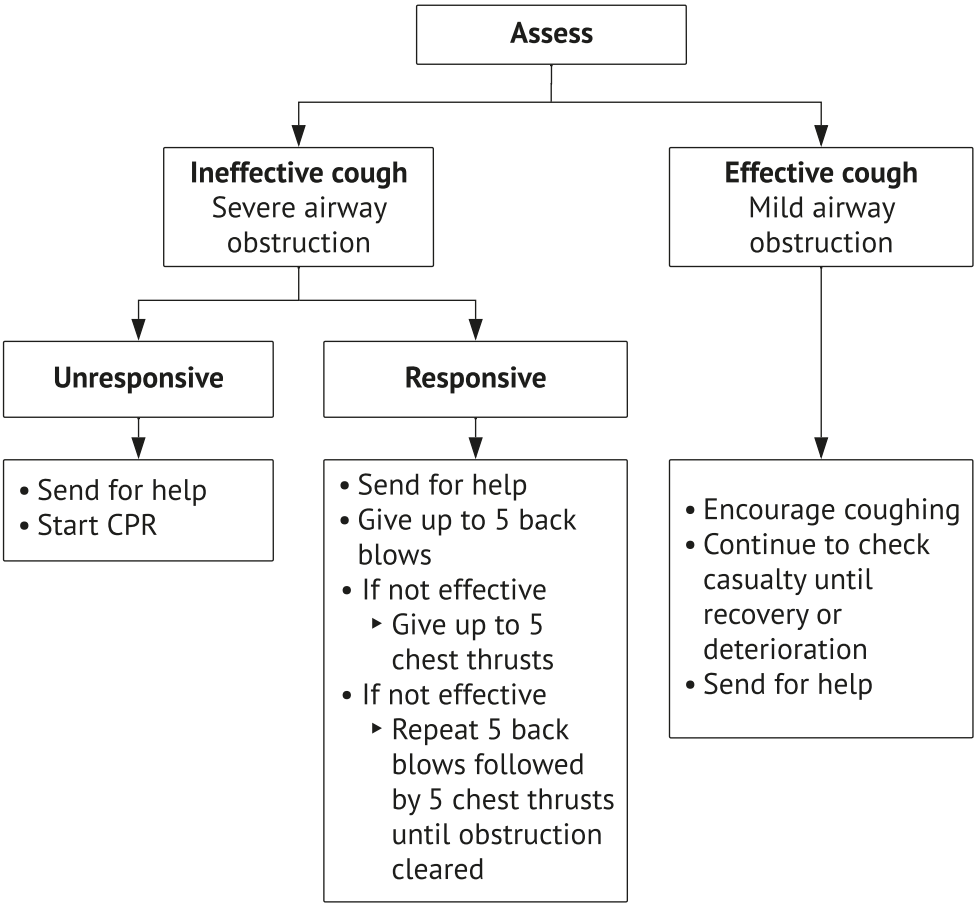
Choking

Red Flags — Urgent Medical Consult

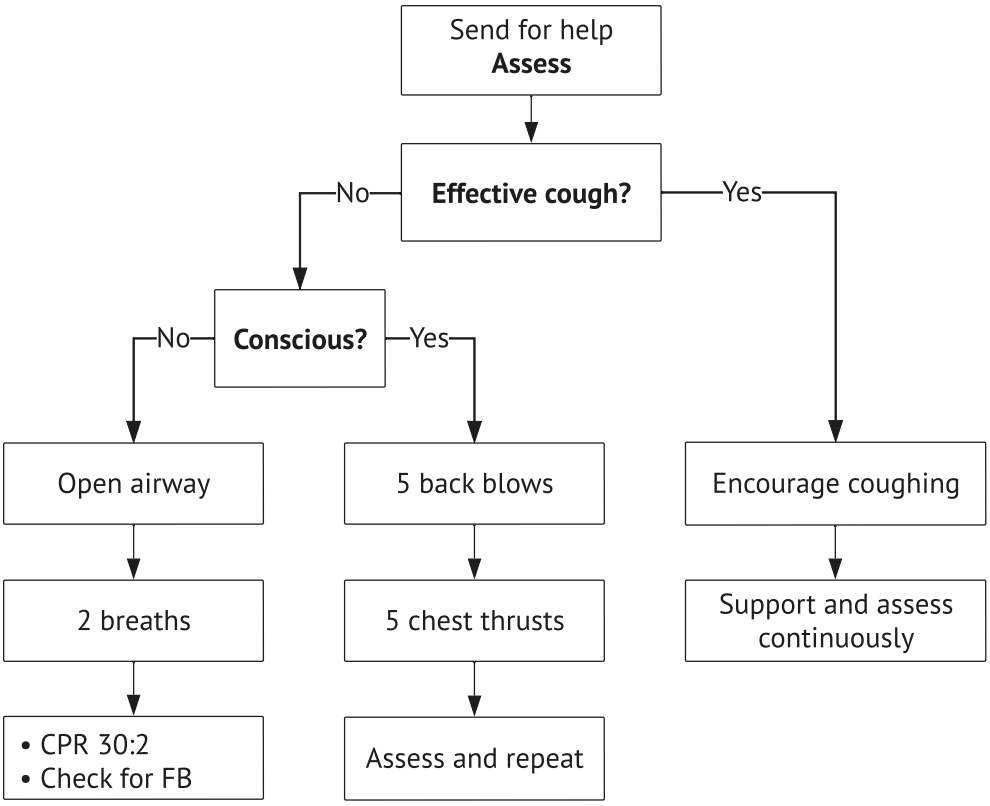
- Total obstruction
  - Trouble breathing
  - No sound of breathing
  - No escape of air from nose and/or mouth
- Partial obstruction
  - Laboured breathing
  - Noisy breathing

What you do

Flowchart 2.3 Management of Foreign Body Airway Obstruction (Choking) Algorithm



Flowchart 2.4 The choking child



Total obstruction (blockage)

Infant

- Sit or kneel. Support infant across thigh or lap in head down, face down position — Figure 2.10
- Give up to 5 sharp blows with an open hand between the scapula (shoulder blades)
- Check between blows to see if obstruction removed
- If this doesn't work — roll infant over to face up position with head in neutral position
- Give up to 5 chest thrusts — central sternum, sharper than CPR, every 2 seconds — Figure 2.11
- Check between thrusts to see if obstruction removed

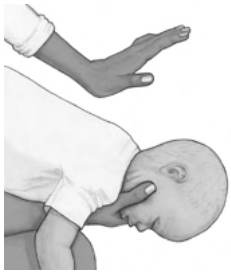


Figure 2.10

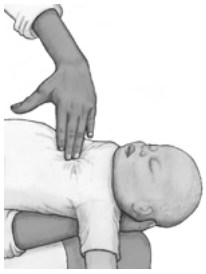


Figure 2.11

- If this doesn't work and infant conscious — alternate between 5 back blows and 5 chest thrusts
- If consciousness lost or was unconscious when discovered
  - Start CPR for basic life support 30:2 (15:2 if 2 operators) with head in neutral position
  - After 30 compressions, open mouth and check for/remove foreign body. If skilled, use laryngoscope and angled forceps (eg Magills)
  - If unable to clear airway prepare for emergency cricothyroidotomy

Adult or child

If standing/sitting and conscious

- Give up to 5 sharp blows with an open hand between scapula (shoulder blades) — Figure 2.12
- Check between blows to see if obstruction removed
- If this doesn't work give up to 5 standing chest thrusts — check between thrusts to see if obstruction removed
  - Stand behind person with their arms raised, your chest pressed into area between shoulder blades. Place clenched fist on their chest covered by your other hand in same position as CPR in centre of sternum — Figure 2.13
  - 1 thrust per second

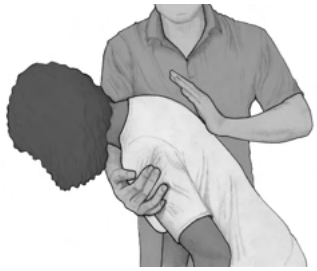


Figure 2.12

Figure 2.13

If on the ground but still conscious — give up to 5 chest thrusts. Compress central sternum as for CPR

If person loses consciousness — lower to ground, face up, start CPR

- After 30 compressions, open mouth and check for/remove foreign body. If skilled — use laryngoscope and angled forceps (eg Magills)
- If unsuccessful — continue CPR
- Prepare for emergency cricothyroidotomy

Part blockage (obstruction)

Do not

- **Do not** give oxygen
- **Do not** force the person to lay down
- **Do not** finger sweep if you can't see cause of blockage (may push object further down)

Do

- Call for help
- Stay calm, be reassuring
- Leave person in position they find most comfortable
- Encourage to cough
- If a foreign body can be seen and easily reached — remove it
  - Take care not to push it further into airway
  - Do no other interventions
- Observe continuously

Domestic and family violence

- Can involve sexual (WBM, page 27), physical, emotional, psychological or economic abuse/ violence or behaviour that causes fear, eg threats of violence and/or stalking — can occur in person, online or by phone
- Usually directed at **intimate partner** — spouse, girlfriend, ex-partner, child. Often by a man against a woman but consider violence in all relationships
- 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 — Aboriginal women and children, pregnant women, disabled people, refugees or new arrivals, gender and sexually diverse people, the elderly
- Children who witness violence can suffer long-term effects — consider counselling and support

Domestic/family violence is a crime

- **Safety** is the first priority for person and practitioner
- **Do not** confront or accuse any likely offender. Avoid doing anything that might make them angry or violent with you, other staff, or person you are helping
- You **must know** your responsibilities under the laws in your state/ territory relating to violence against adults and children and mandatory reporting
- If **you suspect child abuse** (which includes witnessing violence) — after **medical consult** you **must report** to child protection service (page 153), mandatory reporting

Consider domestic/family violence when

- Injury doesn't match story of how it happened
- Injuries to abdomen or genitals (private parts)
- Injuries are covered by clothing — breasts, abdomen, chest, unusual or hidden places on body
- Injuries when pregnant
- Treating women with gynaecological or anxiety problems
- Person often comes to clinic with injuries or vague symptoms or there are delays in seeking medical attention or doesn't want to talk about what happened
- If concerned about a child — see Child neglect, abuse and cumulative harm (page 153)

Person may

- Appear nervous or ashamed and unable to communicate
- Describe person who did it as a bully or getting angry easily (people rarely use term 'domestic violence')
- Seem uncomfortable or anxious when partner present
- Be accompanied by partner who won't let them speak or stays too close
- Have symptoms of chronic stress, anxiety (page 269), depression (page 272)

Always

- Before involving family or other people — ask person who it is or isn't OK to talk to and who they would like as a support person
- Arrange interpreter if needed
- Believe what person tells you — listen to their story, be supportive and responsive, don't judge or blame
- Make sure you talk to person where they feel safe, alone if they want, not when highly distressed. May mean seeing person again later

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. Do not criticise them or partner. Explain that this is a non-judgement space to talk
- Sometimes victim may not feel able to leave their violent home. Accept their choice

If you have serious concerns about safety of person who is refusing help

- Talk about the situation with your manager
- Report situation to the police

Ask

Questions to find out about undisclosed (not reported) domestic/family violence

Build rapport by general conversation (talking about other things) and ask about having another family member, ATSIHP or other health staff in the consult room

- Can I help you with anything today, are you worried or upset about anything
- Are you feeling OK in your body
- Do you have any pain or are you sore anywhere
- Are you worried about anything or anyone in your family

Direct non-blaming questions that won't cause shame or guilt — explain they are part of normal clinical care

- Can you tell me what happened
- How does your partner treat you. Are you having any problems
- Are you afraid of your partner — for yourself or your children
- Does your partner ever threaten to hurt you or your family

Physical and sexual violence

- Has anyone at home hit you or your children or tried to injure you or your children in any way
- Have you ever been slapped, pushed or shoved by your partner
- Have you ever been touched in a way that made you feel uncomfortable
- Has anyone ever made you do something sexual when you did not want to
- **Always** ask about strangulation — especially in intimate relationship assaults

Housing situation

- Have you got somewhere safe to stay
- Where are you staying now. Do you always live there
- Is it your house or someone else's
- Who is staying with you
- How many people live where you are staying
- Does everyone in your house get along OK
- Do you feel happy staying in the house with the people who are there

Social or emotional concerns

- Self-harm or thoughts of self-harm
- Drug and/or alcohol misuse
- Sleeping or eating problems
- Loneliness or isolation from family and friends
- Sexual problems or STIs

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test

Do

- Explain and check that the person understands confidentiality and that you might have to share information for mandatory reporting

Treat person's injuries (if any)

- Measure and describe injuries. Use drawings — see Numbered body and hand charts — may be needed in court
- Record in detail what person says happened and how they presented — but remember it is not your job to investigate the complaint

Call for support

- Women's shelter, police, specialist support services can give person the right legal advice — ask person if you can refer them
  - The person can talk directly to the women's shelter staff if preferred
  - If they want to report what happened to police — offer telephone and privacy. If they are unsure — ask if you or support person can ring for them

Management plan — if person stays in community

- Check they have a safe place to stay
- Record who support people are
- Make sure they know who to contact and how to get help quickly

Talk about a safety plan to avoid possible violence

- Warning signs for 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 children's safety
- Talking with a relative who can discourage (help stop) attacker from violence
- Getting a restraining order or Apprehended Violence Order (AVO). Contact local police for more information

Follow-up

- Review person within 24 hours and often until crisis has passed
- Offer referrals for counselling and support
- Domestic/family violence impacts on immediate and long-term physical and emotional health. Make sure victims are offered routine health checks — Adult health check (page 222) including STI check, Mental health assessment, School-aged health check (page 146), Child health check (page 138)

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
- National sexual assault, domestic family violence counselling service — 1800RESPECT (1800 737 732)

Supporting resources

- Mandatory reporting of child abuse and neglect information
- Family and community safety for Aboriginal and Torres Strait Islander peoples study report

Fits — seizures

- Most seizures are brief and do not require drug treatment
- People with known epilepsy should have management plan in file notes

Red Flags — Urgent Medical Consult

- Person still drowsy 2 hours after fit has stopped
- First fit
- Baby or child
- Pregnant or recently given birth
- 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 or partial — 1 arm or 1 side)
- Other significant sickness at the same time
- Temperature 38.5°C or more 30 minutes after fit
- Taking anticoagulants — warfarin, dabigatran
- Possibility of overdose/poisoning
- Recent head injury or fall
- You are worried for any other reason — irregular pulse, rash, meningism

Ask

- How long has the person 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

- DRS ABC
- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Coma scale
- Head-to-toe exam with attention to
  - sickness or injury that may have caused fit. Consider meningitis (page 126), head injury (page 98), stroke

Do

Figure 2.14

- Put in recovery position — Figure 2.14. Protect them from hurting themselves
- If pregnant — use wedge under hip to tilt to left side — see Fits in the second half of pregnancy (WBM, page 47)
- If breathing obstructed or noisy — put in nasopharyngeal or oropharyngeal airway
  - If they spit out airway or gag — leave in recovery position — Figure 2.14
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in IV cannula or intraosseous needle
- If known epileptic — blood for serum drug levels. Note time of last dose on pathology form
- Check BGL and serum sodium level if available
  - If BGL less than 4mmol/L — see Hypoglycaemia (low blood glucose) (page 118)
- Prepare midazolam for 2 doses — Table 2.9
- Follow Flowchart 2.5
- Monitor closely at clinic for at least 4 hours after fit has stopped or as per patients management plan

Giving medicines

Midazolam

- Be ready to manage airway — midazolam depresses breathing

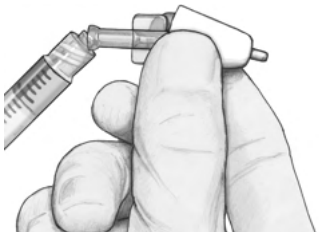


Figure 2.15

Buccal (cheek)

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

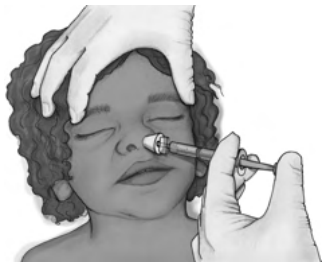


Figure 2.16

Nasal (nose) with atomiser

- Check nostril is clear
- Use undiluted liquid **midazolam** in syringe without needle
- Connect atomiser to syringe — Figure 2.15, put tip into nostril — Figure 2.16
- Apply reasonable pressure on syringe plunger to deliver medicine as fine mist-like spray

Table 2.9 Midazolam doses

Age	Weight	**Cheek or nose** 0.3mg/kg/dose Use undiluted 5mg/mL	**IM** 0.15mg/kg/dose Use undiluted 5mg/mL	**IV/Intraosseous** 0.15mg/kg/dose Mix 1mL of 5mg/mL with 4mL normal saline to make 1mg/mL
		Dose (mL)	**Dose (mL)**	**Dose (mg = mL)** Diluted
Under 3 months	2kg	0.12mL	0.06mL	0.3mg
	3.3kg	0.2mL	0.1mL	0.5mg
3 months	6.2kg	0.4mL	0.2mL	0.93mg
6 months	7.6kg	0.5mL	0.25mL	1.14mg
1 year	9kg	0.54mL	0.3mL	1.35mg
2 years	12kg	0.7mL	0.35mL	1.8mg
3 years	14kg	0.8mL	0.4mL	2.1mg
4 years	16kg	1mL	0.5mL	2.4mg
6 years	20kg	1.2mL	0.6mL	3mg
8 years	25kg	1.5mL	0.75mL	3.75mg
10 years	32kg	1.9mL	1mL	4.8mg
12 years +	33kg or more	2 mL	1mL	5mg

IM

- Use undiluted liquid **midazolam**
- Full effect takes 5–10 minutes

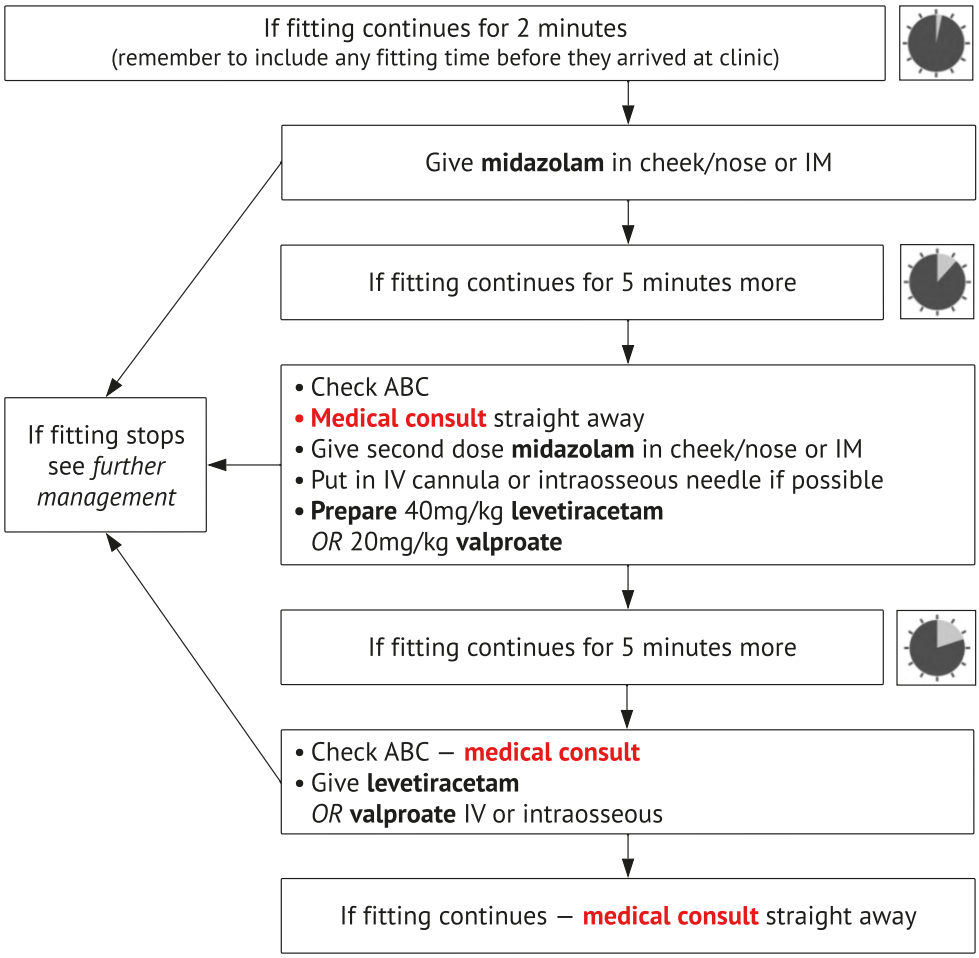
IV/Intraosseous

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

Levetiracetam

- Give **levetiracetam** IV — adult 40mg/kg/dose, child 40mg/kg/dose up to 3g — doses (page 511) — over 5 minutes
- Mix measured dose with 100mL **normal saline** or **glucose 5%**

Flowchart 2.5 Managing fits



Valproate

- **Do not** use if child under 2 years or child with metabolic disease
- Can cause severe sedation or low BP
- Give **valproate** IV/intraosseous — adult 800mg, child 20mg/kg/dose up to 800mg — doses (page 511) — over 15 minutes
- Mix with solvent provided to give 95mg/mL — 400mg + 4mL
- 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 (page 511)

Ongoing care in clinic

Ask

- Ask people who saw fit exactly what happened
- 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 or sniffing petrol recently
- Has person been unwell recently — infection, electrolyte disturbances
- Has person had a head injury recently
- How much sleep has the person had
- Other medical history, usual medicines and allergies

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- ECG
- If person goes home
  - Someone responsible must stay with them all the time for next 12 hours
  - Make sure carers know how to keep person safe and put them in recovery position — Figure 2.14 if they have another fit
- Talk with person about their medicines — are they taking them correctly
- Talk with person and their family or carer about things they shouldn't do — driving, swimming, sleeping too near the fire

Follow-up

Medical follow-up for people with known epilepsy or first fit

Hyperthermia (heat illness)

- May present as heat stroke (severe), heat exhaustion (moderate) or heat cramps (mild)
- Heat stroke is a medical emergency requiring rapid cooling to avoid risk of sudden deterioration and death
- Heat cramps and exhaustion can progress to heat stroke if not managed properly
- Severity of illness may not be apparent straight away
- Children, elderly, sick, people playing sport or working in heat are at most risk

Red Flags — Urgent Medical Consult

- Change in conscious state
- No urine being passed
- Rhabdomyolysis — has more than 3+ protein or 3+ blood (urine looks like strong tea)
- Heat stroke
- Temp still more than 38°C after 1 hour
- Person has not fully recovered after 1 hour
- Other medical problems

Table 2.10 Features of heat illness

Feature	Heat stroke	Heat exhaustion
Temp	More than 40°C	Less than 40°C
Skin	• Flushed, hot • Classic — no sweat • Exertional — may be sweaty	Cold/clammy, sweating
BP	Usually normal. Low in 20% of people	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	• Acute kidney failure • Acute liver failure • Muscle breakdown	Low BGL

Heat stroke or heat exhaustion

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)

Do first

- **Start cooling person as soon as possible — the longer temperature is raised the more dangerous it is for the person**
  - Get person into shade or indoors
  - 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

Ask

- Headache, confusion or strange behaviour
- Weakness, dizziness
- Nausea or vomiting, abdominal pain
- 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

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- ECG and coma scale

Do

- **Medical consult**
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in IV cannula. If not possible — put in intraosseous needle
- POC Test — lactate, pH, sodium, urea/creatinine
- Blood cultures, urine MC&S
- If BGL less than 4mmol/L — see Hypoglycaemia (low blood glucose) (page 118)
- 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**
- If sepsis likely (eg elderly, alcoholic, chronic illness) — see Early recognition of sepsis (page 2)
- Put in indwelling urinary catheter — male, female (WBM, page 327)

Heat cramps

Brief severe muscle cramps that come on suddenly

Do

- Cool person
- Give Oral Rehydration Solution (ORS)
- Rub muscles to ease pain

Hypothermia

Follows exposure to cold, affects all body organs and systems when bodies core temperature falls below 35°C

- **Severe** (core T less than 28°C) — unconscious, with or without vital signs, pupillary constriction reflex unreliable. Loss of reflexes
- **Moderate** (core T 28–32°C) — drowsy, not shivering, may appear drunk or as if they had stroke
- **Mild** (core T 32–35°C) — alert and shivering. Use passive rewarming

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

- 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
  - Follow usual emergency care procedures with very careful handling

Red Flags — Urgent Medical Consult

Following exposure to cold

- Impaired coordination
- Slurred speech
- Apathy, confusion, unconsciousness
- Slow AF, bradycardia
- ECG abnormalities — J wave, prolonged PR, QRS and QT

Resuscitation considerations

- Feel for carotid (neck) or femoral (groin) pulse **for at least 30–45 seconds**
- Chest compressions and cardiac pacing not needed if you feel any pulse, no matter how slow, concentrate on rewarming person
- Only indications for compressions are asystole (no heartbeat), 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
  - May not work if core Temp less than 32°C
  - Try once. If doesn't work — **do not** shock again until core T 30°C or more
  - Continue CPR

Do First

- Stop further heat loss by removing wet clothing and pat dry gently
- Have clinic room or ambulance uncomfortably warm
- Put on dry clothing, wrap in dry blankets or sleeping bag and cover head
- Put heat packs/covered hot water bottles under arms, on groin, abdomen and base of neck
- If conscious give something sweet to drink

Check

- Calculate age appropriate REWS
  - **Adult** — RR, O_2 sats (best centrally), pulse, BP, core Temp (best with low reading thermometer or probe)
  - *OR* **Child** (less than 13 years) — Respiratory distress, RR, O_2 sats (best centrally), pulse, central capillary refill time, core Temp (best with low reading thermometer or probe)
- If not able to monitor core Temp — use history, clinical signs
  - Consider other causes, predisposing factors (eg sepsis, stroke)
- Weight, BGL
- U/A, pregnancy test
- ECG and coma scale

Do

- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%
- Put in IV cannula or Intraosseous needle
- POC Test — potassium
- Blood culture, FBC
- Give warm IV fluids to 43–45°C — microwave fluid for 3 minutes, testing temperature of the bag
  - **normal saline** — 250–500mL bolus
  - *THEN* **Normal saline with 5% glucose** infusion — adult 150–200mL/hr *OR* match IV input with urine output
- Put in indwelling urinary catheter – hourly urine measures — aim for 0.5mL/kg/hr
- If any chance person long-term or regular heavy drinker of alcohol, or malnourished — give **thiamine** IV infusion — 100mg over 30 minutes

Injuries — abdomen and pelvis

Abdomen includes from nipples to tops of thighs at front and sides, on the back from tips of the shoulder blades to buttock creases

If pregnant — see Injuries in pregnancy (WBM, page 38)

- Can be serious abdominal injuries without external evidence of trauma
- Penetrating injuries to chest or buttocks can involve abdominal organs
- Injuries to liver, spleen, pelvis can quickly cause life-threatening blood loss — see Injuries — bleeding (page 89)
- 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)

Do not

- **Do not** let person eat or drink anything — may need operation — consider IV fluids
- **Do not** remove any object sticking into abdomen
- **Do not** probe (poke or feel about inside wound)
- **Do not** replace exposed bowel or gut contents
- **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 first

- Put in 2 IV cannula, largest possible or intraosseous if unable to get IV access
- Give pain relief (page 326) — person will be more relaxed and assessment more accurate

Ask

- Mechanism of injury
  - Blunt, penetrating, multi-trauma (more than 1 area injured)
  - Amount of force — takes a lot of force to fracture pelvis, consider if side-impact car accident, motorbike accident, pedestrian hit by car

- Other injuries
- Pain
  - Abdominal pain (page 332)
  - Back pain
  - At shoulder tip — may mean bleeding inside abdomen
  - On lower limb movement — consider pelvic fracture
  - On weight bearing or walking — consider pelvic fracture
- Allergies, medicines, medical history, time they last ate

Check

Remember: **Log-roll if concerned about spinal injury, or if possible penetrating injury to back causing circulation or breathing problems. Wherever possible person should be moved with a scoop stretcher and rolling minimised**

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A if possible, urine pregnancy test
- Head-to-toe exam — with attention to
  - Abdominal exam
  - Wounds, bruising
  - Shortening or rotation of lower limb/s, flexed hip/s — consider pelvic fracture
  - Bleeding or bruising of genitals (private parts) — consider pelvic fracture
  - Gently feel pelvis for tenderness, swelling, irregularity — consider pelvic fracture
- If wound — immunisation status — tetanus

Do

- **Medical consult**, send to hospital straight away
- If in shock — give boluses — adult 250mL, child 20mL/kg and assess response
  - Use blood if available or **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

- If evidence of shock — low BP and/or high pulse AND suspicion of uncontrolled (internal) haemorrhage AND less than 3 hours from time of injury — **medical consult** for tranexamic acid
  - **Adult** — **tranexamic acid** IV — 1g (in 100mL compatible fluid) over 10 minutes *THEN* 1g (in 1000mL of a compatible fluid) over 8 hours — doses (page 511)
  - **Child** — **tranexamic acid** IV — 15mg/kg up to 1g over 10 minutes *THEN* 2mg/kg/hr for 8 hours, dilution 500mg in 500mL of compatible fluid and infuse at 2mL/kg/hr (maximum dose 125mg per hour) — doses (page 511)
- Give pain relief (page 326)
- Put in indwelling urinary catheter if needed and no sign of urethral or bladder damage

Do — if pelvic fracture

- As soon as you suspect pelvic fracture — put on pelvic binder following the manufacturer's instructions or apply pelvic sheeting
- Pelvic binders should be placed over the greater trochanters — Figure 2.17 and whenever possible should not be placed over clothing

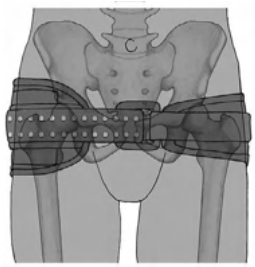


Figure 2.17

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 **cefazolin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — 8-hourly
- For heavily contaminated or severe wounds add **metronidazole** IV — adult 500mg, child 12.5mg/kg up to 500mg, 12-hourly
- If allergy — **medical consult**

Injuries — bleeding

- Visible bleeding can occur at the same time as internal (hidden) bleeding or tension pneumothorax
- Consider internal bleeding into abdomen, pelvis (page 86) or chest (page 92)
- Young person or pregnant woman (WBM, page 38) can lose a dangerous amount of blood without looking very unwell

Red Flags — Urgent Medical Consult

- Increased RR or work of breathing
- Pulse weak and fast (adult — more than 100/min) or difficult to feel
- Capillary refill longer than 2 seconds
- Pale, cool, moist skin
- Restless, confused, drowsy, occasionally unconscious
- Low BP for age or relative to person's previously recorded values

Do not

- **Do not** remove any object sticking out of a wound
- **Do not** remove any bandages that blood soaks through. Apply another bandage on top and maintain pressure

Do First

- Try to stop visible bleeding
  - Apply firm direct pressure with gloved hands with or without pad — Figure 2.18
  - If something in wound — apply pressure to pads above and below or around object
  - Reduce fractures or dislocations
  - Infiltrate site with **lidocaine (lignocaine) 1% + adrenaline (epinephrine) 1:100,000** (eg scalp wounds) up to 50mL
  - When bleeding controlled — bandage pad in place, elevate (raise) part and immobilise if needed
- If lot of blood has been lost — lie person down

Figure 2.18

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Do

- **Urgent medical consult if signs of shock — see red flags**
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in 2 IV cannula, largest possible or gain intraosseous access
- Run blood if available otherwise **Hartmann's solution** or **normal saline** — adult 500mL, pregnant woman 1L, child 20mL/kg — doses (page 35)
  - Reassess for more fluids
- Give tranexamic acid if within 3 hours of injury
  - **Adult** — **tranexamic acid** IV — 1g (in 100mL compatible fluid) over 10 minutes *THEN* 1g (in 1000mL of a compatible fluid) over 8 hours — doses (page 511)
  - **Child** — **tranexamic acid** IV — 15mg/kg up to 1g over 10 minutes *THEN* 2mg/kg/hr for 8 hours, dilution 500mg in 500mL of compatible fluid and infuse at 2mL/kg/hr (maximum dose 125mg per hour) — doses (page 511)
- **Medical consult** — send to hospital

On-going care

- Monitor for signs of shock — see red flags
- 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)
  - RR — increase may be early sign of deterioration
- Consider POC Test
- Put in indwelling urinary catheter — female (WBM, page 327), male
  - If urine output less than 0.5mL/kg/hr — probably needs more fluids
- Keep patient warm — aim for normal temp

Bleeding limb

Do

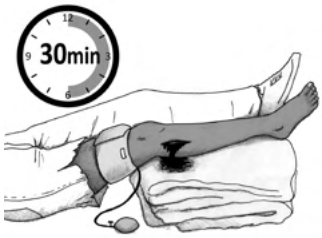


Figure 2.19

If firm pressure for 10 minutes and elevating limb doesn't stop bleeding

- Put BP cuff on arm/leg above and close to wound, blow up to 30mmHg above systolic BP — Figure 2.19
  - 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

AND/OR

- Try to find bleeding point and stop by
  - Direct pressure and infiltration of **lidocaine (lignocaine) + adrenaline (epinephrine) 1:100,000** up to 50mL
  - 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

- **Medical consult** — about further management
- Put on tourniquet, several centimetres proximal (above) to wound — **do not** remove
  - Record time applied
- **Send to hospital urgently**
  - Best chance to save limb if arrive within 4 hours of putting on tourniquet
- If on warfarin give **vitamin K**
- Give **tranexamic acid** 1g in 0.9% sodium chloride (100mL) over 10 minutes if not already administered within 3 hours of injury, then 1g in 1000mL over 8 hours

Injuries — chest

Red Flags — Urgent Medical Consult

- Trouble breathing — RR less than 9/min or more than 30/min (adult) especially if progressively falling/rising further with time
- Altered chest movement
- Chest wound (remember to look carefully at back as well)
- Hard to hear breathing with stethoscope over any part of lungs
- Signs of shock
- O_2 sats less than 94%
- Fast pulse
- Low BP

If any danger signs — consider life-threatening but treatable problem

- Blocked upper airway
- Tension pneumothorax
- Massive haemothorax
- Penetrating chest injury
- Flail chest

Remember: A pneumothorax may develop slowly. Consider if breathing trouble develops

Pneumothorax

Tension pneumothorax

- Air trapped between outside of lung and inside of ribcage, under high pressure
- Be aware that many of the classical clinical signs listed can be difficult to elicit, especially in the early stages
- Be alert for increasing respiratory distress

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Cardiac monitoring and ECG

- Head-to-toe exam — with attention to
  - Increasing respiratory distress
  - Colour — shock (pale) cyanosis (blue)
  - Distended neck veins
  - Less or no chest movement on injured side
  - Less or no breath sounds on injured side
  - Hyper-resonance to percussion on injured side
  - Crepitus (crackly feeling under skin) around neck and top of chest, caused by subcutaneous emphysema (bubbles of air)
  - Fractured ribs — bruising, pain, tenderness
  - Shift of trachea (windpipe) away from injured side — late sign

Do

- Give 100% **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- **Urgent medical consult**
- Needle decompression, leave cannula in place and opened to air
- Put in chest drain if person stable — not urgent. Can wait hours before putting in drain
- Give pain relief (page 326)
- Put in 2 IV cannula or intraosseous if unable to get IV access
- Assess/manage other injuries

Non-tension pneumothorax

Air trapped between outside of lungs and inside of ribcage and not under pressure. Person not usually very breathless or in shock

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Cardiac monitoring and ECG

Do

- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%
- Put in 2 IV cannula, or intraosseous if unable to get IV access
- Give pain relief (page 329)
- **Urgent medical consult**
  - If person flying — may need to put in chest drain

Massive haemothorax

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

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Cardiac monitoring and ECG
- Head-to-toe exam — with attention to
  - Respiratory effort
  - Less or no chest movement on injured side
  - Less or no breath sounds on injured side
  - Dull to percussion on injured side

Do

- **Urgent medical consult**
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in 2 IV cannula, largest possible or intraosseous if unable to get IV access
- If low BP — run blood if available, otherwise **Hartmann's solution** or **normal saline** in 250–500mL boluses. Target systolic BP 80–90mmHg

If serious respiratory distress

- Check for tension pneumothorax — do needle decompression
  - If air rushes out — leave cannula in place and open to air
  - If no improvement with needle decompression, discuss with medical officer. May need second attempt with larger needle or in a different location as directed
- If still serious trouble breathing — will need chest drain. Expect a lot of blood
- Assess/manage other injuries
- Give pain relief (page 326)

Penetrating (open or 'sucking') chest injury

Do not

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

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Cardiac monitoring and ECG

Do

- **Urgent medical consult**
- Give oxygen to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Cover wound, tape on 3 sides only to make a valve — Figure 2.20
  - 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

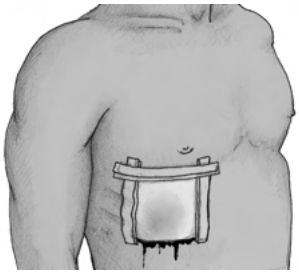


Figure 2.20

- Put in 2 IV cannula or intraosseous if unable to get IV access
- Give pain relief (page 326)
- Give **cefazolin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — every 8 hours until sent to hospital
  - If allergy — **medical consult**
- Assess/manage other injuries

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

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Cardiac monitoring and ECG
- Head-to-toe exam — with attention to
  - Chest movement — one part of ribcage sucks in and rest moves out as person breathes in
  - Shortness of breath

Do

- **Urgent medical consult** — send to hospital
- Give oxygen to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in 2 IV cannula, or intraosseous if unable to get IV access
- Give pain relief (page 326)

Fractured ribs

- Most fractured ribs are not complicated
- If a lot of pain or person unwell — consider Flail chest, or damage to organs underneath fracture — lungs, liver with right lower rib fractures, spleen with left lower rib fractures
- X-rays are of little use for fractured ribs — unless worried about pneumothorax or flail segment

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If suspected sternal injuries ECG and cardiac monitoring

- Head-to-toe exam — with attention to
  - 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

Do

- Give pain relief (page 326)
- 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

Injuries — head

All people with a head injury must be treated as though they also have a neck injury

- If person has **any** red flags they may have a **serious head injury** and/or increased risk of deterioration — see Management (page 103)
- You must know your responsibility under the laws in your jurisdiction relating to violence against adults, children and mandatory reporting

Red Flags — Urgent Medical Consult

- Coma Scale Score below 8 *OR* any decrease from initial score
- Signs of skull fracture
- Limb weakness, lack of movement
- Drowsiness, confusion, headache, vomiting and not improving within 4 hours
- Stroke symptoms — facial droop, language speech difficulties and visual change

Assessment

Do not

- **Do not** assume altered consciousness is due to alcohol. If unconscious person has been drinking — always treat as head injury and do **medical consult**
  - If possible intoxicated person should be observed until clinically not intoxicated
- **Do not** give sedating medication to drowsy, confused or agitated persons with a head injury

Ask

- Mechanism of injury — what happened, when it happened
- Has person had any alcohol or other drugs

Check

Person must always be woken up for all head injury assessments. If unable to wake them — **urgent medical consult**

Do quick initial 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 (trapezius squeeze) — Figure 2.21
  - If only small response — low groan without opening eyes, treat as unresponsive
- **U**nresponsive — unconscious, not responding
- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- Coma scale score (Tables 2.11 and 2.12), pupil reactions — record time in file notes
- Head-to-toe exam — with attention to signs of skull fracture
  - Laceration or haematoma (blood filled swelling) 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 (page 389) *AND* can't see back edge of bleed
  - Feel for skull fractures/bogginess under cuts and bruises on head or face
  - Limb weakness, lack of movement
- Immunisation status — tetanus

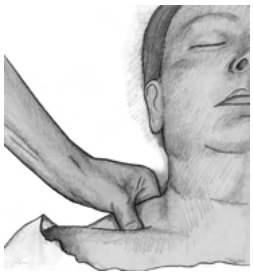


Figure 2.21

Glasgow Coma Scale

Table 2.11 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 quadriplegia (body paralysis) — ask to poke out tongue or raise eyebrows	6
	Localisation — purposeful movement to change painful stimulus (trapezius squeeze) 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 (trapezius squeeze) — clenches fists and bends wrists and elbows, without localisation	3
	Abnormal extension in response to pain (trapezius squeeze) — straightens wrists and elbows, without localisation	2
	No movement	1
	M Score	
	TOTAL SCORE	

Interpreting score

- 3–8 — *Severe head injury*
- 9–13 — *Moderate head injury*
- 14–15 — *Minor head injury*

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

- If coma scale score falling — **medical consult**
- **Drop of 2 or more points in score is very serious**
  - May be problems other than head injury — shock
  - May be due to rising intracranial pressure

Child Coma Scale

Use for children under 5 years

Table 2.12 Child Coma Scale

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 (eg rolls away, pushes your hand away) to change painful stimulus (trapezius squeeze) while keeping eyes shut	5
	Withdrawal — pulls arm or leg away in response to local pain (pinched limb)	4
	Abnormal flexion in response to pain (trapezius squeeze) — clenches fists and bends wrists and elbows, without localisation	3
	Abnormal extension in response to pain (trapezius squeeze) — straightens wrists and elbows, without localisation	2
	No movement	1
	M Score	
	TOTAL SCORE	

* Child over 2 years can often follow commands

Scoring coma scale

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

Pupil reactions

- Pupils should be the same size. Dilated pupils are a late sign of deterioration
- Both should constrict (get smaller) when a light is shone into either eye
- Difference in pupil size of 0.5–1mm may be anisocoria (normal for person). Check carefully for difference in reaction

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 are dilated, sluggish or unequal — Figure 2.22. May be due to
  - Eye or head injury
  - Increased intracranial pressure (bleeding into brain)
  - Some eye drops
  - Some toxins, chemicals

Figure 2.22

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

Management

Medical consult after initial assessment and stabilisation if person has any of the risk factors below

- Child under 12 months
- Child under 2 years not acting normal according to carers and occipital or parietal or temporal scalp haematoma
- Adult over 65 years *O*R at risk of falls (eg balance problems or dementia)
- Unconscious for more than 5 minutes after injury
- Coma scale score
  - Less than 14 on arrival
  - Any decrease from initial score
  - Less than 15 two hours after injury
- Pupils unequal
- Any localised or one-sided weakness
- Stab or penetrating wound to head
- Suspected skull fracture
- Fitting — especially if delayed fit
- Vomiting — especially if continues to vomit
- Remains drowsy or confused
- Increasing agitation, restless or combativeness (wants to fight)
- Bad headache
- Amnesia (loss of memory)
- Known bleeding disorder, liver disease, dialysis or taking anticoagulants
- Dangerous cause of injury
  - 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, motor or quad bike
  - Hit to head

Moderate or severe head injury

Moderate — coma scale score 9–13
Severe — coma scale score 3–8

Do

- **Medical consult**
- 15 minutes observation including coma scale, pupil assessment or as directed by medical consult
- Tilt head of bed up 15–30°. If concern about spinal injury — tilt whole bed
- Keep cervical spine (neck) still — use cervical collar (per organisation guidelines) *OR* cushioning/padding to keep head and neck in position
- Monitor airway
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in IV cannula, largest possible
- POC Test — lactate
- In head injury, too much IV fluid can cause swelling on the brain
  - If bleeding from other injuries causes fast pulse or shock (low BP) — give IV fluids in 250–500mL boluses to keep systolic BP 90–100mmHg
- If low BGL — see hypoglycaemia (page 118)

- Keep temp normal — warm up if temp less than 34°C and cool if temp more than 38°C
- If fitting (page 76) — give **midazolam** (page 36)
- **Medical consult**

Do also — if severe

- **Medical consult** — may need to
  - Give antiemetic (page 420) to stop vomiting — non-sedating preferred (eg **ondansetron**)
  - Manage fitting — load with **levetiracetam** IV infusion over 15 minutes — 20mg/kg/dose up to 3,000mg — doses (page 511)
- If getting worse despite resuscitation (eg deteriorating level of consciousness, unilateral/one-sided paralysis, unequal pupils) — may need mannitol or hypertonic saline. **Medical consult**, doctor should talk with retrieval team
- If scalp skin broken — give **cefazolin** IV or intraosseous — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — every 8 hours (tds) until evacuated. Can give IM if needed but painful
  - If allergy to penicillin or cephalosporins — give **clindamycin** IV — adult 600mg, child 15mg/kg/dose up to 600mg — doses (page 501) — every 8 hours (tds) until evacuated

Follow-up

Send to hospital for CT scan, further assessment and management if

- Severe or moderate head injury
- Possible skull fracture — high risk of bleeding in/around brain, CT scan needed
- Minor head injury with other serious injury/instability

Minor head injuries

Coma scale score 14–15

Do

- Half hourly observations including coma scale score and pupils assessment in clinic for at least 2 hours after injury, if score deteriorates — **medical consult**
- If over 65 years — **medical consult**, CT scan if available
- Can be sent home with responsible carer at 2 hours after injury if **all** the below 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, memory loss
- No known bleeding disorder (eg warfarin use), bad liver disease, dialysis
- No evidence of being under the influence of alcohol or drugs
- Carer is able to check person is not showing any signs of deterioration for next 2 hours (ie person is observed for a total of 4 hours post injury)
- Carer understands signs of deterioration and is able to contact clinic

- Give verbal and written advice (in appropriate language if available) to person or carer
- If during night time hours, carer must wake person at least once for assessment

Follow-up

- Tell them to come back to clinic if **any** of these things happen
  - Confusion, drowsiness, slurred speech, memory impairment, poor concentration
  - Vomiting, headaches, fitting, dizziness
  - Fatigue, sleep disturbance
  - Unusual clumsiness
  - Acting strange, change in behaviour, mood swings
  - Bleeding or fluid loss from ears or nose

Bleeding scalp wound

Check

- Head injury assessment
- Immunisation status — tetanus

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
- Clean wound using large amounts of **normal saline**
- Remove dirt and hair — clip or shave hair with consent
- If pieces of bone — leave in place
  - IV antibiotics (page 108) as for compound fracture
  - **Medical consult**
- Close wound — suture with 3.0 monofilament or silk or staple
- Local anaesthetic — use **lidocaine (lignocaine) 1% + adrenaline (epinephrine) 1:100,000** if available

Injuries — limbs

- Large amounts of blood can be lost with fractured femur (thigh) 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**

Red Flags — Urgent Medical Consult

- Signs of shock
- Pulses absent or weak
- Visible necrosis
- Gas crepitus
- Reduced sensation
- Altered mental state
- More pain than expected

Ask

- About pain
- What happened and when it happened

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- **Signs of shock**
  - Increased RR
  - Pulse weak and fast or difficult to feel, older people with heart problems may not get fast pulse
  - Central capillary refill longer than 2 seconds
  - Pale, cool, moist skin
  - Restless, confused, drowsy, occasionally unconscious
  - Low BP for age or relative to person's previously recorded values
- Head-to-toe exam — with attention to
  - Pain, swelling and limb deformity, may mean fracture, damaged ligaments or tendons
  - Joint movement — if less or more movement than normal or painful, may mean injury to tendon or joint
  - Compare one side of the 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)
  - Sensation (feeling). If numb (no feeling) — may mean damage to nerve

Do

- **If signs of nerve or circulation problems** (cool, pulseless limb)
  - Straighten limb, apply firm traction until pulse returns
  - Splint limb to maintain position after reduction
  - **Medical consult**
- Give **pain relief** (page 326)

Fractured major bones

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

Do First

- Put in 2 large bore IV cannula or intraosseous access in unaffected limb if unable to get IV access
  - If in shock — give fluid boluses — adult 250mL, child 20mL/kg and assess response
- Treat as closed fracture or compound fracture, as needed

Closed fractures

No skin wounds over fractured bone

Do — if pulses weak, absent or reduced sensation

- **Urgent medical consult**

Do — if pulses, movement and sensation normal

- **Medical consult** to send to hospital
  - Give **pain relief** (page 326)
- Try to put limb back into normal shape. If pulse, sensation or movement no longer feeling normal — **stop**
- Splint limb, put on back slab or strap to other limb or body so person can't move joint above or below fracture
- Recheck pulses and sensation
- Keep limb elevated

Compound fractures

Fracture is compound (open) if bone or haematoma (fracture bruise) 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

Do not

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

Check

- Look carefully at broken skin over or near suspected fracture for bone underneath
- Immunisation status — tetanus

Do — manage as closed fracture *AND*

If signs of shock, altered mental state, more pain than expected, visible necrosis or gas crepitus — urgent medical consult

- **Medical consult** to 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 or intraosseous — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — every 8 hours (tds) until sent to hospital. Can give IM if needed but painful
  - If heavily contaminated with material embedded in bone or deep soft tissues — *ADD* **metronidazole** IV — adult 500mg, child 12.5 mg/kg up to 500mg twice a day (bd)
  - If wound has been immersed in water — *ADD* **ciprofloxacin** oral — adult 750mg, twice a day (bd)
- If allergy to penicillin or cephalosporins **medical consult** for **clindamycin** IV — adult 600mg, child 15mg/kg/dose up to 600mg — doses (page 501) — every 8 hours (tds) until sent to hospital
  - If injury happened in water — *ADD* **ciprofloxacin** oral — adult 750mg, child 20 mg/kg up to 750 mg twice a day (bd)

Injuries — soft tissue

Red Flags — Urgent Medical Consult

- Suspicion of internal haemorrhage
- Artery injury — spurting blood, large blood loss, bruise rapidly increasing or pulsing
- Cool, pulseless limbs
- Swelling or discharge — signs of infection
- Constant severe pain
- Penetrating injuries close to a joint, finger or palm of hands

Table 2.13 Type of injury

Signs and Symptoms	Action
Bites or fist cut by teeth	Animal or human bites (page 42)
Burn	Burn (page 55)
Stab wound	Spear and knife wounds (Stab wounds) (page 113)
Significant water exposure — sea, waterholes	Water related skin infections (page 458)
High pressure injection injuries, usually hands and fingers — may be very severe with only tiny surface injury (accidental injection of fluid from high pressure equipment)	**Medical consult**
Penetrating injuries to palm side of hands or fingers	• Palmar spaces can become infected — **medical consult** • Always give antibiotics — Table 2.25 • Review next day for redness or swelling
Necrotising fasciitis	**Urgent medical consult**
Arterial bleeding • Bruise (haematoma) rapidly increasing in size or pulsing/throbbing • Spurting blood, large blood loss, reduced or no pulses, cool limb	Apply pressure straight away — See Injuries — bleeding (page 89) — **urgent medical consult**
Cool, pulseless limbs — bone involvement, signs of nerve or circulation problems	Gently straighten limb, apply firm traction until pulse returns — See Injuries — limbs (page 106) — **urgent medical consult**
Joints move more or less than they should — tendon or joint involvement	• If penetrating injury close to a joint — **medical consult** • Always give antibiotics — Table 2.25 • See Joint sprains (page 357)
Hand or finger injury • Can cause long-term problems if not treated properly. If not sure what to do — always get help or advice Nail bed injury — can lead to problems with nail growth	See Injuries — fingernails and toenails (CPM)
Foot injury and known diabetes	Complicated or severe wound — Table 2.15

Necrotising fasciitis

- Rapidly progressive soft tissue infection — **life threatening — urgent medical consult**
- Often mismatch between the patient's appearance and what is visible
  - Pain that is far more severe than expected for what is seen
  - *OR* severe soft tissue infection with minimal pain (nerves damaged)

Table 2.14

Usual signs/symptoms	Occasional signs/symptoms
• Sepsis • Constant severe pain or tenderness • Bruised appearance at site of infection • Localised swelling • Discharge — watery, putrid • Wound	• Crepitus • Blood blisters • Overlying numbness • Underlying tissue tender and hard (woody)

Ask

- If person has history of RHD, endocarditis, artificial heart valves — see Prevention of endocarditis (page 347)

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to
  - Involving hand, neck, armpit or groin
  - Neurovascular, tendon, joint or bone involvement
  - Risk of penetrating a body cavity — head, chest, abdomen, buttocks, close to hip or shoulder
  - Crush injury or extensive tissue damage
  - Nerve injury — numbness
  - Contamination — carefully check wound for foreign bodies
  - Infection — localised or systemic features, sepsis
- Immunisation status — tetanus

Do

- Clean wound, irrigate with **normal saline**
- If wound very dirty or dead tissue present — **medical consult**
- If wound infected or not improving with antibiotics — swab wound

- 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
- Give pain relief (page 326) — back slab often useful
- If object sticking into body — **medical consult**
- If puncture wound to the sole of foot through footwear — **medical consult**
- If injury to finger needs sutures or closer examination — may need nerve block
- If infection doesn't get better or gets worse — **medical consult**

Injuries less than 8 hours old and clean

Complicated injuries — tendon, joint or bone involvement

Severe injuries — crush injury or extensive tissue damage

- If complicated or severe *OR* appears infected
  - **Do not** close
  - Give antibiotics — Table 2.15 *OR* if significant fresh or salt water exposure — see Water-related skin infections (page 458)
  - **Medical consult** to consider sending to hospital
- If not complicated and not severe — see Examining and cleaning a wound before closing (CPM)

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

- Give antibiotics — Table 2.15 *OR* if significant fresh or salt water exposure — see Water-related skin infections (page 458)
- If complicated or severe — **medical consult**
- If **not** complicated and **not** severe
  - Clean with **normal saline**
  - Debride (cut away dead and badly damaged tissue), 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 — **medical consult**
  - **Do not** close, dress wound daily

Table 2.15 Antibiotics for soft tissue injuries by wound type

Mild contamination *OR* shallow puncture *OR* mild infection *OR* more than 8 hours old
• **Dicloxacillin** *OR* **flucloxacillin** oral — adult 500mg, child 12.5mg/kg/dose up to 500mg — doses (page 501) — 4 times a day (qid) for 5–7 days • *OR* **cefalexin** oral — adult 1g, child 25mg/kg/dose up to 1g — doses (page 501) — twice a day (bd) for 5–7 days • If allergy to penicillin — **medical consult** for **trimethoprim-sulfamethoxazole** oral — adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg — doses (page 501) — twice a day (bd) for 5–7 days
Complicated or severe wound *OR* heavy contamination *OR* severe infection
Give until evacuated • **Cefazolin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — every 8 hours (tds) • *AND* **metronidazole** IV — adult 500mg, child 12.5mg/kg/dose up to 500mg — doses (page 501) — every 12 hours (bd) • If allergy to penicillin — **medical consult** for **clindamycin** IV — adult 600mg, child 15mg/kg/dose up to 600mg — doses (page 501) — every 8 hours (tds)

Injuries — spear and knife (stab) wounds

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

Do not

- **Do not** remove any deeply embedded object (eg knife, spear) from wound
- **Do not** probe (poke or feel around in) stab wounds
  - Above elbow, above knee, trunk, face, neck or head
  - With arterial bleeding
- **Do not** suture

Do first

- If evidence of shock — low BP and/or high pulse AND suspicion of uncontrolled (internal) haemorrhage AND less than 3 hours from time of injury — **medical consult** for tranexamic acid
  - **Adult** — **tranexamic acid** IV — 1g (in 100mL compatible fluid) over 10 minutes *THEN* 1g (in 1,000mL of a compatible fluid) IV over 8 hours — doses (page 511)
  - **Child** — **tranexamic acid** IV — 15mg/kg up to 1g over 10 minutes *THEN* 2mg/kg/hr for 8 hours, dilution 500mg in 500mL of compatible fluid and infuse at 2mL/kg/hr (maximum dose 125mg per hour) — doses (page 511)

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to wounds
- Immunisation status — tetanus

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 the 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 up to 50mL**
- If significant blood loss, deterioration or wound in high risk area — put in 2 large bore IV cannula
- **Medical consult**
  - Boluses of **normal saline** or **Hartmann's solution** — adult 250–500mL, child 20mL/kg
  - Target systolic BP — 80–90mmHg (adult)
- **Always send to hospital if any**
  - 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
- Clean wound thoroughly
- Bandage

Give antibiotics — major wounds

- **Cefazolin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — every 8 hours (tds)
- *AND* **metronidazole** IV — adult 500mg, child 12.5mg/kg/dose up to 500mg — doses (page 501) — every 12 hours (bd)
- If allergy to penicillin — **medical consult** for **clindamycin** IV — adult 450mg, child 10mg/kg/dose up to 450mg — doses (page 501) — every 8 hours (tds)

Give antibiotics — minor wounds — see Injuries — soft tissue (page 109)

- Give **pain relief** (page 326)

Injuries — spinal

Related protocol — Assessing trauma — primary and secondary survey

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 is extremely unlikely

Unconscious person

- If trauma — suspect spinal injury, immobilise, **urgent medical consult**
- Remember DRS ABC
  - Minimise neck movement
  - Use jaw thrust and chin lift before head tilt

Conscious person

Suspect spinal (neck or back) injury, immobilise and **urgent medical consult** if

- Injury caused by (most common mechanisms)
  - Motor vehicle, motorcycle or bicycle accident as occupant, rider or pedestrian
  - An industrial (work) accident or electric shock
  - A sporting accident (eg football)
  - Fall greater than standing height (eg ladder, roof)
  - Kick or fall from horse
  - Hit to head
  - Dived or fell head first into shallow water
  - A severe penetrating wound (eg gunshot)
  - Elderly patient with fall and head/neck injury
- *AND* any
  - Pain or deformity in injured region and/or back of the neck or back
  - Tingling or numbness in the limbs or area below the injury
  - Decreased level of alertness, headache or dizziness
  - Nausea
  - Altered or absent skin sensation
  - Weakness or unable to move limbs
  - Evidence of intoxication (alcohol and/or drugs)
  - Pain that might distract person from pain of spinal injury

Do not

- **Do not** allow person to move their neck if it hurts
- **Do not** log-roll person with suspected spinal injury unless checking back for penetrating injury or loading on/off a stretcher with a trained team
  - Log-rolling may make spinal cord or chest injuries worse, cause bleeding from pelvic fractures, cause unnecessary pain and anxiety

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Neurological assessment

- Can person move their fingers and toes
- Check for loss of feeling
  - Trapezius (muscle on top of shoulder) (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

Immobilise person

- If unable to clear C-spine (based on mechanism of injury, symptoms/level of consciousness or neurological findings) immobilise the C-spine
  - If cooperative, advise to keep neck still, use headblocks/sandbags, clearly mark as 'C-spine not cleared' — Figure 2.23
  - If uncooperative, use manual in-line stabilisation, encourage patient with clear instructions, use head blocks/sandbags as tolerated. Clearly document C-spine not cleared and the challenges of immobilisation

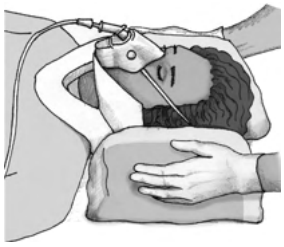


Figure 2.23

  - A collar can be placed according to organisational guidelines if the patient is unconscious with a mechanism of injury suggestive of possible cervical spine involvement *OR* the patient has neurological symptoms suggestive of spinal cord injury
- Immobilise person on spine board/vacuum mattress for transport
- Use PAT slide/spine board for transfers

After immobilisation

- Monitor airway
- Give oxygen to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put in 2 IV cannula
  - Run normal saline — **medical consult** about rate
- If paralysis — systolic BP of 90 is OK (greater than 100 is better) as long as urine output is not less than 0.5mL/kg/hr
  - Also look for and treat other causes of low BP such as haemorrhage
- Put in indwelling urinary catheter
- Give antiemetic (page 420) to stop vomiting — non-sedating preferred
- Consider nasogastric tube
- **Medical consult**, send to hospital

Hypoglycaemia (low blood glucose)

Potential medical emergency — brain cells start to die very quickly without glucose

- Happens when BGL low enough to cause symptoms and signs — **can happen in people without diabetes**
- Person with usually high BGL may have symptoms with normal BGL (eg 5–6mmol/L)
- Newborns very susceptible and high risk of complications
- Many causes — alcohol, glucose control medicines, aspirin, beta-blockers, insulin, sepsis, toxins
- All clinics should keep and maintain **emergency low blood glucose kit**
  - Tubes of glucose gel or jelly beans or sugar sweetened cordial — **not diet or lite**
  - *Weetbix* or dry biscuits/crackers
  - Copy of this protocol

Red Flags — Urgent Medical Consult

- Newborns and infants — poor tone (floppiness), weak cry, poor feeding, breathing problems apnoea (stopping breathing), cyanosis, tremor, seizures
- BGL less than 4mmol/L *AND*
  - Sweaty, pale, clammy, taking deep breaths
  - Hungry, weak, tired, dizzy, shaking, slurred speech
  - Drowsy, confused, tearful, behave differently, appear 'drunk'
  - Aggressive, suspicious, potentially dangerous
  - Fits, loss of consciousness, ataxia

Do first — if person unconscious

- If BGL less than 4mmol/L — **treat straight away. Do not delay**
  - If any chance person is a regular heavy drinker of alcohol or severely malnourished — give **thiamine** IM or IV — 100mg at same time or immediately after glucose
- If IV/intraosseous access — give **glucose**
  - Child 10 years and under — 2mL/kg **glucose 10%** — bolus
  - Child over 10 years or adult — 50mL **glucose 50%** (25g glucose) — slowly into a peripheral vein at a rate not greater than 3mL per minute
  - If 10% glucose not available — dilute 1 part 50% glucose with 4 parts normal sterile saline for injection

- If no IV/intraosseous access — give **glucagon** IM into the thigh, buttock or upper arm
  - Child less than 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 buccal mucosa (inside of cheek)
  - **Child** and adult 15g of **glucose gel** or 3 teaspoons of honey (not recommended for children under the age of 5 years)
- **Medical consult**

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

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
  - If BGL less than 4mmol/L — treat
- Coma scale score
- Do they have right medicines — check bottles/packets, dose aid
- Person is safe (eg seated securely and not at risk of falling)

Do

If person conscious but unable to eat or drink

- **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
  - Child less 25kg — 0.5mg (½ vial)
  - Child 25kg or more or adult — 1mg (1 vial)
- If **glucagon** not available *OR* no response to **glucagon** after 5 minutes — put in IV cannula and give
  - Child under 10 years — 2mL/kg **10% glucose**

  - If **10% glucose** not available — dilute 1 part 50% glucose with 4 parts normal sterile saline for injection
  - Child 10 years and over and adult — 50mL **50% glucose** — slowly into a peripheral vein at a rate not greater than 3mL per minute
- When improved
  - If BGL less than 4mmol/L — give simple sugar/glucose
  - If BGL 4mmol/L or more — give long lasting carbohydrate

If person conscious and can eat and drink

- **Medical consult** as soon as possible, but don't delay treatment
- **Give simple (fast-acting) sugar/glucose** (equal to 15g carbohydrate)
  - 5g for under 5 years
  - 10g for 5–12 years
  - 15g for over 12 years and adults
- Examples of 15g of fast-acting carbohydrates
  - 200mL diluted cordial, 6 jelly beans, 60mL of 75g OGTT mix, 90mL of glucose drink, 2–3 teaspoons of sugar, 3 teaspoons of honey (not recommended for children under 5 years)
- **15 rule** — give 15g of carbohydrates, check BGL in 15 minutes and give another 15g of carbohydrates if BGL still low
- If BGL 4mmol/L or more — **give long-lasting (slow-release) carbohydrate**
  - Examples: 4 dry biscuits/crackers, 1½ *Weetbix*, 1–2 slices bread or damper, 1 piece of fruit, 1 cup of milk

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 to rise if
  - Kidney failure, liver failure, sepsis not ruled out
  - Taken blood glucose lowering medicine — takes long time to wear off
- 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
- **Medical follow-up** if cause not known as further investigation needed
- **Medical follow-up** if person known to have diabetes
  - Review medications
  - Food intake
  - Education with patient and family about hypoglycaemia

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
  - Ideas or behaviour of harm to others
  - Ideas or behaviour impairing persons ability to perform usual functions of daily life
  - High-risk behaviours due to mental illness
  - Psychiatric/behavioural change due to urgent medical condition
  - Psychological crisis due to severe stress, trauma, situational crisis

Red Flags — Urgent Medical Consult

- Person not improving or getting worse
- Family, community or clinic can't manage person safely

Safety

During a mental health emergency consider safety of all concerned — person, staff, carers, community people

- Assess potential risk to self and others
- 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 potential weapons
- Make sure you are not alone — get help (eg family, night patrol, police, Elders). Have them stay quietly nearby
- Limit number of people talking to person to lessen confusion
- **Do not restrain person, seek police intervention if necessary**

Do first

- Get help from ATSIHP, culturally appropriate leader, 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
  - **Do not** promise what you can't give
  - **Do not** persist if calming techniques appear to not be working
  - 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, limit direct eye contact as it 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
- Personalise situation — use person's name, acknowledge their feelings
- Work with person on a way to deal with their concern
- Advise person that use of violence may result in police involvement, if appropriate

- Person may need to be sedated straight away, or held in police custody
  - Sedation and involuntary treatment should only be used if there is no less restrictive means of ensuring that the person receives the treatment and care they require
  - If IV/IM sedation given — must stay in clinic for observation and airway management

Ask

- History from person, family, police, community workers
- If person has already taken any PRN medicine, eg olanzapine

Check

Only if possible and safe

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- Coma scale score if confusion or drowsiness
- Head-to-toe exam — with attention to
  - Head injury (page 98), epilepsy (fits), medicine toxicity, substance use (intoxication), electrolyte imbalance, thyroid disease, infection (eg chest (page 432), ear (page 398), UTI (page 486), meningitis (page 126), encephalitis)

Do

- Mental status examination
- Urine drug screen
- **Medical or mental health consult** to decide if person will be managed in community or sent to hospital
- Consider hospital if
  - Person getting worse
  - Family, community or clinic can't manage safely

Sedation

Always do medical consult before giving sedating medicine — if this will cause serious delay in treatment — give one dose, then do medical consult as soon as possible

- May be useful if person
  - Agitated — including DTs/'horrors'/fits from alcohol withdrawal (page 279)
  - Waiting for transport to hospital
  - Starting treatment in community
- Sedation can be dangerous — oral sedation is the safest
- Monitor airway and breathing, REWS if able, before, during and after any sedation
- Use oral sedation unless person very agitated 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

Oral sedation

- Give **diazepam** oral — 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** IM — 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

Other medicines

Antipsychotics

If person has psychotic symptoms — **medical consult**

Oral

- Usual antipsychotic medicine if prescribed — check file notes
- *OR* **olanzapine** wafer — adult 5–10mg
- *OR* **risperidone** oral — adult 0.5–2mg

OR **IM**

- **Haloperidol** IM — adult 5–10mg *OR* **Droperidol** IM — adult 2.5-5mg
  - Monitor airway after giving haloperidol — risk of laryngeal (throat) spasm
  - Start with lower doses for child/adolescent, older person, person who has not used antipsychotics before
  - Benzatropine may be needed with haloperidol if side effects (eg stiffness, tremor, slowed movement). Less likely to be needed with risperidone or olanzapine
  - **Do not** give IM olanzapine within two hours of IM benzodiazepines (eg midazolam)

After sedation

- Put in wide bore IV cannula. 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
- 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
  - Authorised by doctor or authorised/designated mental health practitioner. **Always consult doctor or on-call psychiatrist**

Important that you know

- Your organisation safety policy
- Your regional mental health referral and admission processes
- How to contact an authorised/designated mental health practitioner
- Your local community support
- Requirements for involuntary assessment or treatment under your state/territory *Mental Health Act* — mental illness, mental disturbance and complex cognitive impairment

- What needs to happen if person being sent to hospital in another state/territory
- **Do not attempt to transport any person who may become violent without support and medical consult**

Transport of person who is or may become violent

- Person can be transported against their wishes if they meet criteria for involuntary assessment or treatment under state/territory Mental Health Act
- If physical problems (eg head injury, delirium) — can be transported under common law
- If under guardianship — can be transported with consent of guardian

Do

- Call police for help if you believe physical safety of attendants is under threat
- Check your organisation protocols for transport of a person who is or may become violent
- **Always do medical consult** about assessment and management plan

For transport by air

- Air retrieval services must follow aviation regulations
- Pilot and medical team will determine if travel is safe
- Will usually involve restraint — air retrieval service, medical team and police to advise plan
- Pilot has ultimate responsibility

For transport by road

- Seat belts must be worn
- Person sits in back seat on passenger side
- Need 2 people apart from driver and person
- Helps if at least 1 escort known to person, can help keep them calm

Meningitis

Consider meningitis in

Any child who	Any adult who
• Is very unwell • Has had a fit — especially with fever • Has had antibiotics for 1–2 days and still unwell • Comes back unwell within 1 week of completing course of antibiotics • Fever with no obvious underlying cause	• Is very unwell • Has headache, fever, stiff neck, altered mental status • Is old, frail or an alcohol misuser with confusion and fever • Has a first fit

- Meningitis may present differently in babies, elderly and anyone recently on antibiotics
- Potential cause for fever (eg infection, doesn't rule out meningitis)
- Normal coma scale score doesn't rule out meningitis
- **If suspected meningitis urgent medical consult — treatment needs to be started quickly**

Red Flags — Urgent Medical Consult

- Sudden onset and very severe headache ('worst headache ever')
- Headache *AND* fever *AND* neck stiffness
- Photophobia (pain looking at light), blurred vision, confusion
- More than one presentation with headache *AND* fever

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

Ask

Always suspect meningitis if 2 or more **bolded** signs present

- **Fever**
- Vomiting
- Rash — purpuric or petechial (flat red-purple blotches/spots) 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 score — **altered mental status**

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Coma scale
- Head-to-toe exam

Do

- **Urgent medical consult**
- Put in IV cannula
- Collect before giving antibiotics if possible, but **do not** delay treatment if you can't get samples
  - Throat swab MC&S
  - Blood for blood cultures, POC Test — WBC
- Give **ceftriaxone** IV — adult 4g, child 100mg/kg/dose up to 4g — doses (page 501) — single dose
  - *AND* **benzylpenicillin** IV — adult 2.4g, child 60mg/kg/dose up to 2.4g — doses (page 501) — single dose
  - If unable to give IV — give both IM
  - If allergy to penicillin — **medical consult**
- If child 1–2 months — also give **gentamicin** IV single dose — **medical consult** about dose
- Give **dexamethasone** IV — adult 10 mg, child 0.15 mg/kg up to 10 mg — doses (page 511) — single dose
  - If not available — give **hydrocortisone** IV — adult 200mg, child 4mg/kg/dose up to 200mg — doses (page 511) — single dose
  - If unable to get IV access — give either IM
- Look after person in a quiet, dark room
- Be ready to support airway and give oxygen if needed
- Be ready to treat fits
- If pain and fever — give **paracetamol** — adult 1g, child 15mg/kg/dose up to 1g — doses (page 511) — up to 4 times a days (qid)

- **Medical consult**
  - About starting maintenance fluids — **do not** give more than 30mL/kg fluid without advice from emergency consultant
  - If they won't reach hospital within 4 hours — may need repeat dose of benzylpenicillin or corticosteroid

Follow-up

- Any person who has been in contact with sick person and has fever in next 2 weeks needs careful check

Public health issues

- If meningitis confirmed
  - Notify local 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 PHU
  - PHU will tell you if you need to treat contacts, give you advice about immunisation

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

Red flags — Urgent Medical Consult

- Underlying bleeding disorder
- Taking anticoagulant (eg warfarin, rivaroxaban) or antiplatelet medications
- History of recurrent or large nose bleeds — foreign body, tumour, bleeding problem
- If still bleeding after initial packing
- Button battery in nose — children

Check

- Airway — look in back of mouth for blood clot, clear if need be
- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- If person taking warfarin — check POC Test — INR
- If person having frequent, recurrent or heavy nosebleeds — check POC Test — Hb

Do

Nose bleed leading to shock

- Sit person up — leaning forward, ask person to spit out any clot in mouth
- Put in IV cannula, largest as possible — **medical consult**
  - Run **normal saline** 10–20mL/kg — see Injuries — bleeding (page 89)
  - Reassess for more fluids
  - Ask person to gently blow their nose to remove any clots
  - Give **tranexamic acid** 500mg (5mL) via nasal atomiser to affected nostril prior to insertion of packing

- 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 themself — Figure 2.24
- **Hold for 15 minutes by the clock** — if pressure released at any time — counting must restart
- Check for ongoing bleeding. Repeat pinching if needed and check that pinch technique is good
- Ask person to gently spit out any blood that trickles down back of throat
- When bleeding stops tell person not to sniff or blow nose for rest of day

Figure 2.24

If bleeding continues after more than 30 minutes of pinching

- **Medical consult**
- Ask person to gently blow their nose to remove any clots
- 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 packs 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 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 (page 420) and sedation first
  - *Merocel OR RapidRhino* prepared nasal packing
  - *OR* use gauze nasal packing if above not available
- After packing, check in throat for blood still trickling down from nose
- **Medical consult** to send to hospital
  - Not urgent if bleeding stopped and/or haemodynamically stable
- **If the pack is going to be in for a long time** (transfer delayed over 12 hours) — Give **amoxicillin** oral — adult 500mg, child 15mg/kg/dose up to 500mg — doses (page 501) — 3 times a day (tds)
  - If allergy to penicillin — **medical consult**

If bleeding still continues despite anterior packing

- **Urgent medical consult**
- Anterior pack may be misplaced — check placement repack
- Bleeding may be from back of nose — put in posterior packing
  - Posterior *RapidRhino* preferred if available
  - Balloon catheter +/- anterior gauze packing if *RapidRhino* not available
- **Medical consult** — consider packing other nostril, deflate initial packing prior to insertion, inflate both packs simultaneously

Further management

- If bleeding site burnt — 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 to stop large scab and lessen the risk of another nose bleed
- Give first aid information and simple steps to stop or manage nose bleeds
- To remove *Merocel* or *RapidRhino* pack — see Nasal packing

In child

- Usually local trauma or inflammation in anterior nose and settles with pinching. Often scab (crusting) in nose removed (picked, knocked, lifted off)
- Foreign bodies in nose may cause bleeding or discharge of pus
- May need urgent referral to ENT specialist for removal
- If bleeding heavy — review in 1 day, POC Test — Hb
- If frequent nose bleeds, easy bruising, other bleeding episodes — **medical consult** to check FBC and clotting studies and consider referral to ENT specialist

Poisoning

Poisons Information Centre — emergency number: 131 126

If person unconscious, drowsy or fitting — see Life support — DRS ABC (page 27), Unconscious person (page 33), Fits — seizures (page 76)

Do not

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

Ask — person or family

- What was taken (swallowed, breathed in or on skin or clothes) — is there label for poison name, type, manufacturer
- Bring product to clinic with person
- 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 deliberately (on purpose) or by accident
- Were alcohol or other drugs taken as well
- Nausea, vomiting, pain, shortness of breath
- Any treatment given already

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- ECG and Coma scale score, pupil reactions
- Head-to-toe exam with attention to
  - redness or swelling of mouth, airways and lung sounds

Do

- If trouble breathing or reduced level of consciousness — give oxygen to avoid hypoxia
  - **Oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- In cases of opioid induced hypoventilation — see Opioids (page 291)
- **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

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
- Crepitations (crackles) and/or wheeze in lower chest
- Pink frothy sputum — in severe cases
- Peripheral oedema (swollen legs or ankles)

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- ECG
- Head-to-toe exam — with attention to
  - Swollen legs or ankles — peripheral oedema
  - Listen to lower chest for crackles and/or wheeze
  - Raised jugular venous pressure

Do

- Sit person up
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%
- Put in IV cannula
- 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** 1 spray under tongue — 400microgram
  - **Always** check BP before and after giving nitrate therapy
  - If shortness of breath doesn't improve — can repeat every 5 minutes
- **Do not** give nitrate therapy if person has used drugs for impotence
  - Sildenafil or vardenafil in past 24 hours
  - Tadalafil in past 2 days
- Monitor urine output — aim for 0.5mL/kg/hr — commence fluid balance chart
- **Medical consult**

3. Child and youth health

Competency, consent and confidentiality

- The law allows children of all ages to consent to treatment where the child can demonstrate that they fully understand the proposed treatment and any risks — Table 3.1
- If a child under 16 years does attend clinic without carer, ensure their immediate safety, treat emergencies, and urgently contact carer
  - **Urgent medical consult** if carer not available and young person is assessed as not competent to provide consent or if there is a potential risk in contacting carer
- Ask about appropriate adult support or even a competent minor — may help identify responsible adult to talk with about their health — parent, other family or ATSIHP, trusted adult in community

Competency to consent to treatment

Table 3.1 Competency to consent to treatment

Under 14 years	• Should be accompanied by a trusted and safe carer • Work in partnership model of care with extended family • Talk to family about who should be involved in care • Help families build on strengths of care — avoid giving directions and share ideas
14-16 years	• Consider the type of health issue — may be able to consent for minor issues (eg graze) but not for major issue (eg contraception) • To be competent the young person must understand ▸ Health condition and why treatment is being offered ▸ Treatment options including side effects ▸ Consequences (what will happen) if no treatment is given
16 years and over	• Usually considered competent to consent

Confidentiality

- Offer confidential health care to all competent young people over 14 years
  - Builds trust between young person and care provider
  - Improves quality of health care
  - Confirm follow-up plans — who can be contacted about results (eg self or carer)
- Let young person know confidentiality can be broken if they or others are in danger
- Example confidentiality statement “everything we talk about will be confidential — that means it stays between you and me. But we will have to tell the right people if someone is hurting you, you are hurting yourself or you are hurting someone else. If I have to break confidentiality we will do it together”

Medicare card

- Medicare wont give information about treatment to carers but carers may find out about appointment if family Medicare card is used
- Over 15 years can get own Medicare card
- Check if wants information uploaded to My Health Record

Protective behaviours

- Protective behaviours is a personal safety framework that teaches children the tools they need to feel safe and get help if they are in dangerous or risky situations
- In early childhood, teach carers about protective behaviours so that they
  - Know where their child is, who they are with and what they are doing (including online)
  - Provide opportunities for children to build relationships with people they trust and feel safe with
  - Listen to children and keep them safe. Help them to feel comfortable to talk about worries
- As children get older help to teach them about early warning signs of feeling unsafe and help them to identify safe people they can talk to
- Talk to teens about
  - Safe and unsafe places and times
  - Risky behaviours and consequences (eg alcohol and other drugs, driving)
  - Personal rights and consent (eg right to negotiate sex — right to say no) — see STI checks for young people (page 303)

Mandatory reporting

- Important you understand laws regarding mandatory reporting in your state/territory
- See Child neglect, abuse and cumulative harm (page 153)

Child health check (0–5 years)

Healthy early childhood and teenage years are important in shaping brain development and future health, particularly reducing risk of chronic conditions. Annual health checks are important to identify and act early on any factors that lead to poor health now and in the future — encourage carers to bring children for regular health checks

- Follow your health service policies and procedures for all health checks
- Children learn new skills (milestones) in a step-by-step predictable way over time - with some differences in rate or timing of skill development
- An understanding of developmental milestones is needed for carers to create a nurturing and stimulating environment to help children to learn
- Best practice is to use a validated developmental screening tool to assess development. **Refer** to child health nurse if not trained, **respond** to carer concerns and **check** developmental concerns red flags — see Child development concerns (0-5 years) (page 143)
- Talk to carers about normal development at routine child health checks
- Support carers to attend community programs that promote child development (eg childcare and preschool)
- **Medical/child health consult** for any concerns

Attachment styles

- Child health and development is set within family and community
- Social factors, including responsiveness of carers, influence child's brain development and future health behaviours like risk taking
- Look for signs of secure attachment — child wants to be close to carer especially if scared or upset — talk to child health nurse about any concerns and assess carer mood — see Perinatal depression and anxiety (WBM, page 127)
- Guide carers in responsive parenting — sensitive, reliable and consistent with providing care when child wants attention, but allows space for safe exploration and age appropriate independence

Table 3.2 Attachment styles

Attachment style	Sub category	Baby's general state	Carer's responsiveness to baby's signals/needs
Secure	Secure	Secure, happy, explores environment	Quick, sensitive, consistent, reliable, engaged
Insecure	Ambivalent (uncertain)	Anxious, insecure, angry	Inconsistent, sometimes sensitive, sometimes neglectful
Insecure	Avoidant	Does not really explore environment, emotionally distant	Distant, disengaged
Insecure	Disorganised	Distressed, angry, passive (non-responsive)	Extreme, erratic, frightened or frightening, passive or intrusive

Preterm (born before 37 weeks) and/or low birth weight (less than 2500g) babies

- **Chronological age** — age from birth date (current age)
- **Corrected gestational age** — age is corrected for prematurity — used until 2 years old. Subtract the number of weeks baby was born preterm from the number of weeks since born (eg for a baby born at 28 weeks gestation (12 weeks preterm), chronological age is 15 weeks, corrected age is 3 weeks (15 weeks minus 12 weeks)
- **Immunisations** given based on chronological age. Check immunisation schedule — extra vaccines may be needed
- **Screening for anaemia** done at chronological age — check schedule
- **Developmental assessment** correct for gestational age until 2nd birthday
- **Growth chart analysis** use corrected gestational age until 2nd birthday. Monitor growth more often — discuss with child health nurse
- **Introduction of solids** check for developmental readiness — see Infant and child nutrition (page 163)
- **Supplements**
  - Give **Pentavite** multivitamin supplement from birth to one year, oral 0.45mL daily
  - Give oral **iron supplement** from one month to one year — see Anaemia in children (page 177)

Scheduled health checks

Birth to 8 weeks

- See Postnatal care of baby (WBM, page 223)
- **Medical consult** at 8 weeks
- Check preterm and Low Birth Weight (LBW) baby has multivitamin and iron supplements prescribed and is taking them
- Give immunisations

Scheduled Heath Checks — 4 months – 5 years

	Assessment — Check / Do / Refer	Discuss / Promote
4 months	• Interaction between carer and baby — look for signs of secure attachment • Nutrition (page 163) — breastfeeding, formula • Elimination — 6 or more heavy wet nappies a day and soft, pasty faeces • Conditions at home — family support, housing, financial and social issues • Substance abuse and passive smoking • Measure, plot, assess growth (page 166) — bare weight, length and head circumference • Head-to-toe exam — attention to skin and ears • Check immunisation status and give if needed **Normal development — can baby** • Hold up head without support • Make noises and turn towards sound • Reach and grab for objects and put them in mouth • Roll over	• **Breastfeeding** (WBM, page 232) **and age-appropriate foods** — see Nutrition (page 163) • **Sleep and settling — safe sleeping** ▸ Sleep baby on back ▸ Swap baby's head from left to right side when sleeping on back ▸ Keep head and face uncovered ▸ **Do not** smoke near baby ▸ Firm, flat mattress and clean bedding ▸ If co-sleeping — adults should not drink, smoke or take drugs and baby should be between carer and edge of mattress • **Hygiene** ▸ Wash hands with soap ▸ Keep face clean ▸ Change nappies regularly and clean skin ▸ Bath or shower baby at least every second day ▸ Brush teeth twice a day, lift the lip (page 362) • **Injury prevention**, including car seats, passive smoking, poisoning risk, water and fire safety • **Protective behaviours** ▸ Know where child is, who they are with and what they are doing ▸ Provide opportunities for children to build relationships with people they trust and feel safe with • **Play with and talk to baby** ▸ Smile, talk and sing ▸ When young baby awake put them on tummy or side to play ▸ Read and tell stories in language and English • **Avoid TV and screen time under 2 years**
6 months, 9 months and 12 months	• Interaction between carer and baby — look for signs of secure attachment • Nutrition (page 163) — introduction to solids at 6 months, breastfeeding, formula • Elimination — 6 or more heavy wet nappies a day and soft, pasty faeces • Conditions at home — family support, housing, financial and social issues • Substance abuse and passive smoking • Measure, plot, assess growth (page 166) — weight, length and head circumference • Head-to-toe exam — attention to skin, ears (page 394) teeth • Check Hb • Give worming medicine (6 and 12 months) — see Worms (page 494) • Check immunisation status and give if needed • Developmental screen — ASQTRAK/ASQ3 if trained **Normal development 6 months — can baby** • Laugh, coo, squeal • Make eye contact with carer, follow and reach for a moving object • Sit with support **Normal development 9 months — can baby** • Babble, try to speak first words • Follow simple instructions (eg wave goodbye) • Poke at objects with pointer finger • Crawl and/or stand with support • **Normal development 12 months — can baby** • Understand simple words • Say some words • Show interest in people • Point to and pick up objects • Move around on their own	

Scheduled Heath Checks — 4 months – 5 years (continued)

	Assessment — Check / Do/ Refer	Discuss/ Promote
18 months and 2 years	• Interaction between carer and child — look for signs of secure attachment • Nutrition (page 163) — solids, water breastfeeding (if wanted) • Elimination — pale coloured urine and soft faeces • Conditions at home — family support, housing, financial and social issues • Substance abuse and passive smoking • **Medical consult** at 2 years • Measure, plot, assess growth (page 166) — weight, length and head circumference • Head-to-toe exam — attention to skin, ears (page 394), teeth • fluoride varnish teeth if trained • Check Hb • Give worming medicine — see Worms (page 494) • Check immunisation status and give if needed • Developmental screen — ASQTRAK/ASQ3 if trained **Normal development 18 months — can child** • Talk and say several words • Point to familiar items when asked • Hold a cup and drink from it • Feed themselves with a spoon • Walk without any support **Normal development 2 years — can child** • Understand lots of words. Use 2 words together • Wash own hands and feed themselves • Run, jump, kick and catch a ball	• **Age appropriate foods** — see Infant and child nutrition (page 163) • **Safe sleeping** ▸ If co-sleeping adults should not drink, smoke or take drugs and baby should be between carer and edge of mattress • **Hygiene** ▸ Wash hands with soap ▸ Keep face clean, blow nose ▸ Bath or shower at least every second day ▸ Strong teeth, lift the lip (page 362) and brush teeth twice a day • **Injury prevention**, including car seats, passive smoking, poisoning risk, water and fire safety • **Protective behaviours** ▸ Know where child is, who they are with and what they are doing (including online) ▸ Provide opportunities for children to build relationships with people they trust and feel safe with ▸ Listen to children and keep them safe. Help them to feel comfortable to talk about worries • **Play with and talk to child** ▸ Smile, talk and sing ▸ Name, point to and count people and everyday things (eg household items, body parts, animals) ▸ Play with things that encourage imagination and creativity (eg blocks) ▸ Read and tell stories in language and English ▸ Throw and kick a ball, run, roll, dance, jump ▸ Encourage attending playgroups and early learning centre ▸ Prepare for school • **Avoid TV and screen time** (TV, phone, computer) under 2 years. After 2 years limit screen time to one hour a day with carer

Scheduled Heath Checks — 4 months – 5 years (continued)

	Assessment — Check / Do/ Refer	Discuss/ Promote
3 years and 4 years (6 monthly checks are recommended — refer to your organisational program)	• Nutrition (page 163) — regular meals, variety foods, water • Conditions at home — family support, housing, financial and social issues • Substance abuse and passive smoking • **Medical consult** • Measure, plot, assess growth (page 166) — weight, length. Head circumference at 3 years • Head-to-toe exam — attention to ▸ Eyes (page 373) — visual acuity ▸ Ears — hearing screen (page 394) ▸ Mouth and teeth ▸ Skin ▸ Gait (walking) • Fluoride varnish teeth if trained • Check Hb • Give worming medicine — see Worms (page 494) • Check immunisation status and give if needed • Developmental screen — ASQTRAK/ASQ3 if trained **Normal development 3 years — can child** • Ask questions, say 3 word sentence • Copy a line and circle drawing • Kick a ball, jump forward with both feet, stand on one leg **Normal development 4 years — can child** • Listen to and tell stories • Take turns and play with others • Dress themselves • Play ball games	• **Age appropriate foods** — see Infant and child nutrition (page 163) • **Safe sleeping** ▸ If co-sleeping adults should not drink, smoke or take drugs and baby should be between carer and edge of mattress • **Hygiene** ▸ Wash hands with soap ▸ Keep face clean, blow nose ▸ Bath or shower at least every second day ▸ Strong teeth, lift the lip (page 362) and brush teeth twice a day • **Injury prevention**, including car seats, passive smoking, poisoning risk, water and fire safety • **Protective behaviours** ▸ Know where child is, who they are with and what they are doing (including online) ▸ Provide opportunities for children to build relationships with people they trust and feel safe with ▸ Listen to children and keep them safe. Help them to feel comfortable to talk about worries • **Play with and talk to child** ▸ Smile, talk and sing ▸ Name, point to and count people and everyday things (eg household items, body parts, animals) ▸ Play with things that encourage imagination and creativity (eg blocks) ▸ Read and tell stories in language and English ▸ Throw and kick a ball, run, roll, dance, jump ▸ Encourage attending playgroups and early learning centre ▸ Prepare for school • **Avoid TV and screen time** (TV, phone, computer) under 2 years. After 2 years limit screen time to one hour a day with carer

Child development concerns (0–5 years)

- Early identification and action on developmental concerns and delays can improve long term outcomes
- Work with families, community programs and multi-disciplinary outreach teams to identify and respond to concerns

Ask

- Caregiver about child's development — check against normal development — see Child health check (0-5 years)
- Identify issues of concern using red flags early identification guide

Do

- Child health check (0–5 years) (page 138) if due
- Assess child's development using validated developmental screening tool (eg ASQ TRAK) if you are trained. These screening tools are not diagnostic and further assessment will be needed
- Encourage families to attend community services (eg strong women workers, playgroups and early childhood education programs) that can be used to promote early childhood development
- Discuss concerns with caregiver. Arrange medical follow-up and refer to child health nurse, hearing health and allied health teams

Table 3.3 Multi-disciplinary referral for developmental concerns

	Promote use of community programs (eg playgroups)	Medical Consult	Refer Child health nurse	Refer early learning centre (eg FaFT) for individual learning plan	Refer hearing health services	Refer Allied Health	Refer Paediatrician
All children	✓	✓	✓	–	–	–	–
Any red flags or ASQ below cut off in more than one area	✓	✓	✓	✓	✓	✓	–
Red flags or ASQ below cut off in 2 or more areas	✓	✓	✓	✓	✓	✓	✓

Follow-up

- Review plan for follow-up and make sure that referrals are actioned

Red Flags Early Identification Guide © State of Queensland (Queensland Health)

National Disability Insurance Scheme (NDIS)

Children under 7 years of age with identified developmental concerns in 2 or more areas may be able to access the Early Childhood Early Intervention (ECEI) pathway through the NDIS. Children are able to access this pathway until the age of 7 years without a confirmed medical diagnosis. It is important to document any developmental concerns and refer to doctor and child health nurse for full developmental screening. Any health professional can refer children to the ECEI pathway through completing an NDIS access request form. For children 7 years and older, assessment by the paediatrician and allied health team is required for NDIS access.

School-aged and young person's health check (6–17 years)

- Healthy childhood and teenage years are important in shaping brain development and future health, particularly reducing risk of chronic conditions
- Key developmental stage with transition to independence
- Before following this protocol you must make sure you understand issues of
  - Assessment of competency to make medical decisions
  - Limits of confidentiality
  - Mandatory reporting requirements
  - See Competency, consent and confidentiality (page 136).

Do first

- Ask carer and young person about concerns, priorities and goals
- Review previous medical and social history and gather information from other sources with consent (eg school) — attention to
  - Hearing — audiology reports, surgery
  - Vision — glasses, optometry reports
  - Respiratory — persistent wet cough, repeated chest infections especially if admitted to hospital
  - Acute rheumatic fever with/without heart disease
  - Growth concerns including overweight/obesity
  - Developmental or learning issues, school attendance, alcohol exposure in pregnancy
  - Involvement of other health care providers — child health nurse, paediatrician, psychologist or other agencies (educational, guardian, legal, child and family services)
  - Allergies and immunisations
- See HEADSS framework for Psychosocial Health Assessment (page 149) for examples of questions that can help engage young people

Check

School-aged health check — checklist

Age	Assessment — Check/Do/Refer	Discuss/Promote
5–17 years	Ask about • Self care — toileting, bathing, brushing • Teeth • Sleep — quality, how much, when (day/ night) • Nutrition — how much, what kind, food security • Physical activity (sport, hunting, fishing), screen time • Home — carer, living arrangements, • overcrowding • Domestic and family violence • Education/training — school attendance, academic progress, behaviour issues • Social group - friendships/peers/ bullying • Smoke exposure — cigarettes, camp fires • Safety — seat belts, water safety, bike helmets	• Talk about hygiene and dental health • Encourage eating fruit and vegetables, water as the main drink, avoiding sugary drinks, avoiding highly processed foods • Encourage regular physical activity — at least 1 hour every day • Encourage limiting screen time (TV, phone, computer) to 2 hours a day • Talk about protective behaviours — the right to feel safe, pay attention to • feelings, tell someone if they feel unsafe, identify people they feel safe with • Encourage carer engagement with school • Encourage spending time with and talking to friends and family — talk about feelings, worries • Talk about safety and injury prevention • including seatbelts, water safety
	• Head-to-toe exam including ▸ BP — cuff needs to cover ⅔ of child's upper arm ▸ Eyes — visual acuity at 6 years, 12 years and 15 years then every year, more often if symptoms or previous abnormality ▸ Ears ▸ Teeth and mouth ▸ Respiratory, cardiac and abdomen ▸ Skin (eg impetigo, scabies, acanthosis nigricans) • Growth (page 166) — weight, height, BMI, waist, circumference to height ratio — plot on growth chart • Hb • Immunisation status. Give if due • Check for development, behaviour, emotional concerns — see School aged child and youth behaviour or development concerns (page 151)	• Arrange time to follow-up and talk about results, treatment, management • Offer copy of health check to carer

School-aged health check — checklist (continued)

Age	Assessment — Check/Do/Refer	Discuss/Promote
10 years and over	**Diabetes risk factors check — 10 years and over** (can be done for under 10 if pubertal or more than one risk factor) • Mother, father or sibling with diabetes or mother had diabetes in pregnancy • Overweight, obese or waist circumference to height ratio more than 0.5 • Acanthosis nigricans (dark discolouration of skin folds and creases) • Takes psychotropic medicine (antipsychotic) • Other conditions linked to obesity or metabolic syndrome (high blood pressure, PCOS, high blood fats) • Do if has risk factors ▸ U/A for protein — if protein 1+ or more send for ACR ▸ HbA1c (POC Test if available), FBC, UEC, eGFR, LFT, TFT, lipids ▸ **Medical consult** ▸ **Dietitian referral**	
12 years and over only	• Ask about puberty, menstruation • Ask about sexual activity ▸ If non-consensual activity identified — see Child neglect, abuse and cumulative harm (page 153) ▸ **STI check** if 14 years or over (consider for under 14 years if indicated) ▸ Discuss contraception • Ask about smoking and smoke exposure • Ask about gambling (young person or someone close to them) — how much, money owed, missing school • Ask about concerns with mood, anxiety, self- harm • Ask about behavioural concerns — school, friendships, police, youth justice	• See Competency, consent and confidentiality (page 136) • Help the young person talk to you • Talk about healthy relationships, safe sex, consent protective • behaviours and contraception — see STI checks for young people (page 303) • Talk about injury prevention including self-harm • Brief intervention for tobacco, alcohol and other drugs • Discuss and reinforce strengths, achievements and goals

Follow-up

- If problems found — make sure person added to recall system and/or referrals completed
- Team approach needed to manage complex problems — could include the young person, family, clinic staff, doctor, paediatrician, dentist, allied health, hearing/eye/mental health team, support services, council, housing associations, education system services

HEADSS interview for psychosocial health assessment

- Young people are more likely to talk about sensitive issues and seek help if asked directly
- Use HEADSS to help you to
  - Engage with young people
  - Identify vulnerabilities
  - Provide early intervention to manage high risk behaviours
  - Provide health promotion advice
- HEADSS is best done with the young person alone
  - Ask carers if they have any worries before they leave the room and again when they return
  - Explain you will ask lots of questions about parts of their life that may affect their health and wellbeing — explain and stress confidentiality
  - You may not be able to cover all questions at one visit — focus on most relevant questions
  - Use general statements to be less intrusive (eg Some young people experiment with cigarettes, alcohol and drugs. Do people at your school use these, what about your friends, and you)
- At end of HEADSS
  - Ask young person who they can trust and talk to if they have problems
  - Check preferred communication about results — what number to call, if anyone else you can talk to
  - Follow-up overdue recalls for health check items (eg blood tests, growth checks, vaccinations)
  - Treat any health issues and manage health risk behaviours — **medical consult** or other referrals if required

Table 3.4 HEADSS interview guide

General questions	• Where are they from • Where is their family from • What do they like about their country/community
Home	• Do they have somewhere to live • Who lives at home, how many people are in the house • Do they feel safe there
Education/ employment	• Do they attend school/VET If yes ▸ How often, how many days ▸ Do they enjoy school, what are they good at ▸ Do they have any issues with learning (concentration, hearing) ▸ Is there any bullying ▸ Do they have employment or know what they would like to do in the future
Eating/ exercise	• Do they think they eat well ▸ Are there times when there is not enough food ▸ Do they or anyone else worry about their weight ▸ Do they play sport/exercise ▸ Do they hunt/fish, eat bush tucker
Activities	• Do they have good friendships and family support • What do they do for fun • Do they participate in cultural activities (carnival, hunting, ceremony) • Any involvement with the justice system
Drugs	• Do they smoke cigarettes/cannabis (what and how often) • Do they use volatile substances • Ask why they use drugs (eg to relieve stress, response to trauma)
Sexuality	• Are they in a relationship • Do they like males/females/both • Are they having sexual intercourse, do they use contraception • Do they need an STI screen • Have they experienced non-consensual sex • See STI checks for young people (page 303) • See Child neglect, abuse, sexual abuse (page 153)
Safety/ Self harm/ Suicide	• Do they feel happy/sad/angry. Do they worry a lot • How is their sleep • Have they ever tried to hurt themselves or had thoughts about hurting themselves • Have things been so bad that they have thought they would rather not be here • Are they currently suicidal. Do they have a plan • Do they experience voices • Is there any family history of mental illness • Have they experienced or witnessed any violence recently • Who can they talk to if they feel unsafe • See mental health assessment • See Domestic and family violence (page 71)
Spirituality	• Do they have any beliefs that are important (religious, spiritual) • Who/what do they turn to if they need help or guidance

School aged child and youth behaviour or development concerns

- Children may be referred by carers or teachers with behaviour or development concerns or issues may be identified during routine health checks
- Trauma and adverse childhood experiences can result from
  - Harm to child — bullying, neglect, emotional, physical or sexual abuse (page 153), self-harm, suicidal thoughts
  - Harm to family — parental or carer mental health or substance use, family violence (page 71), incarceration
  - Harm to community — community unrest including lack of safe spaces, repeated grief or community violence
- Behavioural and developmental concerns may present in different areas of a young person's life. Impacts across domains or environments (home, school, community) can worsen if not addressed
- Stressful or traumatic events impact on a child's relationship with other people which are needed for healthy development
- A multidisciplinary team approach is needed to diagnose and manage concerns

Ask

Development concerns

- Poor school attendance or performance delayed by more than one year
- Difficulties with or loss of speech, listening, playing or coordination skills

Behaviour concerns

- Disruptive, disinterested or inattentive
- Impulsive or overactive
- Aggressive
- Sexual activity inappropriate for age, eg sexual aggression, bullying or force, seeking an audience, sexual contact with others with significant age difference

Emotional concerns

- Anxious (worried), fearful or depressed (sad)
- Often upset or not coping with changes or challenges and cannot calm down
- Not sleeping or too sleepy
- Immature for age

Family and social concerns

- Family concern (eg behaviour is impacting on family or home environment)
- Current or history of trauma
- Risk to self and/or other people
- Not meeting with, talking to or getting along with other people

If concerns identified

Check

- Medical history including mother's and birthing history and involvement of services (eg paediatrician, child protection, school counsellor)
- School aged and young person's health check (page 146) if due

Do

- If any concerns — **medical consult** — refer to paediatrician if needed
  - Referral to NDIS for this age group requires paediatrician and allied health assessments and reports that detail issues
- Advise regular check-in at clinic for any concerns
- Document relevant information provided by carers and family
- Encourage school attendance — involve community workers, school, sport/recreation and youth programs
- **Refer** to allied health, social and emotional wellbeing, alcohol and other drugs services as appropriate

Child neglect, abuse and cumulative harm

- It is important to understand the definitions of abuse and neglect that apply in your state/territory and how to make a child protection report/ notification
- This may include information sharing obligations with other agencies
- **Medical consult** is recommended

Child protection services

NT
- Territory Families, Housing and Communities — Central Intake Team
  - 24 hour phone line — 1800 700 250

SA
- Department for Child Protection
  - 24 hour phone line — 131 478

WA
- Department of Communities, Child Protection and Family Support — Central Intake Team — 1800 273 889
  - Or after hours call Crisis Care 1800 199 008

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

Cumulative harm

- Can be caused by multiple episodes of abuse or neglect — each event may not be severe enough to raise child protection concerns
- Over time the repetition of these events may cause trauma and have negative effects on child's development
- Report cases where you suspect cumulative harm

Neglect

Parent/carer fails to provide level of physical and/or emotional care that child needs to grow and develop well including
- Physical neglect
  - Not providing child's basic needs such as food, clothing or shelter
  - Not adequately supervising child, 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

- 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 and 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 child's needs are met
- Discuss with colleagues and record in file notes — concerns, support offered or attempted and outcomes
- Talk with child health team, doctor, paediatrician about concerns
- If child remains at risk, even with support — notify child protection service (page 153)
- If possible when reporting abuse (all types) advise protective parent/carer you are making a report
  - If not confident to do this — obtain medical advice, talk with child protection service

Emotional or physical abuse

- Changes in behaviour that may indicate abuse
  - Nightmares, sleep walking
  - Avoiding physical or other contact with certain people or groups
  - Changes in general behaviour, activities
  - Avoiding or running away from home
  - Low self-esteem, increased anxiety
  - Extremes of behaviour — very aggressive to very passive
  - Self-harming behaviour, drug and alcohol use

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 or young person for everything that goes wrong
- Calls child or young person names, sees them as 'evil'
- Exposes child or young person to domestic/family violence
- Isolates child or 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 person 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 — see Child health check (0–5 years) (page 138)
- Discuss with colleagues and record in file notes — concerns, support offered or attempted and outcomes
- Talk with child health team, doctor, paediatrician about concerns
- If child remains at risk, even with support — **medical consult**, notify child protection service (page 153)

See Child development concerns 0-5 years (page 143) and School aged child and youth behaviour or development concerns (page 151)

Physical abuse

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

Consider abuse in infant, child or young person if

- History raises concern
  - No history to account for the injury
  - History of unwitnessed trauma
  - History of family violence
  - History incompatible with the child's age or developmental capabilities
  - History is not a likely explanation to account for the injury
  - Inconsistent or changing histories
- Unreasonable delay in seeking medical attention
- Any injury in a child not yet walking
- History of another child causing significant injury
- Certain injuries with high specificity for abuse — ear bruising, rib fractures, any injury in a child not yet walking
- An infant with unexplained neurological symptoms or obvious head injury (suspect abusive head trauma)
- **Inconsistencies which are**
  - Story of how injury happened suggests minor injury but injury is 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

Ask

- Ask what happened, where it happened, when it happened, who was there, what went wrong
- Always record detailed story of how injury occurred

Do

- Manage any injury
- Record injuries — use body diagram to record where injuries or bruises are
- Make sure child is safe, may need to send to hospital
- **Medical consult**, notify child protection service (page 153)

Sexual abuse

Child sexual abuse is a crime — **urgent medical consult**
Must notify child protection service 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
- 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

- Offender usually known to child/young person, may be member of family, may be with the child in the clinic
- Sexual abuse can include
  - Sexual touching
  - Penetration
  - Oral sex acts
  - Sexually explicit talk
  - Indecent exposure
  - Taking sexualised photos of a child
  - Involvement with pornography
  - Involving a child in prostitution
  - Female genital mutilation
  - Threats or bribes to keep a child silent

Symptoms that *may* indicate child sexual abuse

- Physical evidence — not common
- Physical symptoms may include genital or anal pain, soreness, bleeding, discharge, rash, frequency of 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 sexual abuse suspected — **medical consult**
- Plan for safety of child/young person, their family and clinic staff including ATSIHPs, who are part of the community
- May need to evacuate child/young person to ensure safety
- **Must** notify child protection service (page 153)
  - About presentation
  - To plan management

Recent sexual abuse (up to 7 days post-assault)

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

- **Medical consult** with staff from sexual assault service — they will advise how to proceed and preserve evidence
- Get support from experienced staff
- Assess and manage clinical situation

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — treat injuries as needed. See Assessing trauma — primary and secondary survey

Collecting body fluid loss for forensic evidence

Collect forensic evidence with 'Early evidence kits' or 'Preliminary forensic kits' if available at your clinic

- 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 and blankets
- 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
- Never force child/young person to talk
- 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
- 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 — after medical consult you must notify child protection service
- Suspicion is the key issue in proceeding with notification. Suspicion of sexual abuse is managed and notified according to Flowchart 3.1
- **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 — obtain medical advice and talk with child protection service
- 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

STI testing in children

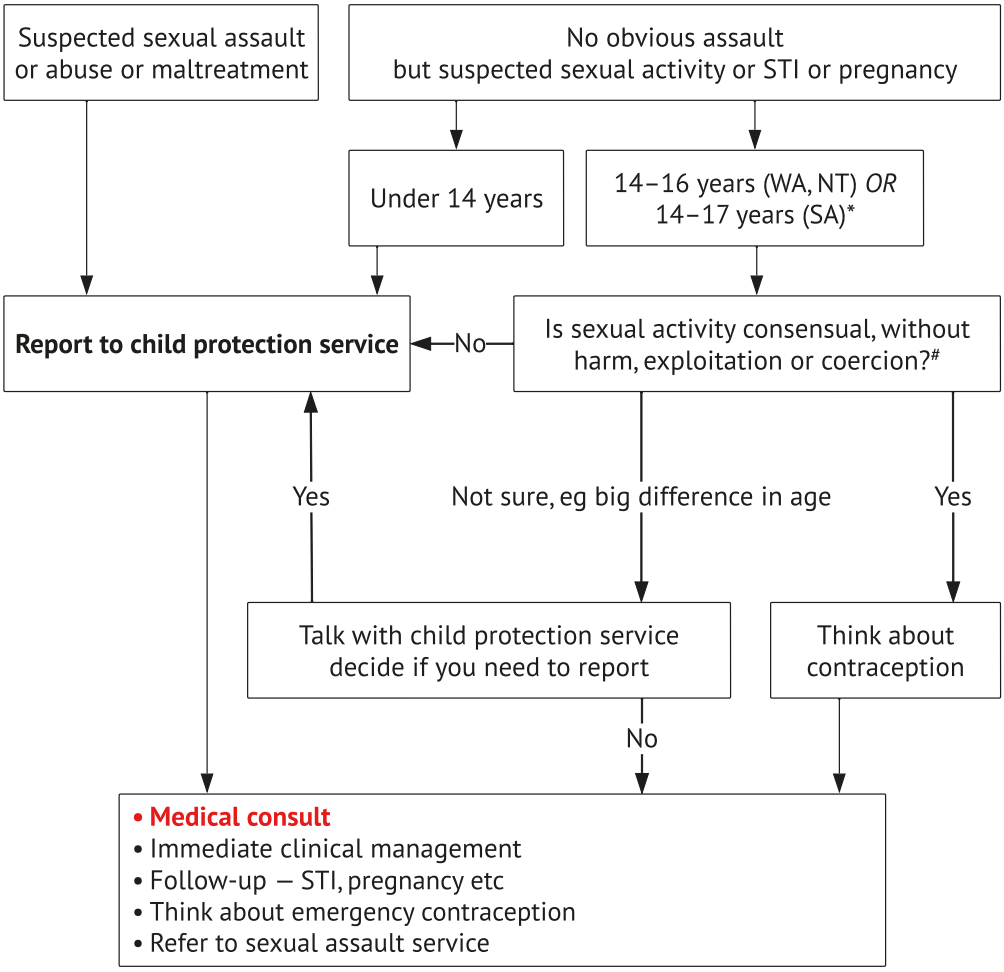
- STI testing is not an appropriate way to confirm or form a suspicion of sexual abuse
- Negative STI test doesn't exclude sexual abuse in a child/young person
- If obvious sexual abuse — **medical/paediatrician/sexual assault doctor consult** before doing STI test
- If child/young person sexually active *OR* suspected sexual abuse —
  - If under 14 years — **medical consult** about STI testing
  - If 14 years and over — see STI checks for young people (page 303)

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 (page 153) if
  - Ongoing concerns about child/young person's safety
  - You have new information

Flowchart 3.1 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 is more than 2 years

State/territory legislation is subject to change. Recommendations correct March 2022

Making a report

- You will need to provide
  - Child's name, date of birth, address
  - Parent/carer names
  - Why you suspect or believe child/young person has been sexually abused (eg 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

Infant and child nutrition

Good nutrition is especially important in early life for
- Healthy growth and to support learning and development
- Developing muscles and building skills needed for eating and talking
- Learning to like and develop habits for healthy foods and water
- Reducing risk of chronic conditions later in life (eg diabetes, heart and kidney disease)

Children grow well with
- A healthy environment that includes love, care, play and sleep
- **Only** breastmilk until around 6 months of age
- A variety of age-appropriate foods introduced at around 6 months

Nutrition under 6 months of age

- Breastmilk will meet all of baby's nutritional needs until around 6 months of age — no other food or fluids including water are needed
- Babies who are not breastfed should be provided with Stage 1 (newborn) infant formula
- See Postnatal nutrition for mother and baby (up to 6 months old) (WBM, page 228)

Introducing solid foods

- **Do not** offer solid foods before 4 months of age
- Babies need food as well as breastmilk at around 6 months of age when they
  - Can hold their head up and sit with minimal support
  - Are interested in and grab for food — Figure 3.1
  - Open their mouth when you offer food — Figure 3.2
  - Are still hungry after breastfeeds
- If baby is not eating any solid foods by 7 months of age — **medical or child health nurse consult**
- Iron rich foods (iron fortified cereal, meat, chicken, fish, eggs, legumes) are needed to support growth, development and prevent anaemia — see Anaemia (weak blood) in children and youth (page 177)

Figure 3.1

Figure 3.2

Feeding young children

- Offer a variety of foods regularly across the day (3 meals plus snacks)
- Let children guide how much food to eat. Children are hungry when they
  - Are excited about and try to reach for food when they see others eating
  - Lean forward and open their mouth ready to be fed
- **Do not** force children to eat if they are not hungry. Offer food later if a child
  - Turns their head away, pushes spoon away or firmly closes their mouth
  - Is distracted or not interested in food
- Encourage families to eat meals together. Children learn new eating skills by watching other people

Table 3.5

Age/Stage	Food/Drink	When to offer	How to offer
Birth to around 6 months	• Breastmilk **only** (or stage 1 infant formula until 12 months old if not breastfed) • No other food or fluids • Oral iron supplement if high risk of anaemia — see Anaemia in children (page 177)	• On demand	• Responsive feeding when baby shows signs of hunger — see Breastfeeding (WBM, page 232)
Around 6 months (not before 4 months) when developmentally ready First foods	• Iron rich foods with breastmilk • Iron fortified cereal (eg Farex) with expressed breastmilk or cool boiled water • Mashed, minced or stewed meats, fish or eggs • Mashed legumes or baked beans • Offer with mashed vegetables and fruit • Can also offer soft, easy to hold finger foods (eg soft fruit or vegetable pieces)	• Offer food after or between breastfeeds • Offer food 2–3 times a day and continue to breastfeed on demand	• **Do not** give small, hard foods these can be choking risk. Offer soft lumps that dissolve in the mouth • Offer food when baby is happy and relaxed — not when tired • Sit baby on carer's lap or in highchair to eat. Always supervise baby when they eat • Give baby time to practice eating skills. Might spit out food or make faces at first. Keep offering foods that have been refused and try new flavours • Let baby make a mess — try to feed themselves

Age/Stage	Food/Drink	When to offer	How to offer
As baby learns to eat After a few weeks of eating	• Offer foods with lumpier textures and finger foods that encourage chewing • Pieces of soft stewed meat or chicken, fish, eggs • Legumes, baked beans, peanut butter • Toast, damper, pasta, rice, cereals • Soft vegetables and fruits • Yoghurt, cheese (small amounts of full fat cow's milk can be used in cooking and on cereal) • Continue to offer regular breastfeeds until at least 12 months old — stage 1 formula is needed if not breastfed • Offer cool, boiled water in a cup after and between meals	• Offer food before or between breastfeeds • Offer food every 2–3 hours, at least 4–6 times a day	• **Do not** give small hard foods that are a choking risk • **Do not** add salt or sugar to foods • Offer a mixture of spoon feeding and finger foods so baby can try to feed themselves • Let baby eat with the family • Choose lumpy, healthy meals from family foods • Sit down to eat. Walking with food is a choking risk • Commercial baby foods are not needed. If used choose savoury option and feed from a spoon — not pouch
Toddlers and young children Over 12 months	• **Do not** give tea or sweet drinks • Offer water as a drink • Can give up to 2 cups a day full fat cow's milk as drink (reduced fat after 2 years) • Continue to breastfeed, with healthy food, for as long as mother and child want. Solid foods should give most of the nutrition • Infant formula is not needed after one year (unless prescribed by doctor or dietitian) • Offer a variety of healthy foods from family meal	• 3 meals plus 1–2 snacks every day	• Eat together as a family and serve child same healthy foods as adults • It is common for toddlers to eat small amounts and be fussy • **Do not** push children to eat or use bribes or rewards • Offer food and drink regularly, every 3–4 hours • Give more finger foods so children can feed themselves and involve children in choosing and making foods • Offer drinks in a cup. Bottles are not needed after 1 year

Infant, child, youth growth (0-17 years)

- All young children have the same potential to grow. Many factors affect growth including nutrition, sleep, health and parent's height
- Growth problems are usually caused by a combination of medical, social and/or environmental issues (eg food insecurity)
- Growth is a very important indicator of a child's overall health and development. Growth problems can impact on a child's learning and development and risk of chronic conditions later in life — see Child development concerns (0-5 years) (page 143) and School aged child and youth behaviour or development concerns (page 151)
- Preterm (less than 37 weeks) and low birth weight babies (<2500g) may need individual growth and nutrition plans — see Child health check (0–5 years) (page 138)
- Management of growth problems needs a multi-disciplinary approach in partnership with the family

Red Flags — Urgent Medical Consult

- Baby not being above birth weight 7–14 days after birth or losing weight if under 3 months

Monitoring growth

- Growth monitoring is one part of a child health check — follow the growth check schedule — see Postnatal care of baby (WBM, page 223), Child health check (0–5 years) (page 138) and School-aged and young person's health check (6–17 years) (page 146) or local endorsed program
- Regular growth checks mean that problems can be found and responded to early. It is very important to have accurate measurements
- If a problem is identified child will need extra monitoring and a care plan developed with family, child health nurses, dietitian and paediatrician

Do

- Always use calibrated equipment in good condition, use same equipment for ongoing checks if possible — see Clinical assessment of children

Measure weight

- Record to nearest 0.1kg
- Under 2 years old — on baby scales, naked (no nappy or singlet)
- 2–5 years — standing on adult scales, wearing dry nappy or underpants only, no shoes
  - If unable to undress, document what child wearing in records
  - If unable to weigh child alone — weigh carer only, then while they are still on the scales, tare (zero) the scales, then hand carer the child. Child's weight will be final reading *OR* subtract carer weight from total weight of carer and child (less accurate)
- 5 years and over — on adult scales, wearing light clothing and no shoes

Measure length or height

- Record to nearest 0.1cm
- Under 2 years old — lying down (length), no nappy, on fixed board or measuring mat with 2 people holding the child
- 2 years and over — standing up using height measure, without shoes, hair ties or hat

Measure head circumference

- Babies and children under 3 years
- Find and measure widest part of head (horizontally) using a narrow (1cm wide), non-stretch tape measure

Calculate Body Mass Index (BMI)

BMI is a measurement of how proportional (balanced) a child's weight is in relation to their height. Unlike adults the healthy BMI range for a child changes with age — **BMI for children must be plotted onto a growth chart**

- For children 2 years and over calculate BMI using the formula: weight (kg) divided by height (cm)^2 *OR* use anthropometric calculator (eg WHO Anthro)

Calculate Waist for Height

- 10 years and over
- Measure waist just above belly button. Divide waist measurement (cm) by height (cm)
- Waist for height ratio of 0.5 or more is a risk factor for chronic conditions — see School-aged and young person's health check (6–17 years) (page 146)

Interpreting growth

- Every time child is weighed and measured — **plot growth onto a growth chart** — WHO charts are used for child aged under 2 years. Use chart approved by your organisation for child over 2 years
- Look at the growth chart to assess growth. Multiple measurements over time are needed to assess if a child is growing well — **the shape of the growth curve is more important than height/weight numbers**
- A baby should be back to or above birth weight 7 to 14 days after birth
- A baby who was preterm or low birth weight should still follow shape of a line on the chart

Growing well

- Weight and length/height generally follow one of the centile lines on the growth chart — Figure 3.3 and Figure 3.4 — *AND* BMI is between the –1 and +1 line on the BMI for age chart — Figure 3.5
- There is good catch up growth if any weight loss during illness

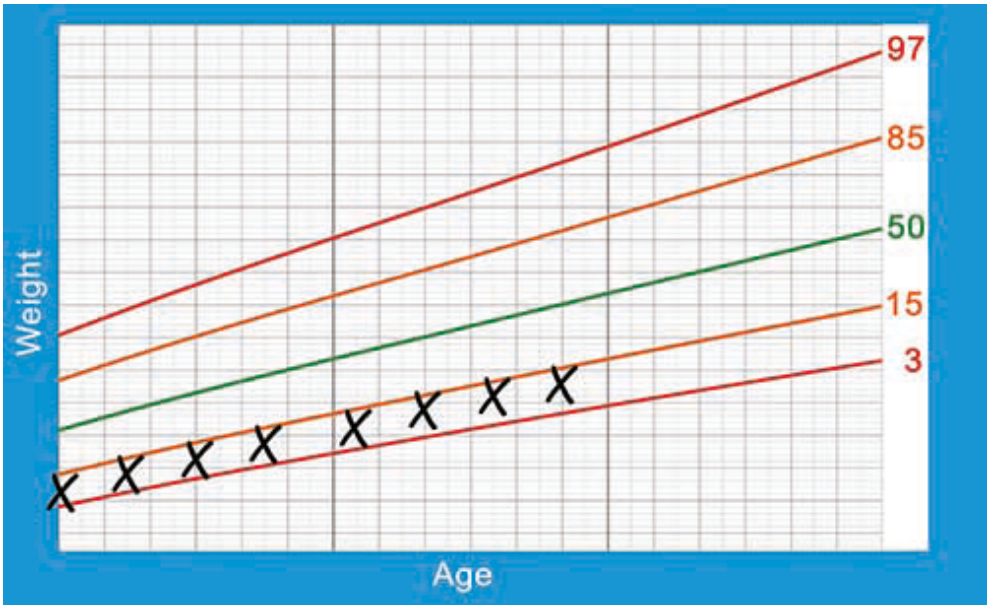


Figure 3.3

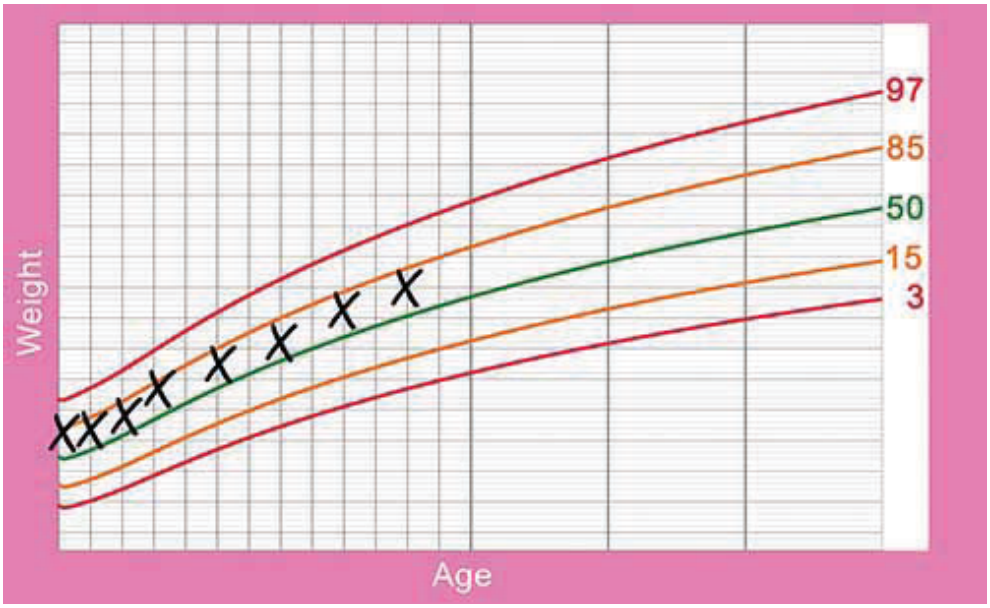


Figure 3.4

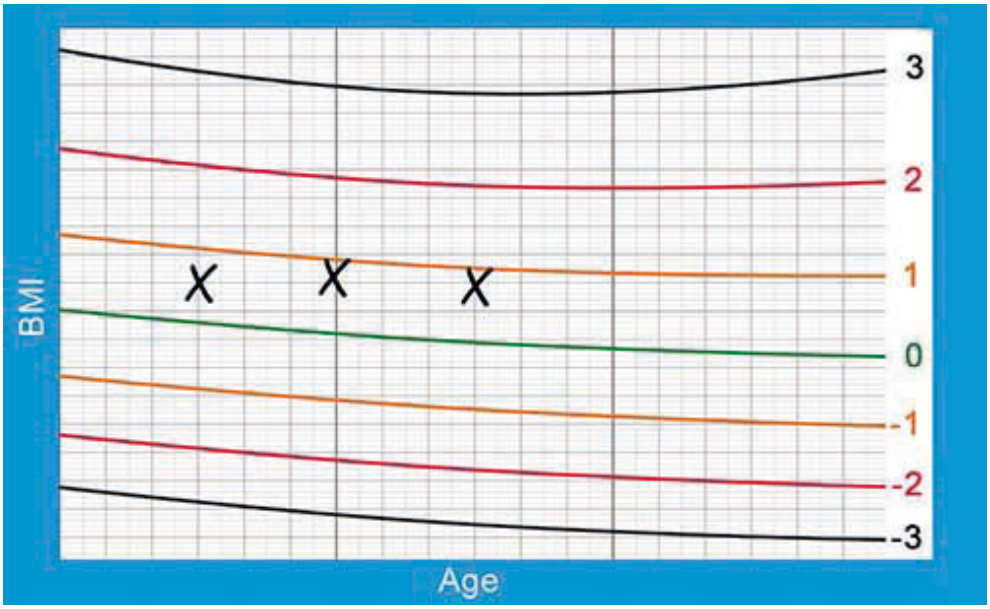


Figure 3.5

Growth faltering

- Weight and/or length/height is beginning to flatten or go down compared to the centile line on growth chart — Figure 3.6 — *AND/OR* BMI is below the -1 line on the BMI for age chart — Figure 3.7
- Can be caused by undernutrition, infections or other medical problems

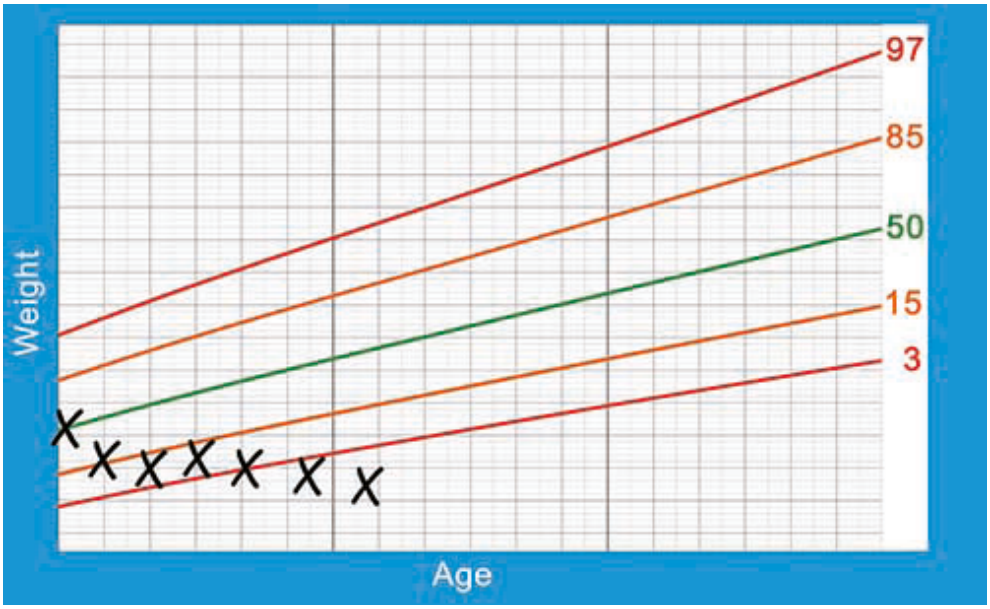


Figure 3.6

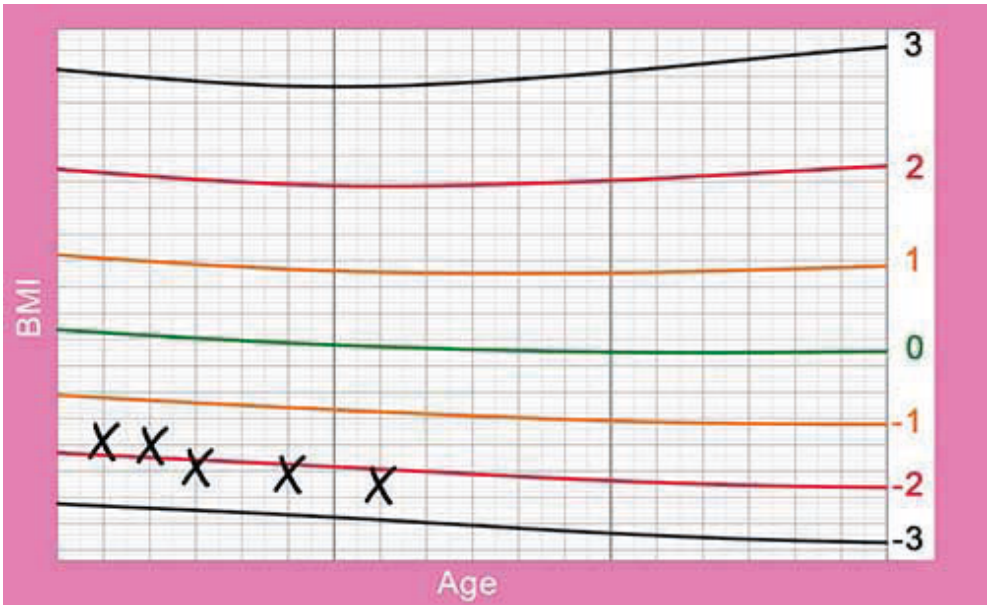


Figure 3.7

Excess growth

- Weight is going up compared to the centile line on growth chart – Figure 3.8 — *AND/OR* BMI is above the +1 line on the BMI for age chart — Figure 3.9
- Waist for height measure in children over 10 years is more than 0.5

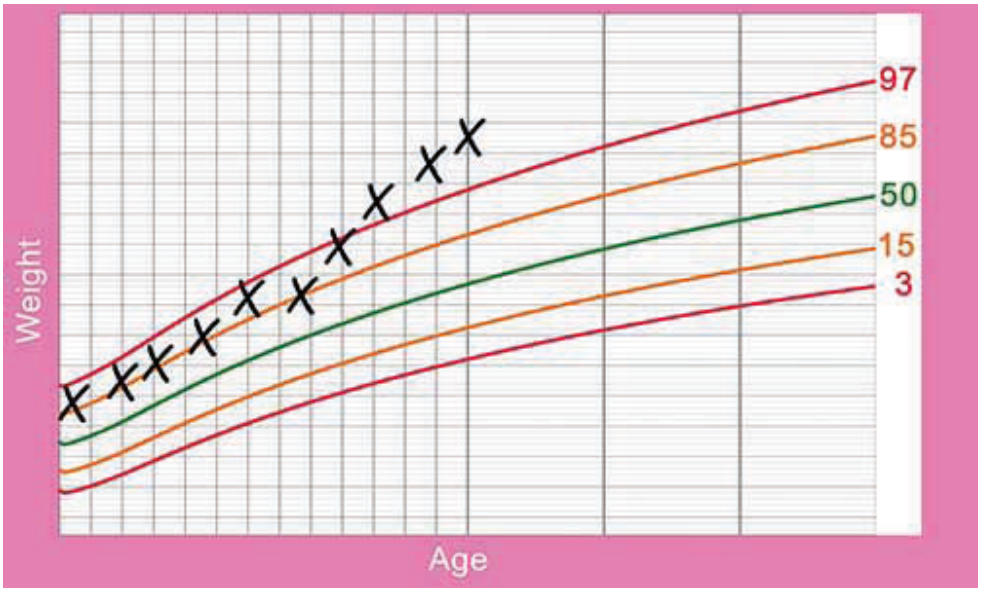


Figure 3.8

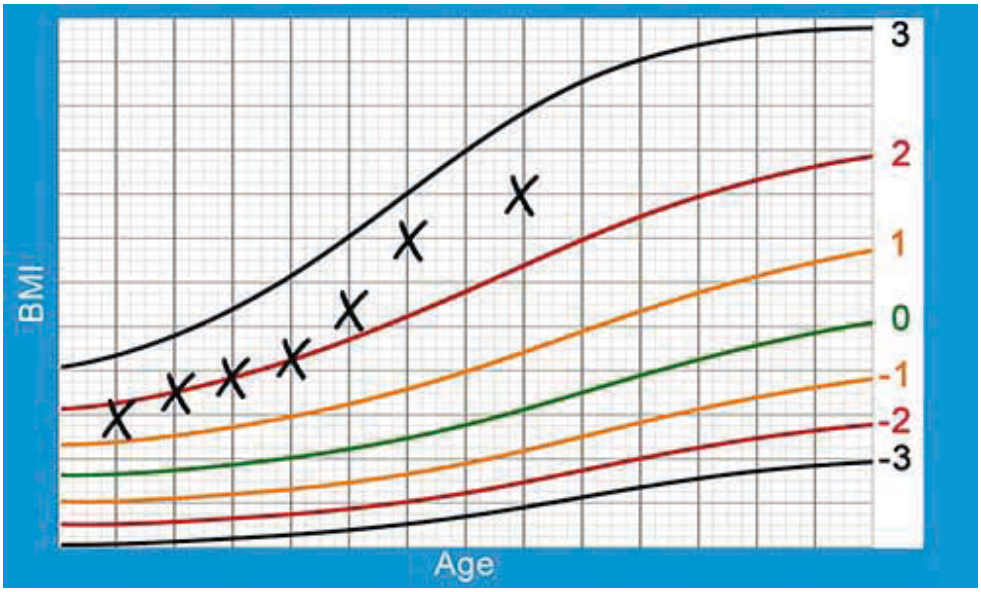
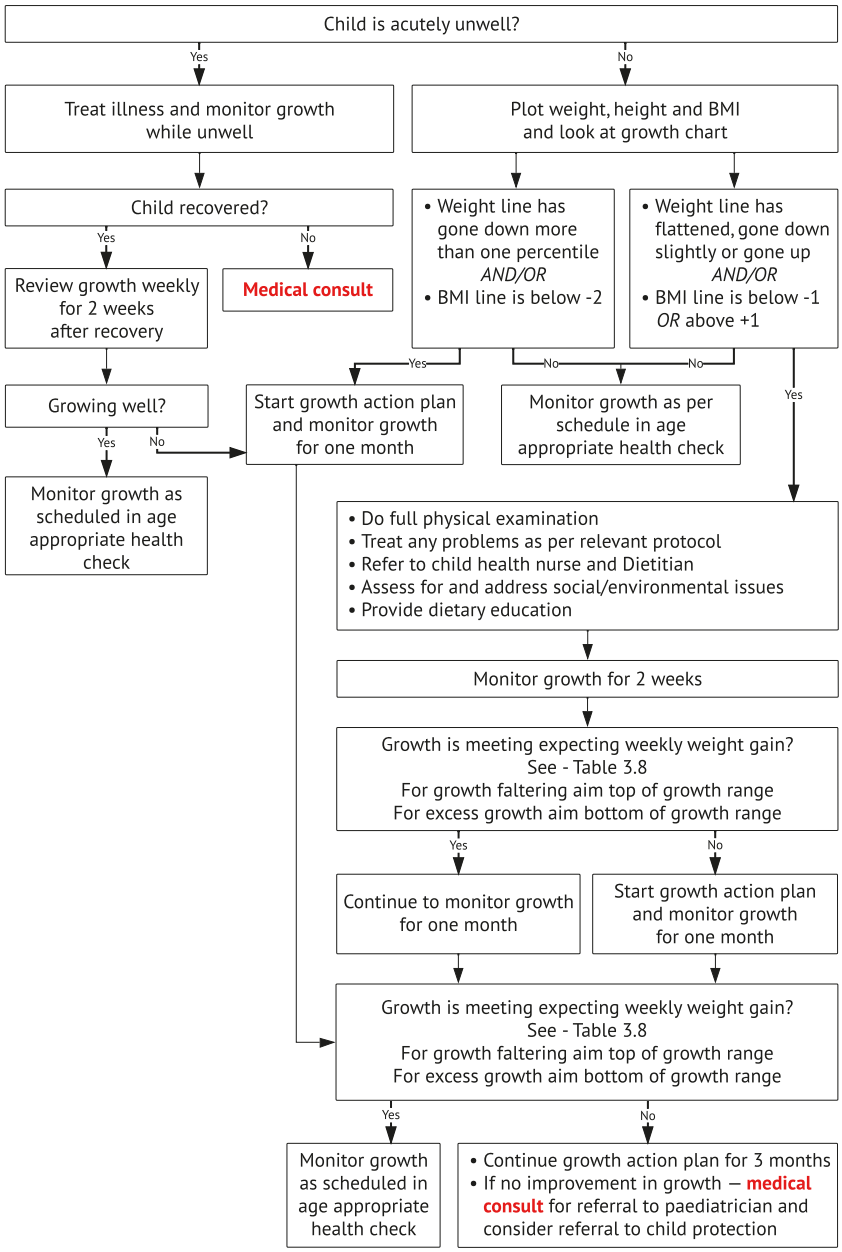


Figure 3.9

Do

- Show caregiver growth chart and talk about growth
- If growing well — do regular child (page 138) or youth (page 146) health check and encourage age appropriate diet (page 163)
- **If growth faltering or excess growth** — start growth action plan — Flowchart 3.2

Flowchart 3.2 Growth action plan



Growth Action Plan

- **Investigate reasons for growth faltering immediately — act quickly and follow-up, including with other clinic if child moves to another community**
- **Medical consult** if baby is not above birth weight 7–14 days after birth or if baby under 3 months old has lost weight
- Involve carers in finding causes for growth problems and solutions. Be sensitive to cultural beliefs and values — a growth action plan uses a multi-disciplinary approach with health staff and the family
- Consider medical, dietary, social, environmental issues. **Do not** judge or criticise
- Provide age appropriate support, education and reassurance

Ask

- About any current or recent illnesses or gastrointestinal symptoms — including vomiting, diarrhoea, constipation, ear or chest infections
- About child's development and behaviour — see Child development concerns (0-5 years) (page 143) or School aged child and youth behaviour or development concerns (page 151)
- About current diet (page 163)
  - Breastfeeding — baby should feed regularly when hungry and should have several wet nappies each day and soft faeces. Mother should be pain free and comfortable — see Breastfeeding (WBM, page 232)
  - Formula fed — check using correct formula, prepared correctly and feeding regularly when hungry, ask how much taken and if stops feeding when baby shows signs of fullness — see Postnatal nutrition for mother and baby (up to 6 months old) (WBM, page 228)
  - Foods eaten — babies older than 6 months should eat iron rich solids foods (2-3 times daily), older children should be offered food regularly (4-6 times daily) — see Infant and child nutrition (page 163)
  - Any problems with child's eating eg fussy eating or chewing problems
- About social and environmental issues
  - Access to money and/or healthy foods, Centrelink payments
  - Housing issues — including overcrowding, plumbing, power, food storage and cooking facilities
  - Maternal depression (WBM, page 127) — including low mood, exhaustion, helplessness, hopelessness
  - Carer and family — access to support, mental health issues, domestic and family violence, drug or alcohol problems, gambling

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Height, BMI
- Hb
- Head-to-toe exam — attention to
  - Skin — look for sores or scabies, hydration
  - Chest — for moist cough, frequent chest infections — see chronic lung conditions (page 201)
  - Ears
- Child (page 138) or youth health check (page 146) — if not recently completed
  - Chronic condition screening for children with excess growth — see School aged and young person's health check (page 146)

Do

- Urine for MC&S
- If diarrhoea (page 207) — faeces for MC&S and OCP
- Listen and respond to carer's concerns
- Treat any medical issues
- **Medical consult** if baby is not above birth weight 7 to 14 days after birth or if baby under 3 months has lost weight
- Refer any developmental concerns to child health nurse — see Child development concerns (0-5 years) (page 143) or School aged child and youth behaviour or development concerns (page 151)
- Give medicines for growth faltering — Table 3.6, once at diagnosis
  - **Do not** give for excess weight gain
- **Medical consult** and refer to child health nurse and dietitian
  - Refer to paediatrician if signs of complications for child with excess growth — sleep apnoea, diabetes, high BP, hip problems (eg slipped femoral epiphysis) or if pre-existing conditions (eg asthma, reflux) getting worse
- Explore solutions with family — refer to community based services that provide activities that support positive parenting and healthy eating, provide food or help with financial and housing issues (eg council, childcare, school)

- Provide education on age appropriate diet — see Infant and child nutrition (page 163)
  - If child recently sick they may not be hungry but should still be offered small healthy meals regularly, at least 6 times a day. Encourage but **do not** force child to eat
  - Sick infants need extra fluids (breastmilk, formula) for hydration and energy. If trouble breastfeeding offer expressed breastmilk from a small clean cup — see Breastfeeding (WBM, page 232) **medical consult** if any signs of dehydration
  - If diarrhoea (page 207) — give extra fluids (breastmilk, formula, water) to prevent/treat dehydration
  - Sit children up to eat. Lying down is a choking hazard
- Encourage physical activity — at least 3 hours a day if 1–5 years and 2 hours if 5 years or over
- Encourage limiting screen time — TV, computer, electronic games, mobile phone — to 2 hours a day

Table 3.6 Medicines for growth faltering

Medicine	Age/weight	Route	Dose	Frequency
Pentavite infant	0–3 years	Oral	0.45mL	daily
Pentavite kids with iron	3–4 years	Oral	3.5mL	daily
	4–12 years	Oral	5mL	daily
Albendazole • To treat *Strongyloides* • **Do not give** if under 6 months • Do not give in first trimester of pregnancy (pregnancy test if not sure) without medical consult	Older than 6 months and less than 10kg	Oral	200mg/day	daily for 3 days
	More than 10kg	Oral	400mg/day	daily for 3 days
Iron If anaemic and recovered from any acute illnesses	see Anaemia (weak blood) in children and youth (page 177)			

Severe growth faltering may require Vitamin A supplementation if not given in previous 6 months — **medical consult**

Follow-up

- **Check growth**
  - Weekly for 2 weeks for child under 5 years
  - Fortnightly for one month for child over 5 years
  - *OR* as per individual growth plan

- If not meeting expected weekly weight gain — Table 3.7 talk to child health nurse/dietitian for individualised plan
- When managing excess growth, support and encourage small successes — slowing of weight gain, weight staying the same, height gain
- If inadequate or excess gain after 4 weeks — **medical consult** to escalate care — within one week for child under 1 year
- Repeat **albendazole** after 3 weeks — see Table 3.6
- Growth action plan should be stopped within 3 months if growth is normal *OR* refer to paediatrician if ongoing growth concerns

Table 3.7 Expected weekly weight gain for age

Age	Average weekly weight gain
0–3 months	150–200g/week
3–6 months	100–150g/week
6–12 months	70–90g/week
1–2 years	40–50g/week
2–5 years	40g/week

Nutritional supplement drinks

- Used in growth faltering for 'catch-up' growth. **Must be prescribed by doctor or dietitian and monitored by dietitian —** refer to organisational guidelines
- Only used for a short time as part of growth action plan for children aged 1 to 5 years weighing more than 8kg
- If weight less than 8kg — **refer** to paediatrician and dietitian
- Not a substitute for food continue to promote healthy diet

Supporting resources

- RCH and WHO child growth and e-learning course

Anaemia (weak blood) in children and youth

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

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

- Reasons for low iron include
  - Low iron in mother before and during pregnancy (WBM, page 135)
  - Low birth weight and/or preterm birth
  - Starting food later than 6 months, not enough food or iron-rich foods
  - Drinking cow's milk before 1 year, drinking tea before 5 years
  - Recurrent infections
  - Hookworm — less common with regular de-worming

Prevention of iron deficiency in young children

- Babies born with low iron stores are likely to become anaemic in their first 6 months
- Babies at high risk of low iron stores
  - Birth weight less than 2,500g and/or preterm babies (born less than 35 weeks)
  - Born to mothers who had anaemia and/or diabetes in pregnancy
  - Twin or multiple birth
  - Umbilical cord clamped immediately (within 30 seconds) after birth
  - Early introduction of complementary (solid) foods — before 4 months of age OR cow's milk before 12 months of age
  - Delayed (after 7 months) introduction of iron rich complementary (solid) foods

Do not

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

Do

- **Medical or child health nurse follow-up** for all low birth weight or preterm babies on return to community

Oral iron supplementation

- Give supplementary **oral iron** from 1 month to 1 year of age to all infants* in communities where prevalence of anaemia is high
  - 2mg/kg per dose, twice per week supported in clinic
  - *OR* 1mg/kg per dose, once daily
  - Provide 2 weeks supply at a time — review uptake after 2 weeks
- Check Hb level at 6 months (**do not** check before 6 months of age) — Table 3.9
  - If normal — continue preventative oral iron supplementation
  - If low — start treatment regimen — Table 3.10

*There are significant long term health benefits for preventive oral iron supplementation for all infants where prevalence of anaemia is high however organisations may limit supplementation to high risk infants based on local capacity — follow organisational policy

Dietary strategies

- Encourage breastmilk only until around 6 months of age if unable to breastfeed provide infant formula (WBM, page 228)
- Continue breastfeeding on demand after 6 months and provide age appropriate iron rich foods (page 163) several times day
  - Encourage foods high in iron like red meats, chicken, fish, eggs, baked beans, smooth peanut butter
  - Encourage foods high in vitamin C like fruits and vegetables including bush foods to help body absorb iron

Other strategies

- Regular de-worming (page 498) — where hookworm is or has been common
- Prevent and treat anaemia in both pregnant (WBM, page 135) and non-pregnant women (page 348)
- Advise mothers that their smoking can contribute to iron deficiency anaemia in children. Provide information and encouragement to quit

Screening and treatment of anaemia

- Check Hb every 6 months from 6 months to 5 years — use non-invasive testing where available
  - Hb testing not needed before 6 months
  - Make sure POC Test machine well maintained and calibrated, collection done correctly — see Testing haemoglobin
- Treat and follow-up all children with anaemia
- Most anaemia in children is 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 3.8 Diagnosis of anaemia — using POC Test Hb by age

Age	6–11 months	1–4 years	5–7 years	8–11 years	12–15 years – male	12–17 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 on FBC 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 diarrhoea and other sickness
- About diet — usual food and drinks (including breastmilk) each day
- When foods were started — in particular high iron foods and cow's milk
- About family supports — money, social situation
- Who is responsible for feeding child and who else could help

Check

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Measure height and weight and plot on growth chart
- Head-to-toe exam
- Immunisation status

Treatment of anaemia

Do not

Treat anaemia when child is acutely unwell

Do

- Treat anaemia if present — Table 3.9 *AND* look for and manage other problems (eg growth faltering (page 166))
- Give **albendazole** oral, single dose
  - 6–11 months — 200mg
  - 1 year and over — 400mg
  - Do not give in first trimester of pregnancy (pregnancy test if not sure) without medical consult
- Encourage healthy eating (page 163) including high-iron foods

Table 3.9 Hb level and what to do

Hb result	What it means	What to do
Low for age but 90g/L or more	Likely to be iron deficient	• Give **iron medicine** ▸ Oral — liquid or tablet ▸ *OR* IM ▸ *OR* IV • If Hb less than 100g/L — **medical consult** • Repeat Hb in 6 weeks
Less than 90g/L at any age If Hb less than 80g/L — **urgent medical consult**	May be other cause of anaemia	• Treat as above • Take blood for FBC • **Medical follow up** • Repeat Hb in 6 weeks

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 **iron**, oral
  - If mild-moderate anaemia (Hb more than 80g/L) for child 29kg or under — 3mg/kg/d, once a day for 3 months — Table 3.10 for quick dose reference

- If severe anaemia (Hb less than 80g/L) for child 29kg or under — 6mg/kg/d, once a day for 3 months — Table 3.11 for quick dose reference
- If child over 30kg (mild-moderate or severe anaemia) — 1 **iron** tablet (80–105mg elemental iron) once a day for 3 months
- Give **iron** once a day if possible — provide 2 weeks supply at a time — review after 2 weeks
- *OR* give daily dose twice a week under supervision in clinic or community

Table 3.10 Ferro-Liquid treatment doses (6mg/mL) for children up to 30kg, with Hb more than 80g/L

Weight	Dose	Duration
Under 5kg	**Medical consult**	For 3 months
5–9kg	0.5mL/kg/day	
10–19kg	5mL/day (30mg)	
20–29kg	10mL/day (60mg)	

Table 3.11 Ferro-Liquid treatment doses (6mg/mL) for children up to 30kg, with Hb less than 80g/L

Weight	Dose	Duration
Under 5kg	**Medical consult**	For 3 months
5–9kg	1mL/kg/day	
10–19kg	10mL/day	
20–29kg	20mL/day	

- Children and youth with Hb less than 80g/L need — **medical consult**

Iron by IM injection

- IM iron can very rarely cause anaphylaxis
- **Do not give if fever (Temp more than 38°C) or very unwell**
- Give every second day (alternate days) until total dose given
  - **Do not** give more than maximum dose per day
- Use **iron polymaltose** (eg Ferrum H, Ferrosig) only
- Use z-track technique — ventrogluteal or anterolateral thigh
- 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

Table 3.12 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)

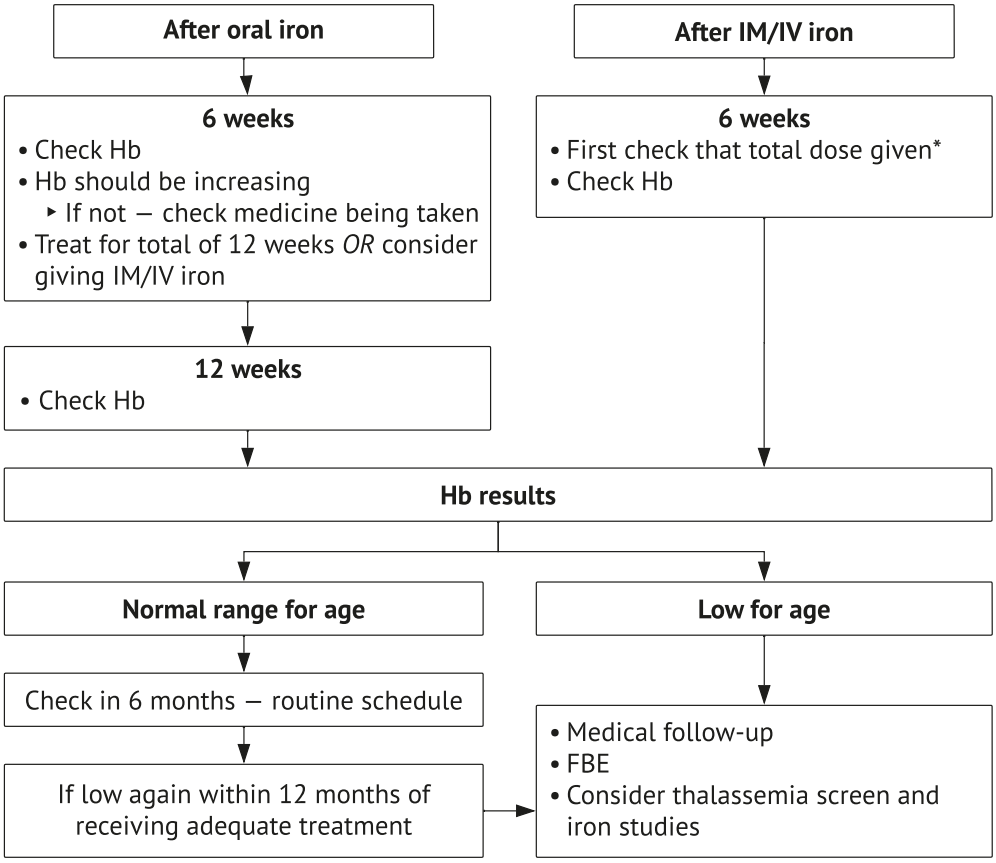
Iron by IV infusion

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

Follow-up

- Recheck Hb — Flowchart 3.3
- Always encourage healthy diet with foods high in iron every day
- If total dose not given but Hb in normal range after 6 weeks — recheck in another 4 weeks
- If treatment course is not completed and Hb remains low
  - Check caregivers have iron supplements and if any barriers to use
  - Attempt oral iron twice within a one week timeframe then **medical consult** to consider FBC, iron studies and IV iron

Flowchart 3.3 Checking Hb after iron treatment



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

Asthma in children

For children 12 years and over — see Asthma in adults (page 421)

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

Consider asthma if

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

Diagnosis

Based on history and physical examination — confirmed by reduced or resolved shortness of breath and/or wheeze after using inhaled bronchodilators

- In infants and toddlers wheeze is often due to bronchiolitis or transient early wheeze — not asthma
- Cough without wheeze or shortness of breath is rarely asthma. Check for CSLD/bronchiectasis (page 201)

Managing an asthma attack

Red Flags — Urgent Medical Consult

- Apnoea (stops breathing for short periods) — mainly infant
- Increased work of breathing (any age)
- Oxygen saturation less than 90% on room air or less than 94% on oxygen and not improving
- Not able to eat/feed
- Not interested in what is happening, lethargic (drowsy)
- Reduced air entry or silent chest
- Cyanosis (blue lips or tongue)

Do

- Use Table 3.13 to assess severity (how bad the attack is) — may be difficult to identify, unwell child may be quiet

Table 3.13 Severity of asthma

Sign	Mild or moderate	Severe	Life threatening
Behaviour	Normal	Normal, anxious	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%

Life threatening asthma

Do first

- Sit person up — carry or use wheelchair to move them
- Start oxygen if O_2 sats less than 92% and titrate to target oxygen saturation of 93–95%
  - **Do not** over-oxygenate to avoid risk of hypercapnia (CO_2 retention)
- Give **salbutamol** nebulised as needed — 5mg *AND* **ipratropium** nebulised as needed — can mix with salbutamol
  - Under 6 years — **ipratropium** 250microgram
  - 6 years or over — **ipratropium** 500microgram
- Nebulisers have high risk of transmitting infection. Wear full PPE
- **Urgent medical consult**
- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp

Do

- Give oxygen to target O_2 sats at least 95%
- Give **hydrocortisone** IM/IV — child 4mg/kg/dose up to 100mg — doses (page 511) — can repeat after 6 hours
- If poor response consider — **magnesium sulfate** IV — child over 2 years 0.2mmol/kg up to 10mmol, slow infusion over 20 minutes *AND* **adrenaline (epinephrine)** IM — child 0.01mg/kg
- **If getting better** — consider reducing salbutamol to every 30 minutes
  - Under 6 years — **salbutamol** 2.5mg
  - 6 years or over — **salbutamol** 5mg

Severe asthma

Do first

- **Urgent medical consult**
- Give medicine by puffer with spacer, shake puffer before each spray. 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
- Give **salbutamol** puffer with spacer — 100microgram/dose
  - Under 6 years — 6 puffs
  - 6 years or over — 12 puffs
- Give **ipratropium** puffer with spacer (or mask) — 21microgram/dose
  - Under 6 years — 4 puffs
  - 6 years or over — 8 puffs
- Repeat **salbutamol** with **ipratropium** every 20 minutes *OR* If patient cannot breathe through spacer or mask use intermittent nebulisation driven by oxygen
- Nebulisers have high risk of transmitting infection and should only be used if absolutely necessary. Wear full PPE
- Give **salbutamol** with nebuliser
  - Under 6 years — 2.5mg
  - 6 years or over — 5mg
- *ADD* **ipratropium** to nebuliser
  - Under 6 years — 250microgram
  - 6 years or over — 500microgram
- Repeat **salbutamol** with **ipratropium** every 20 minutes
- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Do

- Give **oxygen** to target O_2 sats at least 95%
- Give **hydrocortisone** IM/IV — child 4mg/kg/dose up to 100mg — doses (page 511) — can repeat after 6 hours
- **If not getting better** — treat as life threatening asthma (page 185)

Moderate and mild asthma

Ask

- About wheeze and cough and what makes them worse
- How many days have they been sick
- How many days missed school
- Do they have asthma action plan, 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, e-cigarettes, campfire smoke

Check

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam
  - Look at how they are breathing
  - Listen to front and back of chest for wheeze, air entry

Do

- **Medical consult**
- Give **oxygen** to target O_2 sats at least 95%
- Give **salbutamol** puffer with spacer — 100microgram/dose. 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
  - Repeat dose after 20 minutes
- Give **prednisolone** oral — child 1mg/kg/dose up to 50mg — doses (page 511) — single dose
- Check how hard child is breathing every 15 minutes
- **If not better** — treat as severe asthma (page 186)

- **If better** — keep in clinic for 1 hour. If condition stable — send home
  - Advise **salbutamol** puffer with spacer — 100microgram/dose — 4 puffs if under 6 years, 8 puffs if 6 years or over — every 3–4 hours
  - Give **prednisolone** oral — child 1mg/kg/dose up to 50mg — doses (page 511) — once a day for 2 more days
  - Make management plan. Update asthma action plan (page 191), give copy to child/family
  - Review every day
  - Arrange asthma education. Use cultural specific resources if available
  - Medical follow-up at next visit

Managing ongoing asthma

Asthma management in children is based on

- Education — make sure child and family understand and can manage asthma including how to use devices and make a bush spacer
- Triggers identified and avoided, including fire, e-cigarettes and tobacco smoke
- Assessment of asthma type, symptoms, severity and control
- Achieving and maintaining best lung function
- Preventing exacerbations
- Asthma action plan developed — reviewed regularly

Do

- Manage by asthma type — Table 3.14
- Adjust asthma medicines (up or down) according to severity and level of control — Table 3.15
- Aim for good control with least amount of medicine, especially with inhaled corticosteroids

Table 3.14 Management by asthma type

Asthma type	Management
Infrequent, intermittent (occasional) asthma • Short mild attacks more than 6 weeks apart • Usually triggered by virus • No symptoms between attacks	• Use **salbutamol** for symptoms • Child under 6 years may also need low dose inhaled corticosteroid treatment for wheeze
Frequent intermittent (mild) asthma • Mild/moderate attacks less than 6 weeks apart • No symptoms between attacks	• Use **salbutamol** for symptoms and before physical activity if needed • Consider preventer ▸ Low dose inhaled corticosteroid ▸ ***OR* montelukast** (2 years and over)
Persistent asthma • Frequent attacks — mild, moderate or severe • Symptoms between attacks • Hospital admissions	• Use **salbutamol** for symptoms and before physical activity • Use preventer ▸ Start with low dose inhaled corticosteroid *OR* montelukast (2 years and over) • If symptoms not controlled ▸ Low dose inhaled corticosteroid *AND* montelukast (2 years and over) ▸ *OR* medium dose inhaled corticosteroid • If symptoms still not controlled ▸ 6 years or over — consider combined therapy (inhaled corticosteroids + long-acting beta$_2$ agonist) ▸ Under 6 years — refer to specialist

Table 3.15 Levels of asthma symptom control

Level of control	Features — over 4 week period
Good control	All of • Daytime symptoms — 0–2 days/week, 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 • Daytime symptoms — 3–7 days/week, 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 • Daytime symptoms — 3–7 days/week, 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
- Child on long-term corticosteroids should see a 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 using the medicines — for example with devices, eg spacers

Check

- Every 6 months check that puffer and spacer or other devices used correctly
- If over 6 years or over — spirometry (lung function)
- Immunisation status

Do

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

Asthma medicines

Table 3.16 Asthma medicines

Used as	Medicine type	Examples
Reliever — relief of symptoms	Bronchodilator	• Salbutamol • Terbutaline • Ipratropium
Preventer — prevent symptoms happening	Inhaled corticosteroid	• Beclometasone • Budesonide • Ciclesonide • Fluticasone propionate
Preventer — prevent symptoms happening	Oral	• Montelukast
Combined therapy — preventer and long-acting reliever	Inhaled corticosteroid + long-acting beta$_2$ agonist	• Budesonide + formoterol (eformoterol) • Fluticasone propionate + salmeterol

Table 3.17 Total daily doses of inhaled corticosteroids 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 and spacer techniques and give education on correct use and cleaning — see Spacer devices for respiratory medicines
  - Check they know how to make a bush spacer
- 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
  - Table 3.18 for spacer types and sizes
- 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

Table 3.18 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

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. Illustrated Aboriginal asthma action plans available online

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

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

Extra things to do

_____

_____

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 paediatrician / specialist

_____

Medicines due _____ **Immunisations due** _____

Supporting resources

- The CRE in Lung Health resources
- Lung health for kids app
- How to use a puffers and spacer for kids video
- Asthma handbook — managing asthma in children

Chest infections — 2 months to 5 years

For child over 5 see Chest infections — over 5 years (page 432)

- Child with cough and fast breathing probably has a chest infection
- Best indicator of pneumonia in children is fast breathing (high RR)
- Influenza (flu) is a viral chest infection that presents in different ways. Manage based on presenting symptoms and local recommendations for current flu season
- If available, chest x-ray may help with diagnosis

Most important decisions are

- Which children need antibiotics
- Which children need to go to hospital

Consider if child could have chronic suppurative lung disease CSLD (page 201) check file notes for

- 2 or more chest infections in last year
- Treatment for pneumonia in last 4 weeks
- Wet or productive cough for more than 4 weeks
- 3 or more hospital admissions for chest problems
- Episode of severe pneumonia (in ICU)
- Chest deformity (puffed up)
- Signs of abnormality when listening with stethoscope — crackles, unequal air entry, bronchial breathing, wheeze

Red Flags	
Urgent Medical Consult	**Medical Consult**
• Apnoea (stops breathing for short periods) mainly younger children • Oxygen saturation less than 90% on room air or less than 94% on oxygen and not improving • Increased work of breathing (any age) • Sternal recession (chest indrawing) • Not interested in what is happening, lethargic (drowsy) • Not able to eat/feed • Seizures (fits)	• Child in at-risk group for severe disease ▸ Growth faltering ▸ History of preterm birth ▸ Previous pneumonia ▸ Known chronic lung disease ▸ Heart disease ▸ Weakened immune system ▸ Cancer treatment

Table 3.19 Fast breathing in children

Age	RR for fast breathing (suggests infection)
4–11 months	50/min or more
1–5 years	40/min or more

Look, ask and listen before touching and disturbing child. Child should be calm, not crying, better if not feeding

Look and listen

- At breathing
  - RR — count for 1 minute, do at least twice to be sure and take the average
  - Is the child short of breath
  - For sternal or rib recession (chest indrawing)
  - For nasal flaring — nostrils widen when child breathes in. Sign they are working hard to breathe
  - Look for sniffing posture, tripod positioning, head bobbing, grunting, gasping, tachypnoea (fast breathing)
- Listen for abnormal audible airway sounds (snoring, hoarse speech, grunting, wheezing)
- Tone — is the child active, moving around or listless
- Interactivity/mental status — how alert is child, are they interacting with the care giver
- Can the child be comforted by caregiver
- Look/gaze — does the child fix their gaze on a face or is there a glassy-eyed stare, abnormal gaze
- Speech/cry — is the child's speech or cry weak, high pitched or hoarse

Ask

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

Check

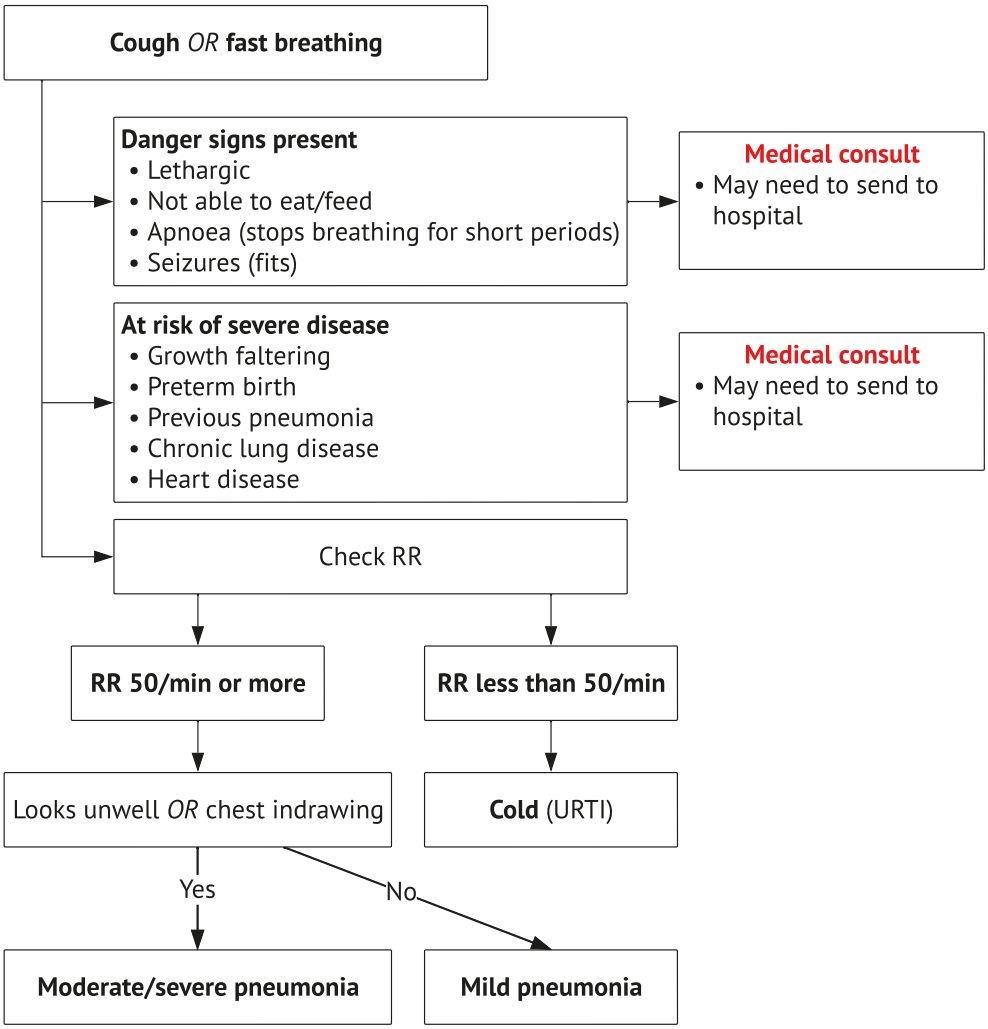
- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Do

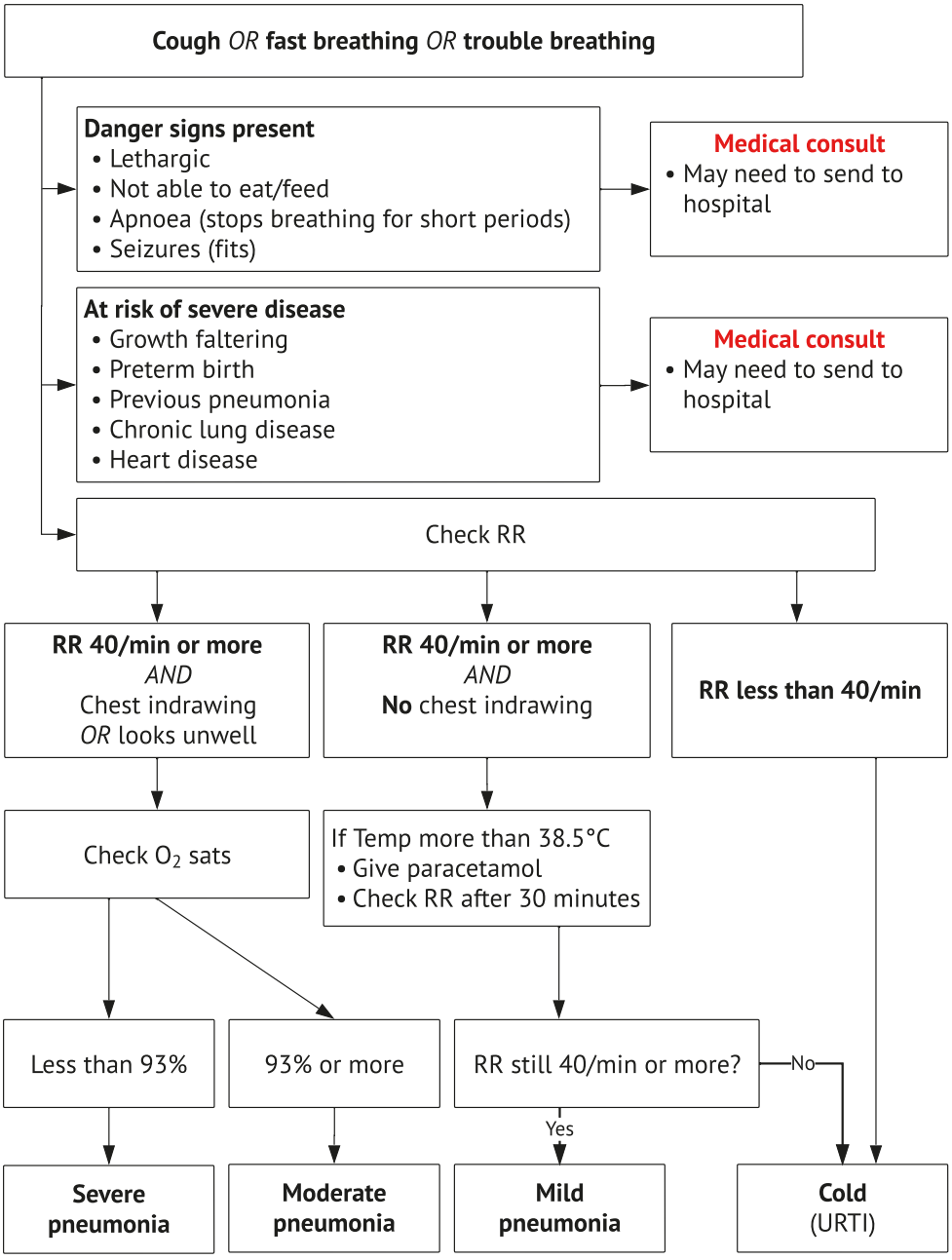
- Assess likely problem and treat as appropriate
  - Pneumonia or cold (URTI) — Flowchart 3.4 and Flowchart 3.5
  - Other conditions — Fast breathing with wheeze (page 199), Croup (page 200), Pertussis (whooping cough) (page 200), Inhaled foreign body (page 200), Bronchiolitis (page 199)

Assessment

Flowchart 3.4 Assessment of chest infections — child 4–11 months



Flowchart 3.5 Assessment of chest infections — child 1–5 years



Pneumonia treatment

Severe pneumonia

- **Medical consult** to send to hospital
- Give **oxygen** to target O_2 sats 94–98%
- Give **benzylpenicillin** IV/IM — child 50mg/kg/dose up to 1.2g — doses (page 501) — single dose
- *AND* **gentamicin** IM — doses (page 501) — single dose
- If allergy — **medical consult**

Moderate pneumonia

- **Medical consult** about need to send to hospital
- If fast breathing (page 194) for age and chest indrawing *OR* O_2 sats less than 95% on room air
  - Give **oxygen** to target O_2 sats 94–98%
- Give **benzylpenicillin** IV/IM — child 50mg/kg/dose up to 1.2g — doses (page 501) — every 6 hours (qid) for 1 day then review
- If allergy — **medical consult**
- Treat initial fever to allow assessment of respiratory distress
- Keep child in clinic until O_2 sats consistently 95% or more and can feed well
- If stays in community and improves to mild after 24 hours give
  - **Procaine benzylpenicillin (procaine penicillin)** IM — child 50mg/kg/dose up to 1.5g — doses (page 501) — every 24 hours for total of 5 days
  - *OR* **amoxicillin** oral — child 40mg/kg/dose up to 1.5g — doses (page 501) — twice a day (bd) for 5 days
  - If allergy — **medical consult**
- If no better after 24 hours or gets worse on any day — **medical consult**

Mild pneumonia

- Give **Procaine benzylpenicillin (procaine penicillin)** IM — child 50mg/kg/dose up to 1.5g — doses (page 501) — every 24 hours for 3 days
- *OR* **amoxicillin** oral — child 40mg/kg/dose up to 1.5g — doses (page 501) — twice a day (bd) for 3 days
- If allergy — **medical consult**
- 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 a total of 5 days
  - May need to review diagnosis

Follow-up — pneumonia and chest infections sent to hospital

- Review after 1 week — should be well, may still have cough
  - If still has wet cough that is not getting better — give **amoxicillin-clavulanic acid** oral — child 22.5+3.2mg/kg/dose up to 875+125mg — doses (page 501) — twice a day (bd) for 14 days then review
  - If still has wet cough on second review — continue **amoxicillin-clavulanic acid** for another 14 days then review
  - If allergy — **medical consult**
- If still has wheeze — **medical consult**. See Chronic suppurative lung disease and bronchiectasis in children (page 201), Asthma in children (page 184)
- **Medical consult** if
  - 2 or more chest infections in last year
  - OR persistent cough after 4 weeks of antibiotics
- Check immunisations up to date including flu immunisation
- Health education including hygiene and smoke-free environment

Cold (upper respiratory tract infection — URTI)

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

Fast breathing with wheeze treatment

Wheeze heard with ear or stethoscope. If not sure treat as child without wheeze

Under 12 months

- Relievers (eg Salbutamol) not recommended — this age group rarely responds. See Bronchiolitis (page 199)

1–2 years

- Give **salbutamol** puffer with spacer and mask — 100microgram/dose (4 puffs)
- If no difference after at least 10 minutes — child very likely has bronchiolitis. **Do not** give any more salbutamol — see Bronchiolitis (page 199)
- If difference (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 spacer and inhaled for a few breaths before next puff
- If child **no longer has** fast breathing or chest indrawing — treat as asthma (page 184)
- If child **still has** fast breathing and chest indrawing 20 minutes after third dose — treat as pneumonia

3–5 years

- Give **salbutamol** puffer with spacer — 100microgram/dose (4 puffs)
  - **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 — treat as asthma (page 184)
- If child still has fast breathing and chest indrawing 20 minutes after third dose — treat as pneumonia

Bronchiolitis

Viral lower respiratory tract infection common in babies under 12 months. Diagnosis based on history and examination. If diagnosis confirmed, antibiotics not needed

- Usually starts as cold then cough, fast breathing and wheeze
- Most severe on days 2–3, resolves in 7–10 days. Cough may last 2–3 weeks
- Monitor for signs of developing chronic cough or asthma
- **Medical consult** — if not sure if pneumonia, especially in children at risk

Croup

Stridor (barking cough and vibration noise) when breathing in — **medical consult**

Pertussis (whooping cough)

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

Inhaled foreign body

Noisy breathing, wheeze on unilateral (1 side), story of choking on something — See Choking (page 67) — **medical consult**

Supporting resources

- Lung health for kids app
- Bronchiolitis (lower respiratory tract infection) flipchart
- Pneumonia (paediatric) flipchart

Chronic suppurative lung disease (CSLD) and bronchiectasis in children

- Respiratory disease with frequent infections and chronic moist or productive cough
- Bronchiectasis in children can be reversed — try to achieve cough-free status

Consider CSLD in child who has any of

- 2 or more chest infections in past year
- 3 admissions to hospital for chest problems (ever)
- Episode of severe pneumonia (in ICU) or treated for pneumonia in last 4 weeks
- Moist or wet cough that doesn't respond to 4 weeks of antibiotics
- Chest deformity (puffed up)
- Past history of risk factors — extreme prematurity, history of inhaled foreign body, immunodeficiency, cardiac illness
- Signs of abnormality when listening with stethoscope — crackles, unequal air entry, bronchial breathing

Ask

- If exposure to smoke — tobacco, campfires, e-cigarettes
- About nutritional intake

Check

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam
- Immunisation status

Do

- If productive cough — sputum for MC&S
- Plot growth on growth chart
- **Medical consult**
  - Chest x-ray
  - Note review, hospital discharge summaries
  - Check with family — number and severity of chest infections, treatment in hospital, frequency of cough, productive cough, getting tired when playing, other respiratory symptoms

- **Refer to paediatrician** for
  - Confirmation of diagnosis, hospital treatment if needed
  - Further investigations — HRCT scan, immune function tests, bronchoscopy
- Support family members to quit smoking, keep child away from smoke
- Make management plan including physiotherapy, treatment of exacerbations
  - Encourage exercise
  - Educate carers about CSLD — see supporting resources

Follow-up

- If unwell, trouble breathing, weight loss, growth faltering — **medical consult** may need to send to hospital
- Clinic review every month — Table 3.20
- Medical follow-up 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 intensive chest physiotherapy, some will be on weekly antibiotics

Table 3.20 Clinic review for CSLD

Check	Do
• File notes for physiotherapy plan — if no plan, ask for one • When child has physiotherapy • Family/carers know what to do — provide resources	• Encourage family/carers to give chest physiotherapy every day • Encourage child to exercise every day • Ask physiotherapist for help if needed
• Weight	• If weight gain poor — see Infant and child growth and nutrition (page 166) • May need nutritional supplements — refer to dietitian
• Immunisations	• Make sure all recommended immunisations given
• Lung function (6 years and over)	• Repeat spirometry —when recovered from acute illness
• Wheeze	• If child wheezy — asthma medicines (page 190) might help
• Exposure to smoke	• Warn children with CSLD about danger to their lungs from smoke and smoking — avoid smoke from tobacco, camp fires, e-cigarettes
• Regular medicines	• Make sure child taking medicines • Some will be on maintenance antibiotics and/or asthma medicines
• Signs of exacerbation (acute episode)	• See — exacerbation of CSLD

Exacerbation (acute episode) of CSLD

Diagnose exacerbation if

- Increased cough (for 3 days or more)
- Change in colour or amount of sputum
- Increasing shortness of breath
- Can't exercise as usual without shortness of breath
- Usually no fever

Check

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to respiratory distress
- Immunisation status

Do

- Sputum for MC&S
- Increase chest physiotherapy to twice a day
- Encourage child to regularly cough up and spit sputum into tissue or suitable container. Dispose of safely
- Encourage small, frequent meals including snacks
- 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**. May suggest
  - **Amoxicillin-clavulanic acid** oral — child 22.5+3.2mg/kg/dose up to 875+125mg — doses (page 501) — twice a day (bd) for 14 days
  - If allergy to penicillin — **medical consult** for **cefuroxime** oral — child (3 months and over) 15mg/kg/dose up to 500mg — doses (page 501) — twice a day (bd) for 14 days
    Note: Doses are higher than usual

Follow-up

- Review in 3 days, at 1 week, and then in 2 weeks
  - If not getting better or getting worse — **medical consult**
  - 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
  - Bronchiectasis in children can be reversed — try to achieve cough-free status

Supporting resources

- Lung health for kids app
- Bronchiolitis (lower respiratory tract infection) flipchart
- Bronchiectasis physiotherapy toolbox

Dental care — 6 months to 5 years

If tooth pain, swelling, abscess — see Pain in teeth or gums (page 363)

- **Look inside mouth** at every child health assessment (lift the lip)
- Use torch and dental mirror (if available) 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) — Table 3.21

Tooth Decay

Table 3.21 Tooth decay in young children

Tooth decay	Do
White spot areas (not yet a hole)	• **Steps to follow for strong teeth** — primary oral health care ▸ Show how to brush teeth with fluoride toothpaste — **do not** rinse out ▸ Smear fluoride toothpaste on decayed teeth — **do not** rinse out ▸ *OR* Paint teeth with fluoride varnish **if trained** — repeat every 6 months ▸ Encourage tooth brushing with soft toothbrush and fluoride toothpaste twice a day — at home and other places children spend time (eg child care, kindergarten)
Active decay (light yellow to brown holes)	• **Brief interventions — strong teeth** • Refer to dentist ▸ 1–3 small holes — less urgent ▸ 4 or more small holes or large hole/s — **urgent**
Arrested decay (blackened holes)	• Dental review • **Brief interventions — strong teeth**

Brief interventions — strong teeth

- Breastfeed babies, then wean to feeding cup not bottle
- If bottle fed — **do not** put baby to sleep with bottle
- Give child plenty of water to drink
- Healthy food — no sweet drinks, lollies, cake, ice cream
- Help clean child's teeth twice a day
- From 18 months use smear of children's low-fluoride toothpaste — spit don't rinse out
- If child has moderate or high caries risk, use a smear of standard fluoride toothpaste — spit and don't swallow, don't rinse out
- 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

Tooth eruption and teething pain

- **Do not** use teething gels — may cause toxicity or serious harm (eg seizures, cardiac effects, death)
- Drooling and irritability common. May have local pain and swelling or mild fever
- Rubbing the gums with a clean finger, cold (not frozen) teething rings and cold compresses can provide symptomatic relief of teething pain
- Systemic analgesics (eg paracetamol) can be used

Diarrhoea

If young baby — see acute assessment of unwell child (page 8)

Red Flags — Urgent Medical Consult

- **Signs of sepsis**
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation
- Severe dehydration
- Persistent diarrhoea
- Baby under 3 months

Most common complications of diarrhoea

- Dehydration — must rehydrate (replace fluids)
- Wrong balance of body chemistry (eg metabolic acidosis, low bicarbonate, low potassium)
- Lactose intolerance (gut not able to digest 'milk-sugar')

Ask

- Diarrhoea — when did it start, how often, is it watery, is there blood or mucus
- Vomiting — when did it start, how often, green (bile), spurting across room (projectile)
- Drinking and eating
  - What is child eating, drinking
  - How much is child breastfeeding, drinking, eating
- Urine — how much urine, how many wet nappies
- Other sickness also present, contact with other sick people

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Assessing dehydration

- Best way to measure dehydration in children is to work out percentage of weight loss — weigh babies without clothes, small children should be weighed with minimal clothes
- Use a recent weight from child's file notes to work out if they have lost weight — percentage of weight loss is about equal to the percentage of dehydration

Table 3.22 Dehydration by percentage weight loss

Dehydration	Mild	Moderate	Severe
Weight loss	Less than 5%	5–10%	More than 10%

- **Working out percentage (%) weight loss**
  - % weight loss = % dehydration
  - [Recent well weight – today's weight] ÷ [recent well weight] × 100

  - ***Example:*** Weight last week was 13.5kg and weight now is 12.6kg
  - (13.5 - 12.6) ÷ 13.5 = 0.067, then × 100 (to make %) = 6.7%
  - Child has moderate dehydration

- If recent weight not known do clinical assessment of dehydration — Table 3.23

Table 3.23 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
Central capillary refill	Normal — less than 2 seconds	2 seconds	More than 2 seconds
Skin turgor	Normal — goes back quickly	Goes back slowly	Goes back very slowly

Do — if severe dehydration

Medical emergency — Urgent medical consult

- Put in IV cannula
  - If can't get IV cannula in — put in intraosseous needle
  - POC Test for electrolytes, if able
- **Start IV *OR* Intraosseous fluids — Hartmann's solution** or **normal saline**
  - If in shock — give 20mL/kg as a bolus
  - 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 20mL/kg/hour over 2–4 hours depending on progress and medical advice, if can't put in IV and child not in shock
- While waiting to send to hospital
  - Check pulse, RR, capillary refill every 15 minutes
  - Check BGL — if hypoglycaemia (low) 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

Additional reasons for medical consult

- Any of the following may mean there is another illness
  - Fever, shortness of breath, fast breathing or deep breathing
  - Altered conscious state, convulsions, drowsy or unusually irritable, floppy
  - Neck stiffness, bulging fontanelle
  - Non-blanching rash (doesn't disappear when you press on it)
  - Blood or mucus in faeces
  - Bile (green) vomit
  - No urine passed all day
- Severe or localised abdominal pain, swollen abdomen
- Baby with projectile vomiting (vomit spurting across room)
- It is late and you are not sure about managing child overnight

Do — if moderate dehydration

- **Medical consult**
- Give **ORS** using cup, spoon, syringe, bottle — Table 3.24
  - Doses Table 3.25
- If 6 months or over and vomiting a lot — **medical consult** to consider giving **ondansetron** wafer — doses (page 511) — may help prevent need for IV rehydration
- Check progress every half hour. If not drinking ORS — use nasogastric tube
- 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 — Table 3.25
  - 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 old
  - 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 every watery diarrhoea
  - Review daily until diarrhoea stops
- If more dehydrated
  - Treat as moderate dehydration
  - **Medical consult**

Do — if no dehydration

- Offer extra fluids
  - Continue breastfeeds (more than usual) or formula (every 3 hours)
  - Continue feeding with good foods
- Give ORS 10mL/kg after every watery diarrhoea
- If child won't drink ORS — give usual fluids, but not high in sugar
- If diarrhoea or vomiting continues — review next day

Good foods

- Rice, bread, cereals, potato, banana, yoghurt, fruit, vegetables

Do not give

- Sports drinks — may increase fluid loss
- Diet soft drinks
- 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

Fluids for treating dehydration

Table 3.24 Dehydration level and fluid rates

Dehydration	Review	Fluid rate	Method
Severe	• **Urgent medical consult**, send to hospital • Check every 15 minutes	**Hartmann's solution** or **normal saline** 20mL/kg • If in shock — give as a bolus • If not in shock — give over 2–4 hours depending on progress and medical advice	IV or intraosseous
Moderate	• **Medical consult** • Check every 30 minutes • Full review of hydration status in 2 hours • If no better — **medical consult**	• Small frequent doses ORS — at least 10mL/kg/hr • Continue breastfeeding/formula/good foods • Oral fluids as tolerated	Oral or NGT
Mild	• 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	• Extra fluids/ORS *AND* 10mL/kg after diarrhoea • Continue oral fluids as tolerated, breastfeeding/milk formula/good foods	Oral — cup, spoon, bottle, ice block

Table 3.25 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
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 — **medical consult** to consider giving **ondansetron** wafer — doses (page 511). May help prevent need for IV rehydration
  - Consider using nasogastric tube
  - **Medical consult** if vomiting not improving
- 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)
- Try ORS ice blocks — but make sure same volume given

Special situations

- If child unwell with signs of sepsis (page 2) — **urgent medical consult**, send to hospital
  - Consider systemic *Shigella* or *Salmonella* infection, especially infants less than 12 months
  - Give **ceftriaxone** IV/IM — child 50mg/kg/dose up to 2g — doses (page 501)
- If blood and mucus in diarrhoea — may be caused by *Shigella*
  - Send faeces for MC&S and OCP
  - If fever, malnourished, unwell — **medical consult**
- If evidence of strongyloides infection — see Worms (page 494)
- 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 PHU

Persistent diarrhoea

If diarrhoea for more than 7 days — treat as persistent diarrhoea. More common in malnourished children. May be caused by

- Long-lasting or recurrent acute infections
- Parasitic infections like *Giardia* or *Cryptosporidium*
- Gut being unable to digest some parts of milk (lactose intolerance)

Ask

- How long diarrhoea has lasted

Check

- Weight (naked)
- Signs of dehydration
- Child's growth on growth chart (page 168) — is child growing well

Do

- If dehydrated
  - Give ORS
  - **Medical consult** — send to hospital
- If growth faltering (page 170) — **medical consult**, may need to send to hospital
- Collect faeces for MC&S and OCP on 2 occasions
- Encourage good food
- If 6 months or over — **elemental zinc** oral — 20mg, once a day for 14 days
  - 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 — child 30mg/kg/dose up to 2g — doses (page 501) — once a day for 3 days
  - If allergy — **medical consult**

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 (page 494) — treat if present

Prevention

Tell parents and carers how to help prevent spread of infection causing diarrhoea

- Hand washing is 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

Urine problems — 2 months to 12 years

- If young baby – see acute assessment of unwell children under 5 years (page 8)
- For child/youth over 12 years — see Urine problems — over 12 years (page 486)

Urinary tract infection (UTI)

Consider UTI if
- Young child — irritable, unexplained fever, poor feeding, vomiting, weight loss or poor growth
- Older child — urinary frequency, dysuria (pain on passing urine), abdominal or flank pain, vomiting

Ask

- Dysuria (pain on passing urine)
- Passing urine more often than usual (frequency)
- Abdominal pain (page 332) or flank/loin pain (page 340)
- In boys
  - Red, swollen penis or foreskin — balanitis (page 219)
  - Ballooning of foreskin on urination, poor stream — phimosis (page 220)
  - Foreskin retracts behind glans and becomes trapped and extremely painful — paraphimosis (page 220)

Check

- Calculate age-appropriate REWS — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam
- Growth assessment
- Collect clean urine sample — Table 3.26
- 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

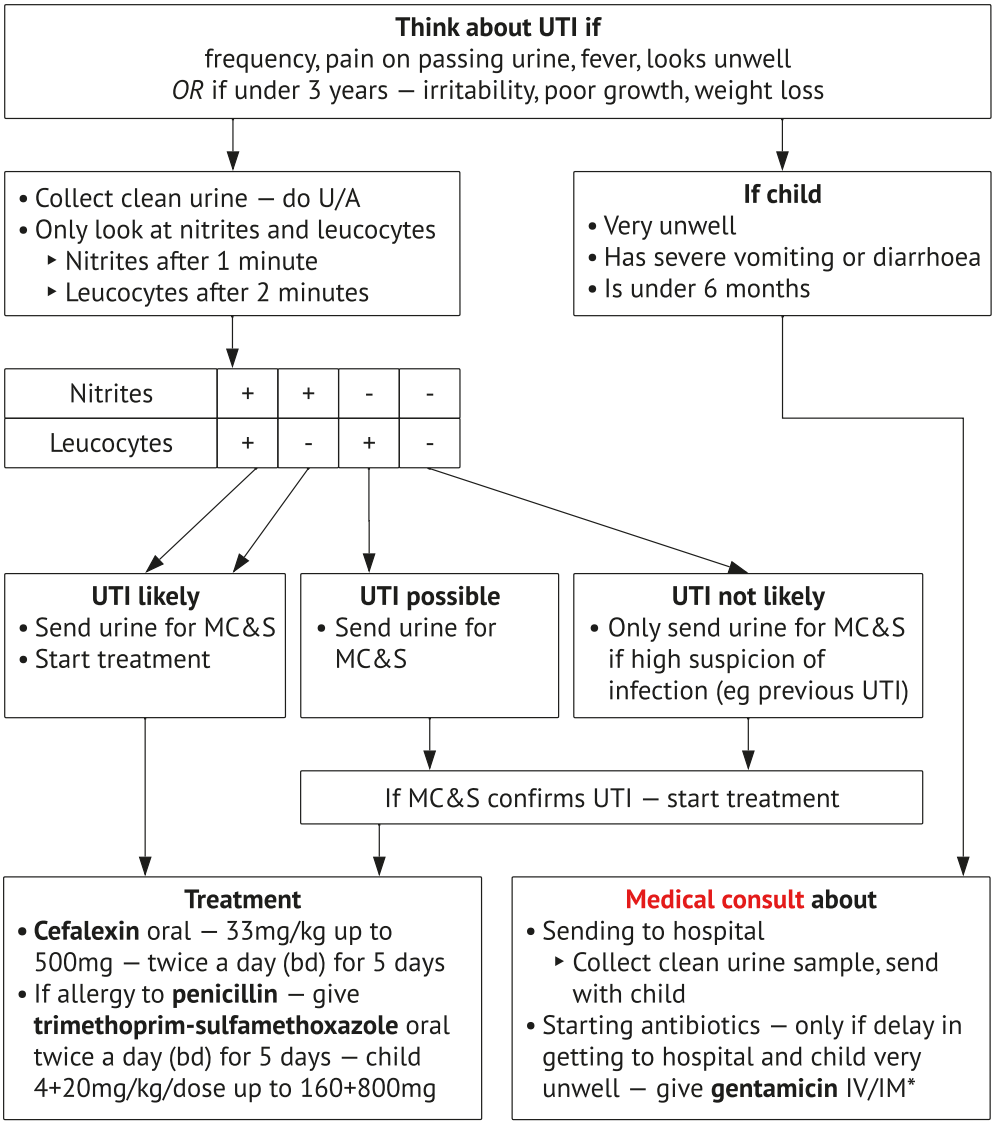
Table 3.26 Collecting urine samples

Collection method	How done	Advantages	Disadvantages
Midstream urine	• Clean genital area with water • **Do not** collect first urine • Collect sample in sterile container after flow started	• Lessens contamination	• Needs cooperation • Not possible in young child
Clean catch	• Clean genital area with water • Wait for infant to void • Catch urine in sterile container after flow started	• Much less contamination than bag sample	• Needs effort and patience from clinic staff or parent
Finger tap	• 15–20 minutes after a good feed • Hold child up under armpits • Tap suprapubic area • Catch midstream urine in clean jar	• Safe and easy collection method for newborns and infants • Not invasive and doesn't upset parents	• Urine to be collected in a specified time frame — may fail
Catheter	• Female (WBM, page 327) • Male	• Sterile urine collection in child who can't void on command	• Invasive • Clinician must be trained
Urine bag		• Useful for excluding UTI	• Contamination rates high. If suggests UTI — confirm with better collection method if possible

Do

- Follow Flowchart 3.6
- UTIs in older children can sometimes be caused by sexual abuse
  - Urine test for STI not a good screening test for sexual abuse
  - **Medical consult** before using as an STI screen — see Child sexual abuse (page 153)

Flowchart 3.6 Investigation and management of possible UTI



* For gentamicin dose see page 501

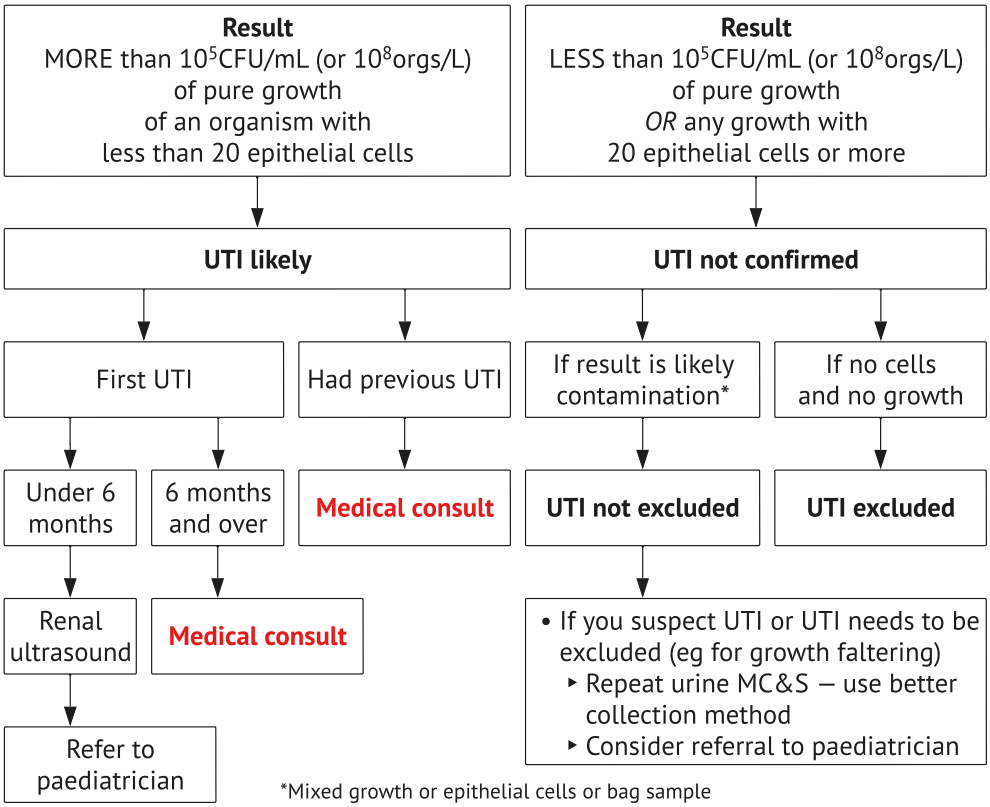
Follow-up

- All urine MC&S results need to be seen by doctor for interpretation — Flowchart 3.7
  - Interpretation depends on collection method — always write collection method on pathology form
- **Medical consult** 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 — Flowchart 3.6
- Renal ultrasound to check for structural problems in urinary system in babies under 6 months *OR* if complicated UTI — talk with **paediatrician**

Flowchart 3.7 Interpreting urine MC&S results



Blood or protein in urine

Post-streptococcal glomerulonephritis (PSGN)

Consider PSGN if

- Moderate (2+) or more blood on U/A
- *OR* macroscopic haematuria (visible blood in urine) — urine dark (tea colour)

AND

- Oedema (swelling) of face or legs — check with parent/s or carer/s
- *OR* unusual and fast weight gain (from oedema)
- *OR* high BP (page 500) for age — correct cuff size important for right BP measurement

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 (page 500) — **medical consult send to hospital urgently**
- Talk to **paediatrician** about need to
  - Give **furosemide (frusemide)** straightaway if BP very high for age
  - Restrict fluids, give more **furosemide (frusemide)** or antihypertensive medicine during transfer
- Notify PHU

Subclinical cases

- Recent Group A streptococcal infection and blood on U/A — but no high BP or oedema (swelling)
- Don't need to go to hospital but need to notify doctor and PHU
- Medical 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 haematuria (blood in urine)

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 exam, weight
- Look for oedema (swelling)
- Look for sores, inflammation, rashes in genital area (private parts)

Do

- If high BP (page 500) for age — **urgent medical consult**
  - Correct cuff size important for right BP measurement
- If blood trace or 1+ on U/A, BP normal, no proteinuria (protein in urine), normal renal function — usually benign. Non-urgent medical follow up

Proteinuria (protein in urine)

If protein more than trace on U/A

Check

- BP
- Consider UTI, STI, etc
- Send urine for ACR

Do

- If high BP (page 500) for age — **urgent medical consult**
  - Correct cuff size important for right BP measurement
- If ACR high — **medical/paediatrician consult**

Vesico-ureteric reflux (VUR)

Urine flows from bladder back up to kidneys. VUR may be a cause of UTIs in babies. It can only be diagnosed by ultrasound of the bladder and kidneys.

All babies with a UTI must be referred for an ultrasound

- 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 — child 4+20mg/kg/dose up to 160+800mg — doses (page 501) — twice a day (bd) for 5 days
- 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 — see Reduction of a tight foreskin

4. Chronic Conditions

Adult Health Check

- Aboriginal adults 18 years and over should have a health check every year to
  - Find problems before they get serious and to promote a healthy life
  - Give health education
- An individual health check **every year is especially important if** person has
  - A history of diabetes in pregnancy (WBM, page 140) or polycystic ovary syndrome (WBM, page 312)
  - Mother/father, brother/sister with diabetes or early onset (under 50 years when diagnosed) kidney failure or heart attack
  - Pre-diabetes (page 249) or microalbuminuria
  - Changes in BP or blood fats but low cardiovascular risk factors
  - Obesity

Doing an Adult Health Check

- Health checks find out what is important for the person, their concerns and goals for health. It is important to follow-up results from the check
- There are different health checks for Aboriginal and non-Aboriginal people. These are based on prevalence of (how many people in the population have) chronic conditions

Adult Health Checks can be provided 2 different ways

Population health screen

- Has a smaller number of checks to find significant health problems. This allows maximum community coverage (more people get screened)
- Can be undertaken (done) by
  - Screening checks at health weeks
  - Screening people when they come to the clinic (opportunistic screening)
  - Screening teenagers or older people (certain age group) or people with certain conditions (targeted screening)

Population health screen plus individual assessment

- Has a larger number of checks and takes more time to do
- Can be claimed as Medicare Health Assessment
  - All Aboriginal or Torres Strait Islander persons — Item 715
  - Non-Aboriginal adults who meet set criteria — Item 701, 703, 705, 707

Risk factors and problems assessed

- Lifestyle risk factors and issues for older people including access to meals
- Chronic conditions, cardiovascular risk, STIs
- Cancers — cervical, breast, bowel
- Common conditions often missed in normal health care delivery
- Social and emotional wellbeing — any stressful events, drug and alcohol issues, worries, violence, safety concerns

Do First

- Always check if person has a known chronic condition — are they aware of it
  - If person has a known chronic condition do the items in the usual management plan — these will cover the chronic conditions part of Adult Health Check
- Check if there are care plans for Adult Health Check on your clinic patient information system

Lifestyle risk factors (SNAPE)

S moking and/or chewing tobacco — ask how much, how long, want to stop, tried to stop — how many times. Quitting smoking is the most important lifestyle change

N utrition — ask about fruit and vegetables, takeaways, sugary/soft drinks and food security. Give information on healthy diet

A lcohol — work out how much alcohol person drinks, provide information on safe drinking and cutting down. Ask about other drugs — cannabis (gunja), inhalants/sniffing, kava

Ask about sleep disturbances — regular use of alcohol and/or other drugs can interfere with normal sleep patterns

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 (page 294), Healthy lifestyle choices, Brief interventions

Adult Health Check checklist — population health screening component

Aim to screen everyone who is eligible with this checklist

POPULATION HEALTH SCREENING	Aboriginal adult 18–54 years	Aboriginal adult 55+ years	Non-Aboriginal adult 45–74 years	Non-Aboriginal adult 75+ years
Ask				
Lifestyle risk factors (see SNAPE (page 223)) check file notes — don't do if done recently	✓	✓	✓	✓
Sexual health — see STI men (page 305) and STI women (WBM, page 246)	✓	✓	✓	✓
Check				
BP	✓	✓	✓	✓
U/A (protein)	✓	✓	✓	✓
Immunisation status	✓	✓	✓	✓
Do				
FBC, UEC, eGFR, HbA1c, BGL (random/fasting), lipids (random/fasting)	✓	✓	✓	✓
Urine ACR — see Chronic kidney disease (page 239)	✓ 30+ years Under 30 years — if protein 1+ or more	✓	✓ If protein 1+ or more	✓ If protein 1+ or more
Check notes for Hepatitis B status (page 407), if unknown do screen	✓	✓		
Cardiovascular risk assessment (page 231) — except if already known to be high	✓	✓	✓	✓
Breast screening (WBM, page 281) — every 2 years	✓ 50+ years (40+ if relative with breast cancer))	✓ Stop at 74 years	✓ 50–74 years	
Full STI check — see STI men (page 305) and STI women (WBM, page 246)	✓ Under 35 years			
Cervical screening (WBM, page 297) if due	✓	✓ Stop at 74 years	✓ Stop at 74 years	
Bowel screening — every 2 years*	✓ From 50 years	✓ Stop at 74 years	✓ 50+ years	
Brief interventions regarding healthy life style and safety	✓	✓	✓	✓
Pre-pregnancy counselling	✓			

* As part of the National Bowel Cancer Screening Program

Adult Health Check checklist — individual assessment component

Extra assessment items if resources/capacity, or plan to claim Medicare item

INDIVIDUAL ASSESSMENT Complete to claim Medicare health assessment	Aboriginal adult 18–54 years	Aboriginal adult 55+ years	Non-Aboriginal adult 45–74 years	Non-Aboriginal adult 75+ years
Ask				
General health	✓	✓	✓	✓
Family health history	✓	✓	✓	✓
Social situation including gambling/financial problems	✓	✓	✓	✓
Medications — understanding of, taking correctly	✓	✓	✓	✓
Sleep — how much, when (day/night), snoring	✓	✓	✓	✓
Vision — glasses, contact lenses	✓	✓	✓	✓
Hearing — hearing aids	✓	✓	✓	✓
Dental and oral problems — pain	✓	✓	✓	✓
Menopause (WBM, page 315) problems	✓ 45+ years	✓	✓	
Contraception (WBM, page 331)	✓			
Urinary incontinence	✓	✓	✓	✓
Erectile dysfunction	✓	✓	✓	✓
Osteoporosis risk factors ††	✓ 50+ years	✓	✓	✓
Physical function, falls, home accidents Social supports, nutrition Memory, dementia (page 360)		✓ If frail		✓
Check				
Pulse	✓	✓	✓	✓
BMI, waist circumference	✓	✓	✓	✓
Vision	✓	✓	✓	✓
Trichiasis (page 387)		✓	✓	
Ears — wax, perforations		✓		✓
Hearing — tuning forks	✓	✓	✓	✓
Mouth, throat, teeth and gums (page 362)	✓	✓	✓	✓
Skin exam — look for scabies (page 469), sores, tinea, acanthosis nigricans	✓	✓	✓	✓
Breast exam (WBM, page 279)	✓ 50+ years	✓	✓ 50+ years	
Do				
Medical Consult	✓	✓	✓	✓
PHQ2‡	✓	✓	✓	✓

†† Osteoporosis risk factors

Bones — fracture with minimal trauma or poor bone density on x-ray indicate likely osteoporosis

- Long-term use of glucocorticoid therapy (eg prednisolone)
- Early menopause (before 45 years) *OR* amenorrhoea *(*prolonged times with no periods), may occur with eating disorders or malnutrition

‡ Patient Health Questionnaire 2 (PHQ2)

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)
Have you been feeling slack, not wanting to do anything				
Have you been feeling unhappy, depressed, really no good, that your spirit was bad				
Total score (0–6)				

Interpreting scores

- 0–2 — likely to be well
- 3 or more — complete Patient Health Questionnaire 9 (PHQ9) (page 273)

Follow-up

- Arrange time to talk about results, treatment and management
- Arrange repeat testing for abnormal results after medical consult, usually within 3 months

Population screen

- Review pathology results
  - If positive STI offer treatment, contact tracing
  - If reduced eGFR OR increased ACR — see Chronic kidney disease (page 239)
- **Medical consult** if
  - Abnormal pathology results
  - Absolute cardiovascular risk more than 15%

Individual assessment

- **Medical consult**
  - Any abnormal findings
  - One or more osteoporosis risk factors
- **Dental consult** if oral or dental problems
- Refer to other agencies as needed
- Write in notes — patient centred goals, recalls, appointments

Combined checks for chronic conditions

- Many chronic conditions are closely related and lead to the same serious complications — heart attack, stroke, renal disease
- Monitoring and management is very similar and most people have more than one chronic condition
- Combined checks Table 4.1 are for all people with one or more of
  - Coronary artery disease (CAD)
  - Hypertension (high BP)
  - Abnormal blood lipids (fats)
  - Chronic kidney disease (CKD)
  - Diabetes
  - Heart failure
  - Schizophrenia, bipolar affective disorder, antipsychotic use
  - Chronic obstructive pulmonary disease (COPD), bronchiectasis
- Tools for completing chronic conditions checks may be available on your clinic information system

When to do checks

New Diagnosis

- Complete assessment and GP management plan/team care arrangements at diagnosis
- CAD, CKD, diabetes, heart failure, CLD — monthly reviews for the first 3 months to achieve good control and support self-management
- Heart attack, cardiac surgery, acute heart failure — weekly reviews for cardiac rehabilitation, self-management support, and then medical follow up at 4 weeks (can be a case discussion)

Timing of ongoing recall cycles

- Do annually
- Frequency of recall (1, 3 or 6 monthly) is based on person's diabetes status, level of absolute cardiovascular risk (page 231) and chronic kidney disease risk — see Table 4.1
  - If check only applies to one condition, the condition is written on table, eg diabetes
  - If check is needed less often than recall schedule, the frequency is written on table, eg 6 monthly

Table 4.1 Combined checks for chronic conditions

Checks	First assessment *AND* Yearly recall	Monthly recall — person with CKD 5	3 monthly recall — Person with diabetes, high CVR AND 1 or more conditions OR mod to high CKD risk level	Person on 6 monthly recall cycle — Person with high BP or hyperlipidaemia, no diabetes, low to mod CVR AND 1 or more other conditions AND normal/low CKD risk level
Ask about				
Current health/ priorities	✓	✓	✓	✓
Chest pain, shortness of breath, ankle or leg swelling	✓	✓	✓	✓
Medicines, any problems	✓	✓	✓	✓
Problems in feet	Diabetes	Diabetes (every 3 months)	Diabetes	Diabetes
Problems with sex	✓			
Contraception (WBM, page 331)	✓			
Smoking, Nutrition, Alcohol, Physical activity, Emotional and social wellbeing (SNAPE)	✓	Smoking	Smoking	Smoking
Check				
Height	✓	Every 6 months	Every 6 months	*
Weight, waist circumference	✓	✓	✓	✓
BMI	✓	Every 6 months	Every 6 months	✓
BP, pulse rate and rhythm	✓	✓	✓	✓
Teeth and mouth	✓			
Ear examination and hearing	✓			
Eyes — visual acuity/trichiasis	✓			
Skin Examination	✓			
Foot check	Diabetes	Diabetes (every 3 months)	Diabetes	Diabetes
PHQ9	✓			
Immunisation status — give any due	✓			
Hepatitis B status	Once			

Checks	First assessment *AND* Yearly recall	Monthly recall — person with CKD 5	3 monthly recall — Person with diabetes, high CVR AND 1 or more conditions OR mod to high CKD risk level	Person on 6 monthly recall cycle — Person with high BP or hyperlipidaemia, no diabetes, low to mod CVR AND 1 or more other conditions AND normal/low CKD risk level
Do				
Urinalysis	✓			
ECG	✓			
Retinal eye check	Diabetes			
Cardiovascular risk assessment (not required if already assessed as high cardiovascular risk)	✓			
Yearly plan: self management plan, clinical goals and team care arrangement	✓			
Team care arrangement/GP management plan				
ATSIHP/nurse review	✓	✓	✓	✓
Medical review	✓	✓	✓ Every 6 months	✓
Renal review/case conference	CKD High or severe risk			
Specialist review	Complex cases	–	–	–
Dental review	✓			
Optometrist	Diabetes			
Podiatrist	Diabetes			

Checks with a tick (✓) are for everyone

Pathology recall cycles

Table 4.2 Monthly pathology — person with CKD 5

	HbA1c	FBE	LFT	Lipids	Urine ACR	EUC and eGFR	Mg, PO_4, Alb, Ca	Iron Studies CRP	PTH
How often to check (months)	12*	1	1	6	6	1	1	3	3

Table 4.3 3 monthly pathology — person with diabetes, high CVR AND 1 or more conditions OR moderate to high CKD risk level

	HbA1c	FBE	LFT	Lipids	Urine ACR	EUC and eGFR	Mg, PO_4, Alb, Ca	Iron Studies CRP	PTH
CKD 1–3a + low CVD risk	12*	12	12	6	12	12			
CKD 1–3a + mod-severe CVD risk	12*	6	6	6	6	6		6	
CKD 3b–4	12*	3	3	6	3	3	3	3	6

*Repeat HbA1c in 3 months if more than 7% or if declining renal function. Repeat in 6 months if HbA1c less than 7% and no decline in renal function

Table 4.4 6 monthly pathology — person with high BP or hyperlipidaemia, no diabetes, low to moderate CVR AND 1 or more other conditions AND normal to low CKD risk level

	HbA1c	FBC	LFT	Lipids	Urine ACR	EUC and eGFR
CKD 1–3a + low CVD risk	12	12	12	6	6	6
Mental health metabolic monitoring	6	6	6	6	12	6

- TFT
  - Do once when Type 1 diabetes diagnosed or CKD reaches mod-high
  - Do every 6 months for person taking lithium
- 25-hyproxyvitamin D — do on first assessment for person with CKD and eGFR less than 60

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
- Use risk calculators to assess new persons or to monitor others with ongoing low or moderate risk — can also be used to explain risk and help motivate lifestyle changes
- Once a person has been assessed as **high cardiovascular** risk they remain at high cardiovascular risk – **do not use risk calculators, do not stop medications**

Assessing absolute cardiovascular risk

High cardiovascular risk

- People with one or more items in Table 4.5 are at HIGH cardiovascular risk — do not use risk calculators for these people

Table 4.5 HIGH cardiovascular risk (if one or more present)

• Known cardiovascular disease (angina, heart attack, bypass surgery, stroke)
• Diabetes *AND* kidney disease with urine ACR 5mg/mmol or more for males, 3.5mg/mmol or more for females
• Diabetes *AND* age over 60 years
• Chronic kidney disease with eGFR less than 45 or urine ACR more than 25 in males or more than 35 in females
• Persistent high BP — systolic 180mmHg or more *OR* diastolic 110mmHg or more
• Total cholesterol more than 7.5mmol/L
• Familial hypercholesterolaemia (genetic disorder with high cholesterol)
• 75 years or over

Cardiovascular risk calculators

- If NOT at high risk according to Table 4.5 — use the appropriate risk calculator in your primary care patient management system to calculate risk for
  - Aboriginal adults aged 18–74 years
  - Non-Aboriginal adults aged 45–74 years
- Use results from before person started any medication for BP or lipids

Risk categories

- The risk category will be determined by the risk calculator
  - Low — medications usually not needed
  - Moderate — benefit from medication if unable to make lifestyle changes
  - High — this category has greatest benefit from ongoing medication

Reviewing absolute cardiovascular risk

- **Low** — every year with Adult Health Check (page 222)
- **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 4.6 Reducing absolute cardiovascular risk

Risk factor	Goal / Action
Smoking (page 294)	• Quit smoking
Overweight/obesity	• Waist circumference: men — 94cm or less, women — 80cm or less • More physical activity • Less processed and takeaway foods — See Healthy diet
Alcohol	• No more than 2 standard drinks/day, no more than 10 standard drinks a week
Physical activity	• 30 minutes moderate activity most days or every day
Hypertension (high BP) (page 258)	• Target BP less than 130/80 • BP lowering medicine (ACE inhibitor or ARB)
High blood glucose levels (page 246)	• Aim for HbA1c 53mmol/mol (7%) or less — strict glucose control reduces cardiovascular risk events
Abnormal lipids (blood fats)	• Treat to target • Statin recommended for high risk, consider for moderate list (below)
Kidney disease (page 239)	• Target BP less than 130/80 • BP lowering medicine (ACE inhibitor or ARB)
Depression (page 272)	• Identify and treat depression
Absolute cardiovascular risk high (more than 15%)	• Treat with statin *AND* ACE inhibitor or ARB • Aspirin recommended if known CVD — heart attack, angina, ischaemic stroke

Lipids (blood fats)

Abnormal lipids (blood fats) are a risk factor for cardiovascular disease — management based on level of cardiovascular risk not blood fat levels

Do

- If abnormal lipids
  - Take blood for TFT, CK, LFT (baseline tests only required)
- If diabetes — good blood glucose control will improve abnormal lipids
- **Medical consult** to prescribe statins according to risk factors — Table 4.7

Table 4.7

Risk factors	Management with statins
• Existing cardiovascular disease • High absolute cardiovascular risk	• Give high dose statin even if lipids (blood fats) normal
• Moderate absolute cardiovascular risk	• May need statin even if lipids (blood fats) normal • Manage other risk factors
• Low absolute cardiovascular risk	• May not need statin even if lipids (blood fats) abnormal

- Statins best medicines for lowering TC and LDL-C, have some effect on raising HDL-C
- If statins not controlling lipids or not tolerated — medical follow up
- Lipids and other cardiovascular risk factors should be managed with Active lifestyle management — see Lifestyle risk factors

Remember: Any lowering of TC or LDL-C or increase in HDL-C reduces CV risk even if target not reached

Follow-up

- If LFT or CK abnormal at start — monitor on a regular basis and medical follow up

Coronary artery disease

- 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
  - Nicotine replacement therapy (NRT) and urge reduction medicines (page 295) can be used
  - If severe angina or less than 4 weeks since heart attack — talk with cardiologist about NRT
- **Reduce cardiovascular risk across** all modifiable risk factors including physical activity and nutrition:
  - Diabetes (page 246)
  - High BP (page 258)
  - Kidney disease (page 239)
  - Abnormal lipids (blood fats)
- Non-modifiable risk factors
  - Family history of heart attack
  - After menopause (WBM, page 315)
  - Previous cardiovascular events

Red Flags — Urgent Medical Consult

- Heart attack (page 20) — with or without pain (silent)
- New chest pain — pressure or pain in chest, can spread to shoulders, arms, neck, jaw or back
- Pain lasts more than 10 minutes, occurring overnight or at rest
- Pain more often than usual
- Dizziness, feeling faint, anxious or nauseous
- Short of breath, fast breathing, trouble breathing, pain on breathing
- Sweating
- Haemoptysis (coughing up blood)

Ask

- Chest pain
  - Where do they get pain, does it spread anywhere
  - When did the pain start
  - What were they doing when pain started
  - Does chest pain happen with activity, or what brings it on
  - 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 (page 326)
- Shortness of breath, ankle swelling
- Palpitations, dizziness, nausea, vomiting
- About risk factors — smoking, physical activity, takeaway and processed foods (saturated 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

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- BMI, waist circumference
- ECG if any new symptoms, and routinely at least every 12 months
  - Any changes from previous ECG
- Head-to-toe exam — with attention to heart and lung exam

Do

- FBC, UEC, BGL, HbA1c, fasting lipids, TFT, urine ACR
- Cardiovascular risk assessment (page 231)
- Risk assessment for recurrent chest pain — see Table 4.8
  - If medium or high risk, or any concerns — **medical consult**
  - If low risk — medical follow-up
  - Start immediate management
  - Organise referrals as needed
- Give information on tobacco (page 295), brief intervention for smoking

Typical angina (chest pain) 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 has only 1 or 2 features of 'typical chest pain'

Table 4.8 Risk assessment and actions for recurrent chest pain

Features	Low risk	Medium risk	High risk
Chest pain	Non-typical	Non-typical or typical	Typical
Risk factors (modifiable and non-modifiable)	None	1–2	• More than 2 • *OR* recent heart attack • *OR* 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	• Treat as needed — no heart medicines • Tell person to return if pain changes • Arrange medical follow up	• **Aspirin** — 100mg, once a day • **Angina medicine**	• **Aspirin** — 100mg, once a day • 2 or 3 **angina medicines**

Based on results of exercise ECG (stress test)

- **If CAD possible**
  - **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 occurs overnight or at rest — use calcium channel blocker not beta-blocker
  - Do brief interventions for smoking (page 294), healthy diet, physical activity
- **If not likely to be CAD**
  - Consider other causes of chest pain — see Acute assessment of chest pain (page 20)
  - May be able to stop aspirin and angina medicine
  - Manage other risk factors
  - If chest pain continues — **medical consult**

Follow-up

- Combined checks for chronic conditions (page 227)

Medicines for CAD

To reduce risk of heart attack *OR* if person has ever had a heart attack — medical consult

- Aspirin
- Statin
- ACE inhibitor
- Beta-blocker (eg atenolol oral — 25–100mg once a day)
  - Start at 25mg once a day, double dose every 2 weeks up to 100mg
- Can add dihydropyridines calcium channel blocker (eg nifedipine, amlodipine)
- If recurrent angina while on aspirin *OR* after heart attack or stent
  - **Clopidogrel** oral — 75mg, once a day for 1 year
  - *OR* **ticagrelor** oral — 90mg, twice a day (bd) for at least 1 year
  - Specialist advice before temporary or permanent cessation

For chest pain (angina)

- Treatment choices for acute angina pain
  - **Glyceryl trinitrate** 1 spray under tongue — 400microgram
  - *OR* **Isosorbide dinitrate** 1 tablet under tongue — 5mg
  - Write date bottle opened on label, replace 3 months later
- Management choices for chronic angina — **medical consult**
  - Isosorbide mononitrate
  - Nitrate patch
  - Nicorandil
  - Ivabradine

Advice for using angina medicines at home

- If chest pain worse than usual — treat as a heart attack. Get help straight away
- **Do not** take more than 1 dose of medication at a time (can make BP too low)
- **Do not** use nitrate therapy if drugs for impotence used recently
  - Sildenafil or vardenafil in past 24 hours
  - Tadalafil in past 2 days
- Always carry medicine for acute angina pain with you
  - Keep it cool and air tight
  - Keep glyceryl trinitrate spray out of the light

- When angina heart pain starts
  - Sit or lie down before taking medicine
  - Take 1 dose of medicine for acute angina pain — expect a headache, dizziness
- 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

Chronic kidney disease (CKD)

- CKD is defined as abnormalities of kidney structure or function, present for more than 3 months
- Very common in Aboriginal people. Often with other chronic conditions (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
- Classified based on cause, glomerular filtration rate (GFR) category (G1–G5), and Albuminuria category (A1–A3), abbreviated as CGA

Table 4.9 Calculating CKD risk level

Prognosis of CKD by GFR and albuminuria categories: KDIGO 2012				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				< 30 mg/g < 3 mg/mmol	30–300 mg/g 3–30 mg/mmol	> 300 mg/g > 30 mg/mmol
GFR categories (ml/min/1.73 m²) Description and range	G1	Normal or high	≥ 90			
	G2	Mildly decreased	60–89			
	G3a	Mildly to moderately decreased	45–59			
	G3b	Moderately to severely decreased	30–44			
	G4	Severely decreased	15–29			
	G5	Kidney failure	< 15			

Green — low risk (if no markers of kidney disease, no CKD
Yellow — moderately increased risk
Orange — high risk
Red — very high risk
GFR — glomerular filtration rate

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 annual Adult Health Check
  - U/A
  - *AND* if Aboriginal 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 (page 305), woman (WBM, page 246)
- 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 follow up
- ACR useful for diagnosis, but once treatment started use eGFR to check progress of kidney disease

At diagnosis

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- Head-to-toe exam
- U/A, pregnancy test

Do

- Blood for UEC, FBC, BGL, lipids, CRP — UEC must be taken on the same day the bloods are sent to the lab or Se K will be elevated
- Calculate 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 electrolytes, creatinine — calculate eGFR

- Work out CKD risk level using eGFR and urine ACR — see Table 4.9
  - Estimates risk of kidney failure or cardiovascular death
- Cardiovascular risk assessment (page 231)
- Promote healthy lifestyle measures — diet, weight control, physical activity, stop smoking, moderate alcohol intake
- Advise to reduce dietary daily salt intake to less than 2g of sodium (or less than 90mmol sodium or less than 5g sodium chloride per day) in patients with high BP and CKD — **refer** to dietitian
- **Medical consult**, including medicines review
- 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
- If female of childbearing age — talk about contraception (WBM, page 331). Pregnancy increases stress on kidneys

Table 4.10 Managing chronic kidney disease by CKD risk level

CKD risk level	Checks	Action
Low	• Yearly Adult Health Check (page 222) • If diabetes — 6 monthly cycle Combined checks for chronic conditions (page 227)	• If diabetes — see Medicines for CKD
Moderate	• 6 monthly cycle Combined checks for chronic conditions (page 227) • If diabetes — 3 monthly cycle Combined checks for chronic conditions (page 227)	• See Medicines for CKD • BP target — less than 120/80
High	• 3 monthly cycle Combined checks for chronic conditions (page 227)	• See Medicines for CKD • BP target — less than 120/80 • If eGFR less than 30 — stop metformin • Give statin even if blood fats normal • Shared care with kidney specialist team
Very high	• Individual care plan	• Shared care with kidney specialist team

Medicines for CKD

- ACE inhibitor or ARB is 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, page 96)
  - To come to clinic to stop medicine as soon as they think they are pregnant — **medical consult**

Step 1

- **ACE inhibitor** (eg ramipril, perindopril)
- If can't take ACE inhibitor (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/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). If pregnant — **medical consult**
  - *OR* **beta-blocker** (eg atenolol). If pregnant — **medical consult**

Step 3

- If BP still above target after 3 months — change to combination medicine
  - **ACE inhibitor + thiazide diuretic** (eg perindopril-indapamide)
  - *OR* **ARB + thiazide diuretic** (eg irbesartan-hydrochlorothiazide)
- If BP not controlled with 3 drugs at maximum dose — **physician/kidney specialist consult**

Kidney specialist referral

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 kidney injury — oliguria (low urine output), blood in urine, acute high BP, peripheral swelling
- 25% reduction in eGFR at any risk level

Consider referral to kidney specialist if

- More than 20% reduction in eGFR
- Ongoing protein and blood in urine

Refer for shared care with kidney specialist 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
- eGFR less than 45 for first time
- Check if further tests or results needed before appointment
- **Renal biopsy** rarely needed
- Follow-up appointments can be telehealth case conference

Common problems — high 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 (eg epoetin, 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 needing contrast injection

Patients on renal replacement therapy (RRT)

Peritoneal dialysis, community based haemodialysis, with kidney transplant

Do

- Develop care plan with shared care between primary care and kidney specialist team
- 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

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- Coma scale score (page 100)
- ECG — check for signs of high serum potassium level Table 4.11
  - Normal ECG does not exclude high potassium levels

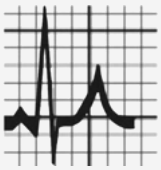
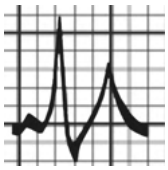
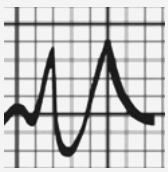
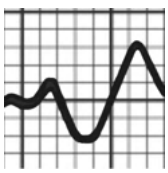
Do

- **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 transport rather than medical retrieval
- POC Test for electrolyte (potassium) level
- Give
  - **Calcium polystyrene sulfonate** (eg *Resonium*) oral — adult 30g, twice a day (bd) — check indications
  - *AND* **lactulose** oral — adult 30mL, twice a day (bd) (reduces constipation)

If serum potassium level high — above 6mmol/L *OR* tall T wave on ECG or Lead II monitoring

- **Urgent medical consult**
- Give
  - **Calcium gluconate 10%** IV bolus — 10–20mL. Give slowly over 3–10 minutes, 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**. Nebulisers have high risk of transmitting infection — wear full PPE

Table 4.11 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

Supporting resources

GFR calculator - Kidney foundation Australia

Diabetes

- Type 1 diabetes — less common
  - Usually diagnosed in children and young people
  - Body is unable to produce enough insulin
- Type 2 diabetes — much more common
  - Initially insulin resistance (increased insulin levels but body can not use it properly). Later the body makes less insulin
  - Very common in Aboriginal adults. Increasingly in children and young people
- Heart attack at a young age is a major cause of death for people with diabetes
  - May be atypical — happens with no chest pain but with symptoms like tiredness or problems breathing

Red Flags — Urgent Medical Consult

- Moderate to high ketones in urine/blood
- Person sick with anything else at time of diagnosis
- BGL more than 15mmol/L and acutely unwell
- Sudden onset vision change
- High risk foot problem (eg infected wound, numbness)

Common problems with diabetes especially if high BGLs

- High BP, abnormal lipids (blood fats)
- Heart attack, stroke
- Nephropathy (kidney disease), kidney failure
- Retinopathy (eye damage) — causes loss of vision
- Neuropathy (nerve damage) — causes 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 — Aboriginal or Torres Strait Islander, Pacific Islander
- Overweight or obese — calculate BMI
- Waist circumference — women more than 80cm, men more than 94cm
- Women — history of gestational diabetes or polycystic ovary syndrome
- Impaired glucose tolerance or prediabetes
- Medicines, eg corticosteroids, antipsychotics

Prevention

- To lessen risk of developing type 2 diabetes or slow its progress — encourage healthy diet, physical activity, weight loss if overweight/obese
- Early diagnosis of Type 2 diabetes through screening may prevent complications — routine Adult Health Check (page 222)
- Targeted screening of at-risk children over 10 years (page 148)
  - Overweight or obese, maternal history of diabetes in pregnancy
  - Parent, sister or brother with diabetes or dyslipidaemia
  - Acanthosis nigricans (dark patches of skin at folds or creases, eg neck, armpit)

Diagnosing prediabetes and diabetes

Diagnosis of diabetes needs

- Diabetes (high blood glucose) symptoms and 1 abnormal test
  - Blood glucose meter readings can't provide a diagnosis — readings need to be checked with accurate testing method, eg venous blood glucose
- If no symptoms — 2 abnormal tests done on different days
- Any combination of abnormal OGTT, venous BGL, HbA1c
  - **Do not** use HbA1c if less than 4 months postpartum (after childbirth)
  - If two different tests are performed and only one is high the test with the high result should be repeated — diagnosis can then be made based on the repeated test
  - Caution in interpreting HbA1c if person has a condition that affects red blood cell turnover

Ask

About symptoms of high blood glucose

- Type 1 diabetes — almost always rapid onset of symptoms, positive ketones, often slim build, may be no family history of type 2 diabetes
- Type 2 diabetes — may be no symptoms until 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

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- U/A (attention to ketones), pregnancy test
- Head-to-toe exam
- If BGL high — POC Test for ketones
- If taking an SGLT2 inhibitor (eg empaglifozin, dapaglifozin) and unwell (abdominal pain, nausea, vomiting, fatigue) check ketones, even if normal BGL

Table 4.12 Interpreting results for prediabetes and diabetes

Test	Normal	Prediabetes*	Diabetes
HbA1c	Less than 5.7% (39mmol/mol)	5.7–6.4% (39–46mmol/mol)	6.5% (48mmol/mol) or more
Fasting plasma glucose (mmol/L)	Less than 6.1	6.1 to 6.9	7 or more
Random plasma glucose# (mmol/L)	Less than 7.8	7.8 to 11	11.1 or more
2 hour glucose on OGTT (mmol/L)	Less than 7.8	7.8 to 11	11.1 or more

*Prediabetes is not relevant for people with type 1 diabetes. The prediabetes threshold of 5.7–6.4% is as per the American Diabetes Society guidelines

Consider further testing with HbA1C or OGTT

Do

Medical consult if

- Person sick with anything else at time of diagnosis
- BGL more than 15mmol/L — may be undiagnosed type 1 diabetes
- 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 — **medical consult**, **needs insulin urgently**
- Diabetic ketoacidosis (usually occurs in type 1 diabetes but can occur in type 2 diabetes). Will have high BGL (might not have high BGL if taking an SGLT2 inhibitor) — **urgent medical consult**

Ongoing care

- Good diabetes care looks after whole person not just blood glucose
- Develop shared care plan with specialist, diabetes educator, doctor, patient
- For females of childbearing age — talk about
  - Contraception (WBM, page 331) — aim for good BGL levels before getting pregnant
  - Pre-pregnancy counselling (WBM, page 96)

Type 1 diabetes

- If suspected — **urgent medical consult**
  - Care will involve specialist consult
- Always need insulin
- 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 even if fasting

Gestational diabetes

- See Diabetes in pregnancy (WBM, page 140)

Prediabetes

Includes impaired fasting glucose (IFG), impaired glucose tolerance (IGT) and raised HbA1c

- See — Diagnosing diabetes and prediabetes
- Do cardiovascular risk assessment (page 231)
- Medical follow-up
- Management plan including yearly BGL, HbA1c, follow-up schedule — see Combined checks for chronic conditions (page 227)
- Give advice about stopping smoking (page 294), healthy diet, physical activity, losing weight (if overweight) to lessen risk of diabetes
- Consider starting metformin

Type 2 diabetes

- Do cardiovascular risk assessment (page 231)
- See — Combined checks for chronic conditions (page 227)
  - 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 follow-up and updated care plan including allied health (eg dietitian)
- Give advice about stopping smoking (page 294), healthy diet, physical activity, losing weight to improve diabetes

Management of type 2 diabetes

- Comprehensive management of diabetes includes lifestyle change, managing blood glucose, BP, lipids (blood fats), kidney disease (page 239), cardiovascular risk (page 231) in partnership with people and families
- Good management reduces risk of complications — microvascular (eye, kidney and nerve damage) and macrovascular (heart attack, stroke, amputation)
- **Medical consult** and paediatric/paediatric endocrinology consult for all young people diagnosed with type 2 diabetes
  - See — Diabetes across the life course (Menzies school of health research)

Blood glucose levels

HbA1c targets

High HbA1c levels increase risk of complications — any decrease in HbA1c is useful. Always be encouraging about improvements

- Good average blood glucose over last 3 months — HbA1c 53mmol/mol (7%) or less

OR if a history of severe hypoglycaemia, limited life expectancy or elderly — HbA1c 64mmol/mol (8%)

OR individual target as per care plan

- If less than 18 years of age — HbA1c 48mmol/mol (6.5%)

BGL monitoring and targets

- BGL self-monitoring helps person understand and manage diabetes
  - Most useful for people on insulin, during changes in drug treatment or if BGLs unstable
  - People with type 1 diabetes need to monitor BGL and ketones when unwell
  - If person on insulin can't self-monitor — do in clinic 2–3 times a week
- BGL targets should be individualised and documented in care plan
- Suggested targets
  - Morning/fasting — 4–8mmol/L
  - Random/2 hours after meal — 5–10mmol/L

Medicines for blood glucose lowering in adults with type 2 diabetes

Must be prescribed by doctor or nurse practitioner

- A patient-centered approach should be used to guide the choice of medicines
- Considerations include cardiovascular comorbidities, hypoglycaemia risk, impact on weight, cost, risk for side effects and patient preferences
- Early combination therapy can be considered in some patients with high BGL or HbA1c
- Early insulin therapy can be considered in some patients with very high BGL or HbA1c or with symptoms
- If HbA1c has not declined by more than 0.5% 3 months after a medication is started — check adherence and **medical consult** to consider change of medication
- Recommend SGLT2 inhibitor as second line therapy if no contraindications *AND* patient preference *AND* any of
  - High risk or established cardiovascular diseases
  - High risk or established heart failure
  - Chronic kidney disease
- Recommend GLP-1 receptor agonists as second line therapy if no contraindications *AND* patient preference *AND* any of
  - High risk or established cardiovascular diseases
  - Weight loss is a priority
  - Chronic kidney disease

Table 4.13 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 months — reassess* *AND* move to Step 2 if needed
Step 2	• *ADD* second medicine — check PBS approved combinations ▸ Sulfonylurea ▸ *OR* SGLT2 inhibitor ▸ *OR* GLP-1 agonist ▸ *OR* gliptin (DPP4 inhibitor) ▸ *OR* insulin — continue oral medicine/s
	If target not reached in 6 months — reassess* *AND* move to Step 3 if needed
Step 3	• *ADD* third medicine from Step 2 list — check PBS approved combinations
***Reassess oral medicines** • Check person understands lifestyle measures and medicine use • Check that medicine is 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 levels • Consider a different diagnosis, eg latent autoimmune diabetes in adults	

Oral medicines

- Only take oral medicines when eating
- If unwell and not eating — stop medicine 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 smaller slow-release tablets (500mg XR)

Table 4.14 Glucose lowering medicines in type 2 diabetes

Medicine	Starting dose	Maximum dose	Comments
Metformin			
Metformin **Metformin XR**	500mg once a day	**Normal release** • Usually 2g total daily dose. • May use 3g daily if overweight or obese. • Up to 1g/dose **Slow release – XR** • 2g once a day	• If kidney disease — reduce dose ▸ eGFR less than 15 — **do not use** ▸ eGFR 15–30 — 500mg daily ▸ eGFR 30–60 — 1g daily ▸ eGFR 60–90 — 2g daily • Caution in liver disease or acute severe illness • Take with food to avoid upset stomach

Medicine	Starting dose	Maximum dose	Comments
Sulfonylureas			
Gliclazide **Gliclazide MR**	**Normal release** 40mg once a day (half a tablet) **Slow release** 30mg once a day	**Normal release** 320mg daily, up to 160mg/dose **Slow release** 120mg once a day	• Take with food to avoid hypoglycaemia (low BGL) • Give advice on recognising and treating a hypo (low BGL) • Avoid use in pregnancy • Associated with weight gain
Gliptins — DPP4 inhibitors			
Linagliptin	5mg once a day	5mg once a day	• No need to adjust dose for kidney disease or liver disease • Avoid use in pregnancy
Sitagliptin	100mg once a day	100mg once a day	• If kidney disease — reduce dose ▸ eGFR 30–45 — 50mg once a day ▸ eGFR less than 30 — 25mg once a day • Avoid use in pregnancy
SGLT2 inhibitors			
Applicable to all SGLT2 inhibitors			• Withhold if unwell, if not eating, 3 days prior to surgery • Check ketones if unwell — even if BGLs are normal • Risk of genital fungal infections and dehydration • **Do not** use if ▸ Recurrent thrush in women, balanitis in men ▸ History of ketosis ▸ Severe liver damage/disease • Avoid use in pregnancy
Empagliflozin	10mg once a day	25mg once a day	• **Do not** use if kidney disease with eGFR less than 30
Dapagliflozin	10mg once a day	10mg once a day	• **Do not** use if kidney disease with eGFR less than 25
GLP-1 receptor agonists			
Applicable to all GLP-1 receptor agonists			• Risk of nausea usually settles within a few months • **Do not use** if ▸ Severe gastrointestinal disorders ▸ Pancreatic cancer ▸ Pregnant ▸ History of pancreatitis
Dulaglutide	1.5mg subcutaneous (injection) weekly	1.5mg subcutaneous (injection) weekly	• **Do not use** if kidney disease with eGFR less than 15
Semaglutide	0.25mg subcutaneous (injection) weekly	Start with 0.25mg weekly for 4 weeks *THEN* increase to 0.5mg weekly for 4 weeks *THEN* increase to 1mg weekly Maximum dose is 1mg weekly	• **Do not use** if kidney disease with eGFR less than 30

Insulin

Diabetes educator/doctor/nurse practitioner consult required for starting and adjusting insulin — consider specialist input

- All people with type 1 diabetes
- Some people with 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

Consider starting insulin in type 2 diabetes when

- Symptoms of high blood glucose
- Diagnosed with type 2 diabetes and HbA1c is more than 11%
- Under 18 years with type 2 diabetes and HbA1c more than 8.5%
- Taking maximum tolerated dose of 2–3 oral medicines *AND* HbA1c above target
- Other reasons can't take oral medications, eg kidney failure

Starting insulin

- Must be prescribed by a doctor or nurse practitioner
- Get help from diabetes educator — can be by telehealth
- Take time for patient education including injecting (preparation, site selection and rotation) and monitoring, thinking it over, talking with another patient on insulin
- Talk with person about practical ways to store insulin
- Explain symptoms of low blood glucose (page 118) and what to do
- Agree on plan for monitoring BGL and insulin dose — dose may need to be adjusted regularly to begin with
- Check technique for giving insulin and injections sites at least once a year

Insulin dosing

- If Type 1 diabetes or prescribed insulin other than glargine — **diabetes educator/nurse practitioner/medical consult**
- **If Type 2 diabetes, on advice of doctor or nurse practitioner** — other clinicians can titrate glargine according to Table 4.15
- 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

- 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 target reached
  - 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 once or twice a day *OR* basal bolus insulin 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 most oral medicines and consider stopping sulfonylurea as BGL improve

Table 4.15 Glargine insulin treatment in type 2 diabetes

Glargine insulin	Action
Starting dose	0.1 units/kg *OR* BMI 25 or less — 10 units BMI more than 25 — 15 units
Maximum dose	• No set maximum dose • If dose high (greater than 70 units) — consider splitting dose between morning and night *AND* re-visit technique, ability to take insulin, diet and physical activity
Adjusting doses	• **Do not** increase dose if fasting BGL less than 4mmol/L at any time in last week • If fasting BGLs above target — increase by 2–4 units

Adjust dose — once or twice a week if
• No hypos or low BGL symptoms
  ▸ **Do not** increase dose if fasting BGL less than 4mmol/L at any time in last week
• *AND* most recent HbA1c outside target range
• *AND*
  ▸ If daily monitoring — fasting BGL outside target range (page 250) 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
	• If BGL less than 4mmol/L — decrease by 2 units *OR* 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

Complications

Foot problems

- Diabetes foot disease is a chronic condition
- Most common complication of peripheral neuropathy (nerve damage) and peripheral arterial disease (blood vessel damage) — may lead to infection, foot ulcers, nerve pain, amputation
- Any changes to the bony and soft tissue structure of the foot or to blood flow or sensation can cause an acute foot complication that needs to be referred quickly to a podiatrist and multidisciplinary team

Red Flags — Urgent Medical Consult	
High Risk Foot — if any of the following **podiatry referral** • Peripheral neuropathy • Peripheral vascular disease • Foot deformity • History of foot wounds or amputations • End stage renal failure	**Two or more of High Risk Foot — urgent podiatry referral** • Foot wound with moderate or severe infection • Positive probe to bone test • Wet gangrene — discoloured skin, numbness, foul discharge • Active charcot foot (hot and swollen foot) • Recent foot related hospital admission without a discharge plan

Ask

- About any recent hospitalisations *AND* read discharge plan

Check

- Regular foot assessment on all diabetic patients — see Foot assessment

Do

- Manage abnormalities in collaboration with multidisciplinary team — at minimum **medical *AND* podiatrist consult**
- Dress wounds as needed — see Wound dressing
- Treat infections — see Injuries – soft tissue (page 109)
- Identify ways to offload pressure on the wound — podiatrist can advise

Follow-up

Table 4.16 Frequency of feet checks

High Risk Feet	Low Risk Feet
3 monthly foot checks minimum	Yearly foot checks
Teach daily foot care	Teach daily foot care
Individualised management plan with podiatry	

Eye disease

- Includes diabetic retinopathy, cataract
- Any change in vision needs to be assessed either as soon as possible by optometrist if gradual onset *OR* **straight away** by ophthalmologist **if sudden onset**
- To lessen risk of blindness
  - Regular screening of vision — yearly fundoscopy or retinal photography
  - Good blood glucose levels and good BP (page 258)
  - Encourage and support stopping smoking (page 294)
  - If diabetic eye damage — more frequent eye specialist examinations
  - Laser treatment, if needed

Dental problems

Type 2 diabetes increases risk of more frequent and severe dental/oral disease — risk also increased by poor dental hygiene, smoking, high BGLs

- Dental/oral disease makes it harder to manage 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 (page 294)

Supporting resources

- RACGP — Management of type 2 diabetes handbook for general practice

Hypertension (High BP)

- Treating high BP lessens risk of stroke, heart disease, kidney disease
- If BP high — may also be other risk factors that need to be managed
- Person may not know they have high BP until checked
- All Aboriginal people over 18 years should be offered a BP check at least every 2 years as part of Adult Health Check (page 222)
- Target BP — less than 140/90 ***OR*** less than 130/80 if diabetes or CKD

Red Flags — Urgent Medical Consult

- Pregnancy
- Blurred vision and headache
- Shortness of breath
- BP 180/120 or more

Taking BP

- Take BP while person sitting and rested
  - 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
- Diagnosis of high BP needs BP to be high on 4 separate measurements — check BP twice on at least 2 different visits
- Consider 24 hr home BP monitor and home based BP monitor records if practicable as a more reliable measure
- Check file notes for
  - Previous records of high BP
  - Existing high BP management plan

Check

- 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

If new diagnosis of high BP

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- ECG, if new diagnosis of hypertension

Table 4.17 BP result and action if not already on a BP management plan

BP (mmHg)*	Action if No diabetes or CKD	Action if Diabetes	Action if CKD
Less than 130/80	Check BP in 2 years, give healthy lifestyle advice	Check BP as per usual Combined check for chronic conditions	Check BP as per usual Combined check for chronic conditions
130/80 or more but less than 140/90	Check BP in 1 year, give healthy lifestyle advice	Check BP twice in next 4 weeks • If still above 130/80 — see Table 4.20	Check BP twice in next 4 weeks • If still above 130/80 — see Chronic kidney disease
140/90 or more but less than 160/100	Check BP twice in next 4 weeks • If still above 140/90 — see Table 4.1	• See Table 4.20 • Medical follow-up within 1 month	• See Chronic kidney disease • Medical follow-up within 1 month
160/100 or more but less than 180/120	• See Table 4.20 • Medical follow-up within 1 month	• See Table 4.20 • Medical follow-up within 1 month	• See Chronic kidney disease • Medical follow-up within 1 month
180/120 or more	**Urgent medical consult**	**Urgent medical consult**	**Urgent medical consult**
* If systolic and diastolic readings in different categories — follow action for higher reading			

Table 4.18 Management of high BP by cardiovascular risk

Risk factors	Action
• High cardiovascular risk (more than 15%) • Diabetes • Cardiovascular disease (CVD) • CKD	• Active lifestyle management† • Start with 1 medicine
• Moderate cardiovascular risk (10–15%) *AND* BP persistently 160/100 or more *OR* family history of early CVD	• Active lifestyle management† • Start with 1 medicine
• Moderate cardiovascular risk (10–15%)	• Active lifestyle management† • Review BP in 3 months
• Low cardiovascular risk (less than 10%) *AND* BP persistently 160/100 or more	• Active lifestyle management† • Start with 1 medicine
• Low cardiovascular risk (less than 10%) *AND* systolic BP more than 140	• Active lifestyle management† • Review BP in 3 months
• **Symptomatic**	• If blurred vision, headache, short of breath — **medical consult**, send to hospital

† See **SNAPE** — Adult health check (page 223)

See Tobacco (page 294), Healthy lifestyle choices, Brief interventions

Medicines for high BP

- **Medical consult**
- ACE inhibitor or ARB mainstay of treatment — maximise dose for best effect
- May take 4 weeks to see full response to each medicine change
- Regular review until good blood pressure control — use recall system

Step 1

- **ACE inhibitor**, eg ramipril, perindopril
  - If can't take ACE inhibitor (eg cough, angioedema) — give ARB (eg irbesartan) — monitor recurrence of angioedema
  - If elderly or heart failure — start with lower dose
- Check BP *AND* UEC 2 weeks after starting
- 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
- At all steps — check if taking medicines if BP still above target

Step 2

- If BP still above target after 3 months
  - *ADD* **calcium channel blocker** (eg amlodipine, felodipine) — **medical consult** if pregnant

OR if CAD (page 234), heart failure (page 134) — 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 target at maximum tolerated doses — see Resistant high BP (page 261)

High BP medicine warnings

- Pregnancy
  - **Do not** use ACE inhibitor or ARB's — 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 Hypertension (high BP) in pregnancy (WBM, page 158)
- **Do not** use ACE inhibitor and ARB together — increased risk of side effects
- 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
- If asthma — avoid beta-blockers, eg atenolol, metoprolol
- If gout — avoid thiazide diuretics, eg indapamide, hydrochlorothiazide

Table 4.19 Doses of BP control medicines

Medicines – selection only	Starting dose	Maximum dose
Ramipril	2.5mg a day	10mg once a day
Perindopril arginine	5mg once a day	10mg once a day
Perindopril erbumine	4mg once a day	8mg 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
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**

Obesity

- Obesity (BMI more than 30) is usually caused by a combination of medical, social and environmental issues
- Be respectful and consider the dignity of larger people — **do not blame or judge people**
- Obesity is a chronic condition and can lead to significant co-morbidities, eg increased risk of other chronic conditions and joint problems
- Weight loss should not be recommended for children under 16 years of age unless recommended by paediatrician
- Weight loss should not be recommended during pregnancy
- Weight loss in people over 65 years or people with end-stage diseases should be monitored by a health professional
- Very low energy diets, medicines and surgery can help people with a BMI more than 35 to lose weight — **these treatments require specialist assessment and management — medical consult and refer to dietitian**
- Public funding for surgery may be available for eligible people
- While medicines may be registered for use in obesity their cost is not subsidised

Considerations when caring for larger people

- Move and handle people to reduce the risk of injury to yourself and the person — assess weight bearing capacity and person's ability to assist with transfers and repositioning (eg respiratory, cardiac and joint conditions) — encourage independence where safe
- Use correct equipment if available — most standard equipment has a weight limit of 120kg — bariatric equipment (eg beds, chairs, stretchers, gowns, bedpans) may be needed for larger people
- If person needs transport — inform transporting and receiving services of person's weight, height and waist circumference

Do

- Adult health check (page 222) if due
- Provide brief interventions on healthy eating and exercise
- Aim for 5–10% loss of body weight for people who are overweight (BMI more than 25kg/m^2) — loss of a few kilograms can improve BP, BGL and arthritis
  - Monitor rapid and unintentional weight loss — risk of malnutrition

- Follow-up outstanding referrals
- **Refer** to dietitian and mental health services
- Assist in finding local programs that may help address social and environmental issues

People with BMI more than 35kg/m^2 with risk factors or comorbidities

- **Medical consult** and/or referral to dietitian for individualised management plan
  - Consider referral to endocrinologist for medical management including consideration of very low energy diets, medicines and/or surgery
  - Ongoing support from doctor and dietitian will be required for people using very low energy diets
  - Weight loss medicines and very low energy diets can lead to side effects such as gallstones, diarrhoea, constipation, headaches, fatigue — **medical consult**

Follow-up care of people who have had bariatric (weight loss) surgery

- A multi-disciplinary team is needed to provide follow-up care post-surgery
  - Monitor weight loss progress
  - Monitor for complications — abdominal pain, diarrhoea, reflux, nutritional deficiencies (eg anaemia, nausea, fatigue, dizziness, hair loss, mouth ulcers at every visit) — **medical consult**
  - Medical follow-up for medication dose adjustments and nutritional supplements — multivitamin, oral iron, Vitamin B12, folic acid, thiamine, calcium and Vitamin D
  - Annual bloods — FBC, UEC, LFTs, ferritin, folate, calcium, Vitamin D, PTH, Vitamin B12

Supporting resources

- Bariatric surgery guide for primary care physicians
- Management of bariatric patients guide

5. Mental health and drug problems

Mental health assessment

- Always consider drug or alcohol problems that may also be present
- Talk with family and ATSIHP about person, their behaviour, who is best to sit with them while talking with you
- If person violent or seriously disturbed — see Mental health emergency (page 121)
- If person talking about suicide — **medical consult**

Children and young people

- Always consult with child and adolescent mental health team
- Before giving mental health medicines — **medical/child and adolescent mental health consult**
- Make sure there are family or carers to provide support, check on their safety and wellbeing while care and management is being arranged

The interview

Consider safety first — in some circumstances you may need to involve police

- Talk with person in quiet place with lots of light — speak calmly and clearly, use simple language and listen carefully
  - Use interpreter if needed and available
  - Cultural support person present is always helpful to have
  - Allow time for person to tell their story
- Be aware of non-verbal cues. Be calm and non-threatening with open relaxed body posture
- Develop relationship and trust by talking about familiar things (eg family, country) and person's strengths before talking about problems
- Explain what you are doing, what is happening and that you need to ask a lot of questions to work out how to help and what to do
- Work with person to solve the problems. Mental health problems are very common and most people recover — encourage positive outlook
- Work on strengths that you find in/around person's life (eg Stay Strong Plan). Brief intervention style tools for talking about what keeps them strong, what takes away their strength and staying in balance.
- Introduce goal setting

Ask

- Why they have come — ask person, family or other observers for their parts of the story
- Personal, family, community problems
- Ask screening questions for anxiety, psychosis, depression — see mental health protocol
- Any mental health problems or treatment in the past — what helped
- About sleep patterns, any changes in appetite
- Any medical sickness and current treatments
- Alcohol (grog) or other drug use — see alcohol assessment
- Is there a cultural reason/explanation — is this presentation outside what is culturally appropriate now

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- Coma scale
- Head-to-toe exam — with attention to head injury, infection (eg chest, ear, UTI), epilepsy (fits), encephalitis, medicine toxicity, hearing impairment, electrolyte imbalance, thyroid dysfunction, anaemia

Do

- Blood for UEC, FBC, LFT, HbA1c, TFT, syphilis, urine MC&S and drug screen
- Mental health assessment — how does person seem to you, use prompts below to help you to describe person's presentation
- Risk assessment
- Cognitive assessment — if worried that person is not thinking clearly. Screen for cognition (whether brain is working properly)

Mental status examination

Consider how person usually is (or ask observer who knows them) and in the cultural context, how are they different now. Most of this will be observed during consultation, rather than needing a separate assessment

Consider

- **Appearance** (as if looking at a photo) — facial expression, clothes, jewellery, make-up, sunglasses, personal care, skin condition and body size
- **Behaviour** (as if looking at a video with sound off) — how are they acting (normal or bizarre), calm, agitated, cooperative, distracted, withdrawn, restless, overactive, posture and movements including walking
- **Mood** (what person describes) — sad, worried, nervous, cranky, happy, angry/wild
- **Affect** (what you describe) — flat, crying, irritable, mood swings, angry, too happy, frightened, unconcerned, excited, aroused. Comment on whether mood and affect are congruent (match)
- **Speech** (as if listening to tape recorder) — absent, faster or slower than usual, unstoppable, pressured, slurred and loud or soft
- **Thoughts**
  - Form — lose track of conversation, mixed up talk, not making sense
  - Content — suicide talk, talking about hurting self or others, paranoia (overly suspicious), delusions (excessively grand beliefs or believing things that are not true)
- **Perception** — does person have auditory, visual or sensory hallucinations (hear, see or taste things that are not really present). Consider cultural context
- **Cognition** — can person remember things, recognise people. Are they confused about who they are, where they are and why they are there
- **Insight/judgement** — does person realise there is a problem, do they understand what the problem is, are they doing silly or dangerous things

Risk assessment

Use to help decide if person can be safely managed in community or needs to be sent to hospital for further mental health assessments and treatment. Mental health crisis lines in each state/territory can help with risk assessment (eg NT Mental Health Access Team)

Consider

- **Serious or unstable medical condition**
- **Risk to others — if issue of public safety, police must be contacted**
  - Children — can't make themselves safe
  - Violence, intimidation or sexual risk
- **Risk to person**
  - Suicide or self-harm
  - Vulnerability — financial or sexual exploitation, neglect, accidents, physical deterioration, victim of violence (eg domestic and family violence)
  - Absconding, wandering
  - Reputation, poor judgement, unrestrained spending, manic behaviour (poor decisions)
- **Protective factors** (things that keep person safe in community)
  - Responsible person or carer they will respect, listen to
  - Level of insight, ability to accept help, support, treatment
  - No history of significant violence, self-harm, suicide attempts
  - Community capacity to support and care for person

Possible diagnosis

- Recently confused, unable to concentrate, poor orientation — see Acute assessment of new onset confusion (delerium) — **potential medical emergency**
- Talking about suicide or self harm — **medical consult**
- Hallucinations, delusions, bizarre behaviour — see Psychosis
- Overactive, grand ideas, not sleeping, pressured speech — may be manic phase of bipolar disorder — see Psychosis
- Withdrawn, sad, not eating or drinking, not talking, not getting out of bed, poor hygiene — see Depression
- Edgy, worried, restless — see Anxiety
- Poor orientation, poor memory, slowly getting worse
- Consider effect of alcohol, cannabis, kava, volatile substances, amphetamines, prescribed medicines

Supporting resources

- Stay strong planning — brief treatment manual
- Stay strong plan — four page assessment tool
- Kimberley Indigenous Cognitive Assessment — cognitive component (KICA-COG)
- Mini Mental State Examination (MMSE)

Anxiety

Affects the way a person thinks, feels, behaves. Occasional anxiety is common

- Anxiety disorders often occur with substance misuse or depression, including perinatal depression (WBM, page 127)
- Panic attack — mind and body overreact to situation
  - Usually lasts 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 — can be triggered by stressful event or be an adverse effect of medicine

Possible 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
  - Insomnia (trouble getting to sleep, waking frequently)

- **Behavioural**
  - Gives up easily, finds it hard to finish things
  - Using more alcohol or other drugs including tobacco
  - Avoiding things that make them anxious — people, leaving home, certain things or places, reminders of traumatic events
  - Hypervigilant (always looking out for danger)
  - Repetitive behaviours
  - Seeking reassurance all the time

Do first

- Take person somewhere calm and quiet, if possible
- Be calm and supportive — reassure them they are safe and 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
  - When did these feelings start
  - What triggers feelings, how long do they usually last
  - What helps
- Thoughts of self harm or suicide (page 121)
- Unhappy or sad mood — see Depression (page 272)
- Cultural explanation — is presentation outside what is normal in community now
- Family history of anxiety
- Alcohol (grog) (page 280) and/or other drug use — long term and recent

Check

- File notes for medical history, medicines review
- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam

Do

- Be calm and supportive — reassure them they are safe and experience will stop
- **If short-term symptoms** — 2–3 days
  - Review in 1 week — anxiety may get better itself
- **If long-term, more serious anxiety condition or not getting better**
  - Adult health check (page 222) or School-aged and young person's health check (page 146)
  - FBC, UEC, LFT, TFT, HbA1c, syphilis serology
  - **Medical consult** — advice about treatment and psychologist referral

Ongoing management

- **Mental health team consult** if not responding to treatment
- Make management plan
  - Consider mental health plan if applicable
  - Practical problem solving — what is important to do first, how to do it
- Education about anxiety, relaxation training, practice slow deep breathing
- Education about regulating sleeping patterns in managing anxiety

Depression

- If pregnant, recent baby or stillbirth — see Perinatal depression and anxiety (WBM, page 127)
- If depressive symptoms and hypomania (high energy levels, positive mood) but no manic episodes — consider Bipolar 2 disorder — **medical/ mental health consult**

Ask

- About suicide
- About safety — theirs, children, others
- About 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, weight loss or gain
  - Sleep disturbed, sleeping too little or too much, no energy, slow speech and thinking
  - Irritability, trouble concentrating or thinking clearly
- Any triggers — relationship problems, domestic 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 the person affected by living away from their country, is presentation outside of what is normal in community now

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- Head-to-toe exam — with attention to infection, anaemia, thyroid problems

Do

- FBC, UEC, Hb, HbA1c, LFT, TFT, B12, Folate, HIV, syphilis, urine drug screen
  - Person taking lithium collect TFT every 6 months
- Standard STI check – man (page 305), woman (WBM, page 246), young person (page 303)
- Mental health assessment
- Depression screening — Patient Health Questionnaire 9 — see Table 5.1
- **Medical consult**
- Talk to mental health team about diagnosis, management, medicines
  - Antidepressant medicines for moderate to severe depression
  - Benzodiazepines (eg diazepam, temazepam) — short-term use only
- Person with severe depression may need to be sent to hospital

Patient Health Questionnaire 9 (PHQ9)

Screening tool to identify symptoms —diagnosis requires further assessment by a doctor

Table 5.1 Patient Health Questionnaire 9 (PHQ9)

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)				

*Only count highest score for each of these sets of questions (ie 5a or 5b, 8a or 8b)

† If positive score on question 9 — **medical consult**

Interpreting PHQ9 score

- 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**

Follow-up

- Make management plan, mental health care plan if applicable
- Education about depression, benefits of physical activity and having regular sleep patterns
- **Refer** to mental health team if you or person concerned

Antidepressant medicines

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 myoclonus (overactive reflexes), 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 **urgent medical consult**

Choosing a medicine

- **Medical consult**
- Not much difference in effect between different antidepressants
- Consider severity and type of presentation, eg agitated, poor sleep
- 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 4 weeks for full effect
- May be an 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 for the first episode — less chance of relapse (depression coming back). If this is not first episode — check with mental health team for treatment timeframe
- 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

Psychosis

- Condition of the mind that is 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, severe depression, alcohol/drug misuse, dementia
- Some physical conditions can look like psychosis, eg epilepsy, delirium (page 11)

Signs and symptoms may include

- Delusions — strongly held false beliefs that are not true of a person's cultural or religious background
- Hallucinations, auditory, visual and sensory — hears, sees, tastes, smells or feels things that are not really present
- Thought disorganisation — not able to think straight, conversation hard to follow
- Severe agitation, restlessness, anxiety, hostility, aggression, paranoia

Seek advice

- For advice on talking with person who may have mental illness — see Mental health assessment (page 265)
- Some experiences can be culturally explained — important to ask ATSIHP or family member for advice
- For help with **immediate management** and risk mitigation — **medical/ mental health team consult**

Red Flags — Urgent Medical Consult

- Very agitated or disturbed
- Threatening self-harm
- Neuroleptic malignant syndrome, extra pyramidal side effects
- Acutely unwell and major risks identified

Acute management

Ask

- Assess risk of harm to others or self — driven by delusions or hallucinations
  - Delusions or beliefs that may lead to the person harming themself or others
  - Auditory hallucinations (voices) or other perceptual experiences (eg command hallucinations) that may drive the person to harm self or others

Check

Only if possible and safe

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- ECG
- Coma scale
  - Head-to-toe exam — with attention to head injury, infection (eg chest (page 432), ear (page 394), UTI (page 486)), epilepsy (fits), encephalitis, medicine toxicity, electrolyte imbalance, thyroid dysfunction

Do

- Mental health assessment
- FBC, ESR, UEC, LFT, TFT, HbA1c, lipids, hepatitis, HIV, syphilis serology, urine drug screen, urine ACR

Antipsychotic medicines

- Oral medicines are first choice when managing psychosis
  - Tablets work quicker, eg some calming effects often in a few hours
- Need for long-term medicine usually decided by psychiatrist — can include oral tablets or depot injections
  - Effects may take several days or weeks
- Always check manufacturer's directions for preparing and giving depot medicines
- Some adverse effects of antipsychotic medications need **urgent medical consult** — Table 5.2

Table 5.2 Serious adverse effects

Urgent Medical Consult	
Neuroleptic Malignant Syndrome (NMS) — rare but potentially fatal complication of antipsychotic medicines — **medical emergency** **Signs and Symptoms** • High temp, altered consciousness, confusion, muscle stiffness • May have fluctuating pulse and BP, fast RR, raised CK **Do** • **Stop all antipsychotic medicines straight away** • Maintain fluids (hydration) • **Send to hospital urgently**	**Extra-pyramidal side effects** (EPSE) **Signs and Symptoms** • Muscular shaking (tremors) • Dystonia (muscular spasms) including spasm of larynx • Parkinsonism (muscular stiffness, rigidity) • Akathisia (restlessness, agitation) • Dyskinesia (involuntary twisting/ squirming, mouth/tongue movements) • Oculogyric crisis (eyes up, hard to look down, bending back of head, grimace) • Hypersalivation (drooling, dribbling) **Do** • Give **benzatropine** IM — adult 1–2mg, single dose • Symptoms should resolve in 15 minutes

Ongoing management

- Usually multi-professional and multi-service provider approach
- **Medical follow-up** to make management plan, 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
- Antipsychotic medicines increase risk of metabolic syndrome (group of conditions that increase risk of chronic disease) — see Combined checks for chronic conditions (page 227)
- If woman has changes in menstrual cycle, swollen/tender breasts and galactorrhoea (milk from breasts when not breastfeeding) — check blood prolactin levels

Alcohol withdrawal

- If person who usually drinks 40–60g or more of alcohol a day (4–6 or more standard drinks) stops drinking there is a risk of alcohol withdrawal for the next 5 days
- A standard drink (Table 5.3) contains 10g of alcohol, takes a healthy liver about 1 hour to remove this alcohol from the body
- If **regular drinker unwell — they 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
  - Has past history of withdrawal or seizures

Table 5.3

1 standard drink =		
425mL light beer	285mL full-strength beer	60mL port
375mL mid-strength beer	100mL wine	30mL spirits

Red flags — Urgent Medical Consult

- Withdrawal fits, DTs, severe withdrawal before, or many withdrawal episodes
- Significant illness — cellulitis, pneumonia, diabetes, heart condition, severe liver disease, chronic kidney disease, respiratory disease, mental illness, epilepsy
- Uses other drugs (eg opioids, benzodiazepines)
- Drinking at high level over long time period
- If CIWA score more than 6
- Signs of head injury

Severe alcohol withdrawal syndrome

- Withdrawal seizures may happen in first 3 days after stopping alcohol
  - May be first feature of withdrawal
  - May happen if other illness at same time
- Delirium tremens (DTs, 'horrors') can happen up to 6 days after stopping
  - Mix of anxiety, agitation, aggressive behaviour escalation, disorientation, hallucinations, dehydration, high heart rate, high BP, low-grade fever, tremors/shaking
  - Risk of death

Uncomplicated withdrawal

- Usually starts 6–24 hours after last drink of alcohol
- Any combination of anxiety, agitation, aggressive behaviour escalation, tremor, sweating, tachycardia (high heart rate), insomnia (can't sleep) — may be mild, hard to detect

Alcohol withdrawal management

- Assess and manage based on Clinical Institute Withdrawal Assessment (CIWA) score — see Table 5.4 *AND* red flags
  - Get advice from doctor or alcohol and drug service if not familiar with CIWA

Ask

- When person had last drink
- How they usually drink — regular or binge drinker
- How much they usually drink
- What time of the day do they start drinking alcohol
- Any previous alcohol withdrawal
- Taking any medicine or other drugs

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- U/A, pregnancy test
- Head-to-toe exam
- CIWA score

Table 5.4 Modified Clinical Institute Withdrawal Assessment (CIWA)

Nausea and vomiting		Shakes (tremor)	
No nausea and no vomiting	0	No tremor	0
Mild nausea and no vomiting	+1	Not visible but can be felt fingertip to fingertip	+1
More severe symptoms	+2	More severe symptoms	+2
More severe symptoms	+3	More severe symptoms	+3
On and off nausea, dry retching	+4	Moderate with person's arms extended	+4
More severe symptoms	+5	More severe symptoms	+5
More severe symptoms	+6	More severe symptoms	+6
Constant nausea, frequent dry retching or vomiting	+7	Severe, even with arms not extended	+7
Skin feels different		**Hearing things/voices that are not there**	
None	0	None	0
Mild itching	+1	Mild sensitivity to sound, easily startled	+1
Some itching, pins and needles or burning or numbness	+2	Sensitivity to sounds, easily startled, mildly frightened	+2
More severe symptoms	+3	More severe symptoms	+3
Itching, feeling of bugs on skin (hallucinations)	+4	Hearing sounds/voices that are not there	+4
Severely responding to 'bugs' on skin	+5	More severe symptoms	+5
More severe symptoms	+6	More severe symptoms	+6
Constant hallucinations. Skin feeling different, burning, itching, crawling	+7	Hearing things all the time, feeling very worried/scared	+7
Sweating		**Seeing things that are not there**	
None	0	None	0
Moist palms	+1	Very mild sensitivity to light	+1
More severe symptoms	+2	Mild sensitivity to light	+2
More severe symptoms	+3	Obvious sensitivity to light	+3
Sweat drops on forehead/face	+4	Responding to visual things that aren't there	+4
More severe symptoms	+5	Moderate visual hallucinations	+5
More severe symptoms	+6	More severe symptoms	+6
Clothes and bed wet with sweat	+7	Constantly present hallucinations	+7
Worries (anxiety)		**Headache**	
Looks relaxed	0	No evidence of headache, or pain/discomfort	0
A bit worried	+1	Appears to have mild headache	+1
More severe symptoms	+2	More severe symptoms	+2
More severe symptoms	+3	More severe symptoms	+3
Looks worried, sometimes panics	+4	Appears to have moderate discomfort	+4
More severe symptoms	+5	Moderate visual hallucinations	+5
More severe symptoms	+6	More severe symptoms	+6
In a panic state all the time	+7	Severe headache	+7
Agitation			
Normal	0		
Little fidgety	+1		
More severe symptoms	+2		
More severe symptoms	+3		
Moderately fidgety and restless	+4		
More severe symptoms	+5		
More severe symptoms	+6		
Very restless, can't sit still, walking quickly without purpose	+7		

Moderate visual hallucinations	
Ask Who am I? Where are you? What time of day is it? Has anything been happening in the community?	
Person ✓ Place ✓ Time ✓ Orientated, aware of recent community events knows the purpose	0
Person ✓ Place ✓ Time ✓ Disorientated to community events	+1
Person ✓ Place ✗ Time ✗ Doesn't know community events	+2
Person ? Place ✗ Time ✗ Doesn't know community events	+3
Person ✗ Place ✗ Time ✗ Disoriented	+4

Observational assessment. Add up score for 10 criteria = score for person

Do

- If CIWA score more than 6 — **medical consult**
- Repeat CIWA every 30–60 minutes. If increasing despite treatment — consider evacuation
- Look after person in quiet, dim room
- Give medicines as needed
- Monitor dehydration — give fluids as needed
- Make sure responsible person is with them all the time

Follow-up

- Review daily until well
- Refer to alcohol and drug service, mental health service if needed
- Make management plan and provide brief intervention

Medicines for alcohol withdrawal

- **Antiemetic** for nausea or vomiting — see Nausea and vomiting (page 418)
- **Loperamide** oral — adult 4mg, single dose for diarrhoea

THEN **loperamide** oral — 2mg after each bowel action, up to 16mg/day

- **Thiamine** IM into buttock — adult 300mg, once a day for 3 days, to correct common nutritional deficiency

THEN **thiamine** oral — adult 100mg, once a day for at least 1 month

AND **multivitamin** oral — 1 tablet, once a day for at least 1 month

- **Paracetamol** — adult 1g up to 4 times a day (qid) for pain — **do not use if severe liver disease**
- **Diazepam** — see doses below

Diazepam doses

Diazepam lessens agitation and other symptoms (eg hallucinations), helps prevent fits and DTs

- **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 older person, low body weight (less than 50kg), person with significant lung, liver or kidney disease (acute or chronic) — give half dose and watch closely for over-sedation
- **Do not exceed these diazepam doses and avoid using diazepam daily for more than 1 week — may lead to tolerance/dependence**
  - If 90kg or under — 40mg oral in first 24 hours
  - If over 90kg — 60mg oral in first 24 hours

Table 5.5 Diazepam doses for alcohol withdrawal

Pattern of withdrawal	Diazepam doses and what to do
Withdrawal fits or DTs in past	• Give **diazepam** oral — 10mg every hour until CIWA less than 6 or mildly sedated • When CIWA stays at less than 6 for 2 hours ▸ Give **diazepam** oral — 10mg, 4 times a day (qid) for 1 day ▸ Then taper dose to nothing over 3 more days*
Very Severe CIWA more than 16	• Give **diazepam** oral — 20mg straight away • Put in IV cannula • **Medical consult**
Moderate to severe CIWA 10–16 *OR* CIWA 8 and other risk factors (see Red flags)	• Give **diazepam** oral — 10–20mg every 2 hours until CIWA less than 6 or sedated • Base dose on how agitated person seems ▸ If agitation score 4 — oral 10mg ▸ If agitation score 7 — oral 20mg • When CIWA stays at less than 6 for 2 hours ▸ Give **diazepam** oral — 10mg, 4 times a day (qid) for 1 day ▸ Then taper dose to nothing over 3 more days* • **Medical consult**
Mild CIWA 6–9 and no other risk factors	• May not need diazepam • If agitation score 4 or more can give **diazepam** oral — 5–10mg, 3–4 times a day for 2 days • Taper dose to nothing over 3 more days*
*Taper dose to nothing — reduce total dose by 25% daily, eg initial dose — 4 times a day (qid), day 1 — 3 times a day (tds), day 2 — twice a day (bd), day 3 — once a day, day 4 — no dose	

Amphetamines and other stimulants

- Amphetamine-type stimulants (ice, crystal meth, speed) all have similar effects on the central nervous system
- Methamphetamine is a stronger stimulant and may cause more severe physical and behavioural problems
- Typically swallowed, snorted, smoked or injected
- Even months after stopping regular use a single moderate dose of stimulant can lead to rapid return of abnormal behaviour patterns

Red Flags — Urgent Medical Consult

- Marked agitation and aggression
- Blood in urine — rhabdomyolysis
- Ongoing psychotic symptoms
- Serotonin syndrome
- Thoughts of self harm

Effects of amphetamines/stimulants

- Decreased sleep
- Elevated mood, confidence, energy, sex drive
- Can cause preterm labour, miscarriage, damage to unborn baby
- If used close to birth — baby may be unsettled, irritable, withdrawal symptoms in first few weeks, can be hard to feed — can be transferred through breastmilk
- Can cause acute psychosis — see Mental health emergency (page 121)

Can cause potentially life-threatening serotonin syndrome, particularly if person also takes other medicines that increase serotonin, eg antidepressants (page 274)

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, fast and/or irregular pulse, high BP, disturbed BGL
- 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 (page 275)

Chronic toxicity

- Skin sores and scabs from scratching
- 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

Management of stimulant withdrawal

- Withdrawal usually takes 7–15 days
- Withdrawal depression can lead to thoughts of suicide, self-harm

Table 5.6 Stimulant withdrawal

Time since last use	Common symptoms
1–3 days Comedown or 'crash'	• Exhaustion, increased sleep, lack of energy • Depression, poor appetite, poor fluid intake • Restlessness, irritability, aggression
2–10 days Withdrawal	• Strong urge to use stimulant — may use other substances — alcohol, opiates or 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	• Mood swings from irritability to feeling flat/depressed • Disturbed sleep • Cravings still present • Appetite increased • Feeling bored
1–3 months	• 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 — 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 the person harm
- Other drugs used — prescribed, legal, illegal
- Existing mental illness
- Thoughts of self-harm or suicide

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A — positive blood may mean muscle break down
- Urine drug screen if drug use unclear — results may take weeks. Still important for long term management
- Coma scale score (page 100), pupil size
  - Head-to-toe exam — with attention to hydration, head injury (page 98), infection from IV drug use (eg endocarditis, encephalitis)

Do

- **Medical consult**
  - If marked agitation, insomnia, aggression — give **diazepam** oral — adult 10mg hourly up to 40mg/day until sedation score 1 (page 330) (a bit sleepy but easy to rouse)
  - If psychotic features — give **olanzapine** oral — adult 5–10mg/dose up to 20mg/day
- Use calming techniques (page 121)
- Maintain nutritional status, fluid balance
- If BGL less than 4mmol/L — see Hypoglycaemia (page 118)

Follow-up

- Refer to alcohol and drug service, mental health service for support
- Make management plan, provide brief intervention

Cannabis

- Also called marijuana, gunja, yarndi, dope, pot, weed
- Commonly mixed with tobacco

Synthetic cannabis is not a cannabinoid related chemical. It may cause severe toxicity and stimulant effects — agitation, paranoia, psychosis, seizures, hyperthermia.

Effects of cannabis

- Cannabis and tobacco smoke damage lungs, reduce physical fitness
- Worse if smoked together or inhaled through water (bong)

Vulnerable populations

- Existing mental health condition — may make symptoms worse or reduce response to medicines — see Mental health emergency (page 121) and Mental health assessment
- Pregnant — increased risk of low birth weight babies, risk of neonatal withdrawal syndrome — see Postnatal care of baby (WBM, page 223) and Brief interventions
- Young people are at risk of greater harm — leaving school, homelessness, social vulnerabilities

Cannabis hyperemesis syndrome

- Occurs in regular daily long term user
- Causes nausea, vomiting, abdominal cramps — partially relieved by hot showers
- May be severe and cause dehydration and electrolyte disturbance
- Usually resolves in days when stop cannabis use but likely to recur if cannabis used again

Intoxication

- Relaxed, happy
- Confused or aggressive
- Reduced coordination and driving impairment
- Panic, feel anxious or paranoid (everyone is against them)
- Cannabis hyperemesis syndrome

Acute psychosis

- Have delusions (believe things that are not true), hallucinations (see or hear things that are not there), strange/disorganised thoughts or behaviour
- 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

Do

- All cannabis users should be offered help to stop — see Brief interventions
- 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

- When person who is dependent stops or cuts down they may get withdrawal symptoms — trouble sleeping, cranky feelings, hostility
- Can start within 24 hours of stopping use. Peaks around 4–10 days, last several weeks
- May increase risk of violence, self-harm, suicide
- Can cause cannabis hyperemesis syndrome
- Cannabis users may also have tobacco dependency (page 294)
- Gradual reduction of cannabis use can be effective in stopping use without need for medicine
- If pre-existing psychotic illness — usual antipsychotic medicine may need to be adjusted

Do

- **Medical consult** about medicines — give until agitation settled and review daily
  - **Diazepam** oral — adult 5–10mg/dose up to 20mg/day
  - Avoid using diazepam daily for more than 1 week — may lead to tolerance/dependence
  - If agitation not settled by diazepam — give **olanzapine** oral — adult 5–10mg/dose up to 20mg/day
  - **Antiemetic** for nausea or vomiting — see Nausea and vomiting (page 418) — check for signs of dehydration and low potassium
- Make management plan
- Refer to drug and alcohol service or mental health team for support

Kava

- Depressant substance made from kava shrub
- Made into a drink used in Top End communities. Less commonly ingested as a processed powder, in capsules or an extract
- Causes a type of drunkenness and can cause health problems
- 1–2 months after stopping kava use
  - Skin and liver problems usually return to normal
  - Underweight people tend to regain lost weight if nutrition and oral intake is adequate

Intoxication (being drunk on kava)

- 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
- Kava dermatitis (dry scaly skin) — '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 — see Melioidosis (page 415)
- May worsen mental health illness — symptoms of depression

Ask

- How often is kava used
- How many people is it shared with

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Blood for FBC, LFT
- Adult Health Check (page 222) and immunisations status
- Head-to-toe exam — attention to skin

Do

- Talk with kava drinkers about
  - If heart disease or pregnant — cut down or stop drinking kava
  - Increased risk of infections
  - Mixing kava with alcohol (grog), benzodiazepines, other depressant drugs can be dangerous
  - Advise to cut down or stop
- Give moisturiser for dermatitis (‘crocodile skin’)

Opioids

- Opioid withdrawal is usually not life threatening — opioid toxicity and overdose is life threatening
- Use of opioids is increasing — typically prescribed or non-prescribed pharmaceutical opioids, eg paracetamol+codeine, oxycodone, morphine, tramadol
- **Chronic use will result in dependence**
- In remote areas opioids usually taken orally but may be smoked or injected
- Regular use of opioids in pregnancy may cause serious harm to foetus — withdrawal, potential effects on neural development of long term exposure
- Use in the mother during labour can result in suppression of babies respiration at birth

Red Flags — Urgent Medical Consult

- Opioid intoxication
- If person asks for opioid medicines prescribed elsewhere
- If person seeking opioid medicines with possible dependence issues
- Withdrawal in pregnant woman

Effects of opioids

- Pain relief
- Calm, decreased anxiety, some euphoria
- Strong respiratory system depressant
- Slows bowel and causes constipation

Table 5.7

Opioid intoxication (overdose)	Opioid withdrawal
• Drowsy • Slow RR, low BP, pinpoint pupils • Unconscious, respiratory arrest	• Restless, agitated, irritable • Pupils dilated, high BP, fast pulse • Runny nose, sneeze, goose bumps • Muscle ache, stomach ache, diarrhoea

Do first

- **If unconscious** — DRS ABC *AND* give **naloxone** IM — adult 0.4mg, single dose
- If naloxone given — monitor in clinic for 4 hours
  - May need repeated naloxone doses until more awake and breathing adequately
  - Giving naloxone may cause rapid reversal of overdose and trigger aggressive behaviour — have 2 staff members with person
  - Naloxone only works in the body for 30 to 90 minutes — after initial recovery, loss of consciousness may return and further treatment with naloxone is needed

Ask — person, family or friends

- What has person taken and how — tablets, injection, smoking
- When did they last have it — day/date and time
- How often and how much used
- Other drugs used — prescribed, legal, illegal
- Existing physical and mental illness — thoughts of self-harm or suicide
- Who is their usual prescriber

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A — positive blood may mean muscle break down
- Urine drug screen if drug use unclear — label opioid use
  - Results make take weeks. Still important for long-term management
- ECG and Coma scale score
- Head-to-toe exam — with attention to pupil size

Do

- Be calm, supportive, reassuring — explain what is happening to them and what you are doing
- **Medical consult**

Give medicines as needed

- Opioid medication is not necessary to manage acute withdrawal. Treat symptomatically for 3–5 days.
- Adult doses
  - **Paracetamol** oral — 1g, up to 4 times a day (qid)
  - **Antiemetic** for nausea or vomiting — see Nausea and vomiting (page 418)
  - **Loperamide** oral — adult 4mg, single dose for diarrhoea *THEN* **loperamide** oral — 2mg after each bowel action, up to 16mg/day
  - Muscle ache — **ibuprofen** (if no contraindications) oral — 200mg, 3 times a day (tds)
  - Abdominal cramps — **hyoscine butylbromide** oral —10mg, 3 times a day (tds)

Follow-up

- Refer to drug and alcohol service, mental health service if needed
- Notify usual opioid prescriber of any opioid overdose episodes
- Make management plan. Provide Brief interventions

If person asks for opioid medicines prescribed elsewhere — you must

- Follow your organisation's policy about supply
- **Medical consult** — doctor to check Prescription Shopping Alert Service
- Contact current prescriber to obtain medical history, reason for using opioids, current dose and usual collection site

If person seeking opioid medicines with concerns raised of dependence issues

- **Medical consult** or get advice from Drug and Alcohol Clinical Advisory Service

Tobacco

- Can be inhaled, chewed or put behind ear (topical skin absorption) — including native tobacco, eg pitchuri, mingkulpa
- E-cigarettes deliver vapour which may or may not include nicotine — can be prescribed for smoking cessation after recommended smoking cessation medicines (NRT, varenicline, bupropion) have failed. Long-term safety is unclear
- 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

Pregnant or breastfeeding women

- Smoking causes major problems for baby
- Try non-medicine approaches first
- **Medical consult** for risk-benefit assessment of short-acting NRT products — gum, lozenges, inhalator
- **Do not** use other 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

Assist with stopping smoking

Ask

- For all patients record at least past 10 years of smoking status — current smoker, ex-smoker (when quit), never smoked
- Assess dependence — smoking within 30 minutes after waking, more than 10 cigarettes a day, withdrawal irritability in previous attempts

Do

- Brief interventions
- Counselling and support — eg Quitline. Aboriginal counsellors available
- Consider nicotine replacement therapy (NRT) or medicines to reduce urge to smoke

Follow-up

- Make management plan
- Talk with person about relapse prevention — action strategies to prevent starting tobacco use again, eg Tackling Aboriginal Smoking (TIS) programs, QUIT program
- Offer resources — Remote AOD Program (Yarning about tobacco)

Medicines to help quitting

- Many people prefer to 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
- Can use after urge reduction medicines to prevent relapse
- Offer oral intermittent NRT (not patches) to all pregnant or breastfeeding women who are interested in using them

Nicotine patches

- Available over the counter or on PBS — prescription with commitment to quit smoking counselling program (eg Quitline), for up to 12 weeks
- Only if person **regularly** smokes more than 10 cigarettes per day — start 21mg/24 hours
- If irregular smoker but potentially averaging 10 or more cigarettes a day — can try lower dose patch 14mg/24hours with gum or lozenges
  - If less than 10 per day — use gum or lozenges only
- 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

Oral NRT

- Available over the counter and available on prescription with commitment to counselling
- Nicotine absorbed by buccal mucous membrane (of mouth)
- **Do not** eat or drink while using — reduces absorption
- More suitable for low dependence or occasional smokers
- To be used **before** cravings start

Nicotine gum

- Assess dental health
- 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
  - **Do not** swallow gum
  - **Do not** chew gum all the time
  - Use only when needed
  - Chew slowly until peppery taste then rest inside cheek until taste fades
  - Chew and rest each piece of gum for 20–30 minutes

Nicotine lozenges

- **Do not** chew or swallow whole
- 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

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

Nicotine spray

- 1mg nicotine spray
- Spray into mouth — nicotine absorbed through mouth lining
- Use 1–2 sprays when cravings — up to 4 sprays per hour

Urge reduction medicine

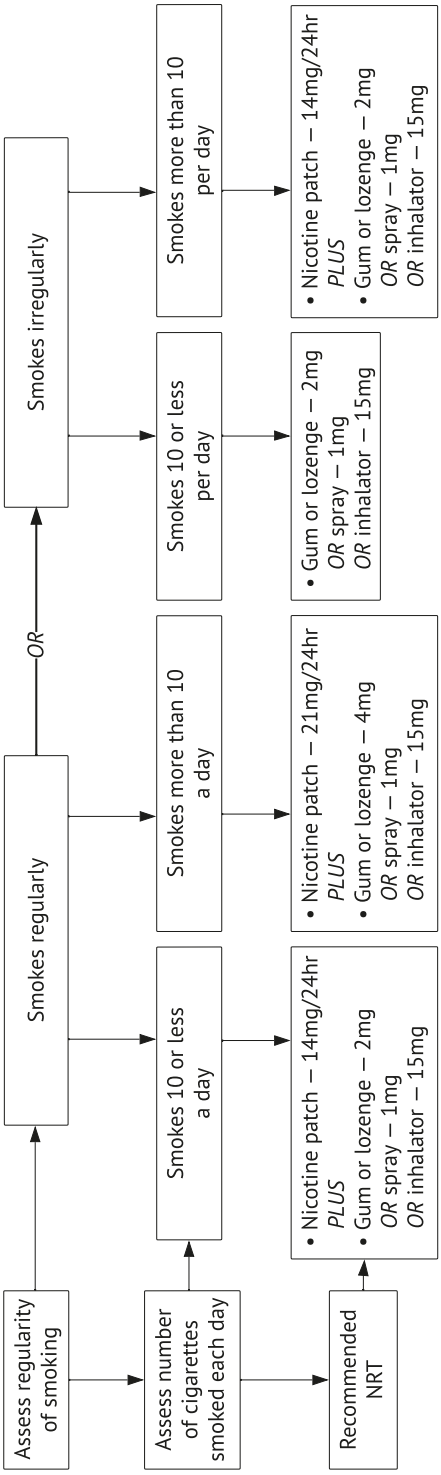
Varenicline reduces desire to smoke

- **Medical consult** before giving **varenicline**
- **Do not** use if pregnant, breastfeeding, under 18 years
- Need authority prescription with commitment to quit smoking counselling program, eg TIS programs, 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
- Nausea — minimised by taking with food or reducing dose
- Other side effects decrease with time — sleep disturbance, unusual dreams

Supporting resources

- Tackling Aboriginal smoking website
- Deadly choices quit smoking resources

Flowchart 5.1 NRT initial dosage guideline



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 brain — intoxicating effect is short (minutes) so use is typically repeated over several hours
- No safe level of volatile substance use
- You must know reporting requirements under your state/territory legislation

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
- **Central nervous system** — fits, poor memory, poor coordination, mood swings, irritable, depressed, brain damage, peripheral nerve damage
- **Psychosocial** — learning difficulties, behavioural problems in school, family stress
- **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
- **Signs of use** — loss of vision and smell, sores around mouth and nose

Do not

Do not grab, scare, chase person — may stress heart if weakened by volatile substance misuse

Make sure you and person are safe

- Ensure a quiet, calm environment for assessment and care
- **If person intoxicated — observational assessment only**
- See Mental health assessment 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

3 main problem areas

- Physical sickness, injury
- Fits
- Self-harm or aggressive behaviour

Ask

- Identify substance used — opal fuel, unleaded fuel, deodorant, lighter fluid, glue, paint, other aerosols
- Medicines, other drug use
- Pregnancy
- Physical illness — include diabetes (page 246), RHD (page 342), chronic lung disease (page 437)
- Thoughts or ideas of suicide (page 121) or self-harm
- Frightened, worried, seeing or hearing things

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- ECG
- Coma scale score (page 100) If less than 14 — check regularly
- Head-to-toe exam — with attention to
  - dehydration, injuries, burns (page 55), meningitis (page 126), head injury (page 98), chest infection (page 432), breathing problems (page 15), fits (page 76), poisoning (page 132)

Do

- Stay calm, supportive and explain what is happening
- If seeing or hearing things that are not present — see Psychosis (page 276)
- If severe behaviour — see Mental health emergency (page 121)
- Contact family/carer
- If person can swallow safely — give water and ask family to give them food
- Monitor person for 2–4 hours until stable

If very restless, aggressive, family having trouble — **medical consult** for

- **Diazepam** oral — adult 5–10mg/dose up to 40mg/day with one repeat at maximum 30 minute interval
  - For child dose — **medical consult**
- If psychotic features — consider olanzapine oral — adult 5–10mg/dose up to 20mg/day with one repeat at maximum 30 minute interval
  - For child dose — **medical consult**

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 giving medications for use at home — ensure someone else can vouch for their safe keeping and administration
- Plan follow-up with family and medical officer

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 for ongoing care and progress review — may need residential rehabilitation
  - Provide brief intervention , relapse prevention for quitting
  - Consider causes for episode/s — include child neglect and abuse (page 153), domestic and family violence (page 71), and safety concerns
  - Consider cognitive assessment (page 360), suicide risk assessment (page 121)
- If baby born to mother who used volatile substances while pregnant — baby needs referral to paediatrician

Supporting resources

- Volatile substance abuse prevention Act (NT)

6. Sexual health

STI checks for young people

Sexually-active young people are at high risk of STIs and are generally under tested

- 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
- Actively screen sexually active young people for STIs even if in a 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 Child neglect, abuse and cumulative harm (page 153)

If you suspect sexual abuse or reportable sexual activity, as defined by your state/territory legislation — you must notify child protection

- **Medical consult**
  - Doctor will advise about STI testing and may talk with child protection service or sexual assault referral centre

Before testing

- If under 14 years — **medical consult**
- If under 16 years — you must obtain consent from parent/carer or assess whether to treat as competent minor (page 136)
- If not able to obtain consent or unresolved child protection issues — **medical consult**
- Explain the importance of doing STI test
  - Most STIs are easily treatable
  - Health consequences of STIs
- Explain you need to report to child protection service if
  - Under certain age — defined by state/territory legislation
  - Positive results depending on age — defined by state/territory legislation
  - Safety concerns

Do

- If 14 years or over and issues of consent and child protection have been addressed — offer STI check men (page 305), women (WBM, page 246)
  - After doing STI check tell young person to come back for results
- Report any identified issues to child protection service — Do not wait for STI results before you report

Discuss

- Treatment needed if positive result
- Safer sex and contraception
  - Are the responsibility of both partners
  - Offer condoms
- Consent and healthy intimate relationships
  - Your body is your own
  - Sexual activity occurs *with* someone not *to* someone
  - Consent must be freely given, informed and mutual
  - Consent between partners must be given each time and a person can always change their mind during sex
- Protective behaviours if you suspect harm or power imbalance — see School-aged and young person's health check (page 146)
  - Help person to identify safe people in their life

Follow-up

- **Medical consult**
  - Contraception (WBM, page 331)
  - Treatment
  - Contact tracing (page 316) — may find other young people at risk of STIs and/or child protection issues
- If under 14 years and positive STI result — repeat notification to child protection service
- 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 (page 305), women (WBM, page 246)
  - See STI management — men (page 309), women (WBM, page 255)

STI checks for men

- If woman — see STI checks for women (WBM, page 246)
- If 14–18 years — first see STI checks for young people

STIs are under-diagnosed and often missed as many men have no symptoms or minor symptoms that clear quickly

- STIs can be at any age but are more common under 35 years
- STI checks routinely recommended in 15–34 year age group
  - If under 14 years — see Child sexual abuse
  - If 14-18 years — first see STI checks for young people (page 303) and consider consent (page 136) and child protection issues
- Times to offer an STI check include
  - Offer opportunistic Standard STI check every 6 months (twice a year) and use a recall system
  - As part of another consultation
  - As part of Adult Health Check
  - If symptoms and risk factors suggest STI
  - If asked for by person, even if not long since last check
  - Opportunistically if 15–34 years, especially if from outside the community
  - During community-wide screening and during outbreaks

Risk factors for STIs

- Living in a community with high STI rates
- Age
  - High risk — sexually active under 35 years
  - Highest risk — sexually active under 25 years
- STI in past 12 months
- New sexual partner in past 3 months and/or 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
- Behavioural risk factors — person or their partner is a man who has sex with men, is transgender/sister-girl, from overseas or person who injects drugs

Types of STI checks for men

- **Standard** — pathology testing with no detailed history or examination
- **Full** — pathology testing plus history and examination, contact tracing

Point of care (POC) testing for STIs

- POC testing for chlamydia/gonorrhoea/trichomonas is available in some clinics
- POC and laboratory tests are completed on the same collection site (single urine sample is usually enough volume for all tests, additional POC swabs are required for other sites)
- **Always do** syphilis serology and other laboratory tests regardless of POC result
- Syphilis POC testing is only suitable in restricted situations and can only be carried out by trained operators — refer to your health service guidelines or a trained colleague

Standard STI check

Indications

- Opportunistic
- Adult Health Check (page 222), yearly STI check, community screening
- 3 month re-test following a positive test result

Do

- Ask about symptoms, eg discharge from penis or pain on passing urine (page 323), sores/ulcers (page 319)
  - If symptoms — see relevant protocols
- Urine — request
  - NAAT for chlamydia, gonorrhoea *AND* if in Northern Territory — trichomonas
  - Gonorrhoea culture
  - Also do POC Test if available
- Take blood for HIV serology and syphilis serology
  - Also do syphilis POC Test if indicated
- If hepatitis B status unknown or not immune (no evidence of previous infection or immunisation) — HBsAg, Anti-HBc, Anti-HBs
- Tell man to come back for results from laboratory or POC Test

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

Follow-up

- If any positive result — do the rest of Full STI check (page 307) 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

Indications

- Symptoms including discharge, pain on passing urine, sores
- Asks for check
- Positive result from Standard STI check — for additional assessment
- Contact (partner) of someone with an STI (page 316)

Ask

- Discharge from penis
- Pain on passing urine
- Sores, rash, lumps on genitals
- Any other symptoms or concerns
- Sexual partners
  - Regular/casual partners. Do they have other partners
  - New partners in past 3 months
  - Number of partners in past 6 months
  - Other men

Check

- File notes
  - Date and results of last STI check
  - Treatment offered and completed
  - Hepatitis B status
- Head-to-toe check — with attention to
  - 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 (page 319)

Collect — for all men

- Urine — request
  - NAAT for chlamydia, gonorrhoea, trichomonas
  - Gonorrhoea culture
  - Also do POC Test if available

- Blood for HIV serology, syphilis serology
  - Also do syphilis POC Test if indicated
- If discharge — penile swabs × 2 (NAAT and MC&S) — ideally before collecting urine
- If Hepatitis B status unknown or not immune (no evidence of previous infection or immunisation) — blood for HBsAg, Anti-HBc, Anti-HBs
- If urinary symptoms and 45 years or over
  - Mid-stream urine
  - *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
  - Request — NAAT for herpes, syphilis, donovanosis
- If man has sex with men — anal swab × 2 *AND* throat swab × 2. Request
  - NAAT for chlamydia, gonorrhoea
  - Gonorrhoea culture

Do

- **If symptoms of STI — offer immediate treatment of symptoms**
  - If pain or discharge — see Discharge from penis and dysuria (pain passing urine) (page 323)
  - If sores or ulcer — see Genital ulcers and lumps (page 319)
- In communities with high STI rates — think about presumptive treatment (immediate treatment even if no symptoms). Treat for gonorrhoea (page 310) (will also treat chlamydia) if
  - Asks for treatment or thinks he has put himself at risk
  - At high risk and unlikely to return for results
  - 15–34 years with leucocytes 1+ or more in urine
- Ask for names of partner/s for contact tracing (page 316) if syndromic or presumptive treatment given or if pathology positive
- If behavioural risk factors for HIV (page 305) consider medical consult for PrEP (page 315)
- Offer STI and safer sex education (page 318)
- Tell man to come back for results

Follow-up

- If positive results — see STI management (page 309)
- 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 management

Get help and advice from local ATSIHPs, health council or respected community members about doing STI work in culturally sensitive way

- Offer treatment **as soon as possible** to prevent complications and stop spread
- If person has symptoms and/or syndromes likely to be caused by an STI, or has put themself at risk — treat straight away — do not wait for laboratory or POC Test results
- See individual protocols
  - Genital ulcers and lumps (page 319)
  - Discharge from penis and dysuria (pain passing urine) (page 323)
  - Testicular pain (page 483)
  - Vaginal discharge (WBM, page 264)
  - Pelvic inflammatory disease (WBM, page 272)
- Treat people with positive pathology and their named partners and contacts (page 316)
- If positive result on Standard STI check or individual test — do remaining checks to complete Full STI check — men (page 305) or women (WBM, page 246)

Red Flags — Urgent Medical Consult

- Syphilis in pregnancy
- HIV in pregnancy
- Pregnant woman with positive STI test *AND* previous premature rupture of membranes, preterm labour, low birth weight baby (under 2.5kg)

Positive pathology results

Chlamydia

- Notifiable disease — follow local protocols and check with sexual health unit if more information needed
- If woman has positive test result — always ask about symptoms of PID (WBM, page 272)
  - Lower abdominal pain is not a normal symptom of uncomplicated chlamydia

Do

- For genital or oral infections — give **azithromycin** oral — adult 1g, single dose

- For anal (anorectal) infections — give **doxycycline** oral — adult 100mg, twice a day (bd) for 7 days
- Contact trace (page 316) and treat partners with same treatment
- Arrange recall for re-test in 3 months — 4 weeks if pregnant
- Advise not to have sex for 7 days after person and partners treated
- Offer condoms, STI and safer sex education (page 317)
- Consider talking about contraception (WBM, page 331)

Follow-up

- Re-test in 3 months — Standard STI check — men (page 305), women (WBM, page 246)
- For anal chlamydia infections — repeat anal swab NAAT test 4 weeks after treatment is completed
- Check HIV and syphilis serology done
- Urine NAAT can still be positive for 4 weeks after treatment

Pregnancy considerations

- Re-test after 4 weeks — send urine or low vaginal swab for NAAT
- **High priority** for contact tracing (page 316) and coordinated treatment of woman and partners, at same time if possible

Gonorrhoea

- Notifiable disease — follow local protocols and check with sexual health unit if more information needed
- If woman has positive test result — always ask about symptoms of PID (WBM, page 272)
  - Lower abdominal pain is not a normal symptom of uncomplicated gonorrhoea

Do

- If person and **all** partners for last 3 months from area with penicillin SENSITIVE gonorrhoea — Table 6.1
  - Give **azithromycin** oral — adult 1g, single dose
    AND **amoxicillin** oral — adult 3g, single dose
    AND **probenecid** oral — adult 1g, single dose
  - If allergy to penicillin — **sexual health consult**
- If person and/or **any** partner for last 3 months from area with penicillin RESISTANT gonorrhoea *OR* partners unknown — Table 6.1
  - Give **azithromycin** oral — adult 1g, single dose
    AND **ceftriaxone** IM — adult 500mg, single dose mixed with **lidocaine (lignocaine) 1%**
  - If allergy — **medical consult**

- If anal gonorrhoea — regardless of geographical area
  - Give **azithromycin** oral — adult 1g, single dose
    AND **ceftriaxone** IM — adult 500mg, single dose mixed with **lidocaine (lignocaine) 1%**
  - If allergy — **medical consult**
- If oral gonorrhoea — regardless of geographical area
  - Give **azithromycin** oral — adult 2g, single dose
    AND **ceftriaxone** IM — adult 500mg, single dose mixed with **lidocaine (lignocaine) 1%**
  - If allergy — **medical consult**

- Contact trace (page 316) and treat partners with same treatment
- Arrange recall for re-test in 3 months — 4 weeks if pregnant
- Advise no sex for 7 days after person and partners treated
- Offer condoms, STI and safer sex education (page 317)
- Consider talking about contraception (WBM, page 331)

Table 6.1 Geographical treatment areas for gonorrhoea

Type of gonorrhoea	Geographical area
Penicillin SENSITIVE	• The Kimberley, Goldfields, Midwest and Pilbara regions of WA
Penicillin RESISTANT	• All of the NT • All other areas except those mentioned above
Call your local communicable disease unit for more information	

Follow-up

- Re-test in 3 months, 4 weeks if pregnant — Standard STI check men (page 305), women (WBM, page 246)
- If anal, oral or cervical infection — 'test of cure' by NAAT 2 weeks after treatment
- 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 (page 316) and coordinated treatment of woman and partners, at same time if possible

Genital herpes

- See Genital ulcers and lumps (page 319)

Donovanosis

- Notifiable disease — follow local protocols and check with sexual health unit if more information needed
- Donovanosis sores are usually a red, beefy, raised, raw, painless ulcer
  - In early stages a small sore may look like primary syphilis
  - Sores won't go away without treatment. Will slowly get larger

Do

- Give **azithromycin** oral — adult 1g, once a week for 4 weeks
- Check sores each week when giving medicine
  - If not healed after 4 weeks — **medical consult**
  - Continue azithromycin oral — adult 1g, once a week until healed
  - If not improving — may need biopsy to test for cancer
- Contact trace and treat partners with same treatment
- Offer condoms, STI and safer sex education (page 317)
- Advise no sex for 7 days after person and partners treated
- Consider talking about contraception (WBM, page 331)

Follow-up

- Check 3 months after sores completely healed — to make sure sores haven't come back

Pregnancy considerations

- **Medical consult**

Syphilis

- Notifiable disease — follow local protocols and 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 is 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 or congenital syphilis in baby

Primary syphilis

- 1 or 2 chancres (ulcers, usually painless) in genital and/or anal area or mouth
  - Usually red and round with firm rolled edge, base clean
- Sore goes away in 4–6 weeks without treatment but syphilis still in blood

Secondary syphilis

- Condylomata lata (fleshy, moist, wart-like lesions in genital or perianal area)
- May also have
  - Skin rashes — especially palms of hands, soles of feet
  - Patchy hair loss including outer eyebrow, beard
  - Oral lesions — ulcers, mucous patches
  - Swollen lymph glands all over body
  - Liver and/or spleen enlargement

Tertiary syphilis

- Dementia or change in personality
- Shooting pain, numbness, pins and needles
- Weakness of hands, arms, legs, gait (unusual way of walking)
- Cranial nerve palsy (problems with nerves of head and face), abnormal pupil reactions
- Deafness that is new
- Eye problems, eg retinal disease, uveitis, iritis
- Aortic incompetence (heart valve weakness)
- Dilation (widening) of ascending aorta on x-ray or echocardiogram

Do

Syphilis treatment depends on how long person has been infected — sexual health unit or syphilis register can give history and advice on management

- Take blood for syphilis serology **just before** starting treatment for accurate pre-treatment baseline RPR level
- If known to be less than 2 years
  - Give **benzathine benzylpenicillin** (Bicillin L-A) IM — adult 2,400,000 units/4.6mL (1.8g) (2 × 2.3mL syringes), single dose
  - If allergy to penicillin — **sexual health consult**
- If unknown or known to be more than 2 years
  - Give **benzathine benzylpenicillin** (Bicillin L-A) IM — adult 2,400,000 units/4.6mL (1.8g) (2 × 2.3mL syringes), once a week for 3 weeks
  - If more than 7 days between injections — talk with sexual health unit or syphilis register — may need to start course again
  - If allergy 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 (page 316) and treat partners with same treatment — very important if newly infected. Get advice from sexual health unit
- Advise no sex for 7 days after person and partners treated
- Offer condoms, STI and safer sex education (page 317)
- Consider talking about contraception (WBM, page 331)

If recent syphilis — often harmless febrile reaction to treatment (Jarisch-Herxheimer) — starts in 3–4 hours and gets better within 24 hours
- Give **paracetamol** (page 327) — adult 1g up to 4 times a day (qid)

Follow-up

- Check syphilis serology again at 3, 6 and 12 months after base line RPR and first treatment
- Advise syphilis register of treatment given and contacts — ask local PHU for number
- Contact Syphilis Register or PHU for reinfection or treatment failure if
  - RPR increases following treatment
  - RPR does not fall 4-fold and below 1:16 within 6 to 12 months

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
- Late latent syphilis (infection more than 12 months ago) can sometimes be transmitted to baby
- **High priority** for contact tracing (page 316) and coordinated treatment of woman and her contacts

Trichomonas

- Notifiable disease in the Northern Territory — follow local protocols and check with sexual health unit if more information needed

Do

- Give **metronidazole** oral — adult 2g, single dose

OR **metronidazole** oral — adult 400mg, twice a day (bd) for 7 days — best for breastfeeding. Take after baby fed

- Contact trace (page 316) and give partners same treatment
- Advise no sex for 7 days after person and partners treated
- Offer condoms, STI and safer sex education (page 317)
- Consider talking about contraception (WBM, page 331)

Follow-up

- Re-test in 3 months — Standard STI check — men (page 306), women (WBM, page 246)
- Check HIV and syphilis serology done

Pregnancy considerations

- If asymptomatic — consider delaying treatment until after first trimester
- Treatment same as for non-pregnant woman

Mycoplasma genitalium

- Treatment varies — **medical consult** or contact sexual health unit

HIV

- Notifiable disease — HIV management is 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
- HIV pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) are available

Do

- Follow advice from sexual health unit and local protocols where appropriate
  - Aim to start treatment early
- Continued involvement of primary care services is important. Usually involves
  - Managing and monitoring antiretroviral medicines
  - Contact tracing and management of contacts (page 316)
  - STI and safer sex education (page 317)

Pregnancy considerations

- Anti-HIV treatment can keep woman healthy during and after pregnancy and reduce the risk of transmission to baby — almost completely if started early enough
- If woman HIV positive — **urgent medical consult** — urgent referral to sexual health or infectious disease specialist to develop comprehensive management plan
  - Maintain confidentiality
  - Provide education and support about lifestyle factors such as diet, exercise and stopping smoking, alcohol and use of other substances
- Most women can have vaginal birth — elective caesarean section is rarely recommended
- Talk with sexual health unit or infectious specialist at PHU about individual breastfeeding plan

Non STI results

- If MC&S results report candida (thrush) or bacterial vaginosis — see Vaginal discharge (WBM, page 264)

Contact tracing

- Contact tracing is important to manage all STIs — critical for syphilis, HIV and any infection during pregnancy
- 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

Ask

- 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

Asking about partners

- Ask about all sexual partners in last 3 months
- Explain if partners 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 contacts
- Make sure you know how to find the person again if needed

Do

- Document details of contacts — DOB or approximate age and address — use appropriate confidential process for your area
- Hand over contact information confidentially to a staff member who can begin treatment of contact — this needs to occur quickly
- Advise no sex for 7 days after index and contacts are treated
- Offer condoms
- If contact treated more than 7 days after index and reinfection is possible — re-treat index if able

Follow-up of partners

- Talk with ATSIHPs about the best way to do this 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
- Do Full STI check — men (page 307), women (WBM, page 246)

- Treat straight away — Table 6.2 — without waiting for laboratory or POC Test results. Even if STI check declined
- Offer STI and safer sex education (page 317)

Table 6.2 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
HIV	Post-exposure prophylaxis (PEP) can be offered
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

STI education

- What STIs are, why they matter and how to protect themself
- How you get one, signs and symptoms, asymptomatic infections
- Need to test for reinfection in 3 months
- Get STI check
  - If under 35 years — every 6 months (twice a year)
  - Straight away if they have unsafe sex, symptoms of an STI
- Important to treat sexual partners from past 3 months
  - To prevent reinfection — no sex or use condoms for 7 days after person and partners 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 education

- 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

Condom education

- Only contraceptive method that protects against most STIs
- Show them how to use a condom
- Offer condoms to take away. Talk about where they can get more

Supporting resources

- Mycoplasma genitalium guidelines
- Australian STI management guidelines for use in primary care

Genital ulcers and lumps

Red Flags Urgent Medical Consult	Medical Consult
• Syphilis in pregnancy	• Any STI in pregnancy • Herpes in pregnancy

Causes

- Herpes — most common
- Syphilis
- Genital warts
- Bartholin's cyst (WBM, page 319)
- Molluscum contagiosum (page 457)
- Local injury from scratching, eg scabies, lice, bad thrush
- Donovanosis — rare
- Cancer — if not better after 4 weeks — **medical consult**, may need biopsy

Ask

- How long have they had sores, are they getting worse
- Have they had sores like these before
- Are sores painful
- Do sexual partners have sores

Check

- Full STI check — men (page 307), women (WBM, page 246)
  - Type of sore — single, multiple, tender, painless, hardened
  - Enlarged lymph nodes near sores

Do

- Full STI check must include syphilis serology *ALSO* syphilis POC Test if available
- Swab sores — NAAT for herpes, syphilis, donovanosis
- Treat straight away — do not wait for test results
  - If multiple recent small painful vesicles (blisters) — treat as herpes (page 321)
  - All other genital sores or ulcers — treat as syphilis and donovanosis (page 320)
- STI and safer sex education (page 318) at first visit

- Consider discussing contraception (WBM, page 331)
- Advise that having sex before sores have healed completely may delay healing and give infection to partners
  - If no sores wait until 7 days after treatment and until partner is treated before having sex

Follow-up

- Review at 1 week
  - Check if symptoms resolved
  - If sores not healed, no cause found — **medical consult** and add recall for 4 week review

Syphilis and donovanosis

Do if pregnant

- **Medical consult** — this is an STI emergency

Do

- Take blood for syphilis serology **before** starting treatment for accurate baseline (pre-treatment) RPR level
- Give **benzathine benzylpenicillin** (Bicillin L-A) IM — adult 2,400,000 units/4.6mL (1.8g) (2 × 2.3mL syringes), single dose — to start treatment for syphilis
  - If allergy to penicillin — **medical consult**
- If donovanosis suspected — **sexual health consult**
- Contact tracing (WBM, page 246) — very important if you suspect new syphilis infection. Get advice from sexual health unit
- Talk about STIs and safer sex

If recent syphilis — often harmless febrile reaction to treatment (Jarisch-Herxheimer) — starts in 3–4 hours and gets better within 24 hours
- Give **paracetamol** (page 327) — adult 1g up to 4 times a day (qid)

Follow-up

- Review at 1 week
  - Check test results. If positive — see STI management (page 309)
  - If ulcer not healing and tests negative — **medical consult** and 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
- Infection with both herpes and syphilis possible

Do

- Keep sores clean with **normal saline** washes
- Give pain relief (page 326) — can put **lidocaine (lignocaine) gel** on sores
- If kidney disease — **medical consult**. May need lower doses of antivirals

First episode

Can be severe. Lasts 2–3 weeks

- Full STI check (page 307) if not done previously — must include syphilis serology
- Medicines are most helpful if blisters present for 3 days or less
  - Give **valaciclovir** oral — adult 500mg, twice a day (bd) for 5–10 days
- Review at 1 week
  - Positive herpes NAAT confirms genital herpes
  - Negative herpes NAAT does not exclude genital herpes — ask to return for another swab if sores come back

Recurrent episodes

Usually less severe. Lasts 1 week or less

- Medicines are most helpful if given before or on the first day blisters appear
  - Give **valaciclovir** oral — adult 500mg, twice a day (bd) for 3 days

OR **famciclovir** oral — adult 1g, twice a day (bd) for 1 day

- 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 —may 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 **valaciclovir** oral — adult 500mg, twice a day (bd) for 5 days
- If recurrent episode — give **valaciclovir** oral — adult 500mg, twice a day (bd) for 3 days
- If severe episode — **medical consult** to send to hospital
- Advise woman with no history of herpes but whose partner has history of herpes to avoid sex (including oral 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 foetal monitoring and instrument delivery

Genital warts

Painless, solid lumps with hard smooth surface or cauliflower-like appearance. May look like condylomata lata (secondary syphilis) (page 312)

Do not

- **Do not** treat as genital warts until secondary syphilis is excluded
- **Do not** give podophyllotoxin if woman is *OR* could be pregnant *OR* is breastfeeding

Do

- If first episode — **medical consult**
- Give **podophyllotoxin 0.5% solution** 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 the medicine
  - Use cotton swab or applicator for lotion
  - Wash hands straight away
  - Only put on wart — can burn skin and cause ulcers
- If not improving — **medical/sexual health consult** about other treatments
- If pregnant or if warts are large, inside vagina or lots of warts — **medical consult**

Discharge from penis and dysuria (pain passing urine)

- Urethral discharge is almost always caused by STI
- Dysuria (pain on passing urine) is most likely due to an 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
- Is there pain when passing urine, discharge from penis
- Is scrotum painful (page 483) or swollen
- Other STI symptoms
  - Sores, blisters, lumps, rashes in genitals
  - Swollen lymph nodes, sore throat, rash, hair loss
- About sexual partners — any from geographical area with penicillin resistant gonorrhoea (page 311)

Check

- Full STI check (page 307) — with attention to
  - Skin and mouth sores, inflammation
  - Lymph nodes in neck, armpits, groin
  - Genitals, and anal area — for sores, blisters, lumps, painful or swollen scrotum

Do

- Treat for both gonorrhoea and chlamydia. Presentations are 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 (page 311)
  - Give **azithromycin** oral — adult 1g, single dose
  - *AND* **amoxicillin** oral — adult 3g, single dose
  - *AND* **probenecid** oral — adult 1g, single dose
- If man and/or any partner in last 3 months from geographical area with penicillin RESISTANT gonorrhoea (page 311) *OR* partners unknown
  - Give **azithromycin** oral — adult 1g, single dose
  - *AND* **ceftriaxone** IM — adult 500mg, single dose mixed with **lidocaine (lignocaine) 1%**
  - If allergy to penicillin — **medical consult**

- Contact tracing (page 316)
- STI and safer sex education (page 317)

Follow-up

- If positive test result — re-test in 3 months — Standard STI check (page 306)
  - Can take up to a month for NAAT tests to become negative after successful treatment

Follow-up if ongoing symptoms

- Check STI test results and contact tracing. If full STI check (page 307) not done — collect remaining samples including urine for trichomonas
- *ALSO* do U/A and send urine for MC&S
- **Medical consult** about NAAT for mycoplasma genitalium

Possible causes of ongoing symptoms

- Symptoms caused by another STI — **medical consult**. May need to
  - Give **doxycycline** oral — adult 100mg, twice a day (bd) for 7 days
  - If trichomonas result unknown — *ALSO* give **metronidazole** oral — adult 2g, single dose
  - If allergy — **medical consult**
- Persistent or recurrent gonorrhoea or chlamydia. If positive for gonorrhoea and or chlamydia
  - Was all first round of treatment taken. If not — repeat
  - Did sexual partners all get treated
- If reinfection (symptoms got better and then came back) likely — repeat STI check (page 305) and treatment for man and partners
- If resistance (never got better at all) likely, ie gonorrhoea may be penicillin resistant
  - Check test results for antibiotic sensitivities
  - Repeat STI check (page 305) — make sure MC&S for gonorrhoea included
  - If amoxicillin given for initial treatment — now give **azithromycin** oral — adult 1g, single dose
  - *AND* **ceftriaxone** IM — adult 500mg, single dose mixed with **lidocaine (lignocaine) 1%**
  - If allergy — **medical consult**

Symptoms not caused by STI — there are other causes of discharge or urine symptoms

- Check urine MC&S results. If positive — **medical consult**
- If persisting symptoms despite all of the above — **medical consult**

7. General topics

Pain management (acute)

- Acute (nociceptive) pain usually has an obvious cause (eg burn, impact injury, appendicitis) and is expected to get better with tissue healing
- Pain treatment involves the use of non-pharmacological (eg heat or ice packs) and pharmacological (eg analgesics) interventions
- Treatment aims to provide comfort rather than total resolution (stopping) of pain
- Always consider comorbidities, side effects and drug interactions when managing pain
- Good response to analgesia does not exclude significant infection or illness

Red Flags	
Urgent Medical Consult	**Medical Consult**
• Serious pain • Person asking for opioid medications prescribed elsewhere • Seeking opioids for dependency issues • Pregnancy	• Neuropathic (nerve), somatic (bone, muscle, skin), visceral (organ) or chronic pain presentations • Frequent presentations for simple analgesia (eg paracetamol)

Ask

- When did the pain start, how long
- Where does it hurt. More than one place, does it move
- All the time, coming and going, if ever completely comfortable
- Had it before, what happened then
- Dull, sharp, cramping, squeezing pain or discomfort
- 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
- About pain score on a scale of 0 no pain to 10 worst ever or use face scale — Figure 7.1

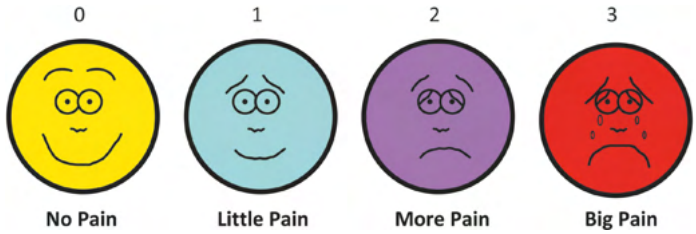


Figure 7.1

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- Head-to-toe exam

Do

- Treat underlying condition or injury
- Communicate with patient and family to reduce fear and anxiety
- Position for comfort
- Consider heat and/or cold therapies
- Consider relaxation and/or distraction techniques
- Give pain relief — check specific requirements for each medicine
- Reassess pain level regularly

Pain Medicines

You must know your organisation's policy about which pain medications can be initiated (started) by a RN or ATSIHP

Paracetamol

- **Do not** give for fever if no pain or discomfort or child not miserable — can make some viral sicknesses last longer
- If ongoing pain — regular doses are 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 (500mg) or 6 tablets (665mg) in 24 hours
- If fasting, known liver disease, regular or heavy user of alcohol — reduce dose to 4–6 tablets (500mg) in 24 hours

Child

- Child dose — 15mg/kg/dose every 4 hours
- Syrups comes in different strengths — **always** check the bottle
- If dose for weight is more than the dose for age — use the dose for age
- No more than 6 doses in 24 hours for first 2 days *THEN* 4 doses a day
- If child needs stronger pain relief - **medical consult**

- Suppositories can be used if adult or child can't or won't take oral paracetamol
  - Come in 125mg, 250mg and 500mg strengths
  - Use 1 or combination for right dose — Table 7.1
  - If suppositories not available — paracetamol syrup can be given in rectum using lubricated 2mL syringe. Same dose as oral

Table 7.1 Paracetamol doses

Age	Weight (kg)	Syrup* (mL) (24mg/mL or 120mg/5mL)	Syrup (mL) (48mg/mL or 240mg/5mL)	Tablet (500mg)	Suppository (mg)
Newborn	3.3kg	2.2mL	1.1mL	–	–
3 months	6.2kg	4mL	2mL	–	–
6 months	7.6kg	4.8mL	2.4mL	–	125mg
1 year	9kg	5.6mL	2.8mL	–	125mg
2 years	12kg	7.6mL	3.8mL	–	125mg
4 years	16kg	–	5mL	½	250mg
6 years	20kg	–	6.4mL	½	250mg
8 years	25kg	–	7.8mL	1	500mg
10 years	32kg	–	10mL	1	500mg
12 years	40kg	–	12.5mL	1	500mg
14 years and over	50kg or more	–	–	2	1000mg (1g)

* If 15kg or over — recommend to use smaller dose of stronger syrup

Oral non-steroidal anti-inflammatory drugs (NSAIDs)

Contraindications for NSAIDs

- eGFR less than 60 or unknown
- Chronic kidney disease (page 239) or heart failure (page 134) *AND* taking diuretic *AND* ACE inhibitor or ARB
- Severe asthma (page 421)
- High cardiovascular risk (page 231)
- Stomach ulcers
- Severe bleeding, eg suspected ruptured organ
- If pregnant — **medical consult** before giving

Paracetamol-codeine (500mg+30mg)

Codeine (opioid) may make person drowsy, constipated — advise extra fluids and high fibre diet

- **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)

Opioids

Aim of opioid injection treatment is to stop severe pain as quickly as possible without sedating person — some discomfort may remain

Always have **naloxone** available when you give an opioid IV or SC

Naloxone

- Patients who have had naloxone administered require close observation — sedation score, pain score, respiratory rate and BP every 5 minutes for 15 minutes and then every 15 minutes for 2 hours.
- If the patient has had sustained release opioids, they may need a naloxone infusion

Adults

- Draw up 400microgram per mL ampoule and add 3mL 0.9% sodium chloride for injection (normal saline) = 100microgram per mL
- Give **naloxone** 100microgram (1mL) every 3 to 5 minutes until sedation score is 2 or less and the respiratory rate is greater than 10 breaths per minute

Children

- Give **naloxone** 10micrograms (0.01mg) per kg /dose up to 200micrograms (0.2 mg) — doses (page 511)

Do first

Before giving opioids

- **Medical consult** — if this will cause serious delay in treatment may give morphine only *THEN* do medical consult as soon as possible
- Assess level of pain on a scale of 0 no pain to 10 worst ever pain
- Check patient's sedation score
- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Do

- Patient must be continuously monitored — repeat observations every 5 minutes for 15 minutes *THEN* every 15 minutes for 1 hour after last opioid dose given

Table 7.2 Sedation Score

Score	Description	Required action
0	Awake	• No action required, continue to observe
1	Mildly drowsy, easy to rouse, able to keep eyes open for more than 10 seconds	• Continue to observe for increasing sedation
2	Moderately drowsy, easily roused, unable to keep eyes open for 10 seconds	• Increase frequency of observation to every 15 minutes until sedation score 1 or 0 • Maintain close observation of the patient • **Do not** give any additional opioids • Give **oxygen** via nasal prongs at 2L/min
3	Severely drowsy, difficult to rouse — may have respiratory depression	• Life support — DRS ABC if needed • Give **oxygen** via non-rebreather mask 10–15 L/min to maintain oxygen saturations above 93% (if COPD 88–92%) • Give **naloxone** • **Medical consult** • **Do not** give any opioids until sedation score less than 2 and respiratory rate greater than 10 breaths per minute

Table 7.3 Side effects of opioid administration

Side effects of opioid administration	Management of side effects — medical consult
Over sedation	Close monitoring of sedation scores. Consider giving naloxone
Respiratory depression	Close monitoring of respiratory rate. Consider giving naloxone
Nausea & vomiting	Consider antiemetic (page 418)
Itch	Consider non-sedating antihistamine
Acute urinary retention	Consider catherisation female (WBM, page 327), male
Constipation	Consider aperients (laxative)

Table 7.4 Acute pain relief (Adult)

Pain level	Treatment
Mild pain (0-3)	Non-pharmacological interventions such as positioning, heat or cold packs *AND* • **Paracetamol** — 500mg, 1–2 tabs, up to 4 times per day (qid) PRN (maximum 8 tablets in 24 hours) *OR* if not contraindicated AND recommended in individual protocol — **ibuprofen** — 200mg, 1–2 tabs as needed, up to 3 times per day
Moderate pain (4-6)	Non-pharmacological interventions such as positioning, heat or cold packs *AND* • **Paracetamol** — 500mg, 1–2 tabs, 4 times per day *AND* if not contraindicated — **ibuprofen** 200mg, 1–2 tabs 3 times per day with food *AND* **oxycodone** (IR) — 5mg, 1–2 tabs every 3 hours PRN — **medical consult** *OR* • **Paracetamol–codeine** — 500mg+30mg, 1–2 tablets, up to 4 times per day (qid) PRN — only 2 doses can be given without a **medical consult** **Do not** give regular paracetamol if using paracetamol-codeine 500mg+30mg
Severe pain (7–10)	Non-pharmacological interventions such as positioning, heat or cold packs *AND* **Medical consult** *AND* if sedation score less than 2 and respiratory rate greater than 8 — **morphine IV** • Draw up **morphine** 10mg /1mL ampoule • Add 9mL normal saline to give you 10mg in 10mL or 1mg per mL For patients younger than 70 years of age • Give 1 to 2mg (1–2mL) slowly (over 1 minute) every 5 minutes to a maximum of 10 mg For patients older than 70 years of age • Give 0.5 to 1mg (0.5–1mL) slowly (over 1 minute) every 5 minutes to a maximum of 10mg • **Morphine IM** — give straight from ampoule per medical consult • **Morphine subcut** — put in subcutaneous cannula into fatty tissue on outer aspect of upper arm *OR* front of thigh *OR* side of belly and secure well For patients younger than 70 years of age — 2.5 to 10mg s/c as a single dose For patients older than 70 years of age — 2.5 to 5mg s/c as a single dose

Abdominal pain

- Many causes of abdominal pain can be life-threatening
- Always consider heart pain (page 63) and pneumonia (page 433) — these can be felt in upper abdomen
- In females always consider PID (WBM, page 272), ectopic pregnancy (WBM, page 35) or miscarriage (WBM, page 36)
- Give pain relief (page 326) early if BP adequate. Person will be more relaxed and assessment more accurate

Red Flags — Urgent Medical Consult

- Severe pain with tenderness or guarding
- Pain goes through to back
- Strong point of pain when coughing — peritonitis
- Blood in faeces, melaena (black faeces)
- Large amount of blood in vomit
- Mass (lump) especially pulsating (throbbing) mass
- Over 55 years old — consider ruptured abdominal aortic aneurism

Abdominal assessment

Do first

- **Remember** Life support — DRS ABC (page 27)
- For initial assessment — see Acute assessment of abdominal pain (page 22)
- In females
  - Always ask about contraception, last menstrual period
  - Do urine pregnancy test (WBM, page 99) If negative — could still be early ectopic pregnancy or miscarriage

Ask

Pain

- Where is the pain. What area did it start
- Where does it go
- Does cough increase pain
- What does it feel like — stabbing or throbbing. Is it deep or just under the skin
- How long does it last. What makes it better/worse
- Why does the person think they have it. Have they had this pain before

Nausea, vomiting, diarrhoea

- Is vomit green (bile indicates obstruction)
- Are they passing wind. When did they last open their bowels — constipation
- Do they have diarrhoea. How often does it occur
- Is there blood in the vomit or faeces

Other Symptoms

- Fever (feeling hot and cold)
- Cough
- Chest pain
- Shoulder tip pain
- Is appetite good or bad
- Pain or burning with urination

Men

- Discharge from penis — potential STI (page 323)
- Painful/tender testicles — see Testicular pain (page 483)

Women

- Vaginal discharge or bleeding
- Last menstrual period, contraception
- Deep pain with sex

Past Medical History

- Abdominal operations
- Pancreatitis
- Ectopic pregnancies
- Heart problems
- High BP
- Kidney stones
- Gallstones
- History of trauma

Medications

- Pain killers, especially NSAIDS
- Other medicines

Alcohol and other drugs

- How much do they normally drink, when did they last have a drink, how much did they drink
- Smoking
- Other drugs

Look

- Pallor — pale lips, tongue, inner eyelids
- Jaundice — yellow eyes or skin
- Rash — consider shingles
- Bruising, other signs of injury
- Masses (lumps)
- Distended abdomen (abdomen swollen), rigid, or moving with breathing

Listen with stethoscope

- Centre of abdomen for bowel sounds
  - May be more than usual, less than usual, none
  - Are they loud, splashing, tinkling like water in a cave — consider obstruction
- Chest for crackles, wheezing, bronchial (harsh breath sounds) — consider pneumonia

Feel

- Percuss and Palpate
  - 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
- Abdomen soft or hard like wood — rigid, guarding *OR* very tender
  - Does it hurt more in one part of the abdomen
  - Does feeling or tapping in one part cause pain in another part of abdomen
- Check for tenderness or sharp pain when percuss — you tap your finger 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 hernias — groin for swellings. Are they hard, soft or tender
  - Hard, tender hernias are strangulated — **urgent medical consult**
- Check genitals (private parts) for males
  - Swollen scrotum — hernia, hydrocele, cancer
  - Tenderness — orchitis, epididymitis (infected testes or cord), torsion (twisted testicle)

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test
- If upper abdominal pain, right upper quadrant, or chest pain — do ECG
  - Repeat ECG after 30–60 minutes to see if pattern changes

Do

- Based on history and physical assessment consider possible cause of pain
- See following pages for more information about common causes

Mild pain

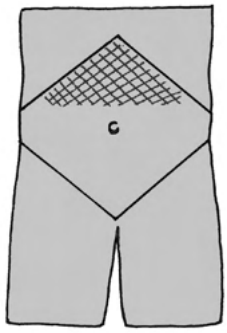
- Mild abdominal pain may not need hospitalisation if a cause is identifiable and pain settles with analgesia — see pain relief (page 326)

Moderate-severe pain

- If person has
  - REWS 3 or more in children *OR* 5 or more in adults
  - Pain not responding to analgesia (pain relief)
  - Appears very unwell
- **Medical consult**
- Keep nil by mouth
- Insert IV cannula
- POC Tests — electrolytes, Hb, WBC
- Take blood cultures before giving antibiotics
- IV antibiotics if infection/sepsis (page 2) suspected
- Give adequate pain relief (page 326)
- Consider IV fluids
- Consider oxygen
- Consider antiemetic (page 420) for nausea and vomiting
- Consider urinary catheter

Upper abdominal or epigastric pain

- Usually caused by irritation of stomach or oesophagus — gastritis, reflux, indigestion
- Can be gastric/peptic ulcer, pancreatitis, gall bladder disease, pneumonia, heart disease
- Can be diabetic ketoacidosis. If high BGL — check ketones
- Common presentation of heart attack — do ECG, see Chest pain (page 63)



Gastritis, reflux, indigestion

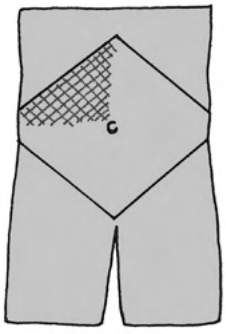
- May be history of gastritis, reflux or indigestion
- Loss of appetite
- Pain linked to hunger or eating certain foods
- Abdomen soft — may have mild tenderness
- Temp, pulse, RR, BP, O_2 sats usually normal
- Normal ECG

Do

- Give **antacids** (aluminium and magnesium salts) *OR* **omeprazole** oral — adult 20mg for 7 days *AND* review
- Advise person not to drink alcohol
- If pain continues for more than a few days with this treatment — **medical consult** about treatment and tests. Could be gastric/peptic ulcer or caused by some medicines

Right upper quadrant pain

- Usually caused by gall bladder disease — but may be heart attack pneumonia, uncomplicated gall stones or hepatitis (liver disease)



Gall bladder disease — infected and/or obstructed

- Suspect if very tender under right ribs
- If fever, pulse more than 100 beats/min, systolic BP less than 100mmHg, O_2 sats less than 90%, yellow skin or eyes (jaundice), bilirubin on U/A — ascending cholangitis (infected bile duct)
- Pain — moderate or severe. Usually constant

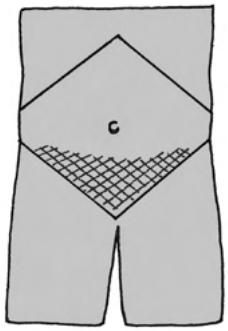
Do

- **Medical consult *AND* consider sepsis**
- Give **amoxicillin** *OR* **ampicillin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose
  - If allergy to penicillin — **medical consult** **for ceftriaxone** IV — adult 1g, child 50mg/kg/dose up to 1g — doses (page 501) — single dose

AND give **gentamicin** IV — doses (page 501) — single dose
AND give **metronidazole** IV — adult 500mg, child 12.5mg/kg/dose up to 500mg — doses (page 501) — single dose

Lower abdominal pain

- Many possible causes — can be hard to tell apart. Consider
  - Appendicitis
  - Strangulated or stuck (incarcerated) hernia



Men

- Twisted testicle
- Infected testes

Women

- PID — common serious cause of lower abdominal pain in non-pregnant women aged 15–35 years, often missed, can cause serious problems
- Ectopic pregnancy

Could also be

- UTI
- Constipation
- 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
- If you suspect appendicitis — **medical consult**

Lower abdominal pain — women

Check

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

Ask

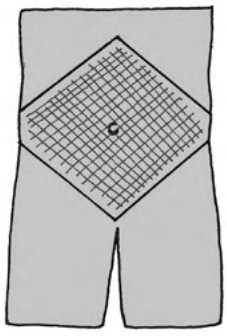
- Deep pain when having sex
- Vaginal loss — fluid, blood, colour, amount
  - Leave pad in place
- If pregnant — contractions (baby pains), baby movements

Do

- If recent childbirth, miscarriage, termination of pregnancy — consider endometritis (WBM, page 89)
- If less than 20 weeks pregnant — consider miscarriage (WBM, page 36), ectopic pregnancy (WBM, page 35)
- If very unwell — consider ruptured ectopic pregnancy, septic abortion
- If more than 20 weeks pregnant — consider labour (WBM, page 176), preterm labour (WBM, page 53), placental abruption (WBM, page 37), intrauterine infection (WBM, page 52)

Generalised abdominal pain

- 3 common causes — gastroenteritis, bowel obstruction (blocked gut), constipation
- 3 uncommon but very dangerous causes — generalised peritonitis, torn or ruptured abdominal aortic aneurysm, intestinal ischaemia



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
- Syncope (person may lose and regain consciousness)
- Person becomes very pale with fast pulse, falling BP, fast breathing

Do not

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

Do

- Give morphine for pain (page 326)
  - Repeat every 3 minutes until comfortable

Gastroenteritis

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

Do not

- **Do not** assume abnormal observations are caused by dehydration

Do

Child — see Diarrhoea (page 207)

Adult

- Can give pain relief (page 326)
- 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 (page 420)
- If no improvement after 2 hours
  - **Medical consult**
  - Do POC Test — venous blood gas, electrolytes

Bowel obstruction (blocked gut)

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

Do

- **Urgent medical consult**
  - Give pain relief — usually morphine (page 326)
- Put in nasogastric tube
- Put in IV cannula
  - Run **normal saline**
- Give antiemetic (page 420) to stop vomiting — **do not** give metoclopramide

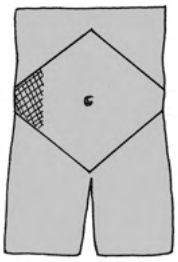
Constipation

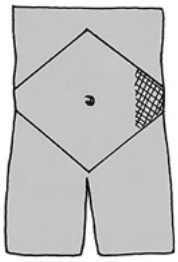
- Always looks well — no fever, normal pulse and BP
- Mild lower abdominal pain, usually crampy
- Small amount and/or hard faeces, may be some diarrhoea (overflow)
- Abdomen may be hard — with or without passing wind
- Usually little nausea or vomiting

Do

- Give dietary advice — high fibre and lots of water
- Can give bulking laxative (eg lactulose) or laxative (eg senna)
- If not better in a few days — **medical follow-up**

One-sided (flank/loin) pain





- Usually kidney problems. Felt in back or side between ribs and pelvis
- Consider pyelonephritis

Renal Colic (kidney stone)

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

Check

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

Do

- Give **pain relief** (page 326) — usually moderate or severe pain
- Give **antiemetic** (page 420) to stop vomiting
- **If no better after 6 hours *OR* if fever develops — urgent medical consult**
- **Must have FBC, UEC, renal ultrasound after first episode**
- Monitor urine for stones passing

Acute rheumatic fever (ARF) and rheumatic heart disease (RHD)

- ARF occurs after throat or skin infection with Group A beta haemolytic streptococcus (Strep A or GAS)
- RHD is damage to the heart valves after ARF
- Risk of RHD starts with first episode of ARF. Each episode of ARF increases risk of RHD developing or getting worse
- ARF and RHD are common in Northern and Central Australia among Aboriginal and Torres Strait Islander, Maori and Pacific Islander peoples
  - Those living in remote or rural areas and with household crowding at highest risk
  - ARF most common from 5–14 years. Also occurs under 5 and between 15–35 years. Less common over 35 years
  - More common in females than males — preconception planning is essential for all females of childbearing age
- RHD is preventable — regular injections of long acting penicillin (usually 4 weekly) prevents recurrent ARF and reduces RHD risk
- People with moderate/severe RHD usually need heart surgery. Severe RHD can lead to heart failure, stroke, sudden death
- ARF and RHD are notifiable in NT, WA, QLD, SA and NSW — contact state ARF/RHD control program or Public Health Unit if ARF or RHD is suspected or confirmed

Red Flags — Urgent Medical Consult

- Signs of heart failure — short of breath, pink frothy sputum, swollen ankles or legs
- Recurrent ARF

Preventing ARF

- Treat all skin infections (page 451) and sore throat (page 481) with antibiotics as directed in these protocols
- Treat scabies (page 469) to reduce risk of skin infection
- Reduce risk of Strep A infection
  - Promote good nutrition and hygiene
  - Support improved social determinants of health, eg housing, education

Suspect ARF in persons presenting with

Fever, sore joint/s

- 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 other arthritis, bone infection

Heart problems (carditis)

- New heart murmur
- Signs of heart failure -- shortness of breath, fast pulse new-tab

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

Note: Often no history of recent sore throat or skin infection

Ask

- Recent throat or skin infections
- Any previous ARF or RHD
- Have they been prescribed regular benzathine benzylpenicillin (Bicillin L-A) injections
  - Have they missed any
- Family history of ARF or RHD

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to possible major criteria for ARF
  - Sore or swollen joint or joints
  - Heart murmur
  - Abnormal movements — Sydenham chorea
  - Raised nodes
  - Erythema marginata (circular, blanching, snake-like skin rash) — can be hard to see on darker skin

ECG — check for

- Prolonged P–R interval
  - 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
- Second degree or complete heart block, accelerated rhythm

Do not

- **Do not** give aspirin or NSAID (eg ibuprofen) without a diagnosis — can be given on medical advice after diagnosis confirmed

Do

- **Medical consult**
  - Send to hospital if signs of heart failure
  - Otherwise transfer all suspected and confirmed cases within 24 hours
  - If delay in coming to clinic and fever and joint pain already settled — monitor and arrange transfer within 72 hours
- Before giving antibiotics
  - Throat swab for culture
  - Blood for ASOT, Anti-DNAse B, C reactive protein, FBC, ESR, blood cultures
- Give **Bicillin L-A (benzathine benzylpenicillin)** IM
  - Child less than 20kg — 600,000 units/1.2mL (450mg) (eg 1 × 1.2mL syringe)
  - Child 20kg or more and adult — 1,200,000 units/2.3mL (900mg) (1 × 2.3mL syringe)
  - Allergy to penicillin is rare. If penicillin allergy — doctor should get advice from allergy specialist — **medical consult**
- If fever/pain — give **paracetamol** — adult 1g, child 15mg/kg/dose up to 1g, up to 4 times a day (qid)
  - If paracetamol not effective (pain can be severe) — **medical consult**
  - Refer for urgent echocardiogram ASAP if not done in hospital — **medical consult**

Preventing recurrent ARF and RHD

Recurrent ARF and development of RHD can be prevented

Everyone with history of ARF or RHD needs Bicillin L-A (benzathine benzylpenicillin) injection every 21–28 days

- There is an increased chance of recurrent ARF if injections are not given by the due date
- Every day missed after day 28 is a day at risk

Bicillin L-A (benzathine benzylpenicillin) injections

- **Oral penicillin not recommended — do not use** without discussion with specialist and family
- Give as soon as person comes to clinic — **do not** ask them to wait
- Give opportunistically if person in clinic prior to due date (days 21–28) and risk of non-adherence
- Clinics need to organise a team approach to the ARF/RHD prevention program and recalls to make sure all Bicillin L-A injections are given on time
  - Use recall system for all people on regular Bicillin L-A — include mobile phones, SMS
  - Set recall reminder in person/carer's phone at each clinic visit
  - Consider offering an outreach or home visit service
  - 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 — need to know the importance of receiving injections on time
- Give hand-held record of diagnosis and treatment to person/carer

Giving Bicillin L-A injections

First injection (and all Bicillin L-A injections) should be as pain free as possible — person may have 15 years of injections ahead of them. Be calm, respectful and reassuring. Use good technique

- Give as deep IM injection
  - **Do not** use deltoid muscle of the arm
  - Ventrogluteal — preferred site *OR* dorsogluteal (upper outer quadrant of buttock) *OR* vastus lateralis (outside thigh)
- 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 in vein (no blood in needle) — change site if needed
- Inject slowly (2–3 minutes) or as preferred by the person

To lessen pain when giving injection

- Ask person where they would like to receive injection
- Ice pack to site beforehand
- Firm thumb pressure on injection site for 30–60 seconds before giving
- Use vibration device, eg Buzzy bee

If more relief needed — consider

- Giving oral pain relief (page 326) beforehand
- Applying anaesthetic spray beforehand
- Adding **lidocaine (lignocaine)** to injection — **do not** give if person has second or third degree heart block
  - Attach a drawing-up needle to 3mL syringe
  - Draw amount of Bicillin L-A needed (2.3mL for 1,200,000-unit dose and 1.2mL for 600,000-unit dose) from pre-filled syringe into the 3mL syringe
  - Using new needle — draw up 0.5mL of 1% **lidocaine** or 0.25mL of 2% **lidocaine** into the tip of 3mL syringe
  - **Do not** mix — keep lidocaine in the tip of syringe
  - Push plunger up carefully to remove any air in syringe
  - Remove the drawing-up needle
  - Attach IM needle (eg 21G) to the syringe

How long to give Bicillin L-A

- Decision to continue or stop Bicillin L-A injections only made by specialist in consultation with person — usually after echocardiogram

Table 7.5

Diagnosis			Minimal duration of Bicillin L-A (years)	Minimum age to cease Bicillin L-A
			Which ever is longer	
ARF	No cardiac involvement		5 years after most recent episode of ARF	21
	With cardiac involvement		As for RHD	
RHD	Borderline		Discuss with cardiologist	
	Mild	History ARF	10 years after most recent episode of ARF	21
		No history of ARF and under 35	5 years after RHD diagnosis	21
		No history of ARF and 35 or over	No prophylaxis required	–
	Moderate	History ARF	10 years after most recent episode of ARF	35
		No history of ARF and under 35	5 years after RHD diagnosis	35
		No history of ARF and 35 or over	No prophylaxis required	–
	Severe	History ARF	10 years after most recent episode of ARF	40
		No history ARF	5 years after RHD diagnosis	40

RHD management plan

- Follow ‘priority classification’ and recommended follow-up — RHD Australia guidelines

- If pregnant — see Rheumatic heart disease in pregnancy (WBM, page 163)
- Dental check within 3 months of diagnosis, then every 6 months — every 12 months if no valve damage
- Yearly health check — adult (page 222), school-aged child (page 146)
- Ensure immunisations are up to date
- If severe valve disease, symptoms and/or had valve surgery
  - **Medical follow-up** every 3–6 months
  - Specialist review and echocardiogram every 3–6 months
- If moderate valve disease, no symptoms
  - **Medical follow-up** every 6 months
  - Specialist review and echocardiogram every 12 months
- If ARF but no valve damage
  - **Medical follow-up** every 12 months
  - Echocardiogram every 2 years for children. Every 2–3 years for adults

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
- Preventive antibiotics recommended before dental, surgical, invasive procedures or if established infection
  - Check management plan
  - **Always do medical/dental consult**
- For dental procedures involving gums, mucous membrane — extraction, implant placement, biopsy
  - Give 1 hour before procedure **amoxicillin** oral — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose
  - *O*R 30 minutes before procedure **amoxicillin** *OR* **ampicillin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose. Max rate 100mg/mL/min
  - If allergy — **medical consult**

Supporting resources

- RHD Australia ARF/RHD guidelines
- ARF/RHD diagnosis calculator app
- Treatment tracker app for patients
- Giving Bicillin L-A e-learning module
- Buzzy Bee vibration/distraction device

Anaemia (weak blood) in adults

- Common in all adults. More common in women
- Iron deficiency anaemia (IDA) most common cause
- Blood loss from gut is the 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, eg 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 in pregnancy (WBM, page 135)

To confirm diagnosis and cause

- Take blood for serum ferritin, CRP, serum B12, folate, TFT, LFT
- Take blood for UEC if not done in previous 12 months
- Faecal blood test

Interpreting results

- Serum ferritin 30microgram/L or less — confirms iron deficiency anaemia (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 — meat consumption, on any special diet
- Gut symptoms — chronic abdominal pain, recurrent loose faeces
- Medicines — aspirin, NSAID, warfarin, apixaban, rivaroxaban
- Rectal bleeding
- Ceremonial practices
- Menstrual periods
- Family history of bowel cancer

Do

- **Medical consult**
- Give iron replacement
  - Oral iron is sufficient for chronic kidney disease if early stages and not on dialysis. If not working — **medical consult** for IV iron
  - If on dialysis — IV iron — **medical/renal consult**
- If from area where hookworm is/has been common (page 494) — give **albendazole** oral — adult 400mg single dose
  - Do not give in first trimester of pregnancy (pregnancy test if not sure) without medical consult
- Talk about healthy food choices — see Healthy lifestyle choices
- 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, page 99)
- If over 40 years or not responding to treatment — gastroscopy and colonoscopy to exclude cancer

Iron replacement

Oral iron

- Iron oral — 60–120mg elemental iron a day. Consider alternate day dosing
- Give Vitamin C to optimise iron absorption
- If required reduce gut side effects by taking at night or with food — absorption is reduced with food
- Repeat FBC in 4 weeks
- **Need to continue to take iron for 3 months after Hb returns to normal**

- 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 consult**

Iron IV infusion

Use if oral iron doesn't work or can't be used — **medical consult**

- **Do not** use if signs of infection
- **Do not** restart oral iron until at least 5 days after infusion given
- **Do not** give more than 20mL (1,000mg) in a single dose. Give second dose at least 1 week after first
- **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 *AND* stays with person during infusion
- Discuss risk of IV iron — injection site reaction and paravenous (surrounding tissue of vein) leakage causing skin staining
- Can safely be administered by
  - Slow IV bolus injection
  - IV infusion using a gravity feed giving set
  - IV infusion using an IV infusion pump
- See – Giving iron by IV infusion (CPM)

Table 7.6 Cumulative Iron Dose Calculation by weight and Hb level for Ferric Carboxymaltose (eg *Ferinject*)

Haemoglobin (g/L) (for person of body weight greater than or equal to 35kg)	Body Weight 35kg to 69kg	Body Weight greater than or equal to 70kg
Less than 100g/L	**1,500mg elemental iron total dose**	**2,000mg elemental iron total dose**
	• Week 1: 1,000mg	• Week 1: 1,000mg
	• Week 2: 500mg	• Week 2: 1,000mg
Greater than or equal to 100g/L	**1,000mg elemental iron total dose**	**1,500mg elemental iron total dose**
	• Week 1: 1,000mg	• Week 1: 1,000mg
		• Week 2: 500mg

Bone infection

Osteomyelitis (bone infection) can occur with or without earlier injury

Red Flags — Urgent Medical Consult

- **Signs of sepsis**
  - High or low temperature
  - Fast breathing
  - Fast pulse
  - Low BP or dizziness
  - Confusion and/or agitation
- Child under 6 years with cellulitis
- Broken jaw with pus or bleeding around tooth
- Infection during wet season in tropical North Australia — may be melioidosis

Consider bone infection if

- Cut or sore still has pus coming out after 14 days of standard treatment
- Cellulitis over bone that is close to the surface (eg hands, fingers, toes, front of shin) is still there after 14 days of standard treatment
- Skin infection for long/unknown time
- Person with diabetes has slow-healing wound or ulcer, especially on feet

Consider melioidosis (page 415)

- 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 debilitated (run down) or have history of melioidosis

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

- Head-to-toe exam — with attention to
  - Painful, hot, tender at one point on bone — usually limb or backbone
  - Pain when tapping on bone away from sore area
  - Bone visible at the base of a sore or ulcer

Do

- **Medical consult to send to hospital urgently**
- Pain relief (page 326)
- Insert two IV cannula
- Blood for cultures, pus swab
- 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 — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose
  - If allergy — **medical consult**

Joint problems

Use this protocol for swollen, painful joints or limp NOT due to accident, injury or trauma

- If accident, injury, trauma — see Sprains and strains (page 357)
- If unclear that problem is in joint — see Bone infection (page 351)
- Consider acute rheumatic fever, especially in child or young person — see Acute rheumatic fever and rheumatic heart disease (page 342)

Red Flags — Urgent Medical Consult

- Fever, unwell and joint problem
- Child with unexplained limp or limp not getting better

Look in file notes

- Recent history of joint problems *AND* chronic condition
- Signs and symptoms of acute rheumatic fever and rheumatic heart disease (page 342)

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

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Signs and symptoms — Table 7.7

Table 7.7 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	Very, worse with small movement	Very	Yes	Yes
Joint tender to touch	Often	Yes	Very	Yes	Not usually
Moving joint	Painful to move	Very painful, holds joint still	Stiff, too painful to move	Morning stiffness for more than 30 minutes	Stiff after rest, in morning — better with movement
Fever	Usually	Usually — 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	Unwell. Other features of ARF (page 342)	Unwell. Painful limp	May have had before — lasting days	Unwell — flu-like symptoms and tired. May have had before	Weakness, limp
Joints most often affected	Knee, ankle, elbow, wrist. Often moves from joint to joint, but may be single joint	Single joint	Big toe, foot, ankle, knee, hand, wrist	Symmetrical (same on both sides of body). Multiple joints — hand, foot, knee	Hand, spine, hip, knee

Acute rheumatic fever (ARF)

- See Acute rheumatic fever (ARF) and rheumatic heart disease (RHD) (page 342)

Septic arthritis (joint infection)

Joint infection can occur with punch injury or without any visible injury

Do

- **Urgent medical consult**
- Give **pain relief** (page 326)
- Blood cultures
- **If very sick or transport time will be more than 4 hours** — **medical/specialist consult** about giving antibiotics
  - Antibiotics are usually not started before transfer as joint aspiration for MC&S done in hospital
- Put limb in splint

Gout

- Caused by too much uric acid in the blood which can deposit in joints
- 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** (page 326)
- If no contraindications to NSAIDs (page 328)
  - **Indometacin** oral — adult 50mg, 3 times a day (tds) until pain improved

THEN **indometacin** oral — adult 25mg, 3 times a day (tds) until pain stops

OR **ibuprofen** oral — 200mg, 3 times a day (tds) up to 800mg a day until pain improved

- If contraindications to NSAIDs (page 328)
  - Give other **pain relief** (page 326) and **prednisolone** oral — adult 20mg, once a day for 3–5 days
- Provide patient education — limit intake of alcohol (especially beer and spirits), fructose-sweetened drinks (soft drinks, juice) and purine-rich foods (eg shellfish, sardines, organ meats like liver)
- If person already taking urate-lowering (eg allopurinol) therapy — advise not to stop or change therapy during an acute attack of gout
- If repeated attacks — **medical consult** — may need **allopurinol** to prevent further attacks after this attack has settled

Rheumatoid arthritis

- Chronic inflammatory disease. Causes joint damage
- Early diagnosis important to manage pain, improve function, prevent permanent joint damage and consider use of disease modifying antirheumatic drugs (DMARDs)

Do

- Blood for FBC, UEC, HbA1c, fasting lipids, LFT, CRP, ESR RF, anti-CCP
- **Medical consult** for
  - Diagnosis — apply 2010 ACR/EULAR classification criteria
  - Early medicines — give **pain relief** (page 326)
  - **Rheumatologist consult or review** — diagnosis, inflammatory arthritis, 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 (page 326) *AND/OR* **methyl salicylate rubbing cream**
- **Medical consult** —
  - Accurate diagnosis
  - X-ray affected joints — weight bearing for hips and knees
  - Review pain relief
  - Physio/OT referral
  - Talk about nutrition and weight loss
  - In later stages — joint replacement

Ongoing management of chronic arthritis

Includes osteoarthritis, rheumatoid arthritis, gout

- Look in file notes for management plan and specialist letters. If no management plan — develop one including
  - Regular reviews, specialist referrals
  - Self-management — physical activity, rest, relaxation, healthy diet, weight loss if needed. Give education, refer to support group
- Encourage physical activity — for mobility and muscle strength — **medical/physiotherapy consult**
- **Refer** to other allied health as needed
  - OT — aids, equipment
  - Dietitian — weight loss
  - Pharmacist — medicines review, education

Supporting resources

- 2010 ACR/EULAR classification criteria for rheumatoid arthritis

Sprains and strains

Swollen, painful joint caused by accident, injury, trauma
If no clear accident, injury, trauma — see Joint problems (page 353)

- Sprains involve ligament
- Strains involve muscle or tendon
- Soft tissue injury usually caused by strains or sprains — also consider dislocation, fracture, ligament/tendon rupture

Do not

Do not use or do these things (HARM) in first 2 days — makes soft tissue injuries worse

- **H** eat
- **A** lcohol (grog), aspirin, anti-inflammatory (eg NSAID)
- **R** unning, strong exercise
- **M** assage

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
- What did they do for immediate management, eg did they ice it
- Have they had a similar injury before

Check

Always compare sides

- How person is holding or supporting joint
- Joint assessment
  - Swelling, bruising, pain, redness, feels hot
  - Deformity (abnormal joint shape)
  - Open wound
  - Limited movement
- If you suspect fracture — do fracture assessment

Do

Medical consult if
- Pins and needles, numbness, loss of muscle strength
- Severe pain on passive movement
- Medium to large effusion (joint swelling)
- You suspect dislocation, fracture, ligament/tendon rupture

Do — for sprains and strains

For first 2 days to let bleeding settle and lessen swelling — **RICE**
- **R** est
  - If unable to bear weight — give crutches
  - Collar and cuff or simple sling to support arm
  - Splint or back slab if needed
  - Gentle movement within limits of pain
- **I** ce
  - **Do not** put frozen material directly on skin — use wet towel between ice and skin
  - Put on for 15-20 minutes every 2 hours — reduce over second day
- **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 or on pillows
- Give **pain relief** (page 326)
  - Use regular doses rather than waiting for pain to get bad
  - Back slab may help

Review after 2 days
- If large amount of swelling and/or pain — recheck for instability (extra movement) 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 consult if
- Unable to walk or has severe pain with movement after 2 days
- Moderate swelling remains after 5 days

Follow-up

- Examine persons walking pattern and 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 can
  - Move joint normally and without pain
  - Balance normally, if lower limb
  - Do full training session without pain or swelling

Dementia

- Progressive disturbance of thinking and behaviour, overall loss of function, often loss of ability to learn or remember new information
- Usually slow onset
- No cure but can be managed with support

Red Flags — Urgent Medical Consult

- Sudden onset memory loss
- Changes to behaviour that increase risk of harm to self or others
- Concerned family members, community members or aged care service providers

Risk factors

- History of repeated head trauma
- Depression or history of depression
- Elevated cardiovascular risk or diabetes
- Substance abuse
- Downs syndrome

Ask

- What is worrying person or family
- How long have the symptoms been developing — if fast onset rule out delirium (page 11)
- Day-to-day living and independence — eating and drinking as usual, sleeping patterns changed, manage own money and travel (eg able to buy food at shop or get themselves onto bush bus), access own food, dress themselves, maintain own hygiene, more or less active than usual, level of awareness changes
- Any issues with bowels or bladder
- Any pain
- Any changes to medications, medication adherence, access to seizure medicines
- Previous or current use of alcohol or other drugs
- Any changes in personality or behaviour — more withdrawn, agitated, forgetful or unable to learn new things
- Is the person repetitive, accusing others stealing, having word finding or naming difficulties

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- U/A, pregnancy test
- Head-to-toe exam
  - Consider delirium, physical sickness, injury, depression

Do

- Blood for FBC, ESR, CRP, UEC, LFT, Ca/Mg, PO4, TFT, vitamin B12, serum folate, lipid profile, HbA1c, syphilis serology, HIV, vitamin D, Urine for MC&S
- Manage any physical illnesses
- Check hearing — history of ear infections or problems
- Check vision — glasses, blinding eye disease
- Assess cognition (person's thinking) with cognitive assessment — KICA screen with interpreter
  - If score more than 21 — monitor with annual health check or recall for assessment in 6 months
  - If score under 21 — **medical consult** and full KICA with interpreter *AND* medicine review every 3 months, management plan

Follow-up

- Appropriate referrals
  - Geriatrician
  - Arrange for MAC/ACAT assessment for Aged Care Support Services approvals
  - Aged care team if eligible — can help with advice re supports CHSP, HCP, respite, nursing home placement in future
  - If not eligible for aged care services — NDIS
  - Hearing and vision
- Consider support for carers, education about dealing with difficult behaviour
- If person can make decisions for themselves — talk with person about
  - Who they want to make decisions for them and document in file notes advanced care planning
  - Support person to do an Advance Personal Plan (APP) — early in the course of the disease while they can still say who they want to make decisions for them if they become unable to do so
- If a person is no longer able to make decisions for themselves and has not filled out an APP — their family will need to consider guardianship

Supporting resources

- KICA-Screening tool
- Full KICA-Cog tool
- Dementia Support Australia website
- Dementia Australia website

Dental and oral problems

For assessment — see mouth, throat, teeth and gums examination

Red Flags — Urgent Medical Consult

- Facial swelling
- Mouth ulcers — more than 2 weeks duration, recurring, non-traumatic, severe in young children
- Dental trauma

Oral health messages

- **Do not** smoke (tobacco or cannabis) — increases risk of dental, gum and mouth disease
- Clean teeth and gums morning and night with soft toothbrush and fluoride toothpaste
  - Spit, don't rinse after brushing
- Avoid regular use of mouthwash containing alcohol —short-term use is OK
- 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 and some milk
- Chew sugar free gum
- Control diabetes — will lower risk of bad gums and tooth loss
- Have a yearly dental and oral health check

Dental pain relief

Continue treatment for the shortest duration possible and no more than 3 days without review (page 365)

Contraindications for NSAIDs

- eGFR less than 25 or unknown
- Severe heart failure (page 134) *AND* taking diuretic *AND* ACE inhibitor or ARB
- Severe asthma (page 422)
- High cardiovascular risk (page 231)
- Stomach ulcers
- Severe hepatic impairment
- Severe bleeding, eg suspected ruptured organ
- If pregnant — **medical consult** before giving

Managing pain in teeth or gums

Table 7.8 Pain in teeth or gums

Type of pain	Likely problem/causes	Management
Brief, sharp pain • Sensitive to cold, heat, sweet stimuli • Stops quickly when stimuli removed	**Reversible inflammation** of tooth nerve Caused by • Decay/hole/crack in tooth • Broken filling • Root sensitivity or decay	• Avoid painful stimuli • If hole in tooth — put on protective cover (could be chewing gum, blu tak) or oil of cloves (eugenol) • **Do not** give pain relief • **Do not** give antibiotics • **Dental consult**
Severe, sharp pain then dull throb • Remains after stimuli removed • Can be spontaneous (sudden) • Can wake person	**Irreversible inflammation of tooth nerve** • Caused as above or by trauma • Can lead to death of nerve with or without abscess	• Avoid painful stimuli • Give dental pain relief (page 362) • **Do not** give antibiotics • Put on protective cover or oil of cloves (eugenol) ▸ **Do not** use oil of cloves if pregnant • **Urgent dental consult**
Throbbing ache • Usually sore when biting • Not sensitive to stimuli	**Nerve death without abscess**	• Give dental pain relief (page 362) • **Do not** give antibiotics • **Do not** fill tooth • **Urgent dental consult**
Intense, severe pain when biting and chewing • Pus under tooth with or without swelling in mouth • May have fever	**Nerve death with acute dental abscess**	• Give dental pain relief (page 362) • Drain pus if possible • May need antibiotics — see Facial swelling (page 368) • **Do not** fill tooth • **Urgent dental consult**
Pain when biting and chewing • Debris (plaque, calculus) on teeth at gum line • Loose teeth/gum recession with or without pus • No hole in tooth or decay seen	**Periodontal (gum) disease and/or gum abscess** • Often associated with diabetes • Food jammed between teeth can cause similar symptoms	• See Acute ulcerative gingivitis (page 367) *OR* periodontal abscess (page 368) • **Urgent dental consult**

Type of pain	Likely problem/causes	Management
Pain at back of mouth — can be severe • Very tender, sore when biting • Localised swelling of gum around crown of tooth — usually bottom jaw • Usually young adult with erupting wisdom tooth • Can have reduced ability to open jaws	**Pericoronitis (infection around crown of a partially erupted tooth)** **Risk factors** • Smoking • Poor oral hygiene	• Salt water and/or **chlorhexidine 0.2%** mouthwash — 10mL. Rinse for 1 minute, 3 times a day (tds) and spit out • Tell person to clean area with soft toothbrush and toothpaste. Expect bleeding until hygiene improves • **Dental consult** • **If systemic** symptoms or infection spread beyond jaw — may need antibiotics — see Facial swelling (page 368)
Pain increasing 1–4 days after tooth extracted with no signs of infection	**Dry socket** • Poor healing. Blood clot in socket breaks down exposing bone • Not an infection • Should get better by itself in 2–3 weeks	• Give dental pain relief (page 362) • **Do not** give antibiotics • Flush socket with warm **normal saline** until all debris removed • Put in dressing (eg *Alvogyl*) if available — see Dressing a dry socket • **Dental consult**
Some pain or swelling after an extraction	• Normal discomfort caused by extraction • May be caused by tooth or bone left in socket	• See Minor swelling or soreness after extraction
• Aching upper teeth • Pain that increases when the head is tilted forward	**Pain from maxillary sinus as pus/ exudate moves forward**	• See Sinusitis (page 435)

Oil of Cloves (eugenol) should not be supplied to patients to take home

Child

- **Paracetamol** (page 328) — 15mg/kg/dose up to 1g, up to 4 times a day (qid) *OR* **ibuprofen** if no contraindications, oral — 10mg/kg/dose up to 400mg — doses (page 511) — up to 3 times a day (tds)
- Can also be combined for enhanced pain management

Adult

- Mild to moderate pain
  - **Paracetamol** oral — 1g, up to 4 times a day (qid) *AND* **ibuprofen** if no contraindications, oral — 400mg, every 6–8 hours (no more than 4 tablets (1600mg) in a day
- Severe pain — after maximum regular doses of **ibuprofen** *AND* **paracetamol** have been tried
  - Stop regular **paracetamol**, continue **ibuprofen**, if no contraindication *AND* **paracetamol-codeine** oral — 1000+60mg, repeat once if required after 4 hours then **medical consult**
- If **ibuprofen** contraindicated — continue **paracetamol** *AND* do **medical consult** for **oxycodone** immediate-release, if available, oral — 5 mg, every 4 to 6 hours as necessary

Gums and soft tissue

Dry mouth

- Reduced saliva reduces health and comfort of mouth and increases the risk of dental decay and severity of gum disease
- Main causes are mouth breathing , smoking, medicines, dehydration, infections, cancer treatments

Do

- Try to find cause — **dental/medical consult** if needed
- See oral health messages (page 362)
- 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 (half teaspoon of bicarbonate soda in a glass of water) and spit out — rinse as soon as you get up and any time during day

Mouth ulcers

Common causes include

- Minor physical trauma, eg from food burn, sharp or rough food, broken tooth, broken fillings, dentures, orthodontic appliances
- Chemical trauma, eg from prolonged exposure to chewing tobacco, aspirin burn, tooth-bleaching products
- Infection, eg virus
- Immune response, autoimmune disease, eg Crohn's disease

Red Flags — Urgent Medical Consult

- Oral ulcers that have lasted more than 2 weeks — potential malignancy
- Oral ulcers that recur
- Non-traumatic ulcers (eg aphthous ulcers) in children — potential systemic disease
- Young child with severe ulcers

Do

- **Paracetamol** (doses (page 511)) and **lidocaine (lignocaine) gel** for pain
- Use saltwater *OR* **chlorhexidine 0.2%** mouthwash — 10mL
  - Rinse for 1 minute, 3 times a day (tds)
  - Will help stop infection and keep mouth clean
- Adults with ulcers not healed within 2 weeks *OR* recurring — **medical consult** to send to hospital for biopsy — potential tumour
- Young child with severe ulcers
  - **Medical consult** to consider antiviral treatment
  - Check for dehydration (page 208) — 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 and teeth loose or fall out
  - Risk factors include smoking and poorly controlled diabetes

Do

If child has periodontitis — **urgent dental consult**

- **Dental consult**
- See oral health messages (page 362)
- If brushing difficult — use **chlorhexidine 0.2%** mouthwash — 10mL
  - Rinse for 1 minute and spit out, 3 times a day (tds) for 5–10 days
- Control diabetes

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

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Intense pain
- Ulcerated tissue in gums between teeth
- Spontaneous (sudden) bleeding of gums
- Very bad breath
- May also have fever, general discomfort, inflammation of lymph nodes

Do

- Give dental pain relief (page 362)
- Give **metronidazole** oral — adult 400mg, child 10mg/kg/dose up to 400mg — doses (page 501) — twice a day (bd) for 5 days
- If allergy — **medical consult**
- **Urgent dental consult**
- If painful and difficult to brush teeth — use **chlorhexidine 0.2%** mouthwash — 10mL, rinse for 1 minute and spit out, 3 times a day (tds) for at least 5 days
- Good oral hygiene — brushing ulcerated area may not be possible due to pain

Periodontal abscess

Risk factors — existing gum disease, uncontrolled diabetes, poor oral hygiene

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Pain, discomfort — can be difficult to localise
- Swollen gum next to tooth/teeth without hole or decay
  - Can be on palate and difficult to see

Do

- Give dental pain relief (page 362) if needed
- If abscess with no systemic features — antibiotic cover only if not receiving dental care within 24 hours *OR* if weakened immune system
  - **Amoxicillin+clavulanic acid** oral — adult 875+125mg (child 2 months or older: 22.5+3.2mg/kg up to 875+125 mg) — doses (page 501) — twice a day (bd) for 5 days

OR If allergy to penicillin — **clindamycin** oral — adult 300mg, child 7.5mg/kg up to 300mg — doses (page 501) — 3 times a day (tid) for 5 days

- **Dental consult** about lancing, debriding, extraction

Facial swelling due to spreading infection

Spreading odontogenic infection with severe or systemic features can rapidly become life threatening — because of the risk of airway obstruction and sepsis

- Localised tooth-related infections are caused by
  - Pulp necrosis (death of tooth nerve) due to decay or trauma
  - Periodontal disease (gum infections)
  - Infection around crown of erupting tooth, eg wisdom tooth
- **Facial swelling (spreading odontogenic infection) may be with *OR* without severe or systemic features**
  - Severe — significant facial swelling and pain, trismus (difficulty opening jaw), neck swelling, difficulty breathing or airway compromise
  - Systemic — pallor, sweating, tachycardia, an axillary temperature more than 38°C or sepsis
- **Do not treat with antibiotics alone — must do dental/medical consult** about treating underlying cause

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Mouth, throat, teeth and gums examination
- If severe or systemic features — **must assess for limited mouth opening**
- If mouth opens less than 2cm — **must assess for airway problems**
  - Difficult or noisy breathing
  - Difficulty swallowing
  - Tongue raised and rigid

Do if airway compromised

- **Remember** — see Life support — DRS ABC (page 27)
- If facial swelling (spreading infection) with severe or systemic features — **medical consult** to send to hospital urgently
- Give **oxygen**
  - to target O_2 sats 94–98%
  - *OR* if moderate/severe COPD 88–92%
- Put in IV cannula
- Give **metronidazole** IV — adult 500mg, child 12.5mg/kg/dose up to 500mg — doses (page 501) — every 12 hours (bd)
  - *AND* **benzylpenicillin** IV — adult 1.2g, child 30mg/kg/dose up to 1.2g — doses (page 501) — every 6 hours (qid)
- If allergy to penicillin — **medical consult**

Do if airway satisfactory

- Make sure person is hydrated
- Give dental pain relief (page 362)
- Give **amoxicillin+clavulanic acid** oral — 875+125 mg (child 2 months or older: 22.5+3.2 mg/kg up to 875+125 mg), twice a day (bd) for 5 day — doses (page 501)
  - If allergy to penicillin — give **clindamycin** oral — 300mg, child 7.5 mg/kg up to 300 mg, 3 times a day for 5 days — doses (page 501)
- If skilled and abscess pointing — lance
- **Urgent dental/medical consult** to drain pus and remove cause, eg extract tooth/teeth

Follow-up

- Review in 2–3 days
- If not improving — **medical consult**

Dental trauma

Knocked out adult tooth

Check

- Head-to-toe exam — with attention to head and neck injuries
- Immunisation status — tetanus

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 not** replant primary (baby) teeth

Do

- If RHD, artificial heart valve, heart transplant, history of bacterial endocarditis or congenital heart problem — give IV preventive antibiotics (page 344) before replacing tooth
- Replace and splint tooth in place **as quickly as possible** — see Replacing knocked out adult tooth

- Recommend short-term use of **chlorhexidine mouthwash** after replantation while the tooth is splinted
  - **chlorhexidine 0.2%** mouthwash — 10mL rinsed in the mouth for 1 minute and spit out, 3 times a day
  - If chlorhexidine used for more than a few days — may cause discolouration of teeth and fillings
- Give **doxycycline** oral — adult 100mg, child (page 501)
  - If pregnant — **medical consult**
- If allergy — **medical consult**
- **Urgent dental/medical consult**

Broken or loose tooth

See Broken tooth (fractured tooth crown) *OR* Loose or displaced tooth — adult or child

Broken jaw

- If **unconscious** with jaw injury — secure airway, pull jaw forward (jaw thrust) — see Life support — DRS ABC (page 27), Injuries — head (page 98)
- 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 cervical collar (may make jaw more painful) *AND* assess situation

Ask

- About pain, especially when moving jaw
- Any trouble swallowing or eating

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

- Head-to-toe exam — with attention to
  - Bony tenderness or numbness of any part of jaw
  - 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
- Immunisation status — tetanus

Do

- **Medical consult** to determine antibiotic choice
- Sit person up — lean them forward to let blood and saliva drain
- Give **antiemetic** (page 420) to stop vomiting
- Give **pain relief** (page 326)

Eye assessment

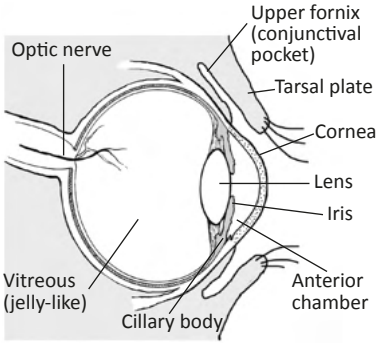


Figure 7.2

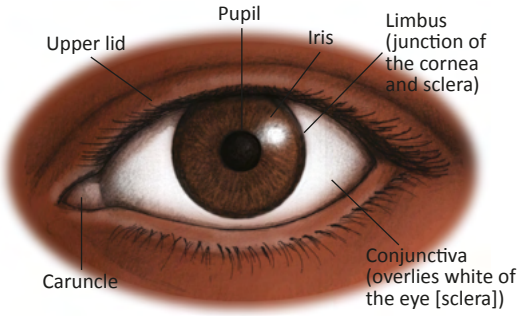


Figure 7.3

Do first

- If chemical burn — wash out (irrigate) eye before starting examination — See eye procedures

Do not

- If suspected or actual penetrating eye injury — **do not** put drops in eye
- **Do not** 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

Ask

- History of problem — one or both eyes, what happened (eg trauma/ injury) and when, eg fast or slow onset
- Problems with vision — near and distant, loss of sight, double or blurred vision, flashes of light, floaters (small moving objects in vision), haloes (fuzzy lights around objects)
- Sore, scratchy, itchy, watery, pussy eyes
- Hammering, grinding, welding, using air compressor or chemicals in last few days
- Eye problems in past — injury, cataracts, eye surgery
- Do they have glasses or contact lenses

Check both eyes

Use good light during examination and magnification if available — 2.5 magnification head loupes, ophthalmoscope, slit lamp, torch

- Check near and distance vision (visual acuity)
- Do eyes look straight or is one turned — squint, strabismus
- Look at outside of eyelids and eyeball — oedema (swollen), erythema (red), 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 a few seconds before numbing eye
  - Put on eye pads until local anaesthetic drops have worn off — try to leave on for 1–2 hours but at least 20 minutes
- **Medical consult** if
  - You can not examine eye properly — may need to send to hospital
  - Examination reveals abnormalities not covered by eye protocols, eg uncommon single red eye (page 377)

Cornea (eye surface)

- From about 30cm — shine a bright light all over cornea and watch for light reflection off the surface. Note if cornea is clear or cloudy
  - If defect — light reflex will be broken up and uneven
- If you suspect abrasion (cut) or defect or not sure — use **fluorescein** stain
  - Damage to eye surface shows up as a green patch
  - Serious injury to cornea may just look like a heavy fluorescein layer (green stain) — may need to put fluorescein stain in good eye to compare
  - Seen best with opthalmoscope blue light

Anterior eye

- Check conjunctiva (covering over white of the eye) for redness, inflammation, foreign bodies
- Check lower eyelid for any redness or discharge, eg pus
- Check white of eye for redness or bleeding — subconjunctival haemorrhage
  - If you can't see the **back edge** of blood — Figure 7.4 — may be skull fracture
  - If history suggests significant trauma — **medical/specialist consult**

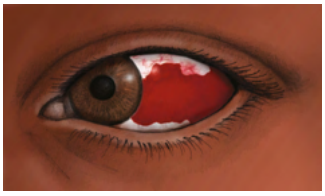


Figure 7.4

Anterior chamber

- Check for hyphema (layer of blood) or hypopyon (pus) — where blood or pus settles depends on the position head has been in
  - If person has been sitting or standing — settles on bottom of iris — Figure 7.5
  - If person has been lying down, sleeping — settles on side of iris — Figure 7.6

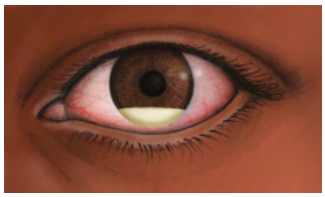


Figure 7.5

Pupil tests

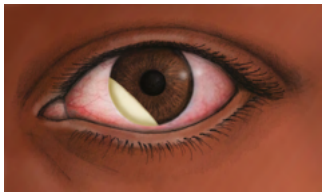


Figure 7.6

- Ask person to look straight ahead into distance — shine bright test light into eye from below line of sight. Move light between eyes
- Discourage person looking at the light — this will cause pupil constriction and confuse the results
- Check size, shape and reaction to light
  - Check for direct response — pupil **with light shining** in it constricts (quickly shrinks)
  - Check for consensual (involuntary) response — pupil **without light shining** in it shrinks the same amount at the same time as other pupil
- Check for **relative afferent pupillary defect**
  - Shine light repeatedly from one eye to the other (swinging flashlight test). Count to 3 before swinging 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
  - Ask person if they get double vision while doing this
  - Watch to see if both eyes move in the same direction
- In facial trauma difficulty looking up may mean cracks or an orbital blow-out fracture (breaks in bone around eye)

Upper eyelid

- Check for trichiasis (page 387)
- **Evert eyelid** — unless something penetrating eye
  - Look for subtarsal and non-penetrating foreign bodies (anything stuck to inside of eyelid or surface of eye)
  - Check for trachoma follicles or scarring

Supporting resources

- Checking for trachoma follicles and trichiasis poster

Eye problems

Red Flags — Urgent Medical Consult

- Orbital cellulitis (cellulitis around or behind eye)
- Conjunctivitis in baby less than 6 weeks old
- Cornea ulcers or infection (damage to cornea)
- Iritis (inflammation of eye)
- Acute glaucoma

Single red eye

- Usually due to foreign body or trauma
- Can be due to corneal ulcer, iritis (inflammation of the eye) (page 383), acute glaucoma, subconjunctival haemorrhage (page 392) (bleeding into white of eye) or episcleritis (inflamed clear outer layer of the white of the eye)

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 tears
- Mild decrease or changes in vision with blinking
- Medicines used, eg antihistamines, diuretics, beta blockers, antidepressants

Check

- Eye assessment (page 373)
- Use **fluorescein** staining to look for eye surface damage — See Eye procedures
  - 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 symptoms are worse on waking — advise the use of a 1cm strip of lubricating paraffin ointment (eg Polyvisc) before sleep — Figure 7.7 Do not touch eye with tube
- If severe or symptoms don't improve with lubricating eye drops or ointment — **medical consult**

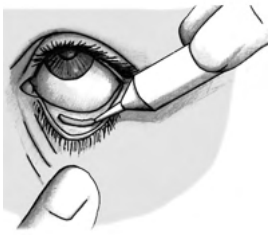


Figure 7.7

Conjunctivitis

- Inflammation due to viral and/or bacterial infection or allergic reaction
- Usually benign and self-limiting
- If only 1 red eye need to also consider other causes — see Single red eye (page 377)

Viral conjunctivitis — highly contagious. Tends to involve other eye within 24–48 hours

Bacterial conjunctivitis — usually one sided but can sometimes spread to other eye

Allergic conjunctivitis — usually in both eyes

Do not

- **Do not** put pad on infected eye — makes infection worse
- **Do not** use vasoconstrictor eye drops (eg Naphcon A) for more than 2 weeks — can cause rebound redness

Check

- Eye assessment (page 373)
  - Widespread redness, swollen, weeping
  - If only red in part of eye or around limbus — consider other conditions
- Viral conjunctivitis — watery discharge, stringy mucus. May be associated with a viral illness
- Bacterial conjunctivitis — discharge is 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
  - Acute glaucoma
  - Corneal ulcer
  - Iritis (inflammation of eye)
  - Foreign body (something in eye)
  - Trauma

Do

- Cultures are only needed if
  - Several patients present within a short time — look for epidemic cause. Contact PHU
  - No response to treatment
  - Atypical features
- Both viral and bacterial conjunctivitis are very contagious. To stop spread to others tell person
  - **Not** to touch or rub eyes
  - **Not** to share towels, pillows, food
  - To wash face and hands several times a day
  - 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) — 1 drop, 4 times a day (qid)
- 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 are most effective if given in first week

- Give **chloramphenicol** 1% eye drops/ointment — 1 drop/strip, 4 times a day (qid) for 5 days — Figure 7.7
  - **Do not** touch eye with tube
- 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

- Ensure eye and surrounding area is cleaned and free of potential allergens
- Suggest cold compress — clean, cool towel against closed eyes
- Tell person to avoid allergens (things that makes their eyes itchy) and not to rub eyes
- Give **lubricating eye drops** (artificial tears) for symptoms when not using antihistamine eye drops — 1 drop — flushes out allergen
- If symptoms not relieved — **medical consult**
  - May need antihistamine eye drops (eg olopatadine 0.1% eye drops) and/or steroid drops

Gonococcal conjunctivitis

- Eye infection in babies (less than 6 weeks of age) — can be sight-threatening — **urgent medical consult**
- Caused by maternal STI (gonococcal infection)
- Consider gonococcal conjunctivitis
  - In babies under 6 weeks with lots of pus from eyes — Figure 7.8
  - In person with very swollen eyelids, lots of pus
  - If a lot of people have conjunctivitis within a short time

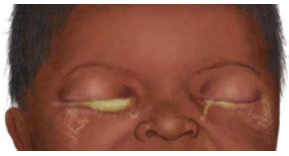


Figure 7.8

Check

- Eye assessment (page 373)
- For babies — do they follow lights and respond normally

Do

- If baby under 6 weeks — **urgent medical consult**
- Swab both eyes — MC&S and NAAT for gonorrhoea and chlamydia
- Wash out eyes with **normal saline** to remove all discharge
  - May need to bathe eyes to remove crusting
  - If eyelids too swollen to examine eye — **medical consult**. May need to send to hospital
- Assess eye with **fluorescein**
  - If only the conjunctiva is affected — apply topical **chloramphenicol** 1% eye ointment to both eyes — Figure 7.7

- If there is staining of fluorescein (damage) on the cornea (eye surface) — Figure 7.9 — apply **ofloxacin 0.3%** — 1–2 drops every 30 mins *AND* **urgent medical consult**

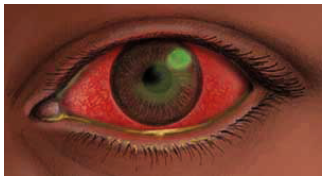


Figure 7.9

- Give **ceftriaxone** IV/IM — adult 1g, child 50mg/kg up to 1g — doses (page 501) — single dose

AND azithromycin oral — adult 1g, child 20mg/kg (max dose 1g), single dose

- If allergy — **medical consult**
- Remain at home for at least 24 hours

Follow-up

- If you suspect gonococcal conjunctivitis or swab confirms it — **medical consult**, **PHU must be notified**
  - Household and school contacts need to be treated straight away — will spread very quickly to other people

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 orbital cellulitis (page 384)

Check

- Eye assessment (page 373)
  - Very swollen eyelids
  - Watery discharge

Do

- Ensure eye and surrounding area is cleaned and free of potential allergens
- Suggest cold compress — clean, cool towel against closed eyes
- Give over the counter antihistamine eye drops, eg **naphcon-A** eye drops — 1 drop, twice a day (bd) for 24 hours

- If antihistamine eye drops not available — give
  - **Loratadine** oral — over 12 years 10mg, 2–12 years 5mg, 1–2 years 2.5mg, single dose
  - *OR* **promethazine** oral — adult 25mg, 2–12 years 0.5mg/kg/dose up to 25mg — doses (page 511) — single dose (at night – sedating)
- Give **lubricating eye drops** (artificial tears) for symptoms at other times — 1 drop — flushes out allergen
- Tell person to avoid allergens (things that makes their eyes itchy)
- If not improving within 24 hours — **medical consult**

Corneal ulcers or infection

Do not

- **Do not** put pad over eye — can make ulcer worse

Ask

- May have painful, scratchy, watery eye
- Recent scratch on eye, something in eye

Check

- Eye assessment (page 373)
- Use **fluorescein** staining to look for corneal (eye surface) damage
  - May be lots of small dots, scratches, larger area of staining
  - Branching pattern of staining could be dendritic ulcer from a viral infection — Figure 7.10
  - Large central area of staining could be severe ulcer — Figure 7.11
- Fluid level of hypopyon (pus inside front of eye) — Figure 7.11

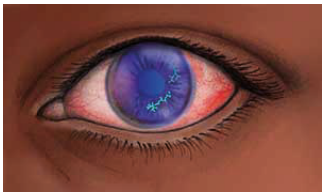


Figure 7.10

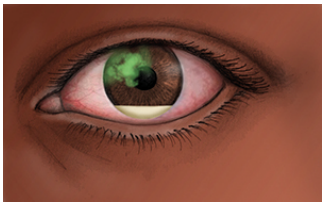


Figure 7.11

Do

- If ulcer, hypopyon (pus inside eye) or eye surface clouding or damage — **urgent medical consult**

- If any possibility ulcer is infected *OR* contact lens related — **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 **ofloxacin 0.3%** — 1 drop every hour for 1 day *THEN* 1 drop every 4 hours until seen
  - **Chloramphenicol 1% eye ointment** can be used overnight while sleeping. Use **ofloxacin** drops again on waking
- If damage is a simple epithelial defect (has clean edges, no clouding)
  - Give **chloramphenicol 1% eye ointment**, 4 times a day (qid) until healed — Figure 7.7 — **do not** touch eye with tube
  - Check every day until healed — use fluorescein staining to see if damage is smaller
  - If damage not smaller after 1 day *OR* not healed after 3 days — **medical consult**

Follow-up

- Check vision again after healed

Iritis (inflammation of eye)

Ask

- About pain
- Photophobia (light hurting eye)
- Loss of vision
- If had same thing before

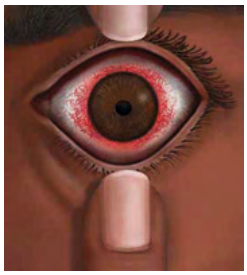


Figure 7.12

Check

- Eye assessment (page 373)
  - Limbal redness — 360° redness, mostly around iris (coloured part of eye) — Figure 7.12
  - No discharge or pus
  - Pupil small and irregular, still reacts to light — can be hard to assess

Do

- **Medical consult** to 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

Hordeolum (stye) and chalazion

- Inflammation and infection in the small glands of the eyelid — very common
- Hordeolums — Figure 7.13 and chalazions — Figure 7.14 can occur on upper and/or lower eyelids

Figure 7.13

Ask

- Pain — tenderness indicates a stye

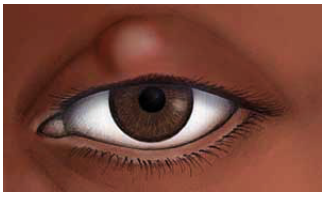


Figure 7.14

Check

- Eye assessment (page 373)
  - Lid swelling — tender or non-tender lump or painful pimple on lid margin
  - Exclude foreign body (something on the eye)

Do

- Warm compresses for at least 10 minutes, 4 times daily — usually resolves within 1 month
- Tell patient — good hand hygiene required to stop recurring
- If not improving — give **chloramphenicol 1%** eye drops, twice a day (bid) for 1–2 weeks
  - If still not improving — may need incision or drainage by ophthalmologist
- If still present after 6 months — **medical consult** to exclude other causes, eg malignancy

Orbital cellulitis (cellulitis around or behind eye)

Can be life-threatening — **medical consult to send to hospital urgently**

Check

Figure 7.15

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Eye assessment (page 373) — consider cellulitis if
  - Eyelids swollen and eyeball red — Figure 7.15
  - Eye movements limited
  - Double vision, vision getting worse, visual field restricted
  - Relative afferent pupil defect (RAPD)

Do

- **Urgent medical consult**
- Put in IV cannula
- Pathology — blood for blood cultures, eye swabs
- Give **ceftriaxone** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose

AND **flucloxacillin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose

  - If allergy — **medical consult**
- Give **pain relief** (page 326)
- Give **antiemetic** (page 420) to stop vomiting before transport

Acute glaucoma

Sight threatening emergency caused by increased pressure inside eye — **urgent medical/specialist consult to send to hospital**

Ask

- Sudden loss or blurring of vision, seeing halos (coloured rings) around lights
- Severe pain
- Nausea or vomiting
- Recent bleeding in eye or drops to dilate pupil

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Eye assessment (page 373)
  - Single red eye
  - Pupil — mid-dilated (4–6mm), reacting poorly to light or fixed — Figure 7.16
  - Cornea cloudy — Figure 7.16
- Measure eye pressure in both eyes if your clinic has equipment (eg iCare tonometer) — follow manufacturers directions

Figure 7.16

Do not

- **Do not** put pad over eye

Do

- Lay person on back
- **Urgent medical consult** to send to hospital within 4–6 hours
  - Give **pain relief** (page 326)
  - Give **antiemetic** (page 420) to stop vomiting before transport
  - Doctor may suggest **acetazolamide** oral (IV if vomiting) — adult 500mg, single dose to reduce pressure
  - **Specialist consult** — for advice on further doses and eye drops to further reduce pressure if available

Trachoma

Potentially blinding eye disease caused by corneal scarring by trichiasis (misdirected eye lashes) after repeated conjunctival infections, which may have occurred in childhood. Often has few or no symptoms

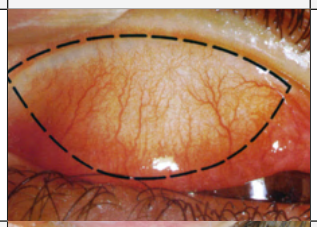
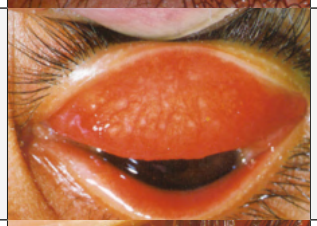
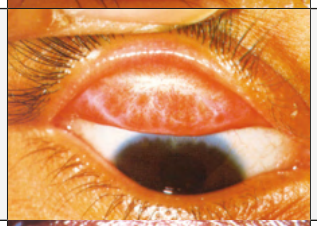
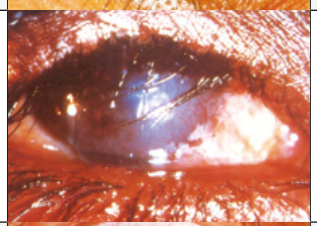
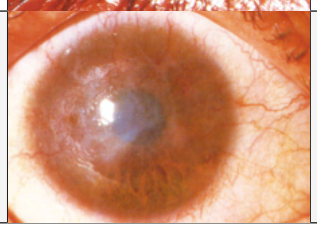
Trachoma control needs

- 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

- Each eye individually — see Eye assessment (page 373)
  - Eyes may be red and irritated with watery or pussy discharge
  - Evert eyelids so you can look under them
- Check for trachoma follicles (TF) — Table 7.5
  - Hold lashes, pull eyelid down
  - Place applicator above lid crease to flip lid
  - Hold flipped lid and look carefully for follicles
- Check for trachoma trichiasis (TT) using the 3 T's — Table 7.5
  - Think — check for trichiasis at every old persons check
  - Thumb — use your thumb to lift the upper eyelid off the eyeball
  - Torch — shine a penlight torch to check for in turned eyelashes

Table 7.9 Trachoma signs and grading

Grading score		Signs (signs can occur alone or together. Grade each sign separately)
		**Normal conjunctiva** • Pink, smooth, thin, transparent • Large, deep-lying blood vessels running up and down
TF		**Inflammation – follicles** • 5 or more small (0.5mm or more) white/grey/yellow spots under upper lid
TI		**Inflammation – intense** • Conjunctiva rough and thickened — velvety redness hides normal blood vessels • Lots of follicles partially or totally covered by thickened conjunctiva
TS		**Scarring** • Scarring following inflammation • White lines, bands or sheets of scar tissue • May not be able to see deep-lying blood vessels
TT		**Trichiasis** • 1 or more eyelashes turned in to touch cornea or plucked eyelashes
CO		**Opacity** • White/grey scarring opacity in cornea with pannus (sheet of blood vessels)

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 — adult 1g, child — doses (page 501) — single dose
  - If allergy — **medical consult**
- Treat all household contacts within 1 week to stop person getting infected again
- Check with PHU for who else needs treatment

Do — if eyelashes touching eyeball (TT) or damage to 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 re-growing
- **Refer to eye specialist** as soon as possible — may need surgery

Eye injuries

Red Flags — Urgent Medical Consult

- Penetrating eye injury
- Blunt eye injury — especially 'blowout fracture' of eye socket
- Bleeding inside eye — hyphema, retinal or vitreous haemorrhage
- Subconjunctival haemorrhage — if you can't see back edge, especially if history of trauma
- Chemical injury — especially if large amount of damage to cornea

Penetrating eye injury

Eyeball punctured — object may or may not still be in eye

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 — consider IV fluids

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Eye assessment (page 373) — only do what is needed to confirm — **do not do lid eversion**
- Immunisation status — tetanus

Do

- **Medical consult** to send to hospital
- Keep person calm — advise them not to cough, sneeze, strain
- Give **antiemetic** (page 420) to stop vomiting before transport
- Give **pain relief** (page 326)
- Give **ceftriaxone** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose
- 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/IM — adult 25mg, child 0.5mg/kg/dose up to 25mg — doses (page 511) — single dose
  - If not enough or under 2 years — **medical consult**
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD — 88–92%
- Put loose fitting shield over eye to prevent eye contents being pushed out — **do not** use eye pad under shield
- If person still very agitated or distressed — **medical consult** about giving midazolam

Foreign body (something in eye)

Something stuck on or in surface of eyeball, eg sand, seed, metal

Check

- Eye assessment (page 373) — always look under eyelid

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 — may remove objects 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**
  - If this doesn't work — put in **topical local anaesthetic** (page 374) and try again
  - If still doesn't work — try to remove with 25G needle 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 — Figure 7.17
- If cornea (eye surface) damage — see Corneal ulcers or infection (page 382)

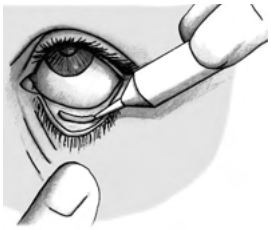


Figure 7.17

Blunt eye injury

Commonly caused by fist, elbow, finger, ball, rock

Check

- Eye assessment (page 373) if possible
  - Can be hard to see into eye if eyelids are swollen — gentle, steady pressure will usually allow you to open eyelids
  - If not — consider using analgesia and emergency eye lid retractor — See eye procedures
- If you can't get eyelids open — **medical consult** to send to hospital to be properly examined
  - **Do not** wait for swelling to go down

Do

- If double vision, reduced eye movements, numbness around eye or upper gum (signs of 'blowout' fracture of eye socket) — **medical consult** to send to hospital. Specialist will arrange scan
- If pupil shape or responses irregular, ruptured globe, bleeding inside eye, no red reflex seen — **medical consult** to 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

- Hyphema (bleeding into front of eye) — look for fluid level at bottom of iris while sitting up Figure 7.18
- Retinal or vitreous haemorrhage (bleeding into back of eye)
  - Will be hard to see — red reflex may be dull
  - May have developed very poor vision since being hit

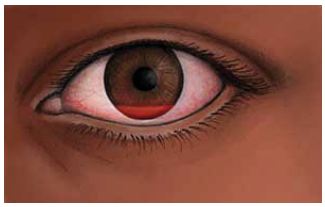


Figure 7.18

Do not

- **Do not** give aspirin, heparin or NSAIDs — may cause more bleeding

Do

- **Medical consult** to send to hospital
- Keep person calm and lying down
- Put pad over both eyes —using 2 pads for each eye
  - If this upsets person too much — let them sometimes uncover good eye

Subconjunctival haemorrhage (bleeding into white of eye)

Check

- BP — may be high
- 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 — Figure 7.19 — not serious and should get better by itself in a week
  - If you can't see back edge — Figure 7.20 — could be skull fracture if history suggests significant trauma — **medical/specialist consult**

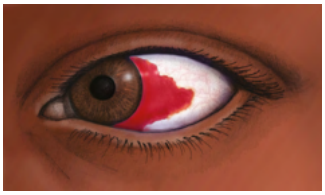


Figure 7.19

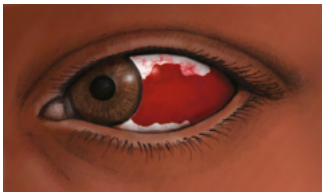


Figure 7.20

Chemicals in eye

Do first

Immediately irrigate (wash out) eye with water or normal saline only — for at least 30 minutes

- **In clinic** — give **local anaesthetic drops** first — will make irrigation easier
  - Use IV-giving set to run **normal saline** steadily over eye while holding lids open
- **Outside clinic** — use plenty of any available clean water — put eye under tap or hose *OR* have person put face in bowl of water. Ask them to blink vigorously

Do not

- **Do not** waste time
- **Do not** wash out with anything except water or normal saline
- **Do not** stop washing out too soon

Ask

- Try to find out type of chemical
  - **Alkalis** like concrete, lime, plaster, bleach are more dangerous than **acids** like car battery fluid, toilet cleaner, rust removers
  - Alkalis may need to be washed out for 2–3 hours

Do

- Irrigate (wash out) eye for **at least** 30 minutes
- Test pH of eye every 15 mins — using pH test strip or pH pad on urine dipstick to conjunctival fornix (pocket between the lower eye lid and globe) — until pH is 7 or same as unaffected eye
- **Urgent medical consult**
- Eye assessment (page 373)
  - Make sure whole surface of eye, under eyelids, in corners is all washed and completely clean — double evert lid
  - Local anaesthetic drops will make this easier
  - If large patch of damage to cornea (eye surface) — **medical consult** to send to hospital
- 5 minutes after stopping wash out — test pH again. If pH has changed — keep washing out until pH 7 or same as unaffected eye

UV keratitis (flash burns)

Red sore eyes caused by sudden bright light, eg ultra violet light from arc welder. May not be aware of it until several hours later

Check

- Eye assessment (page 373) — make sure there is not something in eye

Do

- If anaesthetic needed to examine eye — put in 2 drops of **topical local anaesthetic**
- 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 — Figure 7.17
- Give **pain relief** (page 326)
- Cool compresses (eg clean cool towel) may help
- Remind person to use appropriate eye protection next time

Follow-up

- If not getting better after 1 day — **medical consult**

Ear and hearing problems

- Ear infections 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
- **Serious ear problems are often asymptomatic (painless) — examine EVERY ear of EVERY child at EVERY opportunity**

Red Flags — Urgent Medical Consult

- Severe pain and swelling behind ear (acute mastoiditis)
- Perforation in top of ear drum (attic cholesteatoma)
- Foreign body in ear *AND* fever/unwell/infected grommets
- Baby less than 2 months old with ear problem

Ask

- How long has problem been going on
- Pain or tenderness — in ear, when moving outer ear, behind ear
- Discharge
  - If more than 2 weeks — chronic suppurative otitis media (CSOM)
  - If less than 2 weeks — acute otitis media with perforation (AOMwiP)
- Any swelling behind ear
- Any itch in ear
- Any problems with hearing or talking

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Look in notes and ask about previous ear problems
- If intact ear drum and not too painful — test eardrum movement using pneumatic otoscopy or tympanometry

Otoscopy examination

Need clear view of eardrum for otoscopy examination. Do not syringe if any pain or any holes in ear drum

- Discharge — colour, type and amount. If any discharge — usually means perforation
- Blocked ear canal
  - Pus — clean with tissue spears or syringe — See Ear procedures
  - Wax — soften by filling canal with docusate sodium ear drops for 2 nights before syringing only if ear drum intact
  - Foreign body — syringe only if ear drum intact
- Eardrum — colour, bulge, perforation — Figure 7.21
- Hole in eardrum — note and record in file notes — Figure 7.22
  - Size — small/pinhole (less than 2%), medium (2%–30%), large (greater than 30%), subtotal (very little ear drum remaining)
  - Location — draw the size and position and note right or left ear

Treatment — general principles

- Pain relief (page 326)
- If using ear drops — clean ears then tragal pump (gently push on ear flap) to help ear drops reach middle ear
  - Teach parents how to safely clean ears and add drops
- Persistent otitis media or any CSOM — **refer for both audiology (hearing test) and to ENT**
- If tympanostomy tube otorrhoea or grommets with pus for 4 weeks or intermittent for 3 months — **refer to treating ENT**
- To reduce risk of long term disability due to poor hearing — give information to family and school (with consent) about hearing ability and provide strategies to improve hearing
  - Reduce background noise, use clear louder speech, watch face of speaker, give lots of opportunities to learn speech and language
  - Arrange classroom or individual amplification, sit at front with less distraction
  - Refer to audiologist and speech pathologist

Ear examination charts

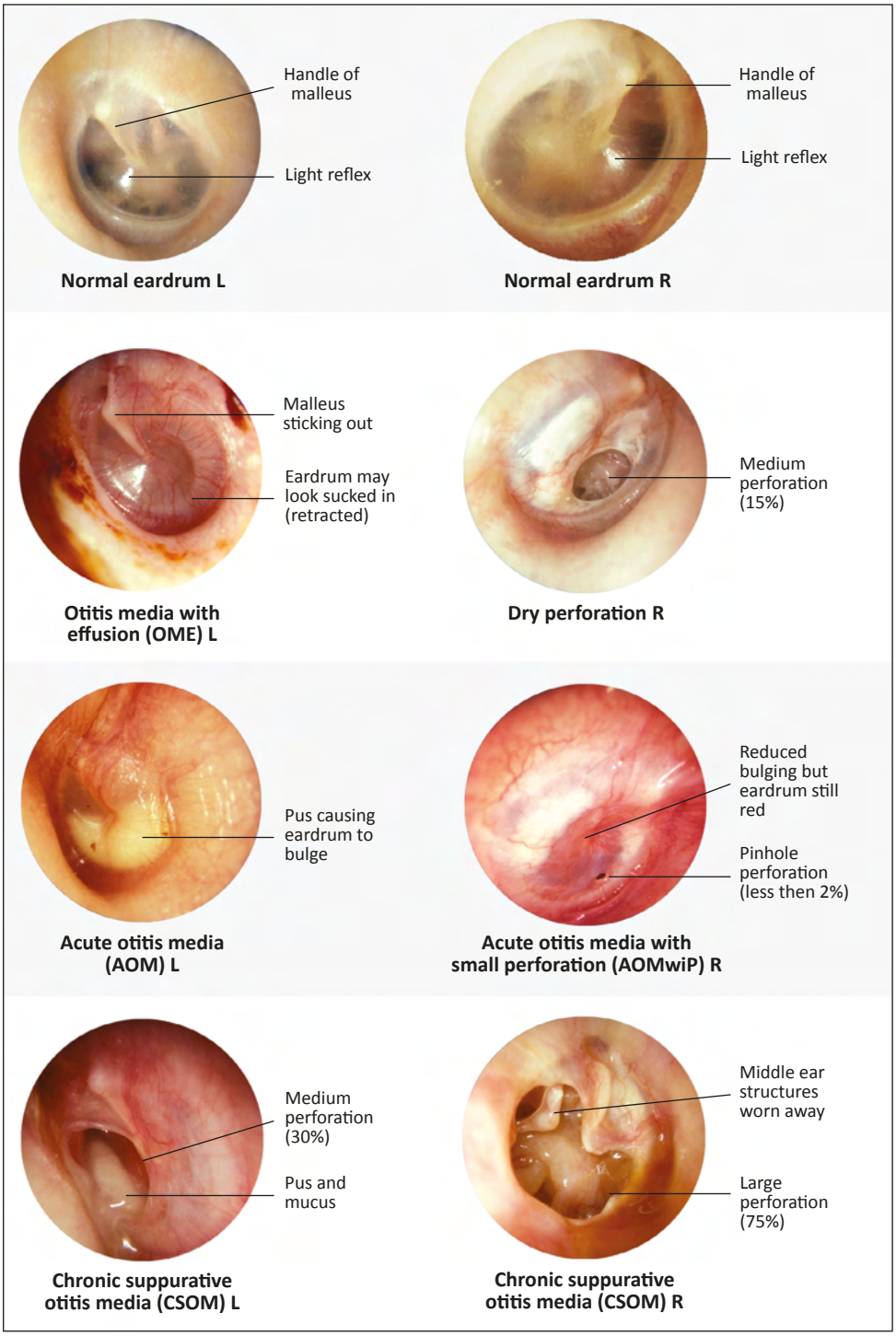
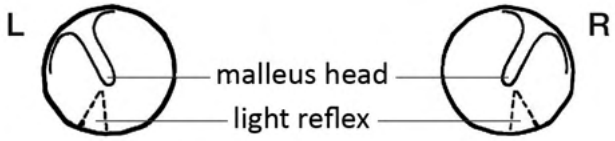
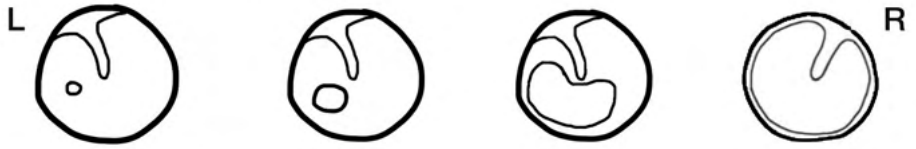


Figure 7.21

Normal eardrum



Perforated eardrum



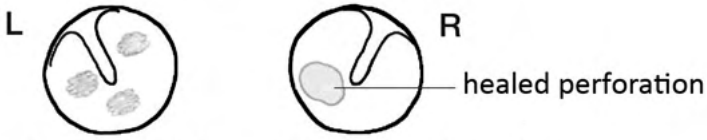
Small (less than 2%)	Medium (more than 2% less than 30%)	Large (more than 30%)	Subtotal (only remnants of eardrum remain)

In subtotal/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

A perforation in the attic (upper) region of the eardrum may be a cholesteatoma and must be seen by a doctor.

Scarring of the eardrum



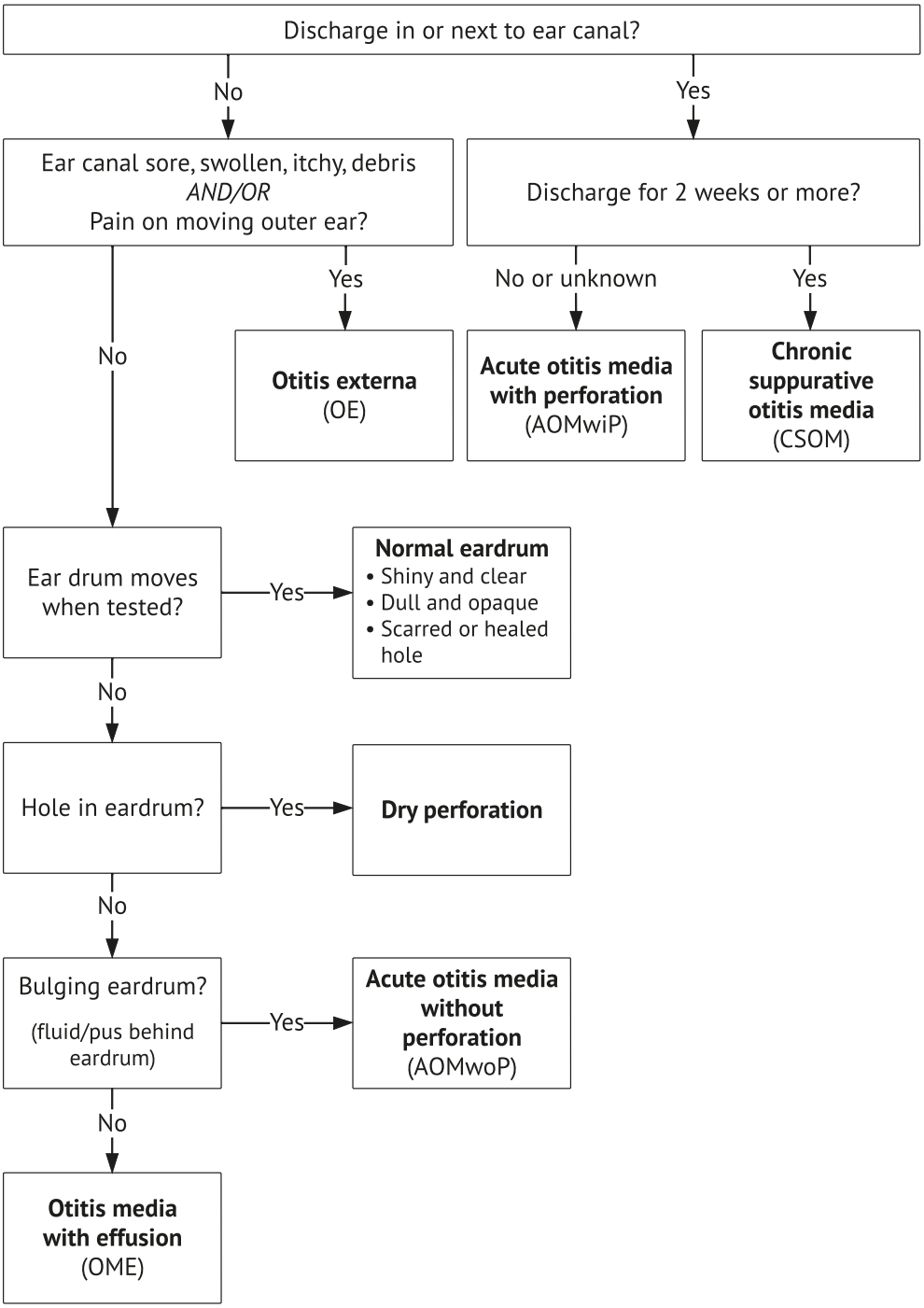
White cloud-like patches

Transparent film — like a patch of cling wrap

Figure 7.22

Diagnosing ear problems

Flowchart 7.1 Diagnosing ear problems



Acute otitis media without perforation (AOMwoP)

- Bulging ear drum with no perforation. May not be painful
- Audiometry is not recommended for episodic AOMwoP, however children at high risk with more than one episode should be referred for audiology
- If child under 2 years — may need many weeks of antibiotics or increased dose to get better and to prevent perforation

Do

- See Treatment — general principles *AND*
- Talk with family about importance of antibiotics to prevent chronic ear problems
- Give **azithromycin** oral — 30mg/kg — doses (page 501) — single dose
- *OR* **amoxicillin** oral — adult 1g, child 25mg/kg/dose up to 1g — doses (page 501) — twice a day (bd) for 7 days
  - *OR* If they have been on antibiotics in past 30 days — give high dose **amoxicillin** oral — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — twice a day (bd) for 7 days
- If allergy to penicillin — give **trimethoprim-sulfamethoxazole** oral — adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg — doses (page 501) — twice a day (bd) for 5 days

Review after 7 days

- If resolved – review in 4 weeks
- If on azithromycin and not resolved
  - Give second dose of **azithromycin** oral — 30mg/kg — doses (page 501) — single dose
- If on amoxicillin and not resolved
  - Check compliance and if treatment regime is understood
  - Give **azithromycin** oral — 30mg/kg — doses (page 501) — single dose
  - *OR* Increase to high dose **amoxicillin** oral — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — twice a day (bd) for 7 days
  - If allergy to penicillin — **medical consult**

Review again after 7 days

- If resolved – review in 4 weeks
- If azithromycin started at last visit and not resolved
  - Give second dose of **azithromycin** oral — 30mg/kg — doses (page 501) — single dose
- If not resolved after 7 days of high-dose amoxicillin or two doses of azithromycin

- Give **amoxicillin–clavulanic** acid oral — adult 1,750+250mg, child 45+6.25mg/kg up 1,750+250mg — doses (page 501) — twice a day (bd) for 7 days
- If allergy to penicillin — **medical consult**

Review again after another 7 days

- If resolved — review in 4 weeks
- If not resolved — **medical consult**

Acute otitis media with perforation (AOMwiP)

- Discharging ear for less than 2 weeks

Do

- See Treatment — general principles *AND*
- Give **azithromycin** oral — 30mg/kg — doses (page 501) — single dose
  - *OR* give high-dose **amoxicillin** oral — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — twice a day (bd) for 14 days
  - If allergy — **medical consult**
- *ALSO* If discharge (pus) present clean ears *THEN* give **ciprofloxacin** — 5 drops, twice a day (bd) for 7 days

Review after 7 days

- If resolved — complete antibiotic course and review in 4 weeks
- If on azithromycin and ongoing discharge (pus) or perforation
  - Give second dose of **azithromycin** oral — 30mg/kg — doses (page 501) — single dose
- If on high dose amoxicillin and ongoing discharge (pus) or perforation
  - Give **azithromycin** oral — 30mg/kg — doses (page 501) — single dose
  - *OR* **amoxicillin–clavulanic acid** oral — adult 1,750+250mg, child 45+6.25mg/kg up to 1,750+250mg — doses (page 501) — twice a day (bd) for 7 days
  - If allergy to penicillin — **medical consult**
- *ALSO* clean ears *THEN* give **ciprofloxacin** — 5 drops, twice a day (bd) for 7 days

Review after a further 7 days

- If not resolved within 2 weeks — treat as CSOM
- If resolved — routine monitoring

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 *AND*
- **Medical consult**
- **Refer for audiometry** (hearing test)
  - If hearing loss of more than 30dB and no imminent ENT surgery — **refer for hearing aid consult**
- Monitor and ask carers about delay in language development and increasing difficulties talking or hearing
- If under 2 years and at high risk of AOMwiP or CSOM — consider preventative antibiotics
  - Give **amoxicillin** oral — adult 1g, child 25mg/kg/dose up to 1g — doses (page 501) — twice a day (bd) for 3 months, then review
  - If allergy — **medical consult**
- Tell parents/carers that preventative antibiotics should reduce number of infections by about half
- If doesn't improve — continue antibiotics and **refer to ENT and paediatrician**
- If rAOM fails to improve despite a trial of preventative antibiotics — **refer to ENT** for consideration of tympanostomy tubes, with or without adenoidectomy

Chronic suppurative otitis media (CSOM)

- Perforation with discharge (pus) for 2 weeks or more and/or if tympanic membrane perforation can be visualised and size estimated to be adequate to allow topical treatments to pass through easily
  - An easily visible perforation is more than 2%
  - If you can't see a perforation on the drum — **do not** use drops

Do

- See Treatment — general principles *AND*
- Clean until ear drum visible using tissue spears
- After cleaning ears give **ciprofloxacin** — 5 drops, twice a day (bd) for 7 days
  - If pinhole perforation — **do not** use ciprofloxacin drops initially — give **amoxicillin** oral — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — twice a day (bd) for 14 days or until perforation is dry for a week
  - If allergy — **medical consult**
- Teach parents to clean/dry mop ears with tissue spears and put in drops

- Advise to keep ear as dry as possible

Persistent CSOM (after 4 months of treatment)

- If no visible perforation — stop drops — give **trimethoprim-sulfamethoxazole** oral — adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg — doses (page 501) — twice a day (bd) for 6-12 weeks
- If allergy — **medical consult**
- **Medical consult** to consider hospital admission for IV or IM treatment
- Review weekly 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* and **refer for hearing test**
- Talk with parents about stimulating speech and language in a young child — lots of talking, going to preschool, childcare, early learning program

Dry perforation (hole)

Do

- Advise family to bring child back to clinic straight away if pus (discharge) from ear — treat as AOMwiP
- See Treatment — general principles *AND*
- If hole in eardrum for more than 3 months — hearing test and **medical follow-up**
- If child over 6 years with perforation not healed in 6–12 months *OR* hearing loss more than 30dB *OR* large perforation of any duration — **refer to ENT**. May need surgical repair
- If hearing impairment — make sure hearing support aids are used at home and school

Otitis media with effusion (OME) — glue ear

- Can be hard to diagnose
  - No eardrum bulge
  - Immobile eardrum or Type B tympanogram *AND* either fluid behind intact eardrum *OR* dull opaque intact eardrum
  - Generally pain-free
- Symptoms may include talking, hearing or listening problems, behaviour problems or poor balance

Do

- See Treatment — general principles *AND*

If problem for less than 3 months

- No investigation or treatment needed
- Reassure carers and suggest communication strategies
- **Medical follow-up** monthly. If persistent for 3 months — treat as for persistent OME
- If any hearing, speech, language concerns — **refer to audiology**

If persistent OME (OME in both ears for 3 months or more)

- **Medical consult**
- Consider long-term antibiotics especially in young child at high risk of CSOM
  - Give **amoxicillin** oral — adult 1g, child 25mg/kg/dose up to 1g — doses (page 501) — twice a day (bd) for 2–4 weeks *THEN* review
  - If allergy to penicillin — **medical consult**
- **Refer for hearing test and ENT review** — hearing aid if hearing loss more than 30dB in the better ear
- Talk with parents about stimulating speech and language in young child — lots of talking, going to preschool, childcare, early learning program
- If concerns about hearing, speech or language development at any time — **refer to paediatrician, speech pathologist, audiologist**

Otitis externa

- Ear canal sore, swollen, itchy
- Pain on moving outer ear

Do

- See Treatment — general principles *AND*
- Check for hole in eardrum — could really be middle ear disease
- Give **dexamethasone-framycetin-gramicidin** ear drops — put in drops by tilting head and filling ear canal
  - *OR* **triamcinolone-neomycin-gramicidin-nystatin** ointment
- If ear canal very swollen, severe symptoms or poorly controlled pain — **medical consult**
- Keep ears dry (no swimming or wetting) for 2 weeks after finishing treatment

Infected grommets or Tympanostomy Tube Otorrhoea (TTO)

Do

- See Treatment — general principles *AND*

Complicated TTO

Continuous for 4 weeks and fever (Temp 37.5°C or more) *OR* redness/swelling behind the ear, on inside and outside of ear canal — **urgent medical consult**

- Give **amoxicillin–clavulanic acid** oral — adult 1750+250mg, child 45+6.25mg/kg up 1750+250mg — doses (page 501) — twice a day (bd) for 7 days
- If allergy — **medical consult**
- **Urgent referral** for ENT assessment and refer for hearing assessment

Complicated TTO with bleeding

Bleeding suggests polyp and inflammation — **urgent medical consult**

- Clean ears and *THEN* give **ciprofloxacin and hydrocortisone** (Ciproxin HC) — 5 drops, twice a day (bd) for 7 days

If uncomplicated — no fever or associated illness

- **Do not** give oral antibiotics
- Clean ears with tissue spears
- After cleaning ears give **ciprofloxacin** — 5 drops, twice a day (bd) for 7 days or until ear dry for 3 days
- Review weekly for 4 weeks
- Keep ear dry (no swimming or wetting) during treatment

Acute mastoiditis

- Rare but can be fatal — infection can spread to brain
- Starts as AOM then becomes infection in mastoid (bone behind ear)

Check

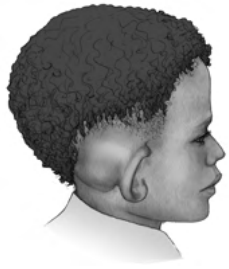


Figure 7.23

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to ears
  - Tenderness, usually swelling behind ear over mastoid bone — Figure 7.23
  - Ear may stick forward at funny angle

Do

- **Urgent medical consult to send to hospital**
- Put in IV cannula if possible
- Blood cultures before giving antibiotics if possible
- Give **flucloxacillin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose
  - *AND* **gentamicin** IV — doses (page 501) — single dose
  - If allergy to penicillin — **medical consult**

Cholesteatoma

- Abnormal cyst (skin growth) in middle ear behind eardrum
- Can occur after repeated infections. May gradually increase and destroy the bones of middle ear
- Consider cholesteatoma if
  - CSOM with perforation in attic (upper) area — Figure 7.24
  - Granulation tissue or scaly material seen through persistent perforation

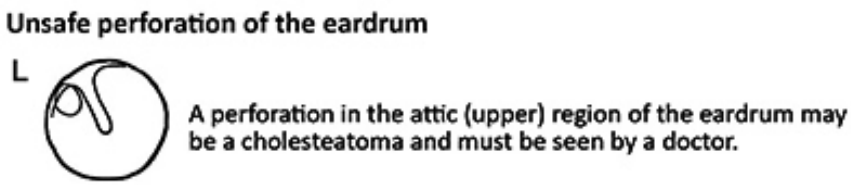


Figure 7.24

Do

- **Refer** all possible cases to ENT specialist for evaluation and management — must be seen within 1 week
- If in pain — **medical consult** to send to hospital

Foreign bodies

Do

- Foreign body with pain, fever (Temp more than 37.5°C), bloody pus (discharge) from ear — **urgent medical consult**
- **Never** use forceps to remove foreign body — most foreign bodies can be syringed out with warm water
- Before syringing — drown insect with vegetable oil, **lidocaine (lignocaine) 1%** *or* **tetracaine (amethocaine) 1%**
- If problems — **medical consult**

Hearing impairment

- Otitis media causes hearing impairment that ranges from mild to severe
- Hearing loss is often temporary but can become permanent with repeated episodes or persistence of otitis media
- **If hearing loss for more than 3 months in both ears**
  - There is a risk to language development and learning — refer to speech pathologist
  - **Refer** for rehabilitation including hearing aids, eg Australian Hearing

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, maternal antibiotics in pregnancy
- An audiogram measures hearing in decibels (dBs) at different pitches (frequencies) — used to predict what problems are likely and what assistance may be needed — Table 7.6
- Audiology services will advise what referrals are needed

Table 7.10 Understanding hearing test results

Hearing test result	Expected hearing and communication disability	Action
0–20dB loss in one or both ears	• None	• Review if still concerned
Loss in one ear only — other ear normal	• Hearing speech when background noise • Localising sounds	• Talk with family about possible problems • Amplification can help
Better ear **Mild** 21–30dB loss	• Hearing speech when background noise • Hearing soft speech sounds • Learning language	• Hearing and educational support • Encourage use of amplification • Communication strategies
Better ear **Moderate** 31–60dB loss	• Hearing speech even in quiet place • Learning a new language • Listening at a distance • Following group conversation	• Hearing and educational support • Encourage use of amplification • Communication strategies
Better ear **Severe** 61–90dB loss *OR* **Profound** 91 or more dB loss	• Unable to hear speech • Unable to acquire language	• Specialised hearing services — including educational support • Encourage use of amplification • Communication strategies

Supporting resources

- Otitis Media guidelines for Aboriginal and Torres Strait Islander children

Hepatitis

If pregnant — see Hepatitis in pregnancy (WBM, page 154)

Red Flags — Urgent Medical Consult

- Dehydrated
- Persistent vomiting
- Confused, unusual behaviour, drowsy, reversal of sleep/wake cycle, tremor
- Unusual bruising or bleeding
- Ascites and oedema (swollen abdomen and legs)
- Fever with abdominal pain
- INR greater than 1.3 *OR* ALT greater than 1000 units/L

Causes of hepatitis

- Viral hepatitis (A, B, C) — Table 7.11
- Syphilis
- 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 copper in body

Symptoms

- Caused by new acute hepatitis or worsening of chronic hepatitis
  - Feel unwell, no appetite
  - Confusion, drowsiness
  - Dark urine — colour of strong tea
  - Pale faeces
  - Nausea and/or vomiting
  - Jaundice (yellow skin or eyes)
  - Upper abdominal pain, tender liver
  - Smokers go off their cigarettes
- If underlying chronic liver disease — may also have signs of cirrhosis
- Children may not be sick at all
- Common to have abnormal LFT without being sick or having any significant liver disease

Table 7.11 Main types of viral hepatitis

	Hepatitis A	Hepatitis B	Hepatitis C
How it spreads	• From faeces to hand to mouth • Contaminated food or water	• Contact with blood* or other body fluids • Infected mother to child, eg during birth • Sex without a condom • Between young children	• Contact with blood* • Blood transfusions before 1990 • Infected mother to 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)	• Child — routine schedule (for Aboriginal and Torres Strait Islander children in NT, QLD, SA, WA) • Anyone living in Aboriginal community • Anyone with any underlying liver disease or other viral hepatitis	• Child — routine schedule • People with STI, chronic kidney or liver disease • Household contacts and sexual partners • Health professionals or others exposed through jobs eg police	• 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

Acute hepatitis

Liver inflammation — measured by raised ALT (liver function test)

Ask

- About symptoms
- Faeces — pale or melena (blood, black and tarry)
- Alcohol use — recent binge
- IV drug use, unprotected sex
- Medicines — prescribed or over the counter

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test

Do

- If hepatitis status unknown or not immune — bloods as needed
  - Hepatitis A — HAV IgG, HAV IgM
  - Hepatitis B — HBsAg, anti-HBc IgG, anti-HBc IgM, anti-HBs — write in clinical notes on pathology form 'query Hepatitis B' so that pathology company can complete all tests
  - Hepatitis C — anti-HCV
- Blood for LFT, AST, INR, FBC, UEC
- **Medical consult**
- Advise person — careful hand washing, separate eating utensils, safer sex (page 318), 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

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
- Put on recall for 6 month review — to see if problem has become chronic

Chronic hepatitis

- Hepatitis (inflamed liver) or viral hepatitis infection for more than 6 months
- ALT is raised if more than 30 units/L in men or 19 units/L in women
- All Aboriginal Australians should be tested for Hepatitis B (HBsAg, Anti-HBs, Anti-HBc) at least once due to the high rate of chronic Hepatitis B in Aboriginal people

- Alcohol, fatty liver and hepatitis B infection are the most common causes of chronic liver disease in remote Aboriginal communities. Hepatitis C is an increasing problem

Classification of hepatitis B status

Understanding hepatitis serology (blood tests) is hard — contact PHU if you need help

Table 7.12 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 complies with the recommended schedule — no further testing for hepatitis B is needed unless
  - They are Aboriginal and/or Torres Strait Islander
  - There is a clinical reason to think they have active hepatitis
  - It is part of routine antenatal testing in pregnancy — see Hepatitis in pregnancy (WBM, page 154)

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

Look in file notes

- Pathology results — HBsAg, anti-HCV
  - If previously positive HBsAg — manage as chronic hepatitis B (page 412)
  - If previously positive anti-HCV — manage as chronic hepatitis C (page 412)
  - If no previous pathology results — do 6 month recall for chronic hepatitis check (page 409)

Check

6 months after first acute presentation *OR* if reoccurrence of symptoms

- Blood for FBC, UEC, LFT, coagulation studies, HIV
- If hepatitis B
  - Take blood for HBsAg, hepatitis B viral load, HBeAg, anti-HBe. If result not known — *ADD* HAV IgG, Anti-HCV
  - 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 and follow-up
- Discuss preventive measures — Table 7.13
- For all new diagnoses of chronic liver disease
  - Liver ultrasound
  - Manage hepatitis B (page 412) and hepatitis C (page 412)
- If not hepatitis B or hepatitis C — may also need tests for antinuclear, anti-smooth muscle, anti-mitochondrial, anti-LKM antibodies, alpha1 anti-trypsin, caeruloplasmin, copper studies, iron studies, HbA1c and non-fasting lipids, immunoglobulins

Table 7.13 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	• **Do not** share razors, needles, toothbrushes • Safer sex (page 318)
Hepatitis C	Hepatitis A and hepatitis B	No	• **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, eg cirrhosis (scarred liver), liver cancer
- Prevent passing infection to others
- Minimise alcohol use — see Brief interventions
  - Shouldn't drink alcohol at all
  - If drinking — advise less than 7 standard drinks (page 279) week and at least 3 alcohol-free days a week

Do — chronic hepatitis B infection

HBsAg positive for more than 6 months

- Adult Health Check (page 222)
- If at high risk of liver cancer (page 413) — 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
- **Medical follow-up** to consider if specialist consult is required

Do — 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 in 8–12 weeks with easy to take tablet medicine
- All patients should have treatment and monitoring discussed with specialist
- If evidence of cirrhosis — **urgent referral to specialist**

Do — 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

Fibrosis (liver scarring) — some people have normal liver function tests and no symptoms or signs of liver disease

More likely if abnormal findings on any of the following

- Clinical signs of chronic liver disease — encephalopathy (altered mental state), spider naevi (red spots on chest wall that go pale with pressure), palmar erythema (red palms), gynaecomastia (breast enlargement in males), palpable spleen, ascites (swollen abdomen), oedema (swollen legs)
- Abnormal blood test results — low platelets, low albumin, high bilirubin, high INR
  - APRI (AST to platelet ratio index) score more than 1 may indicate fibrosis — see APRI online calculator
- 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 Aboriginal people over 50 years with hepatitis B or hepatitis C
- Chronic hepatitis B or hepatitis C *AND* family history of liver cancer in first degree relative
- All persons with proven or suspected cirrhosis

Do

- 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

Supporting resources

- APRI (AST to Platelet Ratio Index) online calculator
- Menzies Hep B Story app
- Menzies Hep B PAST — Hep B hub website

Human T Cell Leukaemia Virus type 1 (HTLV-1)

- The Human T Cell Leukaemia Virus type 1 (HTLV-1) is a human retrovirus that seems to be associated with clinical disease in approximately 10% of people infected — the vast majority will never develop symptoms
- HTLV-1 is the recognised cause of adult T cell leukaemia/lymphoma (ATL) and HTLV-1 associated myelopathy/tropical spastic paraparesis (HAM/TSP)
- HTLV-1 is also associated with inflammatory diseases including bronchiectasis, uveitis, infective dermatitis and severe infections with strongyloides, stercoralis and scabies

Assessment

- Consider HTLV-1 in an Aboriginal person with
  - Progressive difficulties with walking or passing urine
  - Chronic lung disease — see bronchiolitis (page 435)
  - Frequent infective dermatitis
- Review previous specialist assessments and hospital admissions — check if previous testing for HTLV-1
- **Medical consult**

Ask

- About anyone else in the family with similar problem

Check

- Full adult health check (page 222) — including **medical consult** for gait and neurological examination

Do

- **Medical consult** for referral to infectious disease specialist

Follow-up

- Reinforce safe sex messages and advise not to share razors or needles — to prevent spread of HTLV-1 infection
- Specialist advice for
  - Care plan
  - Frequent or unresolving skin and lung infections
  - Breastfeeding women with HTLV-1 — may be advised to cease breastfeeding after 6 months depending on capacity to provide safe alternatives and risk of transmission

Melioidosis

- An infection caused by bacteria found in soil and water
- More common in tropical Northern Australia during wet season. Has occurred in Central Australia after heavy rains and flooding
- Usually affects adults with risk factors

People with melioidosis can go from a bit sick to very unwell very quickly — all need to go to hospital

Risk factors
- Diabetes — highest risk
- Heavy use of alcohol or kava
- Chronic kidney disease
- Chronic lung disease
- Immune suppression from disease or therapy, especially steroids
- Underlying cancer

Red Flags — Urgent Medical Consult
- High risk area
- Moderate/severe pneumonia *AND* one or more risk factors

Consider melioidosis in person with
- Pneumonia
- Fever, unwell
- Ulcers or boils on skin that take longer than usual to heal
- Lower abdominal pain, prostate melioidosis (trouble passing urine in men)

Ask

- History of symptoms and when they started

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam

Do

Collect samples

- U/A for MC&S — ask laboratory to culture for melioidosis
- Blood for cultures, FBC, melioidosis serology
- If coughing — sputum for MC&S — ask laboratory to culture for melioidosis
- Swabs — throat swabs and rectal swabs for all suspected cases. If unhealed lesion — wound swabs. If cough — extra sputum
  - Put in Ashdown's medium, label 'cultures for melioidosis' and keep at room temperature — Ashdown's is special melioidosis culture medium. Keep in fridge before use
  - If Ashdown's medium not available — use ordinary transport medium and ask laboratory to culture for melioidosis

Management and referral

- If you suspect melioidosis — **medical consult**
- If risk factors and moderate/severe pneumonia — send to hospital
- If other symptoms but not very unwell — do tests, give usual treatment and wait for results
  - If melioidosis confirmed by culture — **medical consult** to send to hospital
  - If melioidosis serology positive — **infectious diseases unit consult**
- If confirmed diagnosis and very unwell — will need treatment before going to hospital
  - Take blood for blood cultures **before** giving antibiotics
  - Give (if available) **ceftazidime** IV — adult 2g, child 50 mg/kg up to 2g
  - If ceftazidime is not available — give **ceftriaxone** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose *AND* transfer to hospital for directed melioidosis therapy
- If melioidosis suspected but not confirmed *ADD* to ceftriaxone — **gentamicin** IV — doses (page 501) — single dose for other bacteria
  - If allergy — **medical consult**
- If likely to be transferred to ICU — retrieval team will give meropenem if needed
- Hospital treatment will be IV antibiotics (ceftazidime or meropenem) for a minimum of 2 weeks but often longer is needed

Follow-up

- Melioidosis can come back — further treatment is needed for at least 3 months after IV antibiotics are completed
  - Give **trimethoprim-sulfamethoxazole** oral — adult more than 60 kg — 320+1600 mg, adult 40 to 60 kg — 240+1200 mg, child 1 month or older — 6+30 mg/kg up to 240+1200 mg, twice a day (bd)
  - **Folic acid** oral once a day — adult 5mg, child 0.1 mg/kg up to 5mg
- Weekly follow-up — check any problem taking antibiotics
- Monthly medical follow-up including FBC, LFT, UEC to check for medicine side effects
- Record clearly in file notes that person has had melioidosis

Nausea and vomiting

- Thorough history and clinical examination needed
- Symptoms have many causes — range from easily treatable to serious and life-threatening
- **Must identify and treat cause — see Acute assessment of nausea and vomiting** (page 24)

Red Flags — Urgent Medical Consult

- Large amount of vomited blood — possible oesophageal tear
- Abdominal pain
- Chest pain
- Severe unresponsive vomiting
- Moderate to severe dehydration
- Unknown cause for vomiting
- Child with vomiting and significant pain
- Oculogyric crisis

Ask

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

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A, pregnancy test — if pregnant — see Common discomforts of pregnancy (WBM, page 132)
- If available POC Test — WBC, electrolytes, ketones
- Head-to-toe exam — attention to abdomen and dehydration
  - For child — see Assessing dehydration (page 208)

Do first

- **Medical consult** if
  - Moderate/severe dehydration — to consider IV fluids
  - Ketones — diabetic ketoacidosis (DKA)
  - Abnormal electrolytes
  - If severe unresponsive vomiting

Do

- Mild dehydration — oral fluids
- Treat with fluids without medicines if uncomplicated
- Monitor response to treatment

Medicines — adult
- Antiemetics — Table 7.14
  - Be alert for oculogyric crisis

Medicines — child
- **Medical consult** before giving antiemetic to child
  - The younger the child — the harder to find cause and higher the risk of severe dehydration
- If dehydration — see Fluids for treating dehydration (page 211)
- Gastroenteritis — usually vomiting and diarrhoea. Unlikely if vomiting alone especially with significant pain

**Oculogyric crisis

Metoclopramide, prochlorperazine and promethazine can cause an oculogyric crisis
- Symptoms include stiffness, bending back of head, grimace, twisting back, rolling eyes up
- **Do not** use in Parkinson's disease
- Can happen at any age — more common in children and young women
- Give **benzatropine** IM/IV — adult 1mg, child 20microgram/kg/dose up to 1mg — doses (page 511) — single dose
- **Urgent medical consult**

Table 7.14 Commonly used antiemetics

Medicine	Cautions	Route	Frequency	Doses
Metoclopramide	**Pregnancy:** A — safe to use **Breastfeed:** Safe to use Risk: Oculogyric crisis** **Do not** use if bowel obstruction	Oral IM Slow IV	Up to 3 times a day (tds)	**Adult** • Less than 60kg — 5mg • 60kg or more — 10mg **Child** 40kg or more* • 5mg
Prochlorperazine	**Pregnancy:** C — safe in early pregnancy **Breastfeed:** Safe to use Risk: Oculogyric crisis**	IM Slow IV	Up to 3 times a day (tds)	**Adult** • 12.5mg **Child** • N/A
Ondansetron — non-sedating. Use if sedation a problem or others have not worked Preferred for children and young people	**Pregnancy:** B1 — do not use in first trimester **Breastfeed:** Safe to use	Oral wafer	Up to 3 times a day (tds)	**Adult** • 8mg **Child 6 months to 12 years*** • 2–4mg (doses (page 511))
Promethazine — sedating	**Pregnancy:** C — safe to use, avoid close to delivery **Breastfeed:** Appears safe Risk: Oculogyric crisis**	Oral Deep IM	Up to 4 times a day (qid)	**Adult** • Oral 25mg • IM 12.5mg **Child 2 years and over*** • Oral 0.5mg/kg/dose up to 25mg • IM 0.25mg/kg/dose up to 12.5mg (doses (page 511))

* **Medical consult** before giving to children

Asthma in adults

- Chronic, often allergic inflammation of airway walls causing
  - Narrowing of airways, bronchospasm (tightening of airway wall muscles)
  - Inflammatory oedema and increased mucus production
- Symptoms come and go
- Not all wheeze or shortness of breath is asthma
  - Consider other chronic lung disease (page 437), chest infection or pneumonia (page 432), heart failure (page 134), RHD (page 342), strongyloides (page 494)
  - COPD (page 437) is common if over 40 years and often co-exists with asthma, especially where there is a significant smoking history

Red Flags — Urgent Medical Consult

- Severe, rapidly increasing shortness of breath
- Silent chest (may indicate severe asthma)
- Drowsiness — may indicate CO_2 retention (slow breathing), severe hypoxia, low BP (shock)
- Reduced consciousness, collapse, exhaustion
- Unable to talk

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

Diagnosis

- Confirmed by history or presence of typical symptoms combined with reversible airflow obstruction on spirometry if FEV1 and FEV/FVC are reduced on spirometry then improve by more than 12% *AND* at least 200mL of FEV1 after 4 puffs of salbutamol (400microgram) via spacer
- Normal spirometry does not exclude asthma

Managing an asthma attack

Do

- Use Table 7.15 to assess severity (how bad it is)
  - **Do not** stop oxygen to do pulse oximetry
  - If person is in more than one severity category record the higher category as overall level
  - If not sure if it is mild or moderate — treat as moderate

Table 7.15 Rapid assessment of severity

Mild	Moderate	Severe	Life-threatening
• Alert • Can walk • Can finish a sentence in one breath • RR less than 25 breaths/min • Pulse less then 110 beats/min	• Can only speak a few words in one breath • Can't lie flat due to shortness of breath — sitting hunched forward • RR 25/min or more • Pulse 110 beats/min or more	• Any of these findings: • Use of accessory muscles of neck or intercostal muscles or 'tracheal tug' during inspiration or subcostal recession ('abdominal breathing') • Unable to complete sentences in one breath due to dyspnoea • Obvious respiratory distress (trouble breathing) • O_2 sats 90–94%	• Any of these findings: • Reduced consciousness or collapse • Exhaustion (severe tiredness) • Cyanosis (turning blue) • O_2 sats less than 90% • Very hard to breathe, soft or absent breath sounds

Severe and life-threatening asthma

Do first

- Sit person up — use wheelchair to move them
- Start oxygen if O_2 sats less than 92% and titrate to target oxygen saturation of 93–95%
  - **Do not** over-oxygenate to avoid risk of hypercapnia (CO_2 retention)
- Give **salbutamol** nebulised as needed — 5mg *AND* **ipratropium** nebulised as needed — 500microgram — can mix with salbutamol
- Nebulisers have high risk of transmitting infection. Wear full PPE
- **Urgent medical consult**
- Give **prednisolone** oral — adult 50mg, single dose *OR* if oral route not possible give **hydrocortisone** IV — 100mg, every 6 hours
- If poor response consider — **magnesium sulfate** IV diluted in a compatible solution as a single IV infusion — 10mmol (2.5g) over 20 minutes
- If severe or unresponsive — give **adrenaline (epinephrine)** IM — adult 0.5mg
- Check RR, O_2 sats, pulse every 15 minutes. **If getting better** — try using spacer or reduce nebuliser frequency to half hourly
  - AVPU, RR, O_2 sats, pulse, BP, Temp — work out REWS
  - Can give **prednisolone** oral — 50mg, once a day, for 5 days

Moderate and mild asthma

Ask

- Onset — how many days have they been sick
- Wheeze or cough, what makes them worse — dust, smoke, pollen, grass, recent cold or flu
- Symptoms of chest infections (URTI/LRTI)
- Contacts who are sick
- Medicines they have already used to manage attack, do they use a spacer
- Adherence to regular medications
- Coexisting heart or lung disease
- Smoking status and exposure to second hand smoke
- Do they have an asthma action plan, have they followed it
- Previous hospitalisations for asthma especially intensive care admissions

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- Head-to-toe exam with attention to
  - Breathing — rib recession, accessory muscle use. Listen to front and back of chest for wheeze, air entry

Do

- FEV1 or PEFR
- Treat according to moderate or mild asthma
- If temp more than 38.5°C — **medical consult**

Moderate asthma

- Give reliever
  - **Salbutamol** puffer with spacer — 100microgram/dose (4–12 puffs) *OR* **terbutaline** inhaler — 500microgram/dose (6 puffs)
  - Repeat every 20 minutes for 1 hour (total of 3 doses) if needed
- Check response 10–20 minutes after third dose
- May need **oxygen** to target O_2 sats 93–95%
  - Nasal cannula 2–4L/min *OR* mask 5–10L/min

- **Medical consult**
- Give **prednisolone** oral — adult 50mg, single dose *OR* give **hydrocortisone** IV — adult 100mg — can repeat after 6 hours
- **If not better** — may need to *ADD* **magnesium sulfate** IV diluted in a compatible solution as a single IV infusion — 10mmol (2.5g) over 20 minutes
- **If better** — keep in clinic for 1 hour. When stable
  - Make management plan with doctor. Update asthma action plan (page 428) and give copy to patient
  - Advise to use reliever — **salbutamol** puffer with spacer — 100microgram/dose (2–4 puffs) every 4 hours
    OR **terbutaline** inhaler — 500microgram/dose (1–2 puffs) — repeat every 4 hours *OR* usual reliever
  - Give **prednisolone** oral — adult 50mg, once a day for 4 more days
  - Send home then review every day
  - Medical follow-up next visit

Mild asthma

- Give reliever
  - **Salbutamol** puffer with spacer — 100microgram/dose (4–12 puffs) *OR* **terbutaline** inhaler — 500microgram/dose (4 puffs)
- If person has been sick for a few days or on regular preventer treatment — give **prednisolone** oral — adult 50mg, single dose
- Check response to treatment after 20 minutes
- **If not better** — treat as moderate asthma
- **If better** — keep in clinic for 1 hour. When condition stable
  - Advise to use reliever every 4 hours — **salbutamol** puffer with spacer — 100microgram/dose (2 puffs)
    OR **terbutaline** inhaler — 500microgram/dose (1 puff) — repeat every 4 hours *OR* usual reliever
  - Advise what to do if symptoms get worse
  - Record in asthma action plan (page 428) and give copy to person
  - Send home then review next day
- **If more than 1 attack in last year** — **medical consult** to check and revise asthma action plan (page 428)

Managing ongoing asthma

Asthma management is adults in based on

- Confirmation of diagnosis — symptoms, medicines used, spirometry
  - If diagnosis made elsewhere — get results
- Education
  - Make sure person understands and can manage asthma, including how to use devices and make a bush spacer — See Spacer devices for respiratory medicines
  - Provide advice about smoking, healthy eating, physical activity, healthy weight and immunisation
- Assessment of symptoms and control
  - Reassessing asthma control regularly — increase or decrease preventive therapy based on this
- Monitoring (PEFR or spirometry) — achieve and maintain best lung function
- Triggers identified and avoided including fire, e-cigarettes and tobacco smoke
- Managing comorbid conditions that affect asthma or contribute to respiratory symptoms
- Asthma action plan developed and reviewed regularly

Table 7.16 Levels of asthma symptom control

Level of control	Features — over 4 week period
Good control	All of • 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 • 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 • 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 — Table 7.16 and Table 7.17
- Most important medicines for asthma control are relievers (eg salbutamol) and inhaled corticosteroids (ICS)
- **Regular follow up** is 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 Long Acting Bronchodilator (LABA), eg salmeterol
- **Do not** use LABA without ICS — always use combination LABA/ICS device
- Check inhaler technique regularly and when changing treatment

Table 7.17 Management by level of control

Level of control	Management
All	• Use reliever for symptoms and before physical activity if needed
Newly diagnosed (irrespective of control)	• If stable — start low dose ICS — Table 7.15 • As needed low-dose budesonide-formoterol or beclometasone-formoterol • If acute attack or poor control at diagnosis with or without prednisolone consider short course of high dose ICS
Good control	• Reduce ICS to lower dose if stable for 2–4 months — aim to stop if minimal symptoms • Below patients need to stay on an inhaled steroid ▸ Asthma symptoms twice or more in past month ▸ Waking due to asthma symptoms once or more during the past month ▸ Asthma flare-up in the past 12 months
Partial control	• Increase ICS to higher dose — Table 7.15 • 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	• Review inhaler technique and talk with person about adherence • Reconsider asthma diagnosis and confirm symptoms are not due to something else — bronchiectasis, COPD, heart failure, RHD • Increase ICS to higher dose — Table 7.15 • If on maximum dose ICS — add combination ICS/LABA • If ongoing poor control on maximum dose ICS/LABA — **medical/ specialist consult**

Follow-up care

- If good control — review once a year
- If partial or poor control — review every 4 weeks
- If frequent or persistent asthma — 3 monthly until symptoms well controlled
- **Medical follow-up** 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 *OR* peak flow if spirometer not available — See lungs and respiratory system examination
- Every 6 months check that puffer and spacer or other devices are used correctly
- Immunisations status

Do

- Assess level of control and adjust treatment if needed
- Review and update asthma action plan (page 428)
- Give advice on avoiding triggers, eg avoid exposure to smoke

Asthma medicines

Table 7.18 Asthma medicines

Used as	Medicine type	Examples
Reliever — relief of symptoms	Bronchodilator	• Salbutamol • Terbutaline • Ipratropium — for severe or life-threatening asthma, also used for exacerbations of COPD
Reliever + maintenance — relief of symptoms in mild asthma without regular ICS	Bronchodilator + inhaled corticosteroid (ICS)	• Budesonide-formoterol
Preventer — prevents symptoms happening	Inhaled corticosteroid (ICS)	• Beclometasone • Budesonide • Ciclesonide • Fluticasone propionate
Preventer — prevents symptoms happening	Oral	• Montelukast
Combined therapy — preventer and long-acting reliever together	ICS + long-acting beta$_2$ agonist (LABA)	• Budesonide + formoterol • Fluticasone furoate + vilanterol • Fluticasone propionate + formoterol • Fluticasone propionate + salmeterol

Table 7.19 Total daily doses of inhaled corticosteroids (ICS) for adults

Inhaled corticosteroid	Low dose (microgram)	Medium dose (microgram)	High dose (microgram)
Beclometasone	100–200 microgram	250–400 microgram	More than 400 microgram
Budesonide	200–400 microgram	500–800 microgram	More than 800 microgram
Ciclesonide	80–160 microgram	240–320 microgram	More than 320 microgram
Fluticasone furoate	N/A	100 microgram	200 microgram
Fluticasone propionate	100–200 microgram	250–500 microgram	More than 500 microgram

Inhaled therapy devices

- All metered dose inhalers/MDIs (puffers) work best with a spacer
  - Have person show you their puffer and spacer techniques
  - Check they know how to make a bush spacer — See Spacer devices for respiratory medicines
- Bronchodilators (relievers) 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 are available — find device person prefers or works best for them
- Dry powder inhalers (DPIs), eg 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

Asthma action plan

Every person needs written asthma action plan — make sure they understand it

- Keep copy at home and in file notes

Illustrated Aboriginal asthma action plans are available online — includes

- What to do when
  - Person well
  - Asthma bit worse or they get a cold or chest infection
  - Asthma severe
- How often they need regular reviews, medical follow-up, specialist reviews
- When to collect medicines and have immunisations

Supporting resources

- Remote Aboriginal asthma action plan

Breathing related sleep disorders

- Independent risk factor for high BP and diabetes and 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 — parasomnias (eg sleep walking, restless legs) insomnia (can't get to or stay asleep), central sleep apnoea (problem with underlying drive to breathe)
- There is no perfect screening tool for sleep related breathing disorders or OSA — one simple tool is STOP-BANG

Risk factors include

- Obesity
- Enlarged tonsils
- Regressed chin
- Alcohol use
- Cardiovascular disease
- Chronic conditions especially high BP, heart failure

Ask

Person and someone who has watched them sleeping, eg partner

- STOP — record one point if person
  - **S**nores
  - Is **T**ired during day
  - Has had **O**bserved apnoea (to stop breathing)
  - Has high blood **P**ressure
- Trouble sleeping
- Abnormal movements or activities during sleep
- Suddenly falling asleep at inappropriate times
- Alcohol use

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A
- ECG
- Head-to-toe exam — with attention to
  - Masses or blockages — nose, mouth, back of throat, tonsils, tongue
  - Heart exam
  - Lung exam
- BANG — record one point if person has
  - **B** ody Mass Index — more than 35
  - **A** ge — over 50 years
  - **N** eck size — circumference more than 40cm
  - **G** ender — male

Do

- FBC, TFT, urine ACR
- Calculate STOP-BANG score from Ask and Check
  - If STOP-BANG score **3 or more *AND* able** to manage treatment — **refer** for sleep/respiratory service follow up
  - If STOP-BANG score **3 or more *AND* not able** to manage treatment — provide advice on weight and alcohol management
  - If STOP-BANG score **less than 3** — provide advice on weight and alcohol management and consider other diagnoses. If non-breathing related sleep disorder suspected — talk with sleep/respiratory service
- Assess 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

Referral and management

- **Respiratory nurse consult** to plan and coordinate referral
- **Medical consult** for referral to sleep specialist
  - Sleep specialist will usually do sleep study at home (urban resident) or in hostel (remote resident)
  - If sleep study abnormal and person willing/able — trial CPAP 1–2 months. If trial successful — long-term treatment
  - May suggest other treatments — splints, surgery, lifestyle changes

Follow-up

- If doesn't get better — talk with sleep/respiratory service

If using CPAP

Most CPAP machines can be monitored remotely via cellular modem — the trial provider or the Respiratory Clinical Nurse Consultant can be contacted for efficacy data reports

- **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 is used
  - Check that the air intake filter is clean
  - Is OSA being controlled — machine records this. Look for apnoea hypopnea index (AHI)
  - Can person set up equipment and fit own mask
  - Is 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 follow-up** — at least once a year *OR* as per management plan
  - If person has equipment — must take machine and mask to appointment

Chest infections — over 5 years

Cough doesn't always mean chest infection. Consider other causes — especially if shortness of breath is main problem

Red Flags — Urgent Medical Consult	

• Frail
• Elderly
• Chronic lung disease
• Diabetes, kidney problems, liver disease
• Heart failure
• Cancer
• Volatile substance misuse, alcohol misuse
• Confused, altered mental state
• Sepsis — signs and symptoms can include
  ▸ High or low temperature
  ▸ Fast breathing
  ▸ Fast pulse
  ▸ Low BP or dizziness
  ▸ Confusion and/or agitation
	Tropical Northern Australia
	
	Consider melioidosis if moderate/severe pneumonia and risk factors of
	• Diabetes
	• Alcohol misuse
	• Kava use
	• Chronic kidney disease
	• Chronic lung disease
	• Medicines that suppress immune system
	• 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 (page 439)
- Other medical conditions — see red flags
- Smoking — how many, how long, tried to stop, want to stop

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- ECG
- Head-to-toe exam — listen to chest

Do

- Check for respiratory management plan
- Pneumonia, bronchitis (page 435), exacerbations of bronchiectasis (page 444) and COPD (page 440) can look the same but treatment is different
- If history of positive *Pseudomonas* and severe infection or septic shock — will need treatment with antipseudomonal antibiotics (page 445)
- **Medical consult**

Severe pneumonia

Fever, usually cough *AND* any of

- Looks very unwell
- Short of breath
- Pulse more than 100 beats/min
- Fast breathing — RR 26/min or more
- O_2 sats less than 94% on room air — when settled with good oximeter trace
  - If known chronic lung disease — check what O_2 sats are when well
- Temp less than 35°C *OR* more than 39°C
- Low systolic BP for age (page 500) or compared to previous measurement
- Confused, altered mental state
- Pain with breathing or percussion (tapping on chest)
- Rib recession
- Red flags

Do

- **Medical consult** — consider sepsis
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%
- IV cannula
- Blood cultures, urine for MC&S, sputum for MC&S
  - Ideally before giving antibiotics, but do not delay treatment — send in with person
- Give **ceftriaxone** IV/IM — doses (page 501) — single dose
  - *AND* **azithromycin** oral — doses (page 501) — single dose
  - *AND* **gentamicin** IV/IM — doses (page 501) — single dose
  - If allergy — **medical consult**
- If low systolic BP for age — give normal saline bolus as directed by doctor

Mild or moderate pneumonia

- Fever, usually cough *AND*
  - Looks unwell
  - Fast breathing — RR 21–25/min
  - O_2 sats 94% or more on room air — when settled with good oximeter trace
  - If known chronic lung disease — check what O_2 sats are when well
  - **No** other features of severe pneumonia

Do

- If sputum — collect sample for MC&S
- If Temp less than 35°C *OR* more than 38°C — do blood cultures

Table 7.20 Antibiotics for mild and moderate pneumonia

Mild	Moderate
• Give **amoxicillin** oral — adult 1.5g, child 35mg/kg/dose up to 1.5g — doses (page 501) — twice a day (bd) for 5 days • If allergy to penicillin — **doxycycline** oral — adult 100mg, child over 8 years and less than 26kg: 50mg, 26 to 35kg: 75mg, more than 35kg: 100mg — doses (page 501) — twice a day for 5 days. **Do not use if pregnant**	• **Medical consult** ▸ **Ceftriaxone** IV/IM — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — once a day for 3 days ▸ If improving — **amoxicillin** oral — adult 1.5g, child 35mg/kg/dose up to 1.5g — doses (page 501) — twice a day (bd) for 5 days ▸ If allergy — **medical consult**

- Give **paracetamol** — see Pain management (page 326)
- Tell person to get lots of fluids and rest
- If getting worse at any time, not improving after 3 days, lots of sputum or blood in sputum — **review daily and medical consult**
  - May need to send to hospital for investigation and treatment

Cold (URTI) or influenza

- Fever, aches and pains, sore throat (page 481), blocked or runny nose *BUT* no other features of pneumonia
- Sputum clear or white and small amounts

Do

- For fever, aches and pains — give **paracetamol** — adult 1g, child 15mg/kg/dose up to 1g, up to 4 times a day (qid)
- Tell person to
  - Get lots of fluids and rest
  - Come back if not getting better or develops new symptoms
- If known influenza activity in community *AND* fever, shakes, muscle aches — **medical consult** about need for viral swabs and antivirals

Sinusitis

- Fever, aches and pains, sore throat (page 481), blocked or runny nose *BUT* no other features of pneumonia
- Nasal discharge coloured
- Facial pain — tender over cheeks/eyebrows
- Headaches

Do

- For fever, aches and pains — give **paracetamol** — adult 1g, child 15mg/kg/dose up to 1g, up to 4 times a day (qid)
- Give **decongestant** for 4–5 days only — nasal spray or oral
  - **Do not** give to children under 6 years
  - **Medical consult** before giving to children 6–11 years
- Tell person
  - Sinusitis often takes 1 to 2 weeks to improve or get better
  - Antibiotics usually don't help
  - Get lots of fluids and rest
  - Come back if not getting better or develops new symptoms — often need medical consult
- If symptoms get worse, reoccur or become chronic — **medical consult** to refer for ENT specialist review

Bronchitis

- Fever, aches and pains, sore throat (page 481), blocked or runny nose *BUT* no other features of pneumonia *AND* no history of chronic lung disease
- Sputum may be coloured, thick with large amounts
- Nasal discharge coloured or bloody

Do

- For fever, aches — give **paracetamol** — adult 1g, child 15mg/kg/dose up to 1g, up to 4 times a day (qid)
- 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 (page 201)
  - Chronic obstructive pulmonary disease (COPD) and bronchiectasis in adults (page 437)

Follow-up — all chest infections

- Check immunisation status especially influenza, COVID-19, pneumococcal
- Give advice and help to stop smoking (page 294), alcohol use, volatile substance misuse (page 299)
- Consider chronic lung disease (page 437)
- If still not well or still has cough after 4 weeks — follow-up chest x-ray

Table 7.21 Looking for signs of a chronic problem

Feature	Possible reason — what to do
Any or all of • 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	**Chronic lung disease** (page 439) • **Medical consult** • Chest x-ray
• Wheezing sickness 2 or more times in last year	**Asthma** (page 421) • **Medical consult** • Asthma action plan (page 428)
• Productive cough for more than 3 weeks • Weight loss, night sweats • Coughing up blood • Contact of known TB case in family or community	**TB** (page 447) **or lung cancer** • Chest x-ray • Sputum for AFB • **Medical consult**

Chronic obstructive pulmonary disease (COPD) and bronchiectasis in adults

- COPD, bronchiectasis and some persistent asthma can exist together in one person (overlap syndrome)
- Diagnosis — clinical history, physical examination, lung function tests (spirometry), x-ray, CT scan

Red Flags — Urgent Medical Consult

- Drowsiness
- Severe hypoxia, low BP (shock)
- Severe, rapidly increasing shortness of breath, slow breathing
- Silent chest
- Coughing up blood
- Marked wheeze
- Immobility, confined to bed or chair

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

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL

Do

- Collect blood for FBC
- Show person how to use puffer and spacer or other device as needed
- Spirometry — before and 15 minutes after **salbutamol** puffer with spacer — 100microgram/dose (4 puffs) 30 seconds apart

  - Good response after reliever (FEV1 improves by more than 12% *AND* at least 200mL) usually means at least a component of asthma or reversibility
  - If improvement of more than 400mL — asthma COPD overlap or asthma only likely
  - In bronchiectasis — lung function may be normal, may show obstruction or restriction (FVC reduced, FEV1 normal or reduced, FEV1/FVC ratio 0.7 or more)
- If severe airflow obstruction *OR* shortness of breath worse than expected from spirometry — consider referral for echocardiogram to check for heart failure, pulmonary hypertension
- **Medical consult**
  - If blood in sputum or diagnosis if not known
  - For chest x-ray — look for bronchiectasis, emphysema, over-inflated lung, heart enlargement, heart failure, scarring from lung disease or old infection, malignancy
  - If you suspect bronchiectasis (page 444) — may need high resolution CT scan of chest
  - If snoring, morning headache, daytime sleepiness, fatigue — see Breathing related sleep disorders (page 429)
  - If O_2 sats less than 92% on room air when well or FEV1 less than 40% of predicted — consider home oxygen, may need extra oxygen for air travel

Table 7.22 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	Large when acutely unwell. Spirometry may be normal between exacerbations

Management of all chronic lung diseases

Aim is to improve symptoms and slow worsening of lung function

- Do regular checks
- Consider referral for pulmonary rehabilitation
- Make management/action plan with person and give them a copy
  - Include — self-management, when to have regular checks, allied health and physician referrals, follow-up, what to do for acute episodes
- In severe chronic lung disease — talk with person and family about
  - Treatment choices and going to hospital if they become unwell
  - Developing an Advance Care Plan to reflect their wishes

Regular checks

Every six months

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL

Yearly

- Combined checks for chronic conditions (page 227)
- Blood for FBC, sputum MC&S and AFB/mycobacterial culture for atypical mycobacteria — to help with management of acute episodes
- Spirometry — FEV1 and FVC
- Review and give person written copy of updated management/action plan

Do

- Give immunisations
- 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 consult**

If planning to use oral corticosteroids/prednisolone for more than 2 weeks

- Treat for strongyloides (page 495) every 3 months while on steroids
- Mantoux test to assess for previous or latent TB and risk of reactivation — talk with PHU about interpretation of results and management
- Hepatitis B serology — **medical consult** if HBsAg positive. If non-immune (page 407) — immunise
- Consider baseline and annual assessment of bone mineral density especially if expected to use for more than 3 months — may need calcium and vitamin D supplements
- If Hb concentration increased and/or packed cell volume (PCV) on FBC consistently more than 0.56 (56%) — may need to reduce it by long term oxygen therapy or taking blood — **specialist consult**

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 is the 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

- COPD (without asthma)
  - Poor response (FEV1 improves by less than 12% or 200mL) to inhaled salbutamol
  - FEV1/FVC ratio less than 0.7 or 70%
- COPD with some reversibility/asthma
  - FEV1/FVC ratio less than 0.7 or 70% when asthma (reversible airway obstruction) has been treated

Symptoms

- Cough with sputum most days for several months at a time, over 2 or more years
- Often worse cough in morning — amount of sputum can be small
- May have wheeze

Table 7.23 Grading severity of COPD

Grade	FEV1	Symptoms/signs	Impact
Mild	60–80% of predicted	• Chronic bronchitis • May be short of breath	• May be minimal ongoing symptoms • Acute episodes may affect work
Moderate	40–59% of predicted	• Breathless, wheezing with moderate physical activity, eg walking up hills/stairs	• Breathlessness may affect work and physical activity • Acute episodes may be more severe and need hospitalisation
Severe	Less than 40% of predicted	• Breathless with minor activity, eg walking on flat, getting dressed • Can develop complications — pulmonary hypertension/right heart failure, high Hb	• Quality of life very poor • Acute episodes may be life-threatening

Exacerbation (acute episode) of COPD

- 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

Do first — severe exacerbation

- Sit person up — use wheelchair to move them
- Give **salbutamol** nebulised as needed — 5mg
  - *AND* **ipratropium** nebulised as needed — 500microgram — can mix with salbutamol
- Nebulisers have high risk of transmitting infection and should only be used if absolutely necessary. Wear full PPE
- Continue **oxygen**
  - Monitor O_2 sats continuously by oximeter — aim to keep levels at 88–92%
  - Watch for drowsiness — may indicate CO_2 retention (slowing of breathing)
- **Medical consult** — consider hydrocortisone IV — 100mg, every 6 hours (qid)

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- ECG if chest pain or history of heart disease
- Head-to-toe exam — with attention to level of respiratory distress

Do — mild to moderate exacerbation

- Sputum for MC&S
- Give **oxygen** to target O_2 sats 88–92% — monitor every 15 minutes
- Give **salbutamol** puffer with spacer — 100microgram/dose (8–10 puffs), every 1–4 hours until responding
- If symptoms not well controlled or severe — add **ipratropium** puffer with spacer — 21microgram/dose (4–6 puffs) as needed
- Give **prednisolone** oral — adult 50mg, once a day for 5 days then review — **do not** give for more than 2 weeks
  - If person also has diabetes — may need extra blood glucose control medicine when taking prednisolone
- If signs of infection — fever, change in colour of sputum
  - Regardless of sputum results — give **amoxicillin** oral — adult 1g, twice a day (bd) for 5 days
  - If allergy to penicillin — give **doxycycline** oral — adult 100mg, twice a day (bd) for 5 days. If pregnant — **medical consult**

Medical consult if

- Person needs more oxygen than by 28% venturi (air-entrainment) 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

Ongoing management of COPD

May also have heart failure (page 134), ischaemic heart disease (page 234), RHD (page 342), asthma (page 421) — consider these when person with chronic lung disease is very short of breath

- Stepwise progression of medicines — Table 7.20
- Adherence and inhaler technique should be checked regularly — after each acute episode and when considering progressing medicines

Severe disease

- If O_2 sats less than 92% on room air when well, clinical signs of pulmonary hypertension *OR* polycythaemia (haemoglobin level more than 170g/L)
  - 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

Table 7.24 Progression of medicines for COPD

Step 1	• Short acting reliever for symptoms (SABA or SAMA)	• Go to Step 2 if no change in symptoms
Step 2	• Short-acting reliever as for Step 1 • *AND* regular long-acting controller (SABA *AND* LAMA or LABA) • Try LAMA/LABA if symptoms persist **Do not** use SAMA and LAMA together	Go to step 3 if • 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
Step 3	• Short-acting reliever and 2 regular long-acting controllers (LAMA/LABA) • *AND* if 2 or more acute episodes a year or one hospital admission per year — add inhaled steroid (triple therapy), preferably as a triple inhaler (ICS/LABA/LAMA)* • *AND* if ongoing symptoms — consider low dose theophylline **Do not** use ICS + LABA *with* LABA or LABA + LAMA	If no change in symptoms, frequency of acute episodes, or FEV1 after 6 months — consider stopping ICS + LABA combination

Inhaled steroids

- Improve lung function, quality of life and decrease the rate of moderate and severe exacerbations
- ALSO increase the incidence of pneumonia, especially in patients with severe COPD and do not improve survival
  - Carefully weigh risks and benefits before adding an inhaled steroid
  - Stable patients with rare exacerbations should not be on an inhaled steroid — consider stopping
  - If no benefit after 6 months — consider stopping inhaled steroid
- Patients with asthma/COPD overlap have to be treated with an inhaled steroid

Table 7.25 Medicine types and examples

Medicine type	Example
LABA — long-acting beta2 agonist	Salmeterol, formoterol, indacaterol
LAMA — long-acting muscarinic antagonist	Tiotropium, glycopyrronium, aclidinium, umeclidinium
SABA — short-acting beta2 agonist	Salbutamol, terbutaline
SAMA — short-acting muscarinic antagonist	Ipratropium
LABA + LAMA (eg *Spiolto*, *Anoro*)	Formoterol + aclidinium, Indacaterol + glycopyrronium, Olodaterol + tiotropium, Vilanterol + umeclidinium
ICS – inhaled corticosteroid + LABA (eg *Seretide, Symbicort*)	Fluticasone propionate + salmeterol, Fluticasone propionate + formoterol, Budesonide + formoterol, fluticasone furoate + vilanterol, Beclometasone + formoterol, mometasone + indacaterol
ICS+LABA+LAMA (eg *Trelegy*)	Beclometasone + formoterol + glycopyrronium, Fluticasone furoate + vilanterol + umeclidinium, Mometasone + indacaterol + glycopyrronium

Bronchiectasis

- Widening of airways caused by severe or repeated infections that fail to clear away secretions
- Specialist consult to check for underlying treatable cause
- Diagnosis confirmed by HRCT scan
- Consider bronchiectasis if
  - Chronic productive cough for longer than 8 weeks (despite treatment) in person under 35 years
  - Chest x-ray showing changes caused by infection persisting for more than 6 weeks
  - Spirometry may be normal or have reduced FEV1 and FVC together (restriction)
  - Chronic cough with daily sputum not responding to standard treatment
  - May have shortness of breath, wheeze, chest pain
  - May have haemoptysis (cough up blood)

Exacerbation (acute episode) of bronchiectasis

- Increased cough, amount and darker yellow or green coloured sputum
- Often wheezing, more short of breath, fever
- May have haemoptysis (cough up blood) or chest pain

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- ECG if chest pain or history of heart disease
- Head-to-toe exam — with attention to level of respiratory distress, eg talking in single words or sentences
- Past sputum results for sensitivities

Do

- Sputum for MC&S, check for blood
- Give **amoxicillin** oral — adult 1g, twice a day (bd) for 14 days
  - *OR* **doxycycline** oral — adult 100mg, twice a day (bd) for 14 days
- If allergy to penicillin — give **doxycycline** oral — adult 200mg, single dose
  - *THEN* **doxycycline** oral — adult 100mg, once a day for 13 days
- If pregnant do not give doxycycline — **medical consult**
- If rapid improvement and no resistant bacteria in sputum — can reduce antibiotics to 10 days
- If no improvement — give antibiotics according to most recent sputum results
- Chest physiotherapy — if history or symptoms of reflux. Avoid head down postural drainage
- Reliever (eg salbutamol) may be helpful if person is wheezy

Medical consult if

- Haemoptysis (coughing up blood)
- Can't look after themselves at home — washing, toileting, dressing, eating
- Very wheezy or previous diagnosis of co-existing asthma — may need prednisolone
- Very unwell — may need to send to hospital. Treat according to most recent available sputum results
  - If no results available give **ceftriaxone** IV/IM — adult 2g, once a day
  - If positive Pseudomonas — give **ciprofloxacin** oral — adult 750mg, twice a day (bd) for 14 days
  - If allergy — **medical consult**

Ongoing management of bronchiectasis

- Refer to physio for coughing techniques and aids to help removal of sputum, eg Accapella device, PEP valve, flutter valve
- Inhaled corticosteroids may help if a component of asthma *OR* COPD *OR* very wheezy
- **Medical/respiratory physician follow-up**
  - 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
  - If Pseudomonas *aeruginosa* isolated in sputum for first time
  - For pulmonary rehabilitation

Tuberculosis

- Caused by bacteria — most often affects lungs but can also affect other parts of body
- Spread from person to person through the air when a person with lung tuberculosis (TB) coughs, sneezes or spits
- Two TB-related conditions
  - Latent TB infection (LTBI)
  - TB disease (active TB)
- Most people infected with TB have LTBI and don't get sick — but they usually still need treatment so they don't get sick later

People at high risk of latent TB infection (LTBI)

- People from areas with high rates of TB
  - Aboriginal 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
- People who smoke
- People with diabetes
- People with weakened immune system, eg HIV, kidney disease
- People on medicine that weakens immune system, eg corticosteroids
- People with cancer — particularly of the head and neck, lymphatics or blood

Consider TB if any of

- Cough for more than 2 weeks plus any of
  - 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 (page 201) or bronchiectasis (page 444)

Ask

- Take history including
  - Contact with TB
  - Cough with blood-stained sputum
  - Weight loss
  - Fever, night sweats
  - Travel to countries with high rates of TB

Check

- Calculate age-appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe check — with attention to
  - Lymph nodes
  - Any part of body with symptoms
- Lung sounds especially
  - Over apices (top of lungs)
  - Dullness from pleural fluid collection in bases
- Collect 3 sputum specimens as soon as possible (minimum 8 hours apart) for MC&S and AFB
  - Best to collect one early morning specimen — try for 1 straight away, 1 early next morning and 1 afternoon of second day — label with date and time collected
  - Collect sputum outside away from other people — **do not** collect in toilet or communal space
  - For child — **TB unit consult** — fasting gastric aspirates can be collected instead of sputum
  - Collect a spot sputum (one sputum collected when seen) for AFB in any person at high risk of TB infection
  - Keep specimens out of sunlight. If room bright — put in brown paper bag then in biohazard bag
  - If delay expected before reaching lab — store samples in fridge and transport within 3 days

Do

- **TB unit consult** about patients with known history of past TB disease, known latent TB infection (LTBI) or TB (active TB) contact
- Always arrange chest x-ray — even if TB suspected outside lungs
  - TB unit at PHU can help arrange travel and x-rays
  - Make sure x-ray reviewed by radiologist before person leaves
- If TB diagnosed or highly suspected — talk with 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 to send to hospital with infection control precautions
  - Infected person wears surgical mask and clinic staff caring for person wear P2/N95 masks to prevent spread of infection until person is 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 in notes and on DOT card from PHU
- If diagnosed in hospital
  - Person should receive education about TB before discharge
  - Will be sent home when no longer infectious, medically well and able to take medicine without side effects — may take weeks
  - Must have care plan on discharge — if no care plan ask for one
- 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 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 — **urgent TB unit consult**
- Monthly reviews — check medicine doses and for side effects, take bloods for LFTs as per care plan. 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 doing this
  - Contacts who have latent TB infection (LTBI) but not TB disease (active TB) may be offered preventive treatment to stop them getting active TB — they are not infectious
- BCG immunisation is no longer recommended for all Aboriginal newborns — may be considered for newborns or children from communities with high rates of TB or as advised by TB unit
  - **Not** recommended for adults living in the NT

Supporting resources

- Northern Territory tuberculosis guidelines

Skin infections

Red Flags — Urgent Medical Consult

- Child under 6 years with cellulitis
- Boils and unwell
- Severe cellulitis, unwell and/or poorly controlled diabetes
- Non-healing sores/ulcers

For skin infections occurring at the same time

- Impetigo (school sores) and scabies — treat for both at same time
- Impetigo (school sores) and boils — give antibiotics recommended for boils
- Infected lice or scabies sores — treat as for impetigo (school sores)

Prevention of skin infections

- In community — wash clothes and bedding regularly, wash hands with soap and wash children every day with soap, eg bath, shower, swimming
- In clinic — use good infection control practices

Impetigo (school sores)

- Yellow/brown crusted sores, often surrounding redness. May be pus under crust
- Common, very infectious — must treat as can lead to serious problems (eg PSGN and ARF/RHD)

Ask

- Ask about sores on other household members, especially crusted scabies

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A
- Head-to-toe exam — with attention to scabies, headlice and tinea
- Immunisation status

Do not

- **Do not** use topical mupirocin — resistance develops quickly
- **Do not** send wound swab unless not responding to treatment

Do

- Treat sores
  - Clean with soap and water
  - Give **benzathine benzylpenicillin*** (Bicillin L-A) IM — adult 1,200,000 units/2.3mL (900mg), child — doses (page 501) — single dose OR **trimethoprim-sulfamethoxazole** oral — adult 160+800mg — doses (page 501) — twice a day (bd) for 3 days
  - **Medical consult** if allergy to penicillin or person declines injection
  - If benzathine benzylpenicillin used in the last 7 days give **trimethoprim-sulfamethoxazole** oral — adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg — doses (page 501) — twice a day (bd) for 3 days
  - Dress (cover) sores
- Treat other condition at the same time — see
  - Scabies (page 469)
  - Headlice (page 452)
  - Tinea (page 477)

Follow-up

- Make sure sores are covered and kept clean
- If not getting better or frequent reoccurrences
  - Ask about sores on other household members, especially crusted scabies
  - Send swab for MC&S — check swab results
  - **Medical consult** about antibiotic to use
- If non-healing sores/ulcers — consider melioidosis (page 415) especially in tropical northern Australia

Head lice (nits)

- Problems include infected sores and 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
  - Avoid head-to-head contact where possible

Ask

- Any previous treatments
  - 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 and comb with fine-tooth comb
  - Wipe comb on tissue after each stroke to check for live lice
  - If live lice found — infestation confirmed. Stop combing and start treatment
- Look for eggs (nits) stuck on hairs near scalp — common above ears and around hairline
- Look for infected sores
- Encourage person/carer to check other children and adults in household — treat if needed

Do

- Treat infestation
  - Completely cover clean dry hair with **dimeticone 4%**
  - If using lotion — allow to dry and leave on for at least 8 hours *OR* if using fast-acting gel spray — leave on for at least 15 minutes. Check product instructions as new products become 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 impetigo (school sores)

Follow-up

- Repeat **dimeticone** 4% treatment after 1 week
- Encourage family to continue fine-tooth combing

Boils, carbuncles, abscesses

- Boil — painful, pus-filled bump under the skin caused by infected, inflamed hair follicles. Need incision and drainage — most do not need antibiotics
- Carbuncle — cluster of boils — will need drainage, **medical consult**
- Abscess — confined pocket of pus collected in tissues, organs or body spaces — needs drainage and may need antibiotics

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — attention to swollen, tender, red skin lumps. Feel if soft or hard
- Immunisation status

Do

- If person unwell — **medical consult**
- Give pain relief (page 326)
- If severe or several boils — swab pus for MC&S
- Incision and drainage is the best treatment for large boils (2cm lump or 5cm area of redness) — See cutting and draining abscess
- If very large or in sensitive place (face, hands, perineum) send to hospital to be drained
- Use good hand hygiene — boils can spread
  - Use alcohol-based hand rub after every contact
  - Give person bottle of alcohol-based hand rub and 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

Most boils (70%) get better after they are drained — give antibiotics if person has

- Impetigo (school sores) as well as boils
- Weakened immune system (eg young child, elderly, diabetic)
- Recurrent boils and abscesses

- Severe boils and abscesses — fever, tender lymph nodes, redness spreading from boil or lots of boils
  - Give **trimethoprim-sulfamethoxazole** oral — adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg — doses (page 501) — twice a day (bd) for 5 days
  - If allergy — **medical consult**
- Ask family to wash all clothes and bedding with laundry detergent and dry in the sun

Follow-up

If not getting better

- **Medical consult** — may be deeper infection which needs drainage in hospital and IV antibiotics
- If antibiotics were given — check swab result to make sure antibiotic effective
- Consider alternative diagnosis, eg melioidosis

If keeps getting boils or abscesses

- **Medical consult** — may need different approach
- Can be caused by re-infection from self, household members, companion animals
- Remind about importance of keeping boils covered, washing hands, daily bathing, preventing transmission to other household members, eg separate towels
- Give antibiotics if not given in first treatment

Cellulitis

- Acute inflammation of skin and soft tissues
- If associated with water immersion (salt or fresh water) — see Water-related skin infections (page 458)

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to
  - Area of skin — painful, red, hot
  - Local lymph nodes — may be swollen, tender
  - Cracks/infection — between toes, insect bites, scabies, school sores (start of infection)
  - Underlying boil/s, tender lump — may need to be treated as a boil

Do

- **Medical consult** if
  - Child under 6 years — could be bone infection (page 351)
  - On face — could be *Haemophilus influenzae* type b (Hib)
  - Joint involved — could be joint infection (page 353)
  - 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 (page 456)
- Give pain relief (page 326)
- Give **trimethoprim-sulfamethoxazole** oral — adult 160+800mg, child 4+20mg/kg/dose up to 160+800mg — doses (page 501) — twice a day (bd) for 7 days
  - *OR* **procaine benzylpenicillin (procaine penicillin)** IM — adult 1.5g, child 50mg/kg/dose up to 1.5g — doses (page 501) — every 24 hours for 3–5 days
- If allergy to sulfonamides — **medical consult** to give **clindamycin** oral — adult 450mg, child 10mg/kg/dose up to 450mg — doses (page 501) — 3 times a day (tds) for 7–10 days

Follow-up

- If not improving after 2 days
  - Treat as severe cellulitis
  - **Medical consult**

Severe cellulitis

- If unwell, fever, poorly controlled diabetes — **medical consult** — **consider sepsis**
- Give **cefazolin** IV — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — once a day
- *AND* **probenecid** oral — adult 1g, child 25mg/kg/dose up to 1g — doses (page 501) — once a day
- If allergy to penicillin — **medical consult**
- **If not improving after 1 day — medical consult** to send to hospital

Herpes simplex (cold sores)

- Small watery blisters, often on mouth or face
- First infection may be severe

Check

- Make sure not impetigo (school sores) or hand, foot and mouth disease

Do

- Give topical pain relief — ice, **lidocaine (lignocaine) gel**
- Make sure person is hydrated — 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 are harmless and will get better by themselves
- Treatment is not needed — it will usually go away in 6–9 months
  - May last long longer in patients with atopic dermatitis — improving condition of skin may help
- Advise to avoid scratching or picking at lumps as this can make them spread

Supporting resources

- Skin conditions visual treatment guide
- National healthy skin guidelines

Water-related skin infections

Existing cuts, abrasions, wounds and any skin injuries occurring in water often get infected, eg injuries from coral or fish spines

Red Flags — Urgent Medical Consult

- Skin infections that are not improving after 24 hours of antibiotics
- People with
  - Weakened immune system
  - Liver failure
  - Kidney failure, diabetes
  - Hazardous alcohol use
  - Severe infection

Do not

- **Do not** close puncture wounds

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Immunisation status — tetanus

Do

- Thoroughly clean wound and remove embedded material if present
  - May need local anaesthetic
- Collect swab for MC&S. Specify 'marine infection'
- Treat — Table 7.26

Table 7.26 Treatment for water-related skin infections

Infection	Treatment
MILD	
Appearing as cellulitis or boil	Treat as for cellulitis (page 455)
MODERATE	
Fresh or brackish water	Give **trimethoprim-sulfamethoxazole** oral — adult 320+1600mg, child 8+40mg/kg/dose up to 320+1600mg — doses (page 501) — twice a day (bd)
Fresh or brackish water – if soil or sewage contaminated	*ADD* **metronidazole** oral — adult 400mg, child 10mg/kg/dose up to 400mg — doses (page 501) — twice a day (bd)
Salt water If MRSA risk is LOW	**Medical consult** to give **ciprofloxacin** oral — adult 500mg, child 12.5mg/kg/dose up to 500mg — doses (page 501) — twice a day (bd) *AND* give **ceftriaxone** IV/IM — adult 2g, child 50mg/kg/dose up to 2g — doses (page 501) — single dose
Salt water If MRSA risk is HIGH	**Medical consult** to give **ciprofloxacin** oral — adult 500mg, child 12.5mg/kg/dose up to 500mg — doses (page 501) — twice a day (bd) *AND* **trimethoprim-sulfamethoxazole** oral — adult 320+1600mg, child 8+40mg/kg/dose up to 320+1600mg — doses (page 501) — twice a day (bd)
SEVERE	
Severe or unresolved water-related infections	**Medical/specialist consult** • Severe infection may need treatment in hospital — can become necrotising fasciitis • Unresolving ulcer might be m*ycobacterium marinum*

Follow-up — review after 24 hours

Moderate infection — fresh or brackish water

- If not improving or getting worse — **medical consult** to send hospital
- If getting better — continue antibiotics for 5 days
- Review again with swab result

Moderate infection — salt water

- If getting worse or not getting better — **medical/specialist consult** to send to hospital
- If getting better and MRSA risk is low
  - Change **ceftriaxone** dose to **cefalexin** oral — doses (page 501) — adult 500mg, child 12.5mg/kg/dose up to 500mg, 4 times a day (qid)
  - Continue antibiotics for 5 days
  - If allergy — **medical consult**
- If getting better and MRSA risk is high — continue antibiotics for 5 days
- Review again with swab result

Chickenpox and shingles

- Both chickenpox and shingles are notifiable diseases
- Prevented by immunisation — but immunisation must not be given to immunocompromised people
- Chickenpox can cause
  - Severe sickness in neonates
  - Problems with new born babies if it occurs within the first 28 weeks of pregnancy (foetal varicella syndrome) — refer to obstetrician
  - Mild sickness in children or severe sickness if the child already has a bad skin condition
  - Severe sickness in adults and shingles later in life

Red Flags — Urgent Medical Consult

- 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

Varicella immunity

Ask

- The patient and any high-risk contacts if they have ever had chickenpox or been vaccinated against it

Check

- Immunisation records
- Immune status for women who are pregnant or planning pregnancy

Do — for non-immune contacts exposed to chickenpox or shingles

- If over 12 months *AND* not immunised or had chickenpox — give varicella vaccine. **Do not** give if pregnant
  - If contraindications — **medical consult**
- If person at high risk (see red flags) — **medical consult**
  - Will need varicella zoster immunoglobulin (VZIG) within 10 days of exposure

If more than 10 days since exposure — may need antiviral prophylaxis especially if in second half of pregnancy or if pregnant and underlying lung disease, weakened immune system or smoker

Chickenpox (varicella zoster)

Ask

- Is person at high risk of severe infection — see red flags
- Any contact with people at high risk in last 10 days

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Pregnancy test
- Head-to-toe exam — with attention to
  - Rash — usually itchy, goes from spots to small blisters to dry scabs. The 3 stages can happen together — can take 5–7 days for blisters to dry out
  - Child — any significant pre-existing skin disease, eg eczema

Do

- **Medical consult** for
  - Anyone with severe illness
  - People at high risk (see red flags) — may need antiviral treatment
  - Child with significant pre-existing skin disease
- Viral swab of a skin lesion — open a blister and rub swab on the base with the swab tip. Request 'varicella PCR'
- 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 — 1–2 years 2.5mg, 2–12 years 5mg, over 12 years 10mg, once a day
  - Keep fingernails cut short — less damage from scratching
- Give **paracetamol** — adult 1g, child 15mg/kg/dose up to 1g — doses (page 511) — up to 4 times a day (qid)
- Advise to avoid contact with people at high risk until rash completely scabbed over — avoid schools, childcare, work

Antivirals

- **Adult**
  - If not pregnant — treat if 36 hours or less since rash started.
    If pregnant — treat if 72 hours or less since rash started. If more than 72 hours since rash started and lesions still developing antivirals may still help
  - Give **valaciclovir** oral — 1g, 3 times a day (tds) for 7 days *OR* **aciclovir** oral — 800mg, 5 times a day for 7 days
- **Child**
  - Only treat if significant pre-existing skin disease regardless of when rash started
  - Give **aciclovir** oral — 20mg/kg/dose up to 800mg — doses (page 501) — 5 times a day for 7 days
  - If secondary infection of rash give antibiotics — see School sores (page 451)

Shingles (herpes zoster)

Ask

- Any contact with people at high risk in last 10 days — they will need follow-up
- Is person at high risk of severe infection — **medical consult**
- Face — any tingling, pain or rash involving the eyes, eyebrow, forehead or nose
- Eyes — sore or any change to vision

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Pregnancy test
- Head-to-toe exam — with attention to
  - Rash — starts with burning pain then redness and blistering rash usually only on 1 area on 1 side of body
  - Eye involvement — can cause serious complications or Herpes Zoster Ophthalmicus (blindness)
  - Blisters on ear and Herpes Zoster Oticus (muscle weakness one side of face)
- Eyes at risk if
  - Rash on or around the eyes, eyebrow, forehead, nose or nose-tip
  - Eye swollen, red, eyelid shut, facial droop

Do

Medical consult

- If under 50 years with shingles — may have weakened immune system
- About pain relief (page 326) 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 — **refer to ophthalmologist (eye doctor)** for treatment of any corneal ulcer
- If ear involved or facial droop

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, genitals, limb, neck
- Give **valaciclovir** oral — adult 1g, child 20mg/kg/dose up to 1g — doses (page 501) — 3 times a day (tds) for 7 days *OR* **aciclovir** oral — adult 800mg, child 20mg/kg/dose up to 800mg — doses (page 501) 5 times a day for 7 days — not as good at reducing pain but better for children or if pregnant

Give pain relief

- **Paracetamol** — adult 1g, child 15mg/kg/dose up to 1g — doses (page 511)) — up to 4 times a day (qid)
- If pain severe — **medical consult** about neuropathic pain management
- Ice packs and/or protective dressings may help

If secondary infection of rash give antibiotics — see School sores (page 451)

Follow-up

- Herpes Zoster vaccine can be given if
  - 1 year after episode of shingles *AND* age 50-69 years
  - Age 70 years and over *AND* if no contraindications to live-attenuated vaccines or to any product in the vaccine
  - See *Australian Immunisation Handbook*

Rashes

Red Flags — Urgent Medical Consult

- Purpuric or petechial rash with fever
- Itchy rash with breathing problems
- Young baby unwell with rash

Ask

- 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 recently — including bush medicine or alternative medicine
- Any immunisations given recently
- Any contacts who also have a rash

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — attention to skin, nails, hair, inside mouth and throat
  - Remove clothing if appropriate
  - Make sure there is good light
  - Take photo of rash in sunlight (with consent) — can help with diagnosis
- Immunisation status

Describe rash

- Colour, eg red, purple, pale
- Evidence of scratching — has this affected appearance
- Type of lesions
  - **Purpuric or petechial** — red-purple blotches/spots that don't blanch. Note if raised
  - **Maculopapular** — red spots with raised lesions you can feel
  - **Pustular** — raised lesions more than 0.5cm across. Contain clear fluid or pus
  - **Vesicular** — small raised lesions less than 0.5cm across. Contain fluid
  - **Itchy**
- Size of lesions and distribution over body
- Blanching — rash fades with pressure
  - Press down on skin with glass (eg slide) or acrylic sheet (eg clear plastic ruler) and note if rash fades
  - Bleeding into skin doesn't blanch — pinpoint lesions are petechiae and larger lesions are purpura

Table 7.27 Diagnosis and what to do

Purpuric or petechial rash *AND* other features	Possible diagnosis	What to do
• Fever • +/– confusion • +/– neck stiffness • +/– low BP	• **Meningococcal infection** • **Septicaemia**	• **Urgent medical consult** • See Meningitis (page 126) • See Early recognition of sepsis (page 2)
Other causes — Henoch-Shönlein purpura, enteroviral infection, thrombocytopenia		

Table 7.28

Maculopapular rash *AND* other features	Possible diagnosis	What to do
• Cough • Conjunctivitis • Rash spreads down from head to body • Fever	**Measles**	• **Medical consult** • Notify PHU • Take blood for measles and rubella antibodies • Throat and/or nose swab for measles • Check if any non-immune pregnant women may have been exposed • Infectious until 4 days after rash appears
• Mildly unwell • Swollen lymph nodes, especially behind ears and back of head • Fever	**Rubella**	• **Medical consult** • Notify 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
Other causes — Scarlet fever, Kawasaki disease, drug reactions		

Table 7.29

Vesicular rash *AND* other features	Possible diagnosis	What to do
• 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** (page 461)	• 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 — chickenpox in pregnancy can be harmful • Infectious until all lesions have crusted
• Small vesicles in mouth and on hands and feet • Fever	**Hand, foot and mouth disease**	• Simple pain relief (page 326) • Keep up fluid intake
• Vesicles and ulcers on lips, gums, tongue, palate • Fever	**Oral cold sore** (herpes simplex)	• See Cold sores
• Single or few painless lesions • Small, round, pearl-coloured lump/s	***Molluscum contagiosum* virus**	• See Molluscum contagiosum (page 457)

Table 7.30

Pustular rash *AND* other features	Possible diagnosis	What to do
...	School sores (impetigo)	• See School sores
...	Scabies	• See Scabies

Table 7.31

Itchy rash *AND* other features	Possible diagnosis	What to do
• Papules or plaques • Small to large welts (raised, solid lesions) • May have pale centre • Usually itchy • Can appear and move about body very quickly	**Urticaria** (hives)	• Always check for anaphylaxis (page 37) • **Medical consult** • Need to check for cause — medicines, immunisations, bites, food allergy
• Excoriation (missing skin), red, weeping, crusting • On face and scalp in infants • In bends of joints in older children	**Eczema** Check for scabies	• Avoid soap and hot water • Moisturisers to skin • **Medical consult** about corticosteroid creams
• Scaly, raised, spreading edge • Often area of warm, moist skin, eg groin, armpit	**Tinea**	• See Tinea

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 or rash painful or baby has fever —may be streptococcal or staphylococcal cellulitis
  - Swab lesion for MC&S
  - Give **trimethoprim-sulfamethoxazole** oral — 4+20mg/kg/dose up to 160+800mg — doses (page 511) — twice a day for 7 days
  - If allergy OR if vomiting or won't take oral medicine — **medical consult**
  - 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

Scabies

- Caused by an infestation with a tiny parasitic mite which burrows underneath and lives in the skin
- Itching and scratching cause sores that can get infected with bacteria and lead to kidney and rheumatic heart problems or sepsis
- Spread by direct skin to skin contact — mites can only live 2–3 days off the body
- To stop spread you must treat person and all close contacts including family and household

Ask

- Itching, scratching
- Rash — hidden by clothing or on private part
- Other family members with scabies
- Anyone in family or community with crusted scabies (page 472) — possible source of infection
  - Always consider this for children or elderly people with frequent presentations

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL

Do

- If infected sores — treat as for impetigo (page 451) (school sores) at same time as treating scabies

Treat with topical permethrin 5% *OR* oral ivermectin

- Tell person itching may last for 1–4 weeks after treatment with permethrin or ivermectin
- ***ALSO*** treat all household members, close contacts and people who have had close physical contact (eg person holding child with scabies) with **permethrin 5%** cream

For topical permethrin 5% cream

- In clinic demonstrate whole-body application of thin layer
- Adults and children — leave on for at least 8 hours. Best overnight under clean bed clothes
- Babies under 6 months — leave on for 6–8 hours
- Repeat treatment in 1 week to kill any new mites that hatch after first application

Applying scabies creams or lotions

- Put on clean, dry skin — best at night before bed and left on for at least 8 hours under clean pyjamas or clothes
- Apply to whole body including scalp and face and behind ears — 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 *AND* body creases — behind ears, under jaw, neck, armpits, back, bottom, groin, under breasts *AND* joints and joints creases — elbows, knees, heels
- Advise to put cream on hands again after washing and put on child's hands again before bed

For ivermectin — give oral single dose with food (doses (page 501))

- **Do not** give to children under 5 years or less than 15kg *OR* women who are or could be pregnant or are breastfeeding — do urine pregnancy test if not sure or no contraception
- Repeat in 7–14 days to kill any new mites that hatch

Prevention

- Encourage hand washing and short finger nails
- Ask family to wash clothes and sheets with laundry detergent and dry in sun and to air blankets and mattresses in full sun
- Bed linen and sheets, towels and clothes that cannot be washed can be decontaminated by placing in a sealed plastic bag for at least 8 days — scabies eggs will hatch mites which will die
- Home visit to look for and treat other people with scabies or crusted scabies — may be source of infection

Do — if difficult case or treatment failure

- 2 or more presentations of scabies where
  - **Permethrin 5%** cream application or oral **ivermectin** has not worked
  - *AND* reinfection unlikely because child treated properly/in clinic, repeat application of cream applied or repeat dose of ivermectin has been given and 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

- **Child under 6 months — do not use**
- **Child 6–23 months** — dilute with 3 parts water
- **Child 2–12 years and adults with sensitive skin** — 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

Follow-up

- Make sure second dose of treatment has been given
  - After 7 days for topical **permethrin 5% cream** or **benzyl benzoate lotion** — applied in clinic if required
  - After 7–14 days for oral **ivermectin**
- Return to clinic 3 weeks after second dose of 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
  - 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
- 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 healthy skin program
  - Where prevalence of scabies is assessed as 10% or higher consider an ivermectin-based mass drug administration (MDA) program
  - Talk with primary care team, PHU and infectious disease specialist

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 condition
- 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, impetigo (school sores) with a crust
- Often not itchy

Do not

- **Do not** confuse crusted scabies with severe scabies (with or without crusted skin sores) or tinea

Do

For each episode

- Blood for FBC, UEC, LFT, CRP, HbA1c and blood cultures
- Skin scrapings — scabies microscopy, fungal culture. Use to confirm diagnosis and for notification to PHU
- If associated with impetigo (school sores) — collect swab for MC&S
- If associated with nail disease — collect nail clippings for fungal growth

Diagnosis

- If crusted scabies suspected — **urgent medical consult** as soon as possible
- Can be difficult to diagnosis — **must discuss with specialist**
- **Must notify confirmed cases** — based on laboratory finding of scabies mites on scraping *AND* infectious disease specialist or dermatologist consult of in person, via photos (with consent) or videoconference

- May consider if not done previously — blood for HIV (repeat if ongoing risk), HTLV-1, ANA, IgE/immunoglobulin, T-cell subsets
  - If ANA positive take blood for dsDNA, ENA, C3, C4

Always talk with PHU or infectious diseases specialist

- Confirmed cases get public health response via clinic 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 send 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

Choose best option in each category and add numbers to get score — Table 7.32 Assessment should always be made in consultation with PHU/ infectious diseases specialist

A — Distribution and extent of crusting

1. Wrists, web spaces, feet only — less than 10% of total body surface area (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 pyoderma (pus in skin)
2. Any of — multiple pustules, weeping sores, superficial skin cracking
3. Deep skin cracking with bleeding, widespread purulent exudates (pussy fluids)

Table 7.32

Score of grade severity

4–6 = Grade 1	7–9 = Grade 2	10–12 = Grade 3

Do not

Do not treat patients with Grade 2 or 3 crusted scabies in the community — for all suspected cases talk with PHU/infectious diseases specialist

Do — Grade 1 infection only

Can trial community management in consult with infectious diseases unit or specialist scabies service. Frequent clinical supervision needed — best with directly observed therapy (DOT)

- Give **ivermectin** oral once a day on days 0, 1, 7 — doses (page 501)
  - **Do not** give to children under 5 years or less than 15kg *OR* women who are or could be pregnant or are breastfeeding — do urine pregnancy test if not sure or no contraception
- Whole-body application of topical agent — see applying scabies creams or lotions
  - 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 parts 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* **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

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, family and close contacts for scabies with **permethrin 5%** cream
- Work with hospital to ensure person not discharged home before all contracts treated
- Ask family to make sure that while having treatment with topical permethrin cream or oral ivermectin they
  - Wash underwear, bed clothes, towels and bed linen on hot 60°C wash cycle
  - Take mattresses, blankets and doonas outside or hang on the washing line in full sunlight for 72 hours
  - Vacuum and sweep floor and soft furnishings to remove skin particles
- Sensitive management of household is needed due to stigma and chronic nature of disease

Long-term follow-up of crusted scabies

Secondary prevention

For people getting recurrent crusted scabies or with high risk of re-exposure, eg living in house with young children

- Give supervised whole-body application of topical treatment preferably with **benzyl benzoate** lotion — every 2–4 weeks for 6 months *THEN* review
- If reinfection — infectious disease specialist consult about management
- Treat early before crusts form

Review

- At 2 weeks and 4 weeks after discharge *THEN* every 4 weeks to check skin for signs of reinfection — especially hands, shoulders, bottom
- Moisturise daily to keep skin soft, eg sorbolene
- Regular reviews and early treatment if reinfected — important to break cycle of scabies transmission and community outbreaks
- Lifelong follow-up is needed while living in scabies endemic area

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’

Tinea

- Common fungal infection especially in hot climates
- May get secondary bacterial infection
- Usually spreads between people but can spread from animals
- Help stop spread of infection by reducing fungal spores
  - 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

- Head-to-toe exam — with attention to
  - Dusty-looking, irregular areas of skin with fine scale and raised spreading edge — silver on dark skin, reddish on pale skin
  - Itch
  - May also have weeping or crusty bacterial infection
- Consider crusted scabies (page 472), kava dermatitis (page 289), pityriasis versicolor (page 480), leprosy (uncommon)
  - If leprosy suspected — refer to PHU for specialist review and treatment plan

Do

- Collect skin scrapings from scaly edge of ring — MC&S, fungal culture

For small areas of tinea

- **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**

For widespread tinea

- Give **terbinafine** oral — Table 7.33 for doses, once a day for 2 weeks

- ▸ See Precautions with oral terbinafine
- If rash remains — **medical consult** about another 2 weeks of treatment

Table 7.33 Doses of oral terbinafine

Weight	Age	Daily dose
10–20 kg	1–6 years	62.5mg (quarter tablet)
21–40 kg	7–12 years	125mg (half tablet)
41 kg or more	13 years and over	250mg (1 tablet)

Precautions with oral terbinafine

Rare but serious side effects can develop after about 4 weeks of treatment — liver toxicity, blood abnormalities, skin rashes

- Check for drug interactions before treatment
- **If treatment lasts more than 2 weeks — medical follow-up**
- If person is over 40 years or has kidney disease, acute or chronic liver disease or drinks too much alcohol — check LFT, FBC and UEC **before** treatment
- If LFT abnormal but not more than twice the normal — start terbinafine and retest after 2 weeks
  - ▸ If LFT have then risen further — stop terbinafine and **medical consult**
- If LFT more than twice normal and strong indication for treatment, eg onychomycosis, diabetes, recurrent cellulitis, not cosmetic — can still consider terbinafine but **only under close medical supervision**
  - ▸ Follow-up with LFT after 1 and 2 weeks of treatment
- 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
- **Avoid use in pregnancy *AND* breastfeeding — medical consult**

Tinea capitis (tinea of the scalp)

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

- Head-to toe exam — attention to scalp
  - Scaly rash or kerion (looks like boil but itchy)
  - Broken hairs

Do

- Collect skin scrapings — pull some broken hairs (include root) with forceps — MC&S, fungal culture
- Give **terbinafine** oral once a day for 4 weeks — then reassess
  - Table 7.33 for doses
  - See Precautions with oral terbinafine
  - **Medical supervision needed**
- Also use **selenium sulfide 2.5%** shampoo or **ketoconazole 2%** shampoo
  - Shampoo 3–5 minutes then rinse off — once a day for 5 days

Tinea of the nails

More common on toenails — usually tinea on skin as well

Check

- Head-to-toe exam — with attention to
  - Nails thick, irregular, white, lifting up with chalky material under nail

Do

- Collect nail clippings — MC&S, fungal culture
  - Cut nails as far back as comfortable
  - Scrape and collect chalky material from under nail
- If person high risk (eg recurrent cellulitis, diabetes) *OR* concerned about appearance, even after reassured it is not dangerous
  - Give **terbinafine** oral once a day — 6 weeks for fingernails, 12 weeks for toenails — Table 7.29 — for doses
  - See Precautions with oral terbinafine

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

- Head-to-toe exam — with attention to skin
  - Most common on upper trunk, shoulders, upper arms, neck — occasionally on face
  - Round or oval patches — pale on dark skin, tan on light skin
  - Wood's lamp (black light) — shows pale areas more clearly. Pityriasis versicolor may appear pale greenish-yellow
  - Lots of small hypopigmented (pale) blotches grouped together — scale may be noticed when scraping skin surface
  - Could be ringworm — pityriasis versicolor has finer scale, no raised edge and is usually not itchy

Do

- If diagnosis unclear — collect skin scrapings for microscopy
- Use **selenium sulfide 2.5%** shampoo
  - Rub on affected skin and leave on for 10 minutes — do every day for 7-10 days
  - *AND* shampoo hair every second day for 2 weeks
- *OR* use **ketoconazole 2%** shampoo
  - Rub on affected skin and 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 even after successful treatment

Follow-up

- Often comes back even after successful treatment — repeat treatment if needed
- If not improving — consider dermatitis or leprosy (uncommon)
  - If leprosy suspected — refer to PHU for specialist review and treatment plan

Supporting resources

- Skin conditions visual treatment guide
- National healthy skin guidelines

Sore throat

- Pharyngitis or tonsillitis (sore throats) can be from viral or bacterial infection — can't tell which by looking
- Group A Streptococcus (GAS) is a common cause and highly contagious
- Treating sore throats in at-risk groups is important to prevent ARF, RHD and kidney failure

At risk groups

- People aged 2–25 years in Aboriginal communities
- Anyone with existing RHD or history of ARF
- At-risk groups are always given antibiotics for sore throat — even if it doesn't look red. Other people are treated based on their symptoms

Prevention of Acute Rheumatic Fever (ARF)

To prevent ARF person must be given either

- Benzathine benzylpenicillin (Bicillin L-A) single dose (long-acting)
- *OR* full course of oral antibiotics

Red Flags — Urgent Medical Consult

- Stridor (noisy breathing) or problems breathing
- Unable to swallow saliva

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- Head-to-toe exam — with attention to
  - Red throat with enlarged tonsils or pus on tonsils
  - Swollen glands in neck

Do

- Give **benzathine benzylpenicillin*** (Bicillin L-A) IM — adult 1,200,000 units/2.3mL (900mg), child — doses (page 501) — single dose

* If benzathine benzylpenicillin injection has been given in last 7 days — **medical consult** — patients already given benzathine benzylpenicillin as RHD prophylaxis still need active treatment of sore throats or skin sores

  - *OR* if injection not possible — give **phenoxymethylpenicillin** oral — adult 500mg, child 15mg/kg/dose up to 500mg — doses (page 501) — twice a day (bd) for 10 days
- **Note** — Very few people remember to take oral antibiotics for 10 days — think carefully before offering phenoxymethylpenicillin
  - Can give 5 day supply then re-dispense to encourage contact with patient
- If allergy to penicillin — give **cefalexin** oral — adult 1g, child 25mg/kg/dose up to 1g — doses (page 501) — twice a day (bd) for 10 days
  - *OR* give **azithromycin** oral — adult 500mg, child 12mg/kg/dose up to 500mg — doses (page 501)— once a day for 5 days
- Give **pain relief** (page 326) if needed
- Tell person to
  - Gargle with salt water or dissolved **aspirin — do not** use aspirin for child under 12 years
  - Drink lots of fluids
  - Stay at home, away from others and do not share bedroom for 24 hours after starting antibiotic — to reduce spread to others

Testicular Pain

Lots of things can cause painful testicles. There are 2 main causes but it can be hard to tell which it is — **always do medical consult for testicular problems**

- **Testicular torsion** — twisted testis/testicle is a **medical emergency** — can cause necrosis (testicle tissue can die)
  - If you can't exclude twisted testicle — **send to hospital urgently**
- **Epididymo-orchitis** — infected testes
  - In children — usually due to UTI or viruses but may be STI in sexually active boys — consider sexual abuse
  - 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

Red Flags — Urgent Medical Consult

- Testicular torsion (twisted testicle)
- Epididymo-orchitis (infected testes) in children
- Painless swelling of scrotum — could be cancer

Check

- Calculate age appropriate REWS
  - **Adult** — AVPU, RR, O_2 sats, pulse, BP, Temp
  - **Child** (less than 13 years) — AVPU, respiratory distress, RR, O_2 sats, pulse, central capillary refill time, Temp
- Weight, BGL
- U/A
- Head-to-toe exam — with attention to
  - Abdominal assessment (page 332) —consider hernia
  - Scrotum and testes — Table 7.30
- Full STI check (page 307)
  - If under 15 years — **medical consult**

Table 7.34 Assessing painful testes

	Testicular torsion (twisted testicle)	Epididymo-orchitis (infected testes)
Age	• Any age including infants less than 2 years • Most common 12–18 years	• Any age — less than 2 years and post-pubertal are peak ages • Unusual between 2–14 years
How it started	• Usually starts suddenly — few seconds or minutes but can start more slowly	• Usually starts gradually — over several hours or days
Pain	• Always painful — can be severe • If pain stops in 4–6 hours — testicle may be dying, not getting better	• Usually mild to moderate pain
Temp	• Usually less than 37.5°C	• May be over 37.5°C
Scrotum	• Only one testicle involved • Very tender, hot, swollen • Testicle often higher, lying on its side — examine man standing up	• One or both testicles involved • Tender, hot, swollen
When you lift testicle	• Pain may get worse	• Pain may get better
U/A	• Usually normal	• Almost always leucocytes and/or blood and/or protein
Other problems or symptoms	• Nausea, vomiting • Sometimes lower abdominal pain (page 22)	• Discharge from penis (page 323) • Dysuria (pain when passing urine) • May be lower abdominal pain

Do — if twisted testicle

- **Do not** let him eat or drink anything — may need operation — consider IV fluids
- Give pain relief (page 326) — usually moderate–severe pain
- **Urgent medical consult** to send to hospital

Do — if infected testes

- Give pain relief (page 326)
- 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 — adult 500mg, single dose mixed with **lidocaine (lignocaine) 1%**
  - *AND* **azithromycin** oral — adult 1g, single dose
  - *THEN* **doxycycline** oral — adult 100mg, twice a day (bd) for 14 days *OR* **azithromycin** oral — adult 1g, single dose — second dose 1 week later
  - If allergy to penicillin — **medical consult**

Men 45 years or over with no discharge

- Treat as UTI related

Follow-up

- Tell man to come back straight away if getting worse
- If likely to be STI related — offer Full STI check (page 307) 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 (page 316) and treat partners for gonorrhoea and chlamydia (page 309)
  - STI and safer sex education (page 318)
  - If UTI — see UTI follow-up (page 486)
- If not getting better — **medical consult** to send to hospital
- If getting better — continue antibiotics and review at 1 week

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 — adult 1g, single dose

Urine problems — over 12 years

Urine problems include
- Cystitis (bladder infection)
- Pyelonephritis (kidney infection)
- Haematuria (blood in urine)

Also consider
- STI as cause of pain on passing urine. If sexually active — see STI checks for men (page 305), women (WBM, page 246), young people (page 303)
- Renal colic (Kidney stone pain)
- Chronic kidney disease (page 239)
- If over 55 years with acute confusion AND no urinary symptom — see Acute assessment of confusion (page 11)

Risk factors for complicated UTIs — medical consult
- Pregnancy — management different — see Urine problems in pregnancy (WBM, page 168)
- Adult males
- Kidney stones
- Chronic kidney disease
- Recent urinary tract procedure, eg surgery, catheter — especially long term catheter
- Spinal cord problems, eg paraplegia
- Weakened immune system — taking prednisolone, cancer chemotherapy, organ transplant
- Residents of an aged care facility
- UTI caused by pathogens other than e-coli or an ESBL e-coli that is resistant to first line antibiotics
- Previous treatment failure, eg recurrent UTIs or just finished a treatment for a UTI which has returned
- Previous allergy to antibiotic treatment options

Ask

- UTI symptoms — Table 7.35
  - Can have upper and lower UTIs at same time
- History of recurrent UTIs
- Risk factors for complicated UTIs — *ALSO* check file notes
- STI symptoms — discharge, ulcers, sores, dyspareunia (pain when having sex)

Table 7.35 Upper and lower UTI symptoms

Upper UTI symptoms	Lower UTI symptoms
• Flank/loin pain — pain in back or side between ribs and pelvis • Nausea, vomiting If present — see Pyelonephritis (kidney infection) (page 489)	• Burning, discomfort, dysuria (pain when passing urine) • Passing urine more often than usual (frequency) • Urgency, urinary incontinence • Lower abdominal pain • Haematuria (page 490) (blood in urine)

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- U/A, pregnancy test
- Head-to-toe check with attention to
  - Abdominal examination

Interpreting U/A

- Positive nitrites usually means UTI if symptomatic — but negative nitrites doesn't mean no UTI
- Positive leucocytes common in well women *AND* in men and women with UTIs or STIs
- If blood — can be UTI *ALSO* see Haematuria (page 490) (blood in urine)
- If protein — can be UTI *ALSO* see Testing for kidney disease (page 240)

Do

- If risk factors — always do **medical consult**
- If lower UTI symptoms — see possible cystitis males, non-pregnant females (page 488)
- If upper UTI symptoms — see Kidney infections (page 489)
- If female with lower abdominal pain — see Pelvic inflammatory disease (WBM, page 272)
- If male with pain, discomfort, swelling in testes — see Testicular Pain (page 483)

Bladder infections

Possible cystitis — males

Pain when passing urine in men usually STI

Do

- Full STI check (page 307)
- Treat as STI (page 309) **straight away**
- Urine for MC&S
- If UTI confirmed — **medical consult**

Follow-up

- All men with confirmed UTI need
  - **Medical follow-up**
  - Renal tract ultrasound for stones and abnormalities
- Add recall for test of cure post treatment
- If symptoms return within 2 weeks of treatment — **medical consult** about more/different antibiotics, other tests

Possible cystitis — females *NOT* pregnant

Pain when passing urine in females can be UTI *OR* STI if sexually active

Do

- Standard STI check (WBM, page 246)
- Treat as STI (WBM, page 255) straight away
- Urine for MC&S
- If pain on passing urine and frequency — give **trimethoprim** oral — 300mg, once a day for 3 days
  - *OR* **nitrofurantoin** oral — 100 mg, 4 times a day (qid) for 7 days
- Encourage oral fluids
- **Urinary alkalinisers** may help relieve symptoms but do not treat infection

Persistent UTI (doesn't get better)

UTI that doesn't get better with treatment *OR* relapse (comes back within 2 weeks of finishing treatment) *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**

Recurrent UTI (comes back)

3 or more UTIs in 1 year

- Talk to person about preventative lifestyle changes — drink lots of water (2-3L/day)
- Always send urine for MC&S
- Arrange renal tract ultrasound
- **Medical consult** for preventive antibiotics *AND/OR* topical oestrogen for postmenopausal women

Pyelonephritis (kidney infections)

- Work out level of kidney infection and manage accordingly

Table 7.36 Levels of kidney infection

Mild kidney infection	Moderate/severe kidney infection
• One sided (flank/loin) pain (page 340) • No vomiting • Looks mildly unwell • BP normal • Fever	• One sided (flank/loin) pain (page 340) • Nausea and vomiting • Looks very unwell • BP normal or low • Fever • May be fast pulse

Mild kidney infection

Do

- Urine for MC&S before giving antibiotics
- Give **amoxicillin+clavulanic acid** oral — 875+125 mg, twice a day (bd) for 10-14 days based on clinical response
  - If allergy to penicillin — **medical consult**
- Give **pain relief** (page 326)

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
  - Blood for UEC
  - **Medical consult**
  - Refer for renal ultrasound

Moderate/severe kidney infection

Do

- **Medical consult** to send to hospital
- Put in IV cannula
  - Run **normal saline** 125mL/hr — give faster if vomiting, not eating/drinking, low BP
- Urine MC&S, blood cultures **before** giving antibiotics
- Give **ceftriaxone** IV — over 12 years 1g, single dose
  - If unable to give IV — give **ceftriaxone** IM — 1g mixed with **lidocaine (lignocaine) 1%**
  - If allergy to penicillin — **medical consult**
- Give **pain relief** (page 326)

Follow-up

- If renal ultrasound not done in hospital — arrange referral
- Repeat urine MC&S 2 weeks after antibiotics finished

Haematuria (blood in urine)

Can be caused by infection (bladder, prostate, kidney), glomerulonephritis (kidney problem), renal or bladder stones, hard physical activity, injuries, severe dehydration, menstruation (periods) and other bleeding from uterus in women, cancer, anticoagulant therapy

Ask

- UTI symptoms — upper and lower
- Colour of urine
- Injury, trauma, physical activity

Check

- Calculate REWS — AVPU, RR, O_2 sats, pulse, BP, Temp
- Weight, BGL
- U/A, pregnancy test
- Head to toe exam — attention to
  - Abdominal examination
  - Oedema (swelling of face and feet)

Do

- Urine MC&S
- Full STI check (page 307)
- **Medical consult**

Warfarin

- Anticoagulant (blood thinner) used to reduce risk of blood clotting and possible stroke in people with mechanical heart valves, some clotting disorders and some heart disease, eg atrial fibrillation AF
- Can cause life-threatening bleeding — patient monitoring and education is important
- Women on warfarin should not become pregnant — women of childbearing age need appropriate contraception (WBM, page 331)

Red Flags — Urgent Medical Consult

- Bleeding with international normalised ratio (INR) 4.5 or more
- Pregnant woman

International normalised ratio (INR)

- 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 — check for signs of bleeding
- Low INR may mean person has not been taking their warfarin or dose may need to be increased

Target INR

- Recommended by physician, cardiologist, cardiothoracic surgeon
- Mechanical mitral valve, some older mechanical aortic valves, combined aortic and mitral 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

Monitoring INR

- Use POC Test — can adjust straight away if needed
- Doctor will advise how often to monitor INR in management plan — more often at start of treatment until INR is stable (in therapeutic range for 2 weeks)
  - May need twice weekly testing until stable then weekly for 4 weeks then monthly

- More frequent monitoring if
  - Warfarin dose adjusted or change in INR over a short time
  - Stopped or started other medicine, especially if it interacts with warfarin
- Always supply enough medicine to cover same dosing time frames as other regular medicines, eg DAAs
  - **Do not** use limited supply to get person back for testing — if they run out before coming back the test will be useless
- Tell person to bring their medicines with them in case the dose needs changing

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

Adjusting warfarin

Method for adjusting depends on a number of factors and will be advised by doctor — try to have the same doctor manage warfarin dose if possible

- **Only adjust with medical consult or in line with management plan**
- **Do not** over-correct single borderline abnormal INR readings by changing warfarin dose. If 0.5 or less outside range — may need to keep previous dose and retest in 2-3 days
- If INR outside range — check for possible cause especially if usually stable — eg new medicines, illness, change in diet, recent binge-drinking, ran out of medicines or left behind when travelling
- Record this and advise doctor when discussing warfarin dose
- **Medical consult** if
  - INR low in high risk person, eg mechanical heart valve — may need low molecular weight heparin (LMWH) injection
  - Bleeding or embolic/thromboembolic complications — do not adjust
  - Having surgery within 5 days — may need to stop temporarily

Lifestyle advice

- Take tablets at the same time every day — when convenient for person to remember
- Make sure the tablets are always the same brand — same colour, same dose combination
- Make sure all people treating you are aware you are on warfarin — avoid drug interactions
- Contraception (WBM, page 331) for women of childbearing age. If pregnant or wanting to be — **specialist consult**
- Alcohol — safer drinking
- Some foods interact with warfarin. These can be safely eaten but try to have to same amount every day — avoid sudden changes in amounts of green vegetables and salad greens
- Avoid contact sports, eg football, rugby
- Avoid practices that break the skin — piercings, some traditional practices
- Be aware of signs of bleeding — bleeding gums, bruising, pink urine, dark stools

Do — if bleeding or elevated INR

Table 7.37 Management of bleeding or elevated INR

INR/bleeding	Do
Not bleeding (INR 4.5 or more)	• Stop **warfarin** • **Medical consult** — may suggest vitamin K* • 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 4.5
Bleeding (any INR)	• **Urgent medical consult about** • Sending to hospital • Best warfarin reversal therapy • Stop **warfarin** • Control bleeding — use compression if possible

*Injectable form of vitamin K can be taken orally

Supporting resources

- Warfarin adjustment example
- Adjusting INR — Queensland guidelines
- How to manage Warfarin therapy guide

Worms

Table 7.38 Common worms and sickness due to worms

Worm type	Shape/aspect	Can cause
Hookworm (*Ancylostoma duodenale*, *Necator americanus*)	Transparent worms 8-11mm long	• Anaemia (weak blood) • Cough
Threadworm or pin worm (*Enterobius vermicularis*)	White thread-like worm 5-13mm long. Often seen in faeces	• Itchy backside that wakes child at night
Whipworm (*Trichuris trichiura*)	Round worm 30–50mm long	• Diarrhoea, abdominal pain, anaemia • Weight loss or growth faltering in child • Rectal prolapse if infection heavy — rare
Dwarf tapeworm (*Hymenolepis nana*)	Tapeworm 25–40mm long. Lives in small intestine	• Vague abdominal symptoms. Often no 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), hives/urticaria (itchy sores) on lower back or buttocks ▸ Cough, wheeze, haemoptysis (coughing up blood) ▸ 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

- Keep specimens cool but not refrigerated — heat and cold will kill the worms
- Send faeces specimen — as fresh as possible for
  - OCP (ova, cysts, parasites)
  - *AND* MC&S
  - *AND* strongyloides culture — only some laboratories do this

Testing for strongyloides — faeces and/or serology

- Only test for strongyloides in the following situations
  - Person with symptoms that suggest strongyloidiasis
  - Person starting treatment that may weaken the immune system — test before starting treatment including person starting corticosteroids — if treatment for at least 2 weeks
  - Person with systemic infection from enteric (gut) bug and no other cause identified
- Serology (blood test) — easiest way to test adults with symptoms which may be from chronic strongyloidiasis
  - Immunosuppressed people with disseminated strongyloidiasis may be serology negative
- Faeces test — usually best for children
  - Children with bowel symptoms are likely to have a new infection and may be serology negative

Treatment

Hookworms, threadworms, whipworms, dwarf tapeworms

- If positive faeces test — Table 7.39
- Threadworms — also treat household contacts and carers to reduce risk of reinfection

Strongyloides treatment

- If positive faeces test — Table 7.39 — ivermectin is preferred treatment
- If positive serology — **medical consult** before treating
  - Blood test can be hard to interpret
  - Need to identify underlying or complicating factors
- If person from high prevalence area (remote communities and some town camps) is on or starting treatment that weakens immune system — treat for strongyloides even if blood and/or faeces test negative
  - Treat before starting a treatment that weakens immune system *AND* every 3 months while on treatment
  - People with already weakened immune system may need 4 or more doses of ivermectin — medical consult

Table 7.39 Worm treatment if positive faeces or serology test

Worm	Medicine	Dose	Comments
Hookworm Threadworm	**Albendazole***	Oral single dose • 6–11 months — 200mg • 1 year and over — 400mg	• Best with water on empty stomach • Tablets can be crushed or chewed
Threadworm or pin worm	**Pyrantel**	Oral once a day for 3 days • 10mg/kg/dose up to 1g — doses (page 501) • Repeat dose in 2 weeks	• Use instead of albendazole for females who are or could be pregnant
Whipworm	**Albendazole***	Oral once a day for 3 days • 6–11 months — 200mg • 1 year and over — 400mg	• Best with water on empty stomach • Tablets can be crushed or chewed
Dwarf tapeworm	**Praziquantel**	Oral single dose • 25mg/kg/dose — doses (page 501) **If heavy infection** — repeat in 7 days	• Adults swallow whole • Children don't like taste
Strongyloides	**Ivermectin** (preferred treatment)**	• Oral single dose • 5 years+/15kg+ — 200microgram/kg/dose — doses (page 501) Repeat in 1–2 weeks	• For adults and children 5 years and over and 15 kg or more • Best with full cream milk or fatty food
Strongyloides	**Albendazole***	• Oral once a day for 3 days • 6–11 months and under 10kg — 200mg • 6–11 months and 10kg and over — 400mg • 1–4 years and under 15kg or pregnant (after 1st trimester) — 400mg **Repeat** the 3 day doses in 1–2 weeks	• For children 6 months to 4 years • Best with breastmilk (under 1 year), full cream milk or fatty food

* **Albendazole — do not give** to children under 6 months or females who are in first trimester of pregnancy (urine pregnancy test (WBM, page 99) if not sure) without **medical consult**

** **Ivermectin — Do not give** to children under 5 years or less than 15kg or females who are pregnant (urine pregnancy test (WBM, page 99) if not sure) without **medical consult**

- **People with weakened immune system** may need 4 or more doses of ivermectin — **medical consult**

Follow-up — all worms

Follow-up all people who have been treated

- If had strongyloides and from high prevalence area (remote communities and some town camps) *AND* on treatment that weakens immune system — treat with single dose ivermectin every 3 months
- Everyone else — do faeces test again after 6 months if symptoms continue
  - If still positive — **medical consult**
- Give iron supplements if needed — see Anaemia in children (page 177), Anaemia in adults (page 348)

Prevention

- Encourage personal and household hygiene
  - Keep nails short, wash daily, avoid scratching
  - Wash clothing, towels, bed clothes in hot water
- Wear shoes to help stop worms entering through soles of feet

Asymptomatic eosinophilia

Medical consult — may advise treatment after considering other common causes of eosinophilia such as atopy, allergy, scabies, medications

- Only for those with eosinophils between 0.7 and 1.5 × 10^9/L *AND*
  - Have no symptoms such as gastrointestinal upset or urticaria
  - Not on a drug that may cause eosinophilia
  - Not pregnant
- Give
  - **Albendazole** dose as in Table 7.35 oral once a day for 3 days *AND* **Ivermectin** dose as in Table 7.35 oral single dose. Important to take with full cream milk or fatty food

Community children's de-worming program

Done in areas where hookworm is/has been common. Best done once a year 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 months and over and under 10kg — 200mg
  - 6 months and over and 10kg or over — 400mg
  - Best taken with water on an empty stomach
- *OR* for girls who are pregnant (urine pregnancy test if not sure) — **pyrantel** oral — 10mg/kg/dose up to 1g — doses (page 501) — single dose once a year

Supporting resources

- Asymptomatic eosinophilia — NT Health Pathways guidelines

Reference section

Clinical observations

Approximate normal physiological ranges

Temperature (°C)

- Oral — 36.5–37.5
- Axillary (under arm) — 36–37
- Rectal — 37–37.8
- Tympanic (in ear) — 36.8–37.8

Remember

- Non-touch thermometers are screening tools only and not for clinical use
- Tympanic temperature is unreliable if ear drum is not intact, is scarred or ear canal contains pus, wax or debris

Table 8.1

Age	Weight	Pulse Normal range	RR	BP systolic
Newborn	3.5 kg	120–185 beats/min	25–60 breaths/min	60–95* mmHg
3 months	6 kg	115–180 beats/min	25–60 breaths/min	60–105* mmHg
6 months	8 kg	110–180 beats/min	20–55 breaths/min	75–105* mmHg
1 year	10 kg	105–180 beats/min	20–45 breaths/min	70–105* mmHg
2 years	12 kg	95–175 beats/min	20–40 breaths/min	70–105* mmHg
4 years	15 kg	80–150 beats/min	17–30 breaths/min	75–110* mmHg
6 years	20 kg	75–140 beats/min	16–30 breaths/min	80–115 mmHg
8 years	25 kg	70–130 beats/min	16–30 breaths/min	80–115 mmHg
10 years	30 kg	60–130 beats/min	15–25 breaths/min	85–120 mmHg
12 years	40 kg	65–120 beats/min	15–25 breaths/min	90–120 mmHg
14 years	50 kg	60–115 beats/min	14–25 breaths/min	90–125 mmHg
16 years	60 kg	60–115 beats/min	14–25 breaths/min	90–130 mmHg
17 years+	65 kg	60–115 beats/min	14–25 breaths/min	90– 135 mmHg
*BP for children under 4 years are not reliable and difficult to measure				

Royal Children's Hospital (2020) Acceptable ranges for physiological variables

Antibiotics doses table

Seek a **medical consult** for medicine use in pregnancy or breastfeeding
Contact your closest Pregnancy Drug Information Centre for more information on using medicines when a woman is pregnant or breastfeeding

This table must be used with protocols from CARPA STM (8th ed) or WBM (7th 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

Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				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 (17mL)	124mg (32mL)	152mg (40mL)	180mg (45mL)	240mg (61mL)	320mg (81mL or 1½ tab – *200mg*)	400mg (101mL or 2 tab – *200mg*)	500mg (126mL or 2½ tab – *200mg*)	640mg (161mL or 3½ tab – *200mg*)	800mg (200mL or 1 tab – *800mg*)	# **Mix** 200mg dispersible tablet in 50mL water to give 4mg/mL solution. Mix well and use straight. If weakened immune system – increase dose. If kidney disease – decrease dose.
Albendazole† Tab: 200mg Pregnancy: **D** - **do not** use Breastfeed: appears safe	Hookworm Threadworm	Oral Single dose		N/A		200mg (1 tab – *200mg*)	400mg (2 tab – *200mg* or 1 tab – *400mg*)							Tablets can be chewed or crushed. **Do not give** to children under 6 months or females who are in first trimester of pregnancy without **medical consult**
	Strongyloides Whipworm	Oral Once a day for 3 days												
Amoxycillin† Susp: 50mg/mL Cap: 500mg Pregnancy: **A** – safe to use Breastfeed: safe to use	Nose bleed	Oral 3 times a day (tds)	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)	
	Otitis media	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)	625mg (12.6mL)	800mg (16mL)	1g (20mL or 2 cap)	
	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)												

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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

Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Amoxycillin-clavulanic acid† Susp: 80+11.4mg/mL Tab: 875+125mg Pregnancy: **B1**– avoid if PROM Breastfeed: safe to use	Bite injury Chronic cough CSLD Dental infection UTI	Oral Twice a day (bd)	22.5mg/kg/dose	74.25mg (1mL)	139.5mg (1.9mL)	171mg (2.3mL)	202.5mg (2.7mL)	270mg (3.6mL)	360mg (4.7mL)	450mg (5.8mL)	562.5mg (7.2mL)	720mg (9.0mL)	875mg (11mL or 1 tab)	Doses worked out using amoxicillin component. Take with food. Caution if liver disease.
	Otitis media	Oral Twice a day (bd)	45mg/kg/dose	148.5mg (1.9mL)	279mg (3.5mL)	342mg (4.3mL)	405mg (5.1mL)	540mg (6.8mL)	720mg (9mL)	900mg (11.4mL)	1.13g (14mL)	1.4g (18mL)	1.75g (22mL or 2 tab)	
Ampicillin Inj#: 500mg, 1g Pregnancy: **A** – safe to use Breastfeed: safe to use	Endocarditis prevention Gall bladder	IV Single dose	50mg/kg/dose	165mg (1.7mL)	310mg (3.3mL)	380mg (4mL)	450mg (4.7mL)	600mg (6mL)	800mg (8mL)	1g (10mL)	1.25g (12.7mL)	1.6g (16mL)	2g (20mL)	# **Mix** with WFI to give 100mg/mL – **500mg** with 4.7ml, **1g** with 9.3ml.
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)	
	Severe pneumonia	Oral Single dose	10mg/kg/dose	33mg (0.8mL)	62mg (1.6mL)	76mg (2mL)	90mg (2.5mL)	120mg (3mL)	160mg (4mL)	200mg (5mL)	250mg (6.5mL)	320mg (8mL)	400mg (10mL)	
	Sore throat	Oral Once a day	12mg/kg/dose	N/A	74.4mg (2mL)	91.2mg (2.5mL)	108mg (3mL)	144mg (4mL)	192mg (5mL)	240mg (6mL)	300mg (7.7mL)	384mg (10mL)	480mg (12mL or 1 tab)	
	Otitis media	Oral Single dose	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)	1g (25mL or 2 tab)	
Benzathine benzylpenicillin (Bicillin L-A) Inj: 1,200,000units/2.3mL 600,000units/1.2mL syringe Pregnancy: **A** – safe to use Breastfeed: safe to use	Chickenpox Skin sores Sore throat	Deep IM Single dose	450,000units/0.9mL (337.5mg) For child less than 10kg **paediatrician consult** for secondary prophylaxis regimen					600,000units/1.2mL (450mg) For child 10-19kg		1,200,000units/2.3mL (1 x 2.3mL syringe) (900mg)				Long lasting low levels of penicillin. **Do not** give for pneumonia. **Note:** 1,200,000units=900mg For syphilis dose see STI protocols.
	RHD	Deep IM Every 21-28days	600,000units/1.2mL (1 x 1.2mL syringe) (450mg)							1,200,000units/2.3mL (1 x 2.3mL syringe) (900mg)				

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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

Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				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	Dental infection	IV or IM Every 6hours (qid)	30mg/ kg/dose	99mg (0.3mL)	186mg (0.6mL)	228mg (0.8mL)	270mg (1mL)	360mg (1.2mL)	480mg (1.6mL)	600mg (2mL)	750mg (2.5mL)	960mg (3.2mL)	1.2g (4mL)	# **Mix** with WFI to give 300mg/mL – **600mg** with 1.6ml **1.2g** with 3.2ml **Inject** over 5 min. **Infuse** over 30 min.
	Severe pneumonia	IV or IM Single dose	50mg/ kg/dose	165mg (0.6mL)	310mg (1mL)	380mg (1.3mL)	450mg (1.5mL)	600mg (2mL)	800mg (2.7mL)	1g (3.5mL)	1.2g (4mL)			
	Moderate pneumonia	IV or IM Every 6hours (qid)	50mg/ kg/dose											
	Meningitis	IV Single dose	60mg/ kg/dose	198mg (0.7mL)	372mg (1.2mL)	456mg (1.5mL)	540mg (2mL)	720mg (2.4mL)	960mg (3.2mL)	1.2g (4mL)	1.5g (5mL)	1.92g (6.4mL)	2.4g (8mL)	
Cefalexin† Susp: 50mg/1mL Cap: 500mg Pregnancy: **A** – safe to use Breastfeed: safe to use	Water-related skin infection	Oral 4 times a day (qid)	12.5mg/ kg/dose	41.3mg (0.8ml)	77.5mg (1.6ml)	95mg (2ml)	112.5mg (2.5ml)	150mg (3ml)	200mg (4ml)	250mg (5ml)	312.5mg (6.5ml)	400mg (8ml)	500mg (10ml)	
	Sore throat Soft tissue injuries	Oral Twice a day (bd)	25mg/ kg/dose	82.5mg (1.7ml)	155mg (3.3ml)	190mg (4ml)	225mg (4.5ml)	300mg (6ml)	400mg (8ml)	500mg (10mL) or 1 cap – *500mg*)	625mg (12.5mL)	800mg (16mL)	1g (20mL or 2 cap – *500mg*)	
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 (3.1mL)	380mg (4mL)	450mg (4.5mL)	600mg (6mL)	800mg (8mL)	1g (10mL)	1.25g (12.5mL)	1.6g (16mL)	2g (20mL)	# **Mix** with WFI to give 100mg/mL — **500mg** + 4.8mL **1g** + 9.5mL **2g** + 19mL **Inject** over 3 minutes. **Infuse** over 30 minutes
	Bite injury	IV Twice a day (bd)												
	Compound fracture Head injury Pelvic fracture Penetrating chest injury Soft tissue injuries Severe cellulitis Stab wounds	IV or intraosseous Every 8 hours												
Ceftazidime Inj#: 1g, 2g† Pregnancy: **B1**– safe to use Breastfeed: safe to use	Melioidosis	IV Single dose	50mg/ kg/dose	165mg (1mL)	310mg (1.8mL)	380mg (2.2mL)	450mg (2.6mL)	600mg (3.5mL)	800mg (4.7mL)	1g (5.9mL)	1.25g (7.4mL)	1.6g (9.4mL)	2g (11.8mL)	# **Mix** with WFI to give 170mg/mL — **1g** + 5mL **2g**+ 10mL **Inject** over 3 minutes.

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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

Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				Newborn	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				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	Gonococcal conjunctivitis Gall bladder infection	IV or IM Single dose	50mg/kg/dose	165mg (0.7mL)	310mg (1.2mL)	380mg (1.5mL)	450mg (1.8mL)	600mg (2.4mL)	800mg (3.2mL)	1g (4mL)				# **For IM** mix with **lidocaine 1%** to give 250mg/mL – **500mg** + 2ml **1g** + 3.5ml Not more than 1g in each buttock. **For IV** mix with WFI to give 100mg/mL – **500mg** + 5ml **1g** + 10ml **2g** + 40ml **Inject** (up to 1g) over 3 minutes. In urgent and critically unwell (sepsis), 2g dose can be injected over 5 minutes **Infuse** over at least 30 minutes **Do not** mix with **Hartman's solution**
	Water-related skin infection Pneumonia Diarrhoea	IV or IM Single dose	50mg/kg/dose	165mg (0.7mL)	310mg (1.2mL)	380mg (1.5mL)	450mg (1.8mL)	600mg (2.4mL)	800mg (3.2mL)	1g (4mL)	1.25g (5mL)	1.6g (6.4mL)	2g (8mL)	
	Melioidosis Orbital cellulitis Bowel obstruction Peritonitis Severe pneumonia Sepsis	IV Single dose	50mg/kg/dose	165mg (0.7mL)	310mg (1.2mL)	380mg (1.5mL)	450mg (1.8mL)	600mg (2.4mL)	800mg (3.2mL)	1g (4mL)	1.25g (5mL)	1.6g (6.4mL)	2g (8mL)	
	Meningitis	IV or IM Single dose	100mg/kg/dose	N/A	620mg (2.5mL)	760mg (3mL)	900mg (3.6mL)	1.2g (4.8mL)	1.6g (6.4mL)	2g (8mL)	2.5g (10mL)	3.2g (12.8mL)	4g (16mL)	
Cefuroxime Susp†: 25mg/1mL Tab: 250mg Pregnancy: **B1** – safe to use Breastfeed: safe to use	CSLD	Oral Twice a day	15mg/kg/dose	N/A	93mg (3.7mL)	114mg (4.6mL)	135mg (5.4mL)	180mg (7.2mL)	250mg (10mL or 1 tab – *250mg*)				500mg (20mL or 2 tabs – *250mg*)	Take with food to maximise absorption.
Ciprofloxacin Tab: 250mg, 500mg, 750mg Pregnancy: **B3** – not recommended Breastfeed: safe to use	Water-related skin infections	Oral Twice a day	12.5mg/kg/dose	N/A	N/A	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. Take 1 hour before or 2 hours after food. Drink plenty of water.

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Clindamycin Cap: 150mg 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)		Take with full glass of water.
	Cellulitis	Oral 3 times a day (tds)	10mg/ kg/dose	N/A					150mg (1 cap)		300mg (2 cap)		450mg (3 cap)	
Clindamycin Inj#: 150mg/mL (2mL, 4 mL) Pregnancy: **A** – safe to use Breastfeed: safe to use	Stab wounds	IV Every 8 hours	10mg/ kg/dose	N/A	62mg (0.4ml)	76mg (0.5ml)	90mg (0.6ml)	120mg (0.8ml)	160mg (1.1ml)	200mg (1.3ml)	250mg (1.8ml)	320mg (2.2ml)	**40kg** 400mg (2.8ml) **45kg+** 450mg (3ml)	# **Mix** measured dose with glucose 5% or normal saline to give concentration not more than 12mg/mL. **Infuse** slowly – not more than 30mg/ minute.
	Compound fracture Head injury Soft tissue injury	IV Every 8 hours	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)	
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 (1cap – *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). Take on an empty stomach.
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 – *50mg*)	75mg (1½ tab – *50mg*)	100mg (1 tab – *100mg*)	Take with food
	Pneumonia	Oral Twice a day												

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				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	Soft tissue injuries Nappy rash	Oral 4 times a day (qid)	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). Take on an empty stomach.
	Orbital cellulitis 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** with 9.6ml **1g** with 19.3ml. **Inject** over 3 minutes. If 2g inject over 6 minutes. **Infuse** over 30 minutes. Preferred for 2g.
Gentamicin† Inj: 40mg/mL Pregnancy: **D** – specialist advice Breastfeed: safe to use	Mastoiditis Melioidosis Meningitis	IV Single dose	Children up to 10 years old – 7.5mg/kg/dose up to 320mg Children over 10 years old – 6mg/kg/dose up to 560mg	**Medical consult**	46.5mg (1.2mL)	57mg (1.4mL)	67.5mg (1.6mL)	90mg (2.2mL)	120mg (3mL)	150mg (3.8mL)	187.5mg (4.6mL)	240mg (6mL)		For adult **IV push** over 3–5 minutes — can be diluted with normal saline to 20mL. For children need dilution to 10mg/mL or weaker and **infuse** over 30 minutes. Administer **IM** undiluted. If kidney failure — specialist consult. **No maximum adult dose** — continue to calculate dose by weight If obese — **medical consult** about adjusted dose.
	Pneumonia	IM Single dose												
	Gall bladder Intrauterine infection Mastoiditis Melioidosis Pneumonia Postpartum haemorrhage Uterus infection	IV Single dose	Adult 5mg/kg/dose	N/A									**50kg** 250mg (6.4mL) **60kg** 300mg (7.6mL) **70kg** 350mg (8.8mL)	
	Intrauterine infection Postpartum haemorrhage Uterus infection	IV Once a day												

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Ivermectin Tab: 3mg Pregnancy: **B3** – avoid use Breastfeed: safe to use	Scabies Strongyloides	Oral Single dose	200microgram/kg/dose	N/A						1 tab	2 tab		**40kg** 3 tab **60kg** 4 tab **70kg** 5 tab **80kg+** 6 tab	**Do not** give to children under 5 years, or less than 15kg. Give with full cream milk or fatty food.
	Crusted scabies	Oral Once a day on days 0, 1, 7	200microgram/kg/dose											
Metronidazole† Susp: 40mg/mL Tab: 200mg, 400mg Pregnancy: **B2** – safe to use Breastfeed: safe to use	Bites Dental infection Diabetic ulcer Soft tissue infection Water-related skin infections	Oral Twice a day (bd)	10mg/kg/dose	**Medical consult**	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. Take with food. If pregnant or breastfeeding – give divided doses. Withhold breastfeeding for 12 hours after single high dose (2g) If severe liver disease – reduce dose. **Do not** infuse faster than 5mL/min. Give 500mg over 20 minutes.
	Giardia	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*)	**40kg** 1.2g (3 tab – *400mg*) **50kg** 1.6g (4 tab – *400mg*) **60kg+** 2g (5 tab – *400mg*)	
Metronidazole Inj: 5mg/mL Pregnancy: **B2** – safe to use Breastfeed: safe to use	Gall bladder	IV Single dose	12.5mg/kg/dose	**Medical consult**	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 infection Stab wounds	IV Twice a day (bd)												

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Phenoxymethyl-penicillin† Susp: 50mg/mL (250mg/5mL) Cap: 500mg Pregnancy: **A**– safe to use Breastfeed: safe to use	Sore throat	Oral Twice a day (bd)	15mg/kg/dose	49.6mg (1mL)	93mg (1.9mL)	114mg (2.3mL)	135mg (2.7mL)	180mg (3.6mL)	240mg (4.8mL)	300mg (6mL)	375mg (7.5mL)	480mg (9.6mL)	500mg (10mL or 1 cap)	
Praziquantel Tab: 600mg Pregnancy: **B1** – specialist advice Breastfeed: safe to use	Dwarf tapeworms	Oral Single dose	25mg/kg/dose	N/A	N/A	N/A	300mg (½ tab)			450mg (¾ tab)	600mg (1 tab)	750mg (1¼ tab)	900mg (1¼ tab) **50kg+** 1.2g (2 tab)	Children don't like the taste. Give with food. **Do not** chew tablet.
Probenecid Tab: 500mg Pregnancy: **B2** – specialist advice Breastfeed: safe to use	Severe cellulitis	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. Tablet can be dispersed in water.
Procaine benzylpenicillin (procaine penicillin) Inj: 1.5g (3.4mL syringe) Pregnancy: **A** – safe to use Breastfeed: safe to use	Cellulitis Nappy rash	Deep IM Once a day	50mg/kg/dose	165mg (0.4mL)	310mg (0.7mL)	380mg (0.9mL)	450mg (1.1mL)	600mg (1.4mL)	800mg (1.8mL)	1g (2.4mL)	1.25g (3mL)	1.5g (3.4mL)		Shake well. Put into another syringe to measure small doses accurately. Roll syringe between palms to warm before use. Inject slowly

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Pyrantel Tab: 125mg, 250mg Choc sq: 100mg Pregnancy: **B2** – safe to use Breastfeed: safe to use	Threadworm	Oral Single dose Repeat dose in 2 weeks	10mg/kg/dose	N/A			100mg or 1 sq	120mg or 1 tab – *125mg*	160mg or 1½ sq or 1 tab – *125mg*	200mg or 2 sq or 1½ tab – *125mg*	250mg or 2½ sq or 1 tab – *250mg*	320mg or 3 sq or 3½ tab – *125mg*	**40kg** 400mg or 4 sq or 3 tab – *125mg* **60kg** 600mg or 6 sq or 5 tab – *125mg* **80kg** 800mg or 3 tab – *250mg* **100kg+** 1g or 4 tab – *250mg*	Take with food. Tablet can be crushed and mixed with jam
	Hookworm	Oral Once a day for 3 days												
Trimethoprim-sulfamethoxazole† (co-trimoxazole) Susp: 8+40mg/mL Tab: 160+800mg Pregnancy: **C** – avoid use Breastfeed: caution	Bites Otitis media Skin infection UTI Soft tissue infection Nappy rash	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. Addition of Folic Acid for prolonged or high dose courses.
	Melioidosis		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)	**40-60kg** 240mg (30mL or 1½ tab) **60+kg** 320mg (40mL or 2 tab)	
	Water-related skin infections		8+40mg/kg/dose	N/A	49.6mg (6.2mL)	60.8mg (7.6mL)	72mg (9mL or ½ tab)	96mg (12mL)	128mg (16mL)	160mg (20mL or 1 tab)	200mg (25mL)	256mg (32ml or 1½ tab)	320mg (40mL or 2 tab)	

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose										Notes
				New-born	3 months	6 months	1 year	2 years	4 years	6 years	8 years	10 years	12 years and over	
				3.3kg	6.2kg	7.6kg	9kg	12kg	16kg	20kg	25kg	32kg	40kg+	
Valaciclovir Tab: 500mg, 1g Pregnancy: **B3** – appears safe in 3rd trimester but aciclovir preferred Breastfeed: safe to use	Chickenpox Shingles	Oral 3 times a day	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*)	Tablets can be crushed but taste unpleasant. Mix with jam.
Vancomycin† Inj#: 500mg, 1g Pregnancy: B2 - safe to use Breastfeed: safe to use	Sepsis	IV Single dose	**Paediatric** 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)	600mg (12mL)	**Medical consult** # **Mix** with WFI to give 50mg/mL – **500mg**+10mL **1g+**20mL Doses 500mg or less can be given over 60 minutes. **Do not infuse doses greater than 500mg at a rate faster than 10mg/minute** as red man syndrome can occur
			Adult 20mg/kg/dose							**41-50kg** 1g (20mL) infuse over 1 hour 40min **51-60kg** 1.2g (24mL) infuse over 2 hours **61-70kg** 1.4g (28mL) infuse over 2 hours 20min **71-80kg** 1.6g (32mL) infuse over 2 hours 40min **81-90kg** 1.8g (36mL) infuse over 3 hours **91-100kg** 2g (40mL) infuse over 3 hours 20min **101-110kg** 2.2g (44mL) infuse over 3 hours 40min **Over 110kg** 2.4g (48mL) infuse over 4 hours			

Pregnancy categories: 'Harm' means to foetus. For more detail see *Australian Medicines Handbook* or *Therapeutic Guidelines*
Category A: Have been taken by large numbers of pregnant and fertile women without any known harm
Category B1: Have been used in a limited number of pregnant and fertile women without any known harm. Animal studies have not shown harm
Category B2: Women as for B1. Animal studies are less adequate, but no evidence of harm
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 non–permanent harm
Category D: Have caused or are suspected of causing permanent harm. Category C and D medicines are not always contraindicated for use in fertile women. The risks and benefits need to be discussed
Category X: Drugs which have such a high risk of causing permanent damage to the foetus that they should not be used in pregnancy or when there is a possibility of pregnancy

For more information and details on giving antibiotics see *AMH*, *Therapeutic Guidelines*, *Medicines Book*, *Australian Injectable Drugs Handbook*

Other medicines doses table

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose											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	20microgram/ kg/dose	N/A	N/A	N/A	N/A	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 or 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 (1.5mL)	**50kg** 7.5mg (1.9mL) **60kg** 9mg (2.3mL) **70kg+** 10mg (2.5mL)	Give IV over 1–3 min Give IM if no IV access
Hydrocortisone Inj: 50mg/mL Pregnancy: **A** – safe, but use lowest dose for shortest time Breastfeed: Safe to use, avoid high doses	Meningitis	IV Single dose	4mg/ kg/dose	13.2mg (0.3mL)	24.8mg (0.5mL)	30.4mg (0.6mL)	36mg (0.7mL)	48mg (1mL)	64mg (1.3mL)	80mg (1.6mL)	100mg (2mL)	128mg (2.6mL)	160mg (3.2mL)	200mg (4mL)	Give IV over 1 min Give IM if no IV access
	Severe asthma	IM or IV Single dose		13.2mg (0.3mL)	24.8mg (0.5mL)	30.4mg (0.6mL)	36mg (0.7mL)	48mg (1mL)	64mg (1.3mL)	80mg (1.6mL)	100mg (2mL)				
Ibuprofen† Susp: 20mg/mL Tab: 200mg, 400mg Pregnancy: **C**– avoid Breastfeed: Safe to use	Dental pain Redback spider	Oral 3 times a day (tds)	10mg/ kg/ dose	N/A	62mg (3.1mL)	76mg (3.8mL)	90mg (4.5mL)	120mg (6mL)	160mg (8mL)	200mg (10mL)	250mg (12.5mL)	320mg (16mL)	400mg (20mL or 1 tab)		

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose											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+	
Levetiracetam Inj#: 100mg/mL (5mL) Pregnancy: B3 – get advice Breastfeed: caution	Head injury	IV Loading dose	20mg/ kg/dose	66mg (0.7mL)	124mg (1.2mL)	152mg (1.5mL)	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% Give by IV infusion over 15 minutes (head injury), 5 minutes (fits)
	Fits	IV or intraosseous Loading dose	40mg/ kg/dose	132mg (1.3mL)	248mg (2.5mL)	304mg (3mL)	360mg (3.6mL)	480mg (4.8mL)	640mg (6.4mL)	800mg (8mL)	1g (10mL)	1.28g (12.8mL)	1.6g (16mL)	2g (20mL)	
Naloxone Inj#: 0.4mg/mL (1ml, 5ml) Pregnancy: **B1– medical consult** in opioid-dependent women Breastfeed: May be used	Over-sedation (opioids)	IV	0.01mg/ kg/dose	0.03mg (0.3mL)	0.06mg (0.6mL)	0.08mg (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
Ondansetron† Wafer: 4mg, 8mg Pregnancy: **B1**– safe to use after first trimester if all other options are not suitable Breastfeed: Caution	Head injuries Nausea and vomiting	Oral wafer		N/A		2mg			4mg (1 wafer – *4mg*)				8mg (1 wafer – *8mg*)		Best anti-emetic when sedation not wanted. Always do **medical consult** for children

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Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose											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+	
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 (1.1mL)	93mg (2mL)	114mg (2.4mL)	135mg (2.8mL)	180mg (3.8mL)	240mg (5mL or ½ tab)	300mg (6.4mL or ½ tab)	375mg (7.8mL or 1 tab)	480mg (10mL or 1 tab)	600mg (12.5mL or 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 Pregnancy: **A–** safe, but use lowest dose for shortest time Breastfeed: Safe to use	Asthma	Oral	1mg/ kg/dose	3.3mg (0.7mL)	6.2mg (1.2mL)	7.6mg (1.5mL)	9mg (1.8mL)	12mg (2.4mL)	16mg (3.2mL)	20mg (4mL)	25mg (5mL)	32mg (6.4mL)	40mg (8mL)	50mg (10mL)	Take after breastfeed and wait 4 hours before next feed
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 anti-emetic if sedation needed Always do **medical consult** for children
	Nausea + vomiting Sedation	Oral													
	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 (0.3mL)	10mg (0.4mL)	12.5mg (0.5mL)	

This table must be used with protocols from CARPA STM (8th ed) or WBM (7th 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.

Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose											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+	
Tranexamic acid Inj#: 100mg/mL (5ml, 10ml) Pregnancy: B1 – safe after first trimester Breastfeed: Appears safe	Control bleeding	IV infusion Loading dose	15mg/kg/ dose	N/A					240mg (2.4mL)	300mg (3mL)	375mg (3.75mL)	480mg (4.8mL)	600mg (6mL)	1g (10mL)	**Loading dose:** For **adults**: Dilute 1g in 100mL normal saline or 5% dextrose and infuse over 10 minutes For **children**: Inject undiluted over 10 minutes. Dilute with normal saline if necessary.
		Maintenance dose infusion per hour	2mg/kg/hour	N/A					32mg (32mL)	40mg (40mL)	50mg (50mL)	64mg (64mL)	80mg (80mL)	100mg (100mL)	**Maintenance dose:** For **adults**: Dilute 1g in 1,000mL of normal saline or 5% glucose and infuse over 8 hours For **children**: Dilute 500mg in 500mL normal saline or 5% glucose to give 1mg/mL and infuse at 2mL/ kg/h over 8 hours (maximum dose 125mg per hour).

This table must be used with protocols from CARPA STM (8th ed) or WBM (7th 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.

Medicine and presentation	Common uses	Route and frequency	Dosage	Amount per dose											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+	
Tranexamic acid Inj*: 100mg/mL (5ml, 10ml) Pregnancy: B1 – safe after first trimester Breastfeed: Appears safe	Control bleeding in postpartum haemorrhage	IV		N/A										1g (10mL)	Inject undiluted over 10 minutes. Dilute with normal saline if necessary.
Valproate† Inj#: 400mg Pregnancy **D** - avoid if possible Breastfeed: Appears safe	Fits	IV or intraosseous Single dose	20mg/ kg/dose	N/A				240mg (4.8mL)	320mg (6.4mL)	400mg (8mL)	500mg (10mL)	640mg (12.8mL)	800mg (16mL)	800mg (16mL)	**#Inject:** mix with normal saline to give 50mg/mL or less — **400mg** + 8mL. **Inject** over 15 minutes.
		Infusion dose per hour	1.6mg/ kg/hr	N/A				19.2mg (4.8mL)	25.6mg (6.4mL)	32mg (8mL)	40mg (10mL)	51.2mg (12.8mL)	64mg (16mL)	**50kg** 80mg (20mL) **60kg** 96mg (24mL) **65kg+** 104mg (26mL)	#**Infuse:** mix with 100mL normal saline + 5% glucose to give 4mg/mL.

Pregnancy categories: 'Harm' means to foetus. For more detail see *AMH* or *Therapeutic Guidelines*
Category A: Have been taken by large numbers of pregnant and fertile women without any known harm
Category B1: Have been used in a limited number of pregnant and fertile women without any known harm. Animal studies have not shown harm
Category B2: Women as for B1. Animal studies are less adequate, but no evidence of harm
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 non–permanent harm
Category D: Have caused or are suspected of causing permanent harm. Category C and D medicines are not always contraindicated for use in fertile women. The risks and benefits need to be discussed
Category X: Drugs which have such a high risk of causing permanent damage to the foetus that they should not be used in pregnancy or when there is a possibility of pregnancy

Note: † = Other strengths available
For more information and details on giving medicines see *AMH*, *Therapeutic Guidelines*, *Medicines Book*, *Australian Injectable Drugs Handbook*

Abbreviations

°	degree
%	percent
ABC	airway, breathing, circulation
ACAT	Aged Care Assessment Team
ACE	angiotensin-converting enzyme
ACR	albumin creatinine ratio
ACR/EULAR	American College of Rheumatology /European League Against Rheumatism (classification criteria for rheumatoid arthritis)
ACS	acute coronary syndrome
AED	automated external defibrillator
AF	atrial fibrillation
AFB	acid-fast bacillus
AFP	alpha-fetoprotein
AHI	apnoea hypopnea index
AIDS	acquired immunodeficiency syndrome
AIMhi	Australian Integrated Mental Health Initiative
Alb	albumin
ALP	alkaline phosphatase
ALS	advanced life support
ALT	alanine aminotransferase
AMH	Australian Medicines Handbook
AMI	acute myocardial infarction
ANA	antinuclear antibody
anti-CCP	cyclic citrullinated peptide antibodies (predictive for rheumatoid arthritis)
AntiDNAse B	antibodies against antideoxyribonuclease B
Anti-HBc	hepatitis B core antibody
Anti-HBe	hepatitis B envelope antibody
Anti-HBs	hepatitis B surface antibody
Anti-HCV	hepatitis C virus antibody
Anti-LKM	liver kidney microsomal antibody
AOD	alcohol and other drugs
AOM	acute otitis media
AOMwiP	acute otitis media with perforation
AOMwoP	acute otitis media without perforation
AP	anteroposterior (front to back)
APRI	AST platelet ratio index
ARB	angiotensin II receptor blocker
ARF	acute rheumatic fever
ASOT	anti-streptolysin O titre
ASQ TRAK	developmental screening tool for Aboriginal children
AST	aspartate aminotransferase
ATL	adult T cell leukaemia/lymphoma
ATSIHP	Aboriginal and Torres Strait Islander health practitioner
AVO	apprehended violence order

AVPU	alert, voice, pain, unresponsive
BCG	bacille Calmette-Guérin (vaccine for tuberculosis)
bd	bis die – twice a day
BGL	blood glucose level
BMI	body mass index
BP	blood pressure
BPG	benzathine penicillin G
C	celsius
C3	third component of complement
C4	fourth component of complement
C4	fourth cervical nerve
C6	sixth cervical nerve
C7	seventh cervical nerve
C8	eighth cervical nerve
Ca	calcium
CAD	coronary artery disease
cap	capsule
CARPA	Central Australian Rural Practitioners Association
CARPA STM	CARPA Standard Treatment Manual
CDC	Centre for Disease Control
CDNA	Communicable Disease Network Australia
CFC	chlorofluorocarbon
CFU	colony-forming units
CIWA	Clinical Institute Withdrawal Assessment
CK	creatinine kinase
CKD-EPI	Chronic Kidney Disease Epidemiology Collaboration
CKD	chronic kidney disease
CLD	chronic lung disease
cm	centimetre
CNS	central nervous system
CO	corneal opacity (trachoma grading)
CO_2	carbon dioxide
COPD	chronic obstructive pulmonary disease
CPAP	continuous positive airway pressure
CPM	Clinical Procedures Manual
CPR	cardiopulmonary resuscitation
CRE	Centre for Research Excellence
CRP	c-reactive protein
CSF	cerebrospinal fluid
CSL	Commonwealth Serum Laboratory
CSLD	chronic suppurative lung disease
CSOM	chronic suppurative otitis media
CT	computerised tomography
CVD	cardiovascular disease
CVS	cardiovascular system
DAA	dose administration aid
dB	decibel
disp	dispersible

DM	diabetes mellitus
DMARDs	disease modifying antirheumatic drugs
DNA	deoxyribonucleic acid
DOT	directly observed therapy
DPI	dry powder inhaler
DPP4	dipeptidyl peptidase-4
dsDNA	double stranded deoxyribonucleic acid
DTs	delirium tremors
DVT	deep vein thrombosis
ECEI	Early Childhood Early Intervention
ECG	electrocardiogram
EDTA	ethylenediaminetetra-acetic acid
eg	exempli gratia – for example
eGFR	estimated glomerular filtration rate
EMD	electromechanical dissociation
ENA	extractable nuclear antigens
ENT	ear, nose and throat
EPSE	extra-pyramidal side effects
ESBL	extended spectrum beta-lactamase (enzyme)
ESR	erythrocyte sedimentation rate
etc	et cetera – and so forth
ETT	endotracheal tube
EUC	electrolytes, urea and creatinine
F	figure
FaFT	Families as First Teachers
FAS	foetal alcohol syndrome
FASD	foetal alcohol spectrum disorder
FBC	full blood count
FEV1	forced expiratory volume in 1 second
fL	femtoliter
FOBT	faecal occult blood test
FVC	forced vital capacity
G	gauge
g	gram
GAS	Group A beta haemolytic streptococcus
GFR	glomular filtration rate
GGT	gamma glutamyl transferase
GLP1	glucagon-like peptide-1
GTN	glyceryl trinitrate
HAM/TSP	myelopathy/tropical spastic paraparesis
HAV	hepatitis A virus
HAV IgG	hepatitis A antibody
HAV IgM	hepatitis A antibody
Hb	haemoglobin
HbA1c	glycated haemoglobin
HBeAg	hepatitis B envelope antigen
HBsAg	hepatitis B surface antigen
hCG	human chorionic gonadotrophin

HCO3	bicarbonate
HCV	hepatitis C virus
HDL-C	high density lipoprotein cholesterol
HF	heart failure
HFA	hydrofluoroalkane (inhaler)
Hib	*Haemophilus influenzae* type b
HIV	human immunodeficiency virus
hr	hour
HRCT	high resolution computerised tomography
HSV	herpes simplex virus
HTLV-1	human T lymphotrophic virus
ICS	inhaled corticosteroids
ICU	intensive care unit
IDA	iron deficiency anaemia
IDC	indwelling urinary catheter
IFG	impaired fasting glucose
IgG	immunoglobulin G
IgM	immunoglobulin M
IGT	impaired glucose tolerance
IM	intramuscular (in the muscle)
inj	injection
INR	international normalized ratio
IO	intraosseous (in the bone)
IUD	intrauterine device
IV	intravenous (in the vein)
J	joule
JVP	jugular venous pressure
kg	kilogram
KICA	Kimberly Indigenous Cognitive Assessment
km	kilometre
L	litre
LA	local anaesthetic
LABA	long-acting $beta_2$ agonist
LAMA	long-acting muscarinc antagonist
LBTI	latent TB infection
LDL-C	low density lipoprotein cholesterol
LFT	liver function test
LMWH	low molecular weight heparin
LRTI	lower respiratory tract infection
m	meter
MAC	My Aged Care (government support)
MAOI	monoamine oxidase inhibitor
max	maximum
MC&S	microscopy, culture and sensitivity
MCV	mean cell volume
MDI	metered dose inhaler
Mg	magnesium
mg	milligram

MH	mental health
min	minute
MILS	manual in-line stabilisation
mL	millilitre
mm	millimetre
mmHg	millimetre of mercury
mmol	millimole
MMS	multimedia messaging service
MMSE	Mini Mental State Examination
mod	moderate
mol	mole
MRI	magnetic resonance imaging
MRSA	methicillin-resistant Staphylococcus aureus
N/A	not applicable
NAAT	nucleic acid amplification test
NDIS	
NGT	nasogastric tube
NMS	neuroleptic malignant syndrome
NRT	nicotine replacement therapy
NSAID	non-steroidal ant-inflammatory drug
NT	Northern Territory
O_2	oxygen
O_2 sats	oxygen saturation
OCP	ova, cysts, parasites
OGTT	oral glucose tolerance test
OME	otitis media with effusion
orgs	organisms
ORS	oral rehydration solution
OSA	obstructive sleep apnoea
OT	occupational therapist
p	page
PBS	Pharmaceutical Benefits Scheme
PCR	polymerase chain reaction
PCV	packed cell volume
PE	pulmonary embolism
PEA	pulseless electrical activity
PEFR	peak expiratory flow rate
PEP	positive expiratory pressure
PEP	post-exposure prophylaxis
PHQ	Patient Health Questionnaire
PHU	Public Health Unit
physio	physiotherapist
PID	pelvic inflammatory disease
PO_4	phosphate
POC	point of care
PR	per rectum
PrEP	HIV pre-exposure prophylaxis
PRN	pro re nata (when required)

PSGN	post-streptococcal glomerulonephritis
PTH	parathyroid hormone
qid	quater in die – 4 times a day
QLD	Queensland
rAOM	recurrent acute otitis media
RAPD	relative afferent pupillary defect
RDW	red cell volume distribution width
REWS	remote early warning score
RF	rheumatoid factor
RHD	rheumatic heart disease
RPR	rapid plasma reagin
RR	respiratory (breathing) rate
RRT	renal replacement therapy
S1	first sacral nerve
SA	South Australia
SABA	short-acting $beta_2$ agonist
SAMA	short-acting muscarinc antagonist
SGLT2	sodium-glucose co-transporter 2
SIDS	sudden infant death syndrome
SMS	short message service
SNRI	serotonin and norepinephrine reuptake inhibitor
SSRI	selective serotonin reuptake inhibitor
STEMI	ST-elevation myocardial infarction
Strep A	Group A beta haemolytic streptococcus
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
temp	temperature
TF	trachomatous inflammation — follicular
TFT	thyroid function test
TG	triglycerides
TI	trachomatous inflammation — intense
TS	trachomatous scarring
TT	trachomatous trichiasis (turned in eyelashes)
TTO	tympanostomy tube otorrhoea (infected grommets)
TV	television
U/A	urinalysis (with dipstick)
UEC	urea, electrolytes, creatinine

UHT	ultra-high temperature (pasturisation)
URTI	upper respiratory tract infection
UTI	urinary tract infection
VBG	venous blood gas
VF	ventricular fibrillation
VT	ventricular tachycardia
VUR	vesico-ureteric reflux
VZIG	varicella zoster immune globulin
WA	Western Australia
WBC	white blood count
WBM	Women's Business Manual
WFI	water for injection
WHO	World Health Organisation
XL, XR	extended release

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ISBN 978-0-6455848-0-6