- GIT: persistent bile-stained vomiting, mass >2 cm other than hydrocele or umbilical hernia, significant faecal blood
- CNS: convulsions
- Skin: petechial rash

Airway and breathing[5]

Assessment of the airway and breathing is an important barometer of life-threatening illness and impending cardiac arrest due to hypoxia. The effort and efficacy of breathing must be assessed in the sick infant and child.

Important signs to observe with indicators

- Inspiratory noises with obstruction

  bubbly noises—partial obstruction with fluid

  snoring—decreased level of consciousness

  stridor—partial obstruction to larynx or trachea
- Apnoea—no respiratory effort for >20 seconds
- Bradypnoea—respiratory rate < normal for age
- Tachypnoea—rate > normal for age (indicates need to ↑ O_2 and ↓ CO_2)
- Chest recession—on inspiration
- Tracheal tug—downward pull on inspiration
- Accessory muscle use
- Nasal flaring
- Gasping—severe hypoxia; impending arrest
- Grunting—expiration against obstructed glottis
- Oxygen saturation—efficacy of breathing; use oximetry only as an adjunct to clinical assessment
- Cyanosis

Secondary signs of worsening obstruction

- Increased respiratory rate or effort
- Decreased oxygen saturation
- Increasing tachycardia
- Deterioration of colour
- Development of agitation or decreased level of consciousness

Pulse oximetry and oxygen saturation

The pulse oximeter measures arterial saturation of arterial blood (SpO_2). In healthy young people, the SpO_2 should be 97–99%. The ideal value is 97–100%. The median value in neonates is 97%, in young children 98% and in adults 98%. A level less than 95% and particularly 92% is a serious concern. The aim of treatment, including for asthma, is to keep it above 94%.

Indications for investigations are presented in TABLE 89.1 .

Table 89.1 Indications for investigations in the sick child[2]

Urine microscopy, culture and sensitivity	All with fever
Full blood examination	All <4 weeks Risk factors present Doctor uncertain
Blood microscopy, culture and sensitivity	All <3 months Risk factors present Doctor uncertain
Faecal microscopy, culture and sensitivity	All with diarrhoea
Chest X-ray	All with significant respiratory tract symptoms and signs
C-reactive protein	Those on antibiotics Doctor uncertain
CSF examination (lumbar puncture contraindicated in the unresponsive febrile patient)	Suspected meningitis (infant drowsy, pale and febrile) Convulsion in febrile child and: • source of fever unknown • receding drowsiness and pallor

- infant <6 months, child >5 years
- prolonged convulsion (>10 minutes)
- postictal phase longer than usual (>30 minutes)

Collapse in children

Collapse in children is a very dramatic emergency and often represents a life-threatening event. It is important to remember that the child's brain requires two vital factors: oxygen and glucose.

There is only a 2-minute reserve once cerebral blood flow stops. Bacterial meningitis should be considered as a cause.

Important causes of collapse are presented in TABLE 89.2 . Keep in mind child abuse as a cause of collapse.

Table 89.2 Collapse in children: causes to consider

Anaphylaxis	Penicillin injection Stings
Asphyxia	Near drowning Strangulation
Airways obstruction	Asthma Epiglottitis Croup Inhaled foreign body
CNS disorders	Convulsions Meningitis Encephalitis Head injury
Severe infection	Gastroenteritis → dehydration Septicaemia Myocarditis
Hypovolaemia	Dehydration (e.g. heat) Blood loss (e.g. ruptured spleen)

Cardiac failure	Arrhythmias Cardiomyopathy
Metabolic	Acidosis (e.g. diabetic coma) Hypoglycaemia Hyponatraemia
Poisoning	Drug ingestion Envenomation
SIDS	Near-miss
Functional	Breath-holding attacks Conversion reaction Vasovagal

Note: Consider child abuse.

Initial basic management[6]

1. Lay child on side.
2. Suck out mouth and nasopharynx.
3. Rescue breaths.
4. Intubate or ventilate (if necessary).
5. Give oxygen 8–10 L/min by mask.
6. Pass a nasogastric tube:

   0–3 years 12 FG

   4–10 years 14 FG
7. Attend to circulation: IV access

   ?give blood, Haemaccel or N saline.
8. Take blood for appropriate investigations.
9. Consider ‘blind’ administration of IV glucose.
10. A pulse oximeter is ideal. Monitor SpO_2.

Cardiopulmonary resuscitation[6]

Sudden primary cardiac arrest is rare in children. It is mostly due to hypoxia. Asystole or severe bradycardia is the usual rhythm at the time of arrest.

The following basic life support plan should be followed:

- Check breathing and pulse.
- Inspect oropharynx and clear any debris using suction if necessary.
- Basic life support for infants and children is 2 breaths and 15 compressions (with 2 rescuers). Outside the hospital setting is 30:2 compression ventilation ratio, including two initial rescue breaths. The ratio of 30:2 for one rescuer is appropriate for all ages regardless of the number of revivers present (see: www.resus.org.au/policy/guidelines/index.asp).
- Tilt head backwards, lift chin and thrust jaw forwards (the sniffing position).
- Ventilate lungs at about 20 inflations/min with bag-valve-mask or mouth to mask or mouth to mouth. An Air Viva using 8–10 L/min of oxygen is ideal if available.
- Intubate via mouth and secure, if necessary (must pre-oxygenate).
- If intubation not possible, use a needle cricothyroidotomy as an emergency.
- Start external cardiac compression immediately if pulseless or <60 beats/min (see TABLE 120.2 in CHAPTER 120). Use two fingers or thumbs for infants <1 year and heel of one hand for children 1–8 years.
- If >8 years use a two-handed technique. Avoid pressure over ribs and abdominal viscera. The compression ratio for children is 100 per minute (one per 0.6 seconds).

Guidelines

Differences in children's airways for intubation:

- epiglottis longer and stiffer, more horizontal
- larynx more anterior → difficult to intubate 'blind'
- cricoid ring is narrowest position → cuffed tube not required
- shorter trachea → increased risk intubating right main bronchus
- narrow airway → increased airway resistance

Rule for endotracheal tube (ETT) size (internal diameter in mm)

- ETT (mm) = (age in years ÷ 4) + 4

  or

  the size of the child's little finger or nares

- ETT length (cm) oral = (age in years ÷ 2) + 12 from lower lip; nasal—add 3 cm

For endotracheal size refer to TABLE 89.3 and for a basic schedule for CPR refer to TABLE 120.2 .

Table 89.3 Childhood intubation: endotracheal tube size and insertion distance[6]

Age	Internal diameter (mm)	Length to lip (cm)
Newborn	3.0	8.5
1–6 months	3.5	10
6–12 months	4.0	11
2 years	4.5	12
4	5.0	14
6	5.5	15
8	6.0	16
10	6.5	17
12	7.0	18
14	7.5	19
Adult	8.0	20

Drugs that can be administered through the ETT can be considered under the mnemonic NASALS:

N = **N**aloxone

A = **A**tropine

S = **S**albutamol

A = **A**drenaline

L = **L**ignocaine

S = **S**urfactant

Paediatric advanced life support

- Compression ventilation ratio of 15:1 for infants and children should be used in an advanced life support situation (i.e. in a hospital setting).
- Give a single shock instead of stacked shocks (single shock strategy) for ventricular fibrillation/pulseless ventricular tachycardia. Page 1026
- Where the arrest is witnessed by a health care professional and a manual defibrillator is available, then up to three shocks may be given (stacked shock strategy) at the first defibrillation attempt.
- Monophasic or biphasic defibrillation: first shock—2 J/kg, subsequent shocks—4 J/kg.

Poisoning

Poisoning in children is a special problem in toddlers (accidental) and in adolescents (deliberate). Children aged 1–6 years are most prone to accidental poisoning, with a peak at 2 years. The most common cause of death in comatose patients is respiratory failure.

The common dangerous poisons in the past were kerosene and aspirin. Excluding household chemicals, camphor/moth balls, pesticides, insecticides, organophosphates and opioids, the most dangerous drugs or substances, even in small doses, are:

- antidepressants, especially tricyclics
- antihistamines
- antihypertensives
- antipsychotics
- anxiolytics (e.g. benzodiazepines/barbiturates)
- beta blockers
- calcium-channel blockers
- chloral hydrate
- clonidine
- disc (button) batteries

- digoxin
- dishwashing powder
- iron tablets
- Lomotil (diphenoxylate)
- opiates/‘designer’ drugs
- paracetamol/acetaminophen (the most common in Australia)
- paraquat
- potassium tablets
- quinine/quinidine/chloroquine
- salicylates (e.g. aspirin)
- selective serotonin reuptake inhibitors

Be mindful of the serotonin syndrome (see CHAPTER 10).

In a UK study[7] the main cause of deaths from poisoning were (in order) tricyclics, salicylates, opioids including Lomotil, barbiturates, digoxin, orphenadrine, quinine, potassium and iron. Another study highlighted, in addition, carbon monoxide and corrosive substances.

Principles of treatment[8,9]

The vast majority of paediatric exposures are benign, and do not require hospital referral for observation or assessment. The management of childhood poisoning has undergone a transformation, with the cornerstone being conservative–supportive and symptomatic care.[8]

Early discussion with a poisons information centre is appropriate and will often help direct management. Key initial steps are to identify the poison and rapid triage of the child.

In an emergency, call for an ambulance and consult your local emergency department or poisons information centre. The process is:

- Identify the poison
- Rapid triage
- Support vital functions—ABCD:

  Airway—relieve any obstruction

  Breathing—ventilate with oxygen

Circulation—treat hypotension/arrhythmias

Detect and treat seizures and/or hypoglycaemia (consider dextrose to avoid hypoglycaemia)

- Administer antidote early if indicated (see TABLE 89.4)

Table 89.4 Important antidotes for poisons[10]

Poison	Antidote
Amphetamines (cause hypertension)	Glyceryl trinitrate IV Esmolol or labetalol
Benzodiazepines	Flumazenil
Beta blockers	Glucagon and isoprenaline
Calcium blocker	Calcium chloride IV *or* Calcium gluconate IV
Carbon monoxide	Oxygen 100% Hyperbaric oxygen
Cyanide	Hydroxocobalamin Sodium nitrite IV Sodium thiosulphate IV
Digoxin	Digoxin-specific antibodies Magnesium sulphate
Heavy metals (e.g. Pb, As, Hg, Fe)	Chelating agents, e.g. dimercaprol
Heparin	Protamine IV
Iron	Desferrioxamine
Isoniazid	Pyridoxine
Lead	Dimercaprol → calcium disodium edetate
Methanol, ethylene glycol	Ethanol (ethyl alcohol) Fomepizole
Narcotics/opioids	Naloxone (Narcan)
Organophosphates	Atropine Pralidoxime (2-PAM)
Paracetamol	N-acetylcysteine (IV) (effective within 12 hours)

(acetaminophen)	consider up to 36 hours
Phenothiazines	Benztropine
Potassium	Calcium gluconate Kayexalate Sodium bicarbonate (if acidosis) Salbutamol aerosol
Tricyclic antidepressants	Sodium bicarbonate IV
Warfarin	Fresh frozen plasma Vitamin K

Note: Emesis, gastric lavage and charcoal are not routinely recommended and are best given on the advice of a poisons information centre (Poisons Information Centre: 13 11 26).[7]

- Treat any complications:

  respiratory failure: hypoventilation, apnoea

  pulmonary aspiration of gastric contents

  arrhythmias

  hypotension

  seizures

  delayed effects (e.g. paracetamol—hepatotoxicity; tricyclics—arrhythmia)

Investigations

- Drug levels (e.g. paracetamol, aspirin, iron)
- Blood gas analysis
- X-ray:

  chest

  abdomen (e.g. radio-opaque iron tablets)

  skull

- ECG

Psychosocial care

The reasons for the poisoning need to be carefully evaluated and proper support and advice given.

Envenomation

Bites and stings, see CHAPTER 120 .

Swallowed foreign objects

High-risk foreign bodies

- Bbutton batteries
- Large objects > 6 cm long, wider > 2.5 cm
- Magnet + metal object
- > 1 magnet
- Lead-based objects (lead toxicity if impacted)
- Abnormal GI tract, e.g. previous surgery, TOF

A golden rule

The natural passage of most objects entering the stomach can be expected. Once the pylorus is traversed the FB usually continues.

This includes:

- coins
- buttons
- sharp objects
- open safety pins
- glass (e.g. ends of thermometers)
- drawing pins

Special cases are:

- very large coins: watch carefully
- hair clips (usually cannot pass duodenum if under 7 years)

Management

- Manage conservatively.
- X-ray all children (mouth to anus, especially chest and abdomen) on presentation (the oesophagus is a concern).
- Investigate unusual gagging, coughing and retching with X-rays of the head, neck, thorax and abdomen (check nasopharynx and respiratory tract).
- Watch for passage of the FB in stool (usually 3 days). Defecate into a container.
- If not passed, order X-ray in 1 week.
- If a blunt FB has been stationary for 1 month without symptoms, remove at laparotomy.

Button and disc battery ingestion

If not in stomach, these (especially lithium batteries) create an emergency if in the oesophagus because electrical current generated destroys mucous membranes and perforates within 6 hours (must be removed endoscopically ASAP). This also applies to the ear canal and nares.

Fever[11]

Fever, which is commonly defined as a temperature >38°C, is a significant symptom in a child, especially in neonates (see CHAPTER 42). If an infant aged less than 3 months presents with a fever but no focus of infection, consider bacteraemia. One recommendation is that all febrile neonates should have a full septic work-up and be admitted for parenteral antibiotics.

Not to be missed

- Meningitis/encephalitis
- Sepsis
- Pneumonia
- Osteomyelitis/septic arthritis
- Pertussis
- Urinary infection (especially if no focus)

Febrile convulsions

Diagnosis based on presence of fever, short duration and no clinical evidence of CNS pathology.

Clinical features

- The commonest cause is a URTI (e.g. the common cold or similar viral syndrome).
- About 4 per 100 incidence in children.
- Rare under 6 months and over 5 years.
- Commonest age range 9–20 months.
- Recurrent in up to 50% of cases.
- Consider meningitis and lumbar puncture after first convulsion if under 2 years or cause of fever not obvious.
- Epilepsy develops in about 2–3% of such children.

Management of the convulsion (if prolonged >10–15 minutes), also for status epilepticus

- Undress the child to singlet and underpants or light clothing but take care to prevent the child getting cold.
- Maintain the airway and prevent injury.
- Place patient chest down with head turned to one side.
- Oxygen 8 L/min by mask.
- Give midazolam or diazepam.
- Give midazolam by one of four routes:

  IV 0.15 mg/kg, IM 0.2 mg/kg, buccal

  2–5 mg/dose or (preferable) intranasal

  0.3 mg/kg undiluted (use 1 mL of drops from vial)

  Buccal and nasal routes slower response—IM may be most practical.
- Give diazepam by one of two routes:

  IV 0.2 mg/kg, undiluted or diluted (10 mg in 20 mL N saline)

  or

  rectally 0.5 mg/kg (dilute with saline or in pre-prepared syringe) up to 10 mg or with suppository or rectal gel.

Note: Although the IV route is preferred, the rectal route is ideal in a home or office situation; for

example, consider a 2-year-old child (weight 12 kg) with a persistent febrile convulsion. The dose of diazepam injectable is 0.5 mg/kg, so 6 mg (1.2 mL) of diazepam is diluted with isotonic saline (up to 10 mL of solution) and the nozzle of the syringe pressed gently but firmly into the anus and injected slowly. *Observe carefully for respiratory depression.*

rectal paracetamol 15 mg/kg statim

The anti-epileptics can be repeated in 5 minutes if fitting continues.

Check blood glucose: if <3.5 give a bolus dose of IV dextrose.

If still fitting, admit to an appropriate unit and rapidly induce 'coma' with thiopentone or propofol (preferred) followed by intubation.

Explain risk of later epilepsy is small: <3%.

Meningitis or encephalitis

Diagnosing meningitis and encephalitis requires a high level of clinical awareness and watchfulness for the infective problem that appears more serious than normal. Follow the appropriate guidelines: ABCDEFG (see earlier in this chapter). Refer also to CHAPTER 20 .

Bacterial meningitis[12]

Bacterial meningitis is basically also a childhood infection. Neonates and children aged 6–12 months are at the greatest risk. For clinical features see CHAPTER 20 . Meningococcal disease can take the form of either meningitis or septicaemia (meningococcaemia) or both. Most cases begin as septicaemia, usually via the nasopharynx.

Treatment for suspected meningitis (summary)[9]

First—oxygen and IV access (interosseous if difficult):

- take blood for culture (within 30 minutes of assessment)
- for child give bolus of 10–20 mL/kg of N saline
- admit to hospital for lumbar puncture when patient is resuscitated and stable and without signs of raised ICP
- dexamethasone 0.15 mg/kg up to 10 mg IV
- ceftriaxone 50 mg/kg up to 4 g, IV statim then daily for 3–5 days

  or

  cefotaxime 50 mg/kg up to 2 g, IV statim then 6 hourly for 3–5 days

Neonates to 3 months:

- ampicillin/amoxicillin (or benzylpenicillin) + cefotaxime

Meningococcaemia[12,13]

Note: Treatment is urgent once sepsis suspected (e.g. petechial or purpuric rash on trunk and limbs). It should be given before reaching hospital according to the following plans (see CHAPTER 20).

- Antibiotics:

  ceftriaxone 50 mg/kg IV or IM (max. 2 g) 12 hourly or cefotaxime 50 mg/kg statim then 6 hourly for 5 days

  or

  benzylpenicillin 60 mg/kg IV (max. 1.8 g), 4 hourly for 3–5 days. Give IM if IV access not possible

- Admit to hospital
- Continue antibiotics for 7–10 days
- Consider corticosteroids in severe cases

Treat contacts who:

- live in the household and <24 months
- have kissed patient in the previous 10 days
- have attended the same day-care centre

For prophylaxis—rifampicin dose:

adult—600 mg bd for 3 days

child <1 month—5 mg/kg

child >1 month—10 mg/kg

give bd for 2 days

or (if unsuitable)

ceftriaxone 1 g (child: 25 mg/kg up to 1 g) IM daily for 2 days

ciprofloxacin 500 mg (o) as single dose (child 125 mg)

give meningococcus type C vaccine

A simple plan for children (prehospital): benzylpenicillin[13]

- Infants <1 year: 300 mg IV or IM
- 1–9 years: 600 mg
- ≥10 years: 1200 mg

Other septicaemic shock

- Take blood for culture
- If unknown pathogen, give flucloxacillin IV plus cefotaxime IV

Practice point

In a very sick child with fever, give IV antibiotics while awaiting culture.

Acute epiglottitis

Acute epiglottitis due to *H. influenzae* is a life-threatening emergency in a child. A toxic febrile illness, with sudden onset of expiratory stridor, should alert one to this potentially fatal condition. A high index of suspicion of epiglottitis is always warranted in such presentations. This is uncommon since Hib immunisation.

Differential diagnosis

The main alternative diagnosis is viral laryngo-tracheobronchitis (croup). There are, however, significant clinical differences.

Epiglottitis is characterised by fever, a soft voice, lack of a harsh cough, a preference to sit quietly (rather than lie down) and especially by a soft stridor with a sonorous expiratory component.

Croup is distinguished by a harsh inspiratory stridor, a hoarse voice and brassy cough.

Other differential diagnoses include tonsillitis, infectious mononucleosis and bacterial tracheitis.

Diagnostic tip

Children with epiglottitis usually sit still with their mouth open, drooling saliva, and their eyes follow you around the room because limited head movement protects the compromised airway.

Practice tip

Do not examine the throat in the office

A swollen, cherry-red epiglottis recognised on examination of the nasopharynx confirms the diagnosis. However, the initial diagnosis should be made on the clinical history and appearance of the child.

Management

Admit the child to hospital for the following:

- Intubation: in theatre suck away profuse secretions and perform nasotracheal intubation
- Antibiotics:[13]

  cefotaxime 50 mg/kg up to 1 g IV 8 hourly for 5 days

  or

  ceftriaxone 50 mg/kg to max. 1 g/day IV daily for 5 days
- Consider single dose dexamethasone IV (specialist advice)

Croup[14]

Croup refers to a symptom complex with a harsh, brassy cough, usually with an inspiratory stridor and with or without respiratory difficulty.

Clinical features of viral laryngotracheitis:

- caused by parainfluenzal and other viruses, e.g. RSV
- most common type of childhood croup
- usually 6 months to 6 years—peak incidence 1–2 years
- prodrome of URTI or coryza for 2 days

- fever variable—rarely above 39°C
- loud barking cough—increased if upset
- usually self-limiting

Treatment[14,15,16]

The grading system for croup is outlined in TABLE 89.5 .

Table 89.5 Grading system for croup

Croup score	
Grade 1: mild	No or minimal stridor at rest with mild chest wall retractions and no distress, tachycardia
Grade 2: moderate	Stridor at rest with sternal and chest wall retractions, tachycardia
Grade 3: severe	Marked respiratory distress indicated by irritability, pallor, cyanosis, tachycardia and exhaustion (i.e. impending airway obstruction)

Management

If barking cough only and no clinical signs of obstruction, no specific treatment is indicated.

Mild to moderate croup

Admit to hospital, especially if moderate.

Single dose of oral steroids (e.g. dexamethasone 0.15–0.3 mg/kg/dose *or* prednisolone 1 mg/kg/dose *or* budesonide 2 mg by inhalation via nebuliser) if stridor and chest wall retraction develop.

A randomised controlled trial showed no additional benefit from mist (supersaturated air) therapy when coupled with oral corticosteroids (level II evidence).[16,17]

If persistent accessory muscle use, stridor at rest or distress, treat as for severe croup.

Severe croup

Severe croup (inspiratory stridor at rest, use of accessory muscles, patient restless and agitated). Adrenaline is first-line therapy:

- nurse in intensive care
- oxygen
- nebulised adrenaline 0.1% (1:1000) solution

0.5 mL/kg/dose (to max. 5 mL)

(beware of possible rebound effect after 2–3 hours—must be observed for minimum 4 hours)

Note: Can use 4 ampoules of 1:1000 solution in a nebuliser run with oxygen 8 L/min. Repeat the dose if no response at 30 minutes, do not dilute solution. Plus a corticosteroid:

- dexamethasone 0.2 mg/kg (max. 12 mg) (o) (or IM or IV (if vomiting) as a single dose)

  or

  budesonide 2 mg by inhalation via nebuliser

  or

  prednisolone 1 mg/kg (o) as a single dose

- have facilities for artificial airway
- may need endotracheal intubation (if going into respiratory failure) for 48 hours. Use a tube 0.5–1 mm smaller than normal for age.

There is no place for cough medicines or antibiotics. Steaming methods are discouraged.

Wheezing in an infant < 12 months

Probability diagnosis: bronchiolitis

Not to be missed

- Foreign body
- Anaphylaxis
- Heart failure
- Pneumonia
- Apnoea
- Smokers in the household (consider)
- Immune deficiency

Clinical signs to cause concern

- Grunting

- Apnoea (ex premature)
- Low oxygen saturation
- Reduced feeds and wet napkins

Bronchiolitis[18]

- An acute viral illness usually due to RSV
- The commonest acute LRTI in infants
- Usual age 2 weeks to 9 months (up to 12 months)
- Prodromal symptoms for 48 hours (e.g. coryza, irritating cough, then 3–5 days of more severe symptoms)
- Wheezy breathing—often distressed
- Signs of hypoxia (restlessness, agitation, drowsiness)
- Tachypnoea
- Hyperinflated chest: barrel-shaped, usually subcostal recession

Note: All that wheezes is not necessarily asthma.

Auscultation

- Widespread fine inspiratory crackles (not with asthma)
- Frequent expiratory wheezes

X-ray. Hyperinflation of lungs with depression of diaphragm—but chest X-ray should not be used for diagnosis or routinely performed.[19]

Virus identified by PCR on nasopharyngeal aspirate (not routine). Rapid RSV viral test available. Blood glucose should be assessed in all sick patients.

Management

Admission to hospital is usual, especially with increasing respiratory distress reflected by difficulty in feeding (particularly less than half normal over 24 hours) and >50 breaths/minute. Dehydration is a serious problem, especially with exhausted infants.

- Minimal handling/good nursing care
- Careful observation: colour, pulse, respiration, oxygen saturation (pulse oximetry)

- Oxygen (preferably warmed and humidified) for signs of hypoxia: by nasal prongs or even simple facemask to maintain SpO_2 above 90% (preferably ≥95%), O_2 not required if SpO_2 >95% in room air
- Fluids IV preferably or by nasogastric tube if unable to feed orally
- Antibiotics not indicated unless secondary bacterial infection. There is no evidence to support the routine use of nebulised adrenaline, bronchodilators or corticosteroids.[14]

Note: Increased tendency to asthma later.

Very severe asthma[20]

See CHAPTER 73 .

Observe closely according to the ABCD rule. Very severe asthma in children should be referred to an intensive care unit; stepwise action includes:

- inhaled salbutamol (4–8 puffs) from spacer, or
- continuous nebulised 0.5% salbutamol via mask[4]
- oxygen flow 6 L/min through the nebuliser (best option)
- IV infusion of

  salbutamol 5 mcg/kg/min

  hydrocortisone 4 mg/kg IV statim, then 6 hourly

Common mistakes

- Using assisted mechanical ventilation inappropriately (main indications are physical exhaustion and cardiopulmonary arrest—it can be dangerous in asthma)
- Not giving high-flow oxygen
- Giving excessive fluid
- Giving submaximal bronchodilator therapy

Acute heart failure

Clinical features (infants)

- Increasing fatigue, dyspnoea, orthopnoea, poor feeding

- Failure to thrive, poor exercise tolerance
- Tachycardia, cardiomegaly, gallop rhythm
- Fine basal crackles
- Hepatomegaly
- Usually no peripheral oedema or wheezing

Causes include:

- congenital (e.g. VSD)
- cardiomyopathy
- tachyarrhythmias
- postprocedural myocardial dysfunction
- rheumatic heart disease

Management

- Admit to hospital
- Pulse oximetry, ECG, CXR and echocardiography
- Diuretic (frusemide and spironolactone)
- ACE inhibitors—consider digoxin
- Oxygen to maintain P_aO_2 at 85–95%
- CPAP
- Treat complications

Breath-holding attacks

This is a dramatic emergency. There are two types: one is related to a tantrum (description follows) and the other is a simple faint.

Clinical features

- Age group—usually 6 months to 6 years (peak 2–3 years)
- Precipitating event (minor emotional or physical)

- Children emit a long loud cry, then hold their breath
- They become pale and then blue
- If severe, may result in unconsciousness or even a brief tonic–clonic fit
- Lasts 10–60 seconds

Management

- Reassure the parents that attacks are self-limiting, not harmful and not associated with epilepsy or intellectual disability.
- Advise parents to maintain discipline and to resist spoiling the child.
- Try to avoid incidents known to frustrate the child or to precipitate a tantrum.

Note: Important childhood emergency drugs with dosages are presented in TABLE 89.6 .

Table 89.6 Important childhood emergency drugs[21]

Drug	Route	Dose	Notes
Adrenaline 1:10 000 Adrenaline 1:1000	IV IM	0.1 mL/kg/dose 0.01 mL/kg/dose	Anaphylaxis, asystole (repeat every 5 minutes until response)
Adrenaline 1:1000	Nebuliser	0.5 mL/kg/dose (max. 5 mL)	LTB* (patient must be admitted)
Aminophylline	IV slowly	5 mg/kg loading	Moderate to severe asthma
Atropine	IV	0.02 mg/kg	Bradycardia producing shock
Benztropine	IV or IM	2 mg/2 mL	Dystonic reactions
Calcium gluconate 10%	IV	0.5 mL/kg (max. 20 mL)	Hyperkalaemia, hypocalcaemia
Dextrose 50%	IV	1 mL/kg	Hypoglycaemia
Diazepam	IV PR	0.2 mg/kg	Seizures
Fentanyl citrate	IV	1.2 mcg/kg (intranasal effective)	Pain control
Glucagon	IV or IM	0.1 mg/kg (max.	Hypoglycaemia

		1 mg)	
Hydrocortisone	IV	4 mg/kg	Anaphylaxis, asthma
Midazolam	IV or IM, intranasal	0.15–0.2 mg/kg/dose	Seizures
Morphine	IV or IM	0.1–0.2 mg/kg	Sedation, pain relief
Naloxone	IV or IM	0.01 mg/kg (max. 2 mg)	Opioid overdose
Paracetamol	O	15–20 mg/kg loading	Fever
Paraldehyde	PR	0.3 mL/kg (dilute 1:2 in peanut oil)	Seizures
Salbutamol	Nebuliser	0.3 mL/kg	Asthma
	Spacer	<6 yrs 6 puffs >6 yrs 12 puffs	
	IV	5 mcg/kg	
Sodium bicarbonate 8.4%	IV	2 mL/kg	Titrate against blood gases
Soluble insulin	IV infusion	0.1 U/kg/h	Only if glucose >14 mmol/L

*LTB = laryngotracheal bronchitis (croup)

Note: Volume resuscitation: IV fluid bolus 20 mL/kg statim of crystalloid (e.g. N saline)

Source: Pitt[21]

Aspirated foreign body

Parents or guardians may not be able to give a history of inhalation. One in eight episodes is not witnessed.

Symptoms

- Choking or coughing episodes while eating nuts or similar food or while sucking a small object (e.g. plastic toy)
- Persistent coughing and wheezing (‘all that wheezes is not asthma’)
- Sudden onset of first wheezing episode in a toddler with no past history of allergy, especially after a choking bout

Signs

- Reduced or absent breath sounds over whole or part of a lung
- Wheeze

Investigations

Chest X-ray (full inspiration and full expiration) to exclude an area of collapse or obstructive hyperinflation.

Note: Normal X-rays do not absolutely exclude an FB.

Management

First aid:

- most cough out the FB, so encourage coughing
- a finger sweep helps, as do back slaps, lateral chest compression and the Heimlich manoeuvre if >8 years (take care with viscera). A good rule is the rule of 5s—5 breaths, 5 back blows, 5 chest thrusts, 5 abdominal thrusts (older child). If unresponsive, start CPR and seek help

If complete obstruction—attempt removal of the FB with forceps. If unsuccessful, perform a tracheostomy or cricothyroidotomy.

Note: Once an FB has passed through the larynx it is very rare for there to be an immediate threat to life, so referral is usually quite safe.

Note: Do not instrument the airways if the child is coping.

Bronchoscopy

Bronchoscopy is necessary in almost every child where there is a strong suggestion of an inhaled FB. It is difficult and requires an expert with appropriate facilities.

Prevention

- No child <15 months should have popcorn, hard lollies, raw carrots and apples
- Children <4 years—no peanuts
- Children <3 years—no toys with small parts

Anaphylaxis[5]

The management of airway obstruction and hypotension can be summarised as:

- oxygen 6–8 L/min by mask
- adrenaline 10 mcg/kg of 1:1000 IM; 0.05–0.1 ml if <1 year

  (repeat adrenaline every 5 minutes as necessary)

  if no improvement set up a continuous infusion

  (1 mg adrenaline in 1000 mL N saline)

  avoid SC use
- autoinjector, e.g. Epipen

  <10 kg: not recommended

  10–20 kg: 150 mcg

  >20 kg: 300 mcg
- nebulised salbutamol for bronchospasm
- admit to hospital (observe at least 4 and up to 12 hours)
- colloid or crystalloid solution IV: give repeated boluses 10–20 mL/kg
- only if necessary: corticosteroid 4 mg/kg IV

If persistent upper airways obstruction—try nebulised 1% adrenaline (max. 4 mL); intubation may be necessary. Admit to hospital and observe for at least 12 hours.

Note: Anaphylaxis can be biphasic; refer to ASCIA prophylaxis action plan, www.allergy.org.au/.

Status epilepticus/prolonged seizure[22]

Ensure adequate oxygenation: attend to airway (e.g. Guedel tube): give oxygen. Check blood glucose.

Anti-epileptic options include:[5]

midazolam 0.1–0.2 mg/kg IV *or* 0.2 mg/kg IM *or*

0.3 mg/kg intranasal

diazepam 0.2 mg/kg IV *or* 0.5 mg/kg per rectum

clonazepam 0.25 mg (<1 year), 0.5 mg (1–5 years), 1 mg (>5 years)

phenytoin 15 mg/kg slowly over 20–30 minutes

thiopentone: titrate the dose (usually 2–5 mg/kg)

If refractory (up to 60 minutes), use full anaesthetic with intubation.

Consider hyponatraemia as the cause of convulsions with meningitis. Perform an ECG (look for prolonged QT interval). Consider IV ceftriaxone if meningitis suspected.

Near drowning

The differences between salt water and freshwater drowning are usually not clinically significant. If global hypoxic cerebral ischaemia and pulmonary aspiration, treat as follows:[6]

- adequate high-flow oxygenation and ventilation
- CPR—start rescue breaths ASAP
- decompress stomach with nasogastric tube
- support circulation with IV infusion of colloid or IV saline solution and dopamine (dobutamine) 5–20 mcg/kg per minute
- attend to hypothermia
- mannitol 0.25–0.5 g/kg IV if cerebral oedema
- correct electrolyte disturbances (e.g. hypokalaemia)
- consider intubation, especially SpO_2<95%

Intraosseous infusion[3]

In an emergency situation where intravenous access in a collapsed person (especially children) is difficult, parenteral fluid can be infused into the bone marrow (an intravascular space). Intraosseous infusion is preferred to an intravenous cutdown in children under 5 years. It is useful to practise the technique on a chicken bone.

Site of infusion

- Adults and children over 5: distal end of tibia
- Children under 5: proximal end of tibia

- The distal femur: 2–3 cm above condyles in midline is an alternative

Avoid growth plates, midshaft and the sternum.

Method for proximal tibia

Note: Strict asepsis is essential (skin preparation and sterile gloves).

- Inject local anaesthetic (if necessary).
- Choose 16 gauge intraosseous needle (Dieckmann modification, e.g. Cook critical needle 15.5 gauge) or a 16–18 gauge lumbar puncture needle (less expensive).
- Hold it at right angles to the skin over the anteromedial surface of the proximal tibia about 2 cm below the tibial tuberosity (see FIG. 89.1). Point the needle slightly downwards, away from the joint space (<90° to long axis).

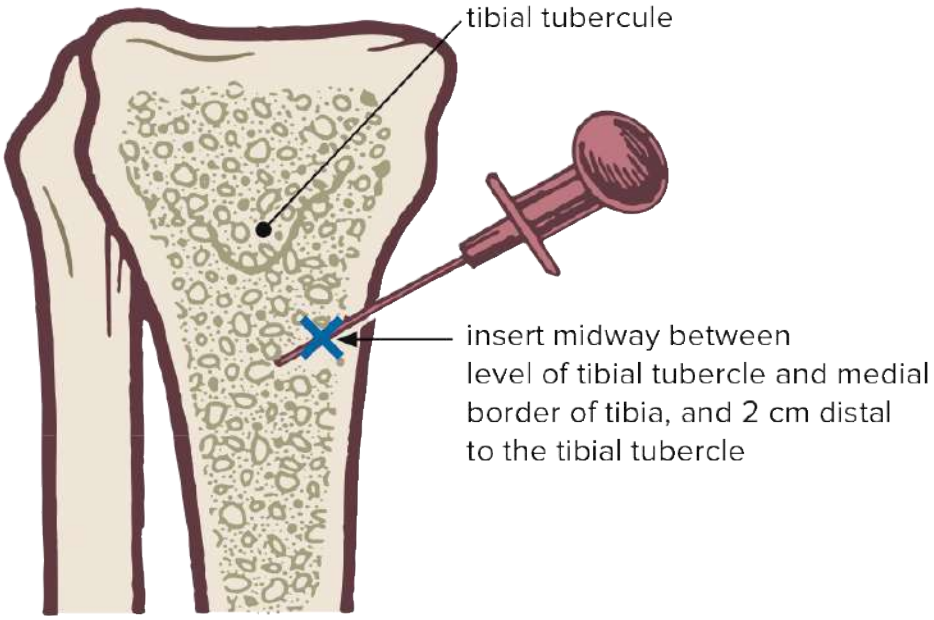

FIGURE 89.1 Intraosseous infusion

- Carefully twist the needle with downward pressure to penetrate the bone cortex; it enters bone marrow with a sensation of giving way.
- Remove the trocar, aspirate a small amount of marrow to ensure its position. Flush with saline to confirm correct position.
- Hold the needle in place with a small plaster of Paris splint.
- Fluid, including blood, can be infused with a normal IV infusion—rapidly or slowly. Watch

for any fluid extravasation.

- The infusion rate can be markedly increased by using a pressure bag at 300 mmHg pressure.

Note: Any fluid or drug that can be given IV can be administered through the interosseous route.

Serious gastroenterological conditions

GIT conditions that cause vomiting require careful evaluation because of potentially fatal outcomes.

Vomiting

Red flags

- Pale, very sick looking child
- Vomiting without diarrhoea
- Blood in stool
- Severe abdominal pain or abdominal signs
- Persistent diarrhoea
- Bilious (green) vomit

Treatment

Ondansetron (oral wafer):

<6 months or <8 kg—not recommended

8–15 kg—2 mg

>30 kg—8 mg

Gastroenteritis[23]

This condition should not be treated lightly. Assessment of general signs such as arousal, presence of pallor, degree of weight loss, fluids in and fluids out is important (see CHAPTER 34). If concerned or in doubt, arrange hospitalisation. The social situation needs to be taken into account.

Intussusception

It is important to recognise this condition as about 50% of infants with intussusception are not diagnosed on initial presentation.[2] Characteristic features include sudden-onset pallor that persists, episodic crying and vomiting. Rectal bleeding and an abdominal mass (see

CHAPTER 34) are present in only 40% of cases.

Pyloric stenosis

Pyloric stenosis, which appears from 2 weeks to 3 months of age, should be suspected with projectile vomiting, acute weight loss and alkalosis. It must not be confused with projectile vomiting from overfeeding. If in doubt, expert ultrasound examination of the pylorus will assist diagnosis (refer to CHAPTER 49).

Red flag pointers for GIT conditions

- Bile-stained vomitus: indicates urgent referral to consider possible intestinal malrotation and mid-gut volvulus
- Failure to pass meconium beyond 24 hours: may represent congenital intestinal atresia and stenosis, meconium ileus or Hirschsprung disorder

Sudden infant death syndrome (SIDS)

- SIDS is the major cause of death between 1 and 12 months of age (peak incidence 4 months).
- The incidence is around 1 per 500 live births but improving.
- The causes are unknown, but risk factors have been identified. Overwhelming infection is a possibility.
- No investigations have identified susceptible infants.
- Although SIDS can recur in a family, the risk is small.
- There is an association with low socioeconomic status.

Risk factors

- Prone sleeping position
- Smothered airways (debatable)
- Artificial feeding (possible)
- Passive smoking (before or after birth)
- Hyperthermia or excess warmth

- Extreme prematurity <32 weeks
- Parental narcotic/cocaine abuse
- Intercurrent viral infections

Preventive advice

After baby is born:

- Place baby to sleep on its back (preferable) with no pillow (unless special reason for placing it on its stomach, e.g. gastro-oesophageal reflux).
- Ensure the head is uncovered.
- Encourage breastfeeding.
- Ensure the baby is not exposed to cigarette smoking (before and after birth).
- Ensure the baby does not get overheated (sweating around the head and neck indicates the baby is too hot).
- Ensure bed coverings are no more than adults require.
- Advise nothing else in cot (e.g. soft toys).

Reactions of bereaved parents

- May be hostility to GP, especially if recent examination
- May ‘hear’ the baby cry
- Distressing dreams
- Guilt/self-blame, especially mother
- Psychiatric morbidity
- Other stages of bereavement: denial, anger, bargaining, depression, acceptance

Management of SIDS

- Allow the parents to see or hold baby.
- Give explanations, including reasons for coroner’s involvement.
- Provide bereavement counselling.
- Early contact with counsellors and continuing support.

- Contact the SIDS support group.
- Revisit the home.
- Provide hypnotics (limited).
- Offer advice on lactation suppression (see CHAPTER 101).
- Remember: siblings can also experience grief reactions.
- The police and coroner must be notified—the law requires an autopsy.

Apparent life-threatening episode

ALTE, or ‘near-miss SIDS’, is defined as a ‘frightening’ encounter of apnoea, colour change or choking. At least 10% will have another episode. Management includes admission to hospital for investigation and monitoring.

Guidelines for home apnoea monitoring

- ALTE
- Subsequent siblings of SIDS victims
- Twin of SIDS victim
- Extremely premature infants

Obstructive sleep apnoea syndrome

A childhood disorder of breathing during sleep characterised by noisy, disturbed breathing and periods of apnoea. Leads to daytime sleepiness, disturbed behaviour and cognitive dysfunction. Requires referral.

Resources

ViCTOR: Victorian Children’s Tool for Observation and Response: https://www.victor.org.au/, including Back to Basics videos, available from: https://www.victor.org.au/implementing-victor/victor-back-to-basics/, accessed 14 May 2018.

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90 Adolescent health

The feeling of apartness from others comes to most with puberty, but it is not always developed to such a degree as to make the difference between the individual and his fellows noticeable to the individual.

W SOMERSET MAUGHAM (1874–1965), *OF HUMAN BONDAGE*

Adolescence is the transitional period of development between relatively dependent childhood and relatively independent adulthood. The time of onset and duration varies from one person to another but it is generally considered to occur between the ages of 10 and 19 years.[1] It is a critical period of transition in the human lifespan, marked by rapid growth and physical and mental changes second only to infancy.

While biological changes drive this transition, the duration and characteristics of adolescence can vary depending on cultural and socioeconomic settings. Adolescence has also altered over the past century, occurring earlier and being influenced by societal changes such as later marriage, increased urbanisation, global communication, information technology, social networking and changing sexual attitudes and behaviours.[1,2]

Adolescent patients require special understanding and caring from their family doctor. They can present very challenging and sometimes confronting issues. A profound increase in mental health issues (particularly mood disorders)[3] in adolescents has exacerbated the frequency of challenging adolescent consultations in general practice. Another common difficulty is establishing rapport and trust with adolescents, who may be trying to break away from the adult world to establish their own sense of adult self, so it can be vitally important to address confidentiality issues. Actively raising and clarifying confidentiality parameters and doing so at the beginning of the consultation can greatly assist the interaction with an adolescent patient.

In recent times, reference is made to the young person in the context of health policies. Young people are defined as those between the ages of 12 and 24 years and youths as those between 15 and 24 years.[2] Some 18% of the population are young people, and they tend to have a low rate of GP visits; if they do visit, it is usually for physical reasons, despite the fact that the largest health burden for adolescents is actually mental health issues.

Adolescent development periods[4]

Early adolescence (10–14 years): *'Am I normal?'*

This stage is dominated by adjustment to physical and psychosexual changes and by the beginnings of psychological independence from parents. Girls generally advance through this stage more rapidly than boys.

Middle adolescence (14–17 years): *'Who am I?'*

Middle adolescence is a time when boys have caught up physically and psychologically with girls, so that peer group sexual attractions and relationships are common preoccupations at this stage. It is a phase of peer group alliances, clothes, music, jargon and food and drink. The average age for first sexual intercourse for both sexes is 16 years. It is a stage where intellectual knowledge and cognitive processes become quite sophisticated. Experimentation and risk-taking behaviour is a feature, and confidentiality issues are often important.

Late adolescence (17–19 years): *'Where am I going?'*

This is the stage of reaching maturity and leads to more self-confidence with relationships and successful rapport with parents. Thought is more abstract and reality-based. Relationships may become more intimate, moral value systems are more established, and vocational and educational goals become more central.

Sexual development

Puberty occurs with the maturation of the hypothalamic-pituitary hormone axis. The Tanner staging system[5] that defines physical measurements of development based on external primary and secondary sex characteristics is a useful guide (see: https://wikipedia.org/wiki/Tanner_scale).

The onset of puberty is 9–14 years: in boys, the average age is 11–12 years (mean 11 years); in girls, 8–13 years (mean 11 years) with the mean age of menarche 12.5 years; menstrual disorders are presented in CHAPTER 94 .

Delayed puberty[6]

This is the absence of pubertal development (testicular enlargement in boys or breast development in girls) in:

- girls >13 years
- boys >14 years

Significant causes include:

- constitutional delay of growth and puberty (CDGP) is usually familial and the commonest

cause. It is associated with delayed growth and bone age

- chronic illness (e.g. severe asthma, cystic fibrosis, kidney failure)
- poor nutrition and exercise
- anorexia nervosa

Other less common causes include chromosomal abnormalities (e.g. Turner syndrome) and gonadal hormone deficiency (e.g. Kallmann syndrome, post-chemotherapy). Consider referral to a paediatric endocrinologist for investigation and management, which can include testosterone for boys and oestrogen for girls.

Precocious puberty[7]

Puberty is trending earlier than in previous generations, known as the 'secular trend', and is presumed to be due to improved nutrition and absence of chronic disease. True precocious puberty is considered to be:

- girls <8 years
- boys <9 years

Growth spurts will be earlier and bone growth will be advanced, though final adult height may be reduced from what would otherwise be expected due to premature fusion of the long bones (height issues may determine the need for treatment). True precocious puberty is 20 times more common in girls than boys. It is usually idiopathic, though pituitary adenomas are a rare cause and more common as a cause in boys. Treatments are often not required, but may include gonadotrophin releasing hormone (GnRH) analogues and cyproterone.

A child with proven central precocious puberty should be investigated with MRI brain imaging.

Premature thelarche[7]

This is breast development in girls under 8 years old without other pubertal signs. It usually occurs in girls under 3 years and spontaneous regression can be expected. It may present at birth. Observation with reassurance for this benign condition is appropriate.

Premature adrenarche[7]

This is the isolated appearance of pubic hair in boys or girls aged 6–9 years old. There are no other features of virilisation or oestrogenisation, and the hair remains until other signs of puberty appear at the normal time. It is usually a normal variant (no specific treatment necessary) but may rarely signify atypical congenital adrenal hyperplasia. Referral is indicated if any concerns.

Pubertal gynaecomastia[7]

This is a normal variant of male puberty, with a prevalence of about 40–50% and is usually a transient phenomenon, subsiding in 2–3 years.

There is a palpable and/or visible disc of breast tissue, which in boys may feel quite firm and needs to be distinguished from adipose tissue in overweight boys. There is no hormonal or medical treatment and surgical removal is rarely necessary. Advice regarding clothes (e.g. loose T-shirts for social activities or swimming) or explanatory letters to school can be helpful.

Major areas of health problems

- Psychological health problems with high rates of first onset in adolescence include depression, self-harm, anxiety disorders, behavioural disorders (e.g. ADHD, conduct disorders) and eating disorders. More than 80% of mental illness starts under the age of 25
- Other areas of concern: substance abuse, schizophrenia and drug-related psychosis
- Eating disorders, including obesity, fast food, bulimia nervosa and anorexia nervosa (refer to CHAPTER 67)
- Injuries, including sporting injuries, motor vehicle accidents and interpersonal violence
- Risk-taking behaviour, including drug abuse
- Sexual adjustment, including unsafe sexual practices and teenage pregnancy
- Chronic illness and disability, including survivors of inherited disorders
- Asthma, which is a leading cause of hospital admissions for both sexes in the 10–14 years age group
- Overexposure to sunlight
- Acne, which can be very distressing for adolescents. Severe acne can increase the risk of suicide[8]

Overweight and obese children

Approximately a quarter of Australian children are overweight or obese.[9] A national nutrition survey showed that children eat too much saturated fat and sugar and regularly exceed the recommended maximum times spent watching screens.[10] Obesity in childhood increases the risk of adult obesity. Nutritional obesity is associated with growth acceleration and advancement of bone age, while endocrine obesity has the opposite effect. Refer to CHAPTER 67 .

Myths about the adolescent patient

The following are myths that some practitioners feel apply to the adolescent:

- different from adults in needs
- ‘superficial’ thinkers
- represent a ‘quick’ consultation
- shun personal questions
- resent invasion of space

It is important to treat adolescents as normal human beings.

Hallmarks of the adolescent

The main hallmarks of the adolescent[2] are:

- self-consciousness
- self-awareness
- self-centredness
- lack of confidence

These basic features lead to anxieties about the body, and so many adolescents focus on their skin, body shape, weight and hair. Concerns about acne, curly hair, round shoulders and obesity are very common.

There are usually special concerns about boy–girl and same sex relationships, and there may be guilt about sexual matters. Many adolescents therefore feel a lack of self-worth or have a poor body image. They are very private people, and this must be respected. While there are concerns about their identity, parental conflict, school, their peers and the world around them, there is also an innate separation anxiety.

Age and informed consent

As a rule, parents and physicians should not exclude children and adolescents from decision making without persuasive reasons. Across Australia, common law states that 18 years of age is the age of consent. It also states that consent *may* be given under 18 years, but that the nature of the medical intervention and the ability of the young person to fully understand need to be taken into consideration. A concept that can be applied to this is the Gillick test, which prescribes that the parental right to determine their child’s treatment terminates once an adolescent under the age of 16 is capable of fully understanding the medical treatment proposed. Two questions that GPs may be confronted with are:

- When can a young person under 18 years of age consent to medical treatment?
- When can parents or guardians consent to medical treatment for young people under 18 years of age?

When considering these questions, a competency assessment of the adolescent should be undertaken that includes considering:

- age
- level of independence
- level of schooling
- maturity
- ability to express own wishes

In NSW and South Australia, additional laws allow for those aged 14 years (NSW) and 16 years (SA) and over to consent to their own treatment. GPs in these states should familiarise themselves with these laws in situations where consent is problematic.

Guidelines according to age

≥18—adulthood

≥16—consenting age

14–16—ideally involve parents, but decisions according to ‘Gillick competence’

<14—as above.

What do adolescents value and what are they concerned about?

A large ongoing survey by Mission Australia[11] on 15–19-year-olds shows that these adolescents most value:

- friendships
- family relationships
- school and study satisfaction

- physical and mental health

The top issues of personal concern include:

- coping with stress (increasing from 19% to 38% from 2009 to 2013)
- school or study problems (37%)
- body image (31%)

Some 20% were also extremely or very concerned about family conflict.

The internet is the number one source of information for young people, 20% of whom spend >20 hours a week on social network sites.

Access to general practice

There can be many barriers to adolescents accessing general practice. This is especially so for those marginalised by factors such as homelessness or risk of homelessness, involvement in the juvenile justice system, disability, same sex attraction, or being from an Indigenous, non-English-speaking or refugee background. Barriers include:[12]

- knowledge of services
- concerns about confidentiality
- availability of services, particularly in regional, rural and remote areas
- cost
- poor previous experiences
- location of services
- complicated systems and referral processes

Because of these significant barriers, improving adolescents' access to health services in general, and specifically to general practice, is essential. While youth-specific services such as the national headspace initiative (see: www.headspace.org.au) have gained momentum in recent years, general practice remains the cornerstone of primary health care for young people.[11] The characteristics of a youth-friendly practice have been defined[12] as having:

- accessibility to young people (e.g. visual appearance, online services, registering for Medicare)
- youth participation in the practice (e.g. involving adolescents in policy development, employing adolescent/young person on staff)

- collaboration and partnerships (e.g. with housing or mental health services)
- professional development in youth service provision
- evaluation by the practice of services provided to young people
- evidence-based approaches to the health of adolescents
- sustainability of these approaches

Teenagers want to be asked about sexual health, mental health and substance use, even if they present to their GP for other reasons, according to Tasmanian research. They also want non-judgmental doctors who 'avoid medical jargon, listen, assure them about confidentiality and respect their views and choices'.[13]

The clinical approach

Confidentiality

Confidentiality is a major issue when seeing adolescent patients, especially those who are new to the practice or who have had negative experiences with authority previously (e.g. involvement in community services or the juvenile justice system) or in cases where other members of a family (particularly the parents) are also your patients. The whole concept of adolescents struggling to establish an identity separate from their carers is tied up in the burgeoning relationship with the GP, and the rules of medical confidentiality, well known to most adults, are often a mystery to young people.

Some tips on reassuring adolescents on confidentiality issues[12,14] include:

- having a practice confidentiality policy visible for all patients to see (e.g. online, in waiting room, in practice information leaflets/orientation pack)
- talking about or defining what medical confidentiality means (and the boundaries or exceptions to this—see TABLE 90.1) up-front, i.e. before the first consult starts, especially if you suspect the patient may be worried about such issues
- reinforcing these principles when sensitive issues arise through the evolving GP–patient relationship (e.g. contraceptive or other sexual health issues, mental health issues)

Table 90.1 Three main exceptions to confidentiality[4]

1. If the young person discloses suicidal intent or is threatening significant self-harming behaviour
2. If someone else is threatening or harming them (e.g. physical, sexual or

emotional abuse)

3. If the young person is at risk of physically harming someone else (e.g. assault, abuse)

Note: Other exceptions exist (e.g. notification of infectious diseases) but these can be explained if and when necessary. The above are recommended exceptions to explain up-front.

Cost

One of the major barriers to adolescents accessing primary care is cost. They are often unaware of how Medicare operates and how to access a card. Adolescents can acquire their own Medicare card from the age of 15. Having application forms available in the surgery (you need photo identification) can help. Young people should be made aware that they do not need to have the card on them to see the doctor. Medicare doesn't reveal to anyone (including parents) who has used the card, provided they are over the age of 14.

Who is in the room and who talks?

An adolescent may present alone or accompanied by others, including, often, a parent. The parent may take a dominating role, doing the talking for the adolescent. Teasing out the two roles (that of the adolescent and that of the parent) as two separate entities can be a challenge, and needs to be done sensitively. The objective of the GP should be to establish rapport and a patient–doctor relationship with the adolescent him or herself, while not threatening the role of the parent.

Most parents will be aware of and sensitive to this, and may even encourage the adolescent to talk for themselves or offer to leave the consulting room. An offer like this should be taken up, with a view to bringing the parent back into the room after a private conversation with the adolescent. It should be made clear exactly what the adolescent will and will not allow to be revealed to the parent (once he or she returns) during the private conversation.

Asking a parent to leave (if no offer is made) may surprise an anxious or overbearing parent, and should be negotiated carefully. Normalising this early in the consultation, as your usual approach, can help.[4] 'Normally when seeing a young patient like your son/daughter, I like to see them by themselves at some stage in the consultation and then get the parent back in afterwards. Is that okay by you?'

If a parent does not want to leave the room, or continues to talk for or over the top of the adolescent, a more forthright approach may be warranted, though this is unusual. It will be difficult to foster a patient–doctor relationship with the adolescent in such circumstances.

Communication and rapport with adolescents

> The single most crucial role of a GP caring for an adolescent, regardless of their presenting complaint, is to foster and develop a relationship of trust.[15]

Tips for fostering engagement with adolescents[3] include:

- Treat the young person as responsible and capable of contributing to decision making.
- Take a curious, non-intrusive and respectful stance.
- Be open and honest as much as possible.
- Clarify what the young person wants from you.
- Establish agreed goals or explain clearly why you cannot help.
- Be honestly interested in what the young person has to say.
- Be yourself, don't fake it.
- Use metaphor and humour (where appropriate) to build rapport.
- Use language that is clear and easily understood and avoid jargon; overuse of slang is probably worse than not using it at all.
- Warn the young person if you are going to ask questions about topics that may be difficult (e.g. sexual matters).
- Avoid getting into a controlling, authoritarian position.
- Remember that engagement may wax and wane.

HEEADSSS[4]

HEEADSSS is a guide (not a script or tick list) that can be useful for a GP when conducting a psychosocial assessment of an adolescent. It is a framework designed to progress from the (usually) less sensitive to more sensitive areas of potential concern in an adolescent. It does not have to be covered all in one consultation, and the areas that are covered may be tailored to the individual patient and his or her circumstances. A shortcut on clinical software may prompt the GP to use HEEADSSS. It has recently been expanded to reflect the major causes of adolescent morbidity and mortality.

H = **H**ome
E = **E**ducation and **E**mployment
E = **E**ating and **E**xercise
A = **A**ctivities and peer relationships
D = **D**rug use, cigarettes and alcohol
S = **S**exuality
S = **S**uicide and depression (including mood and possible psychiatric symptoms)
S = **S**afety

Physical examination

Adolescents are often very sensitive about their bodies and physical appearance, especially when going through puberty. When physically examining adolescents:

- carefully explain what you are going to do before you do it
- obtain consent for examining adolescents
- consider offering a chaperone for examining breasts or genitals, especially a male doctor and female adolescent patient
- gender and cultural differences and norms should be considered prior to physical examination

Note: The new cervical screening test is not required until the age of 25.

Risk behaviours

Risk behaviours are common in adolescents and should be actively but sensitively screened for. The HEEADSSS model can be employed to do this screening. If there are risk behaviours:

- Assess how high the risk is (e.g. multiple risk behaviours? is it escalating? aware of the risk and potential consequences?).
- What are possible protective factors (e.g. support from family, school, positive peer relationships or culture)?
- Focus on strengths and abilities the adolescent may have.
- Build motivation and reinforce capacity to change.
- Actively promote behaviour change by using guided decision making.
- Provide appropriate information and education on the risk behaviour and potential consequences.
- If high-risk behaviours are identified, refer to appropriate services (e.g. drug and alcohol, psychologists) while the GP maintains a case management role.

Developing a management plan[4]

Informing an adolescent of your assessment and actively involving him or her in the development of your management plan will help improve trust and compliance. It is also useful to:

- identify risk behaviours—provide relevant information and education

- set realistic treatment goals appropriate to your adolescent patient
- where appropriate, discuss how much he or she wants parents to be informed and involved
- guide parents in how to best support their adolescent child and best respond to risk-taking behaviours

Mental health in adolescents[4]

- Up to 25% of adolescents suffer from a mental health and/or substance abuse problem.
- Mental health in adolescents is worsening.
- Many chronic mental health issues have their onset in adolescence.
- Anxiety and depression are the leading mental health problems in adolescents (17% of the male disease burden and 32% of the female).
- Behavioural disorders are also common (8% of 12–17-year-olds have ADHD, and 3% have conduct disorders) as are eating disorders.
- There is a marked increase in risk factors and risk-taking behaviours for mental health in adolescence (e.g. substance abuse, peer conflicts).
- Mental health issues in adolescents can present differently from in adults, with mood swings, poor school performance or attendance, irritability, anger, substance abuse, somatic complaints, risk-taking behaviours or conflict with peers or family being more common.
- Adolescents are generally ill informed about mental health (<25% seek help).

Depression in adolescents[3,4]

(See CHAPTER 10 for a discussion on depression.)

- Up to 24% of adolescents will have suffered an episode of major depression by the age of 18.
- Depression can be more masked by the patient and harder to detect in adolescents, so requires more active screening.
- Psychosocial development may be compromised by depression in adolescence.
- Effective engagement and developing a trusting therapeutic alliance are critical in managing depressed adolescents.
- Using the HEEADSSS tool can help in assessment.
- Comorbidity with other mental health issues (anxiety disorders, behavioural disorders, eating disorders, substance abuse) is common.

- It helps to encourage protective factors such as positive peer relationships, support from schools or families, regular sleep patterns and pleasurable activity scheduling.
- Counselling and psychological treatments are first line in the treatment of adolescents with depression. These interventions for all grades include general support and education, family therapy, interpersonal psychotherapy and cognitive behavioural therapy.
- Using mental health Medicare item numbers may help improve access to services.

Use of antidepressants in adolescents

In major depression in adolescents, treatment with fluoxetine can be considered. There appears to be an age-related mechanism linking SSRI treatment with an increased risk of suicidal thinking, with adolescents being at greatest increased risk. Because of this, if pharmacological therapy is warranted, it should be prescribed by a practitioner who is very familiar with the range of adverse effects and able to monitor the young person appropriately. Close monitoring for suicidality is especially important in the first 4 weeks. If there are concerns regarding severe symptoms or risk of suicide, referral to a psychiatrist who treats adolescents is recommended.

Suicidality in adolescents[4]

- Hospital rates for suicide attempts are 3 times higher in females, but suicide deaths are 3 times higher in males (males use more lethal means).
- More than half of all adolescents who try to kill themselves will have visited a GP within the previous month (i.e. GPs can play a very important preventive role, see TABLE 90.2).

Table 90.2 Warning signs of potential suicide in adolescents[16]

Change in behaviour (e.g. risk taking, isolation, giving away possessions, losing interest in activities)
Change in mood (e.g. hopelessness)
Change in thinking (e.g. guilt, bizarre thoughts)
Preoccupation with death
Talk of suicide
Perceived intolerable loss or stress
Apparent resolution (e.g. sudden calmness/happiness after other warning signs)

Risk factors

- Previous suicide attempt/self-harm
- History of previous attempts in family/friends
- Concrete suicide plan
- Underlying mental disorders—e.g. depression, anxiety, substance abuse
- Comorbid conditions—e.g. eating disorder, conduct disorder
- Recent stressful life events (e.g. relationship breakdown, humiliation, school problem, conflict with peers)
- Ongoing family problems
- Victim of bullying
- Lesbian, gay, bisexual, transexual (LGBT) orientation
- Cultural conflicts or concerns

Management

- Fully explore the adolescent's thoughts, plans and actions. Assess his or her level of risk.
- Do not agree to secrecy.
- Confidentiality is over-ridden if there is serious or imminent danger of suicide. Gently explain this to the adolescent while trying to maintain and protect a therapeutic alliance.
- Contact and mobilise family and social supports.
- Get help from peers or other health providers where possible. Mental health services such as crisis teams may need to be involved.
- If possible, remove or limit access to means of self-harm (e.g. medications).
- Consider (in conjunction with other therapeutic approaches) a 'no-suicide contract'. Usually verbal, this is an agreement for the adolescent to commit to you that he or she will not act on any suicidal thoughts until you next see them. This should be done for only a short (<1 week) period.

Anxiety disorders in adolescents[17]

In a similar fashion to depression, anxiety disorders—especially generalised anxiety disorder and OCD—in adolescents are common, hard to detect and heavily reliant on the GP having a trusting relationship with the adolescent; they also have psychological therapies as the first-line

treatment. See CHAPTER 70 for further discussion on anxiety disorders.

Eating disorders

Anorexia nervosa, bulimia nervosa and binge eating arise usually in the early to mid-teens (see CHAPTER 67). There are many sub-syndromal variations that threaten to develop into a serious state but these can settle, especially with early identification and counselling.

Practice tips in handling adolescents

- Confidentiality is of great importance to adolescents.
- Barriers to adolescents accessing general practice should be removed wherever possible.
- Seeing adolescents by themselves at some stage in the consultation is desirable.
- Developing a relationship of trust is critical when dealing with adolescents in general practice.
- HEEADSSS is a useful tool for conducting a psychosocial assessment.
- Mental health problems in adolescents are common, often hard to detect, and are heavily reliant on the GP having a trusting relationship with the adolescent.
- Adolescents need support and understanding.

Disruptive behaviour disorders[17]

This describes a group of mental health disorders that include conduct disorder and oppositional defiant disorder. They may be comorbid with other disorders such as ADHD, and require careful assessment and treatment.

Treatment is basically non-pharmacological, while specialist referral is advisable if pharmacological treatment is contemplated.

Adolescent violence in the home

Adolescent violence towards parents is defined as ‘any act of a child that creates fear in, and is intended to hurt parents’. It usually refers to behaviours by adolescents between 12 and 18 years of age.

In 2012, Victoria Police (2012) reported a 40% plus increase over the previous six years in family violence incident reports where the perpetrator was under the age of 18. This has been repeated in other states.[18]

Types of adolescent violence include physical, psychological/emotional, financial and sexual behaviours.

Resources

Help guidelines include:

- Lifeline Australia 13 11 14
- Parent line, which is available in each state via a different phone number
- Kids helpline 1800 551 800
- Relationships Australia 1300 364 277

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Part 7 Women's health

91 Cervical cancer screening

We are forecasting that over the next 30–40 years, rates of cervical cancer will drop from around the current 1000 cases a year in Australia to just a few … we are well positioned to be the first country to effectively end this deadly cancer.

PROFESSOR SUZANNE GARLAND, 2018

Cervical cancer

Cervical cancer is the fourth most common cause of cancer death in women worldwide, especially in developing countries.[1] It is the most common cancer in women in Eastern and Middle Africa, and the 14th most common in Australian women.[1,2] Australia has the second lowest incidence of cervical cancer in the world as a result of the success of the National Cervical Screening Program introduced in 1991, which has halved its incidence.[3]

The most common cervical cancer is squamous cell carcinoma (SCC), accounting for 80% of cases. Adenocarcinoma is less common and more difficult to diagnose because it starts higher in the cervix. Cervical cancer almost exclusively occurs in women who have been sexually active, due to exposure to human papillomavirus (HPV). Other risk factors include smoking, use of combined oral contraception >5 years, immunosuppression and exposure to diethylstilboestrol in utero.[4]

Since the introduction of the human papillomavirus (HPV) vaccine in Australia in 2007, the incidence of low- and high-grade abnormalities has significantly reduced in vaccinated populations. Studies have revealed reductions as high as 45% for low-grade abnormalities and 85% for high-grade abnormalities.[5] Recent modelling suggests that, with the tools available, elimination of cervical cancer in local populations is achievable within our lifetime.[6]

Cervical cancer and human papillomavirus[7]

It is now well established that the primary cause of cervical cancer is human papillomavirus.

There are approximately 200 different types of HPV, 40–50 of which specifically infect the anogenital area. These types are mainly spread by skin contact during sexual activity.

Of the genital HPV types, 15 are classified as ‘high risk’, as they are associated with anogenital cancer (including squamous and adenocarcinoma of the cervix). HPV 16 and 18 are responsible for around 70% of invasive cervical cancers and 50% of high-grade lesions.

Prior to immunisation, infection with HPV was common and mostly transient, with 80% of women being infected with at least one genital type of HPV in their lifetime without ever knowing it. Cervical cancer is a rare outcome of HPV infection. Most cervical HPV infections are cleared or suppressed by cell-mediated immunity within 1–2 years of exposure. Persistent infection of the cervix with a high-risk HPV is known to cause high-grade cervical changes that, if left untreated, can progress to cervical cancer. More than 99.7% of cervical cancers test positive for HPV DNA.[8]

Basic pathology

The focus of attention is the transformation zone (see FIG. 91.1), where columnar cells lining the endocervical canal undergo metaplasia to squamous cells in the region of the squamocolumnar junction. It is important clinically to realise that this transformation zone can extend with progressive metaplasia of columnar epithelium and so the squamocolumnar junction may recede into the endocervical canal. This is a feature in postmenopausal women (see FIG. 91.2). As squamous cell carcinoma almost always arises in the transformation zone, it is vital that cells from this area are sampled.

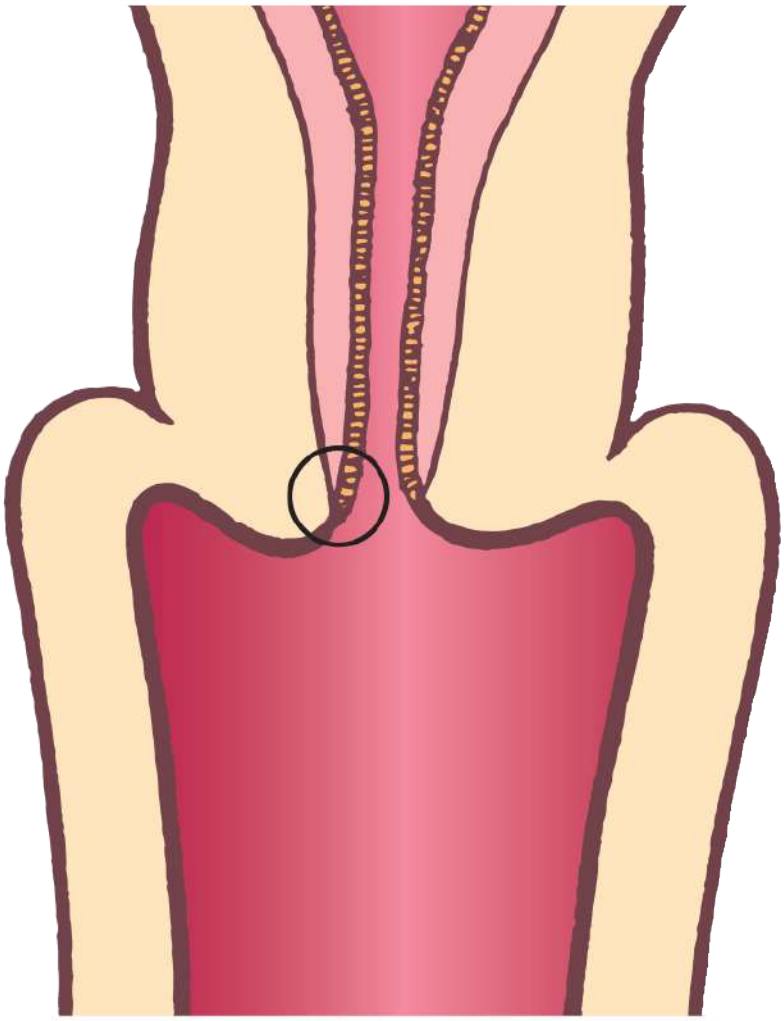

FIGURE 91.1 The transformation zone: it is vital that cells are taken from this zone in cervical screening tests

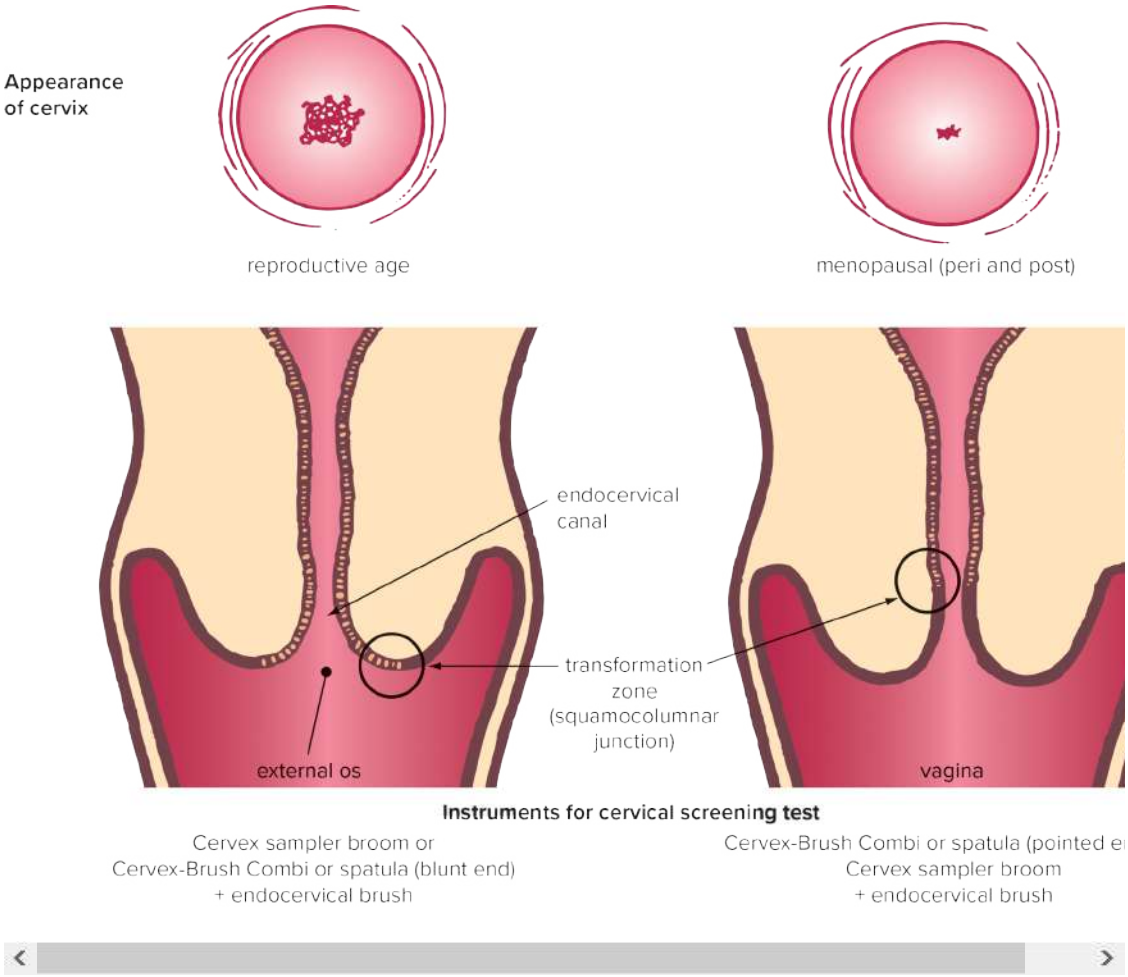

FIGURE 91.2 Changing position of the transformation zone with age, and a selection of sampling instruments according to its position

HPV and the natural history of cervical neoplasia[9]

Low-grade squamous intraepithelial lesions (LSILs) represent an acute HPV infection of the transformation zone. LSILs are seen with both low- and high-risk HPV types. Most women will clear the virus over about 10 months with no lasting effect. Persistent infection with an oncogenic HPV type causes precancerous changes (high-grade squamous intraepithelial lesion or HSIL).

HSILs may return to normal, persist or eventually progress to invasive cervical cancer. The average duration between HSILs and cancer is between 10 and 15 years. However, women with histologically confirmed moderate to severe dysplasia require a colposcopic assessment. FIGURE 91.3 and TABLE 91.1 illustrate the disease spectrum of cervical neoplasia.

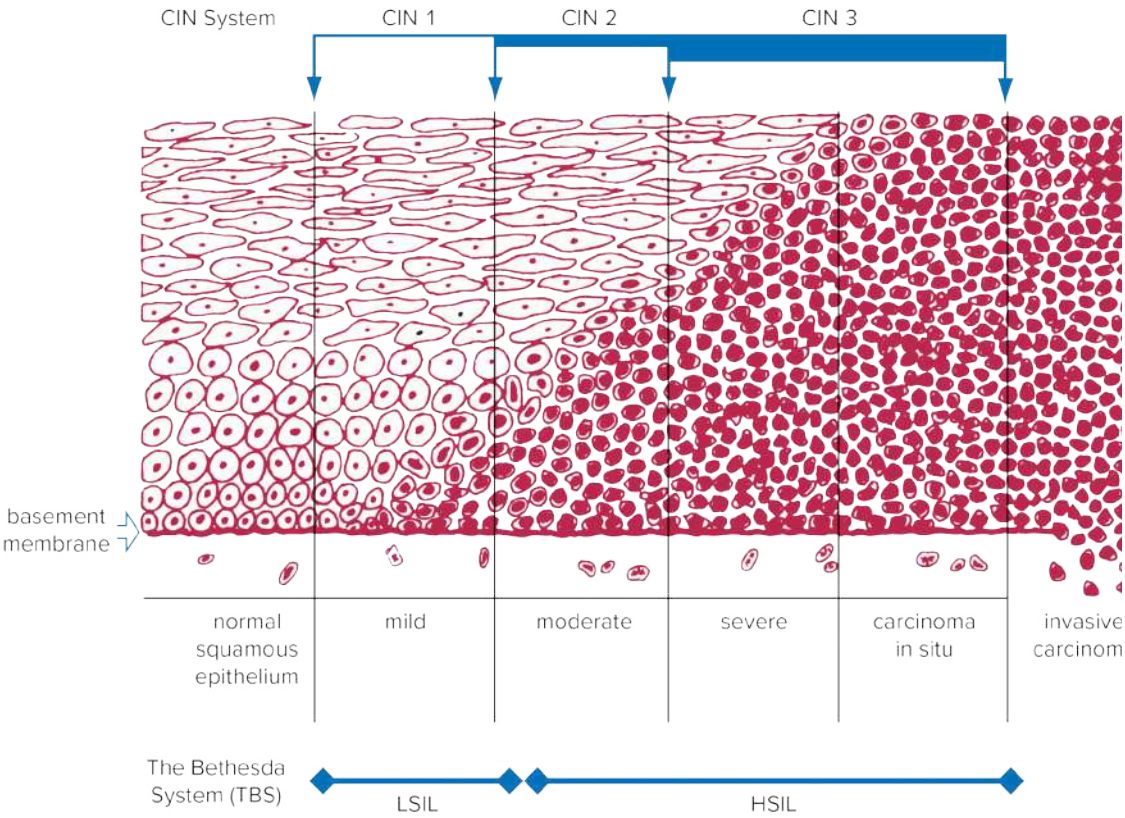

FIGURE 91.3 Illustration of the various grades of squamous intraepithelial lesions and CIN (comparison of nomenclature)

Table 91.1 Squamous cell abnormalities and the different nomenclatures[8]

	Description	CIN grade	Australian modified Bethesda System
1	Normal	Normal	Within normal limits
2	Atypia: reactive or neoplastic	Atypia	ASCUS
3	HPV	HPV	LSIL
4	Mild dysplasia	CIN 1	LSIL
5	Moderate dysplasia	CIN 2	HSIL
6	Severe dysplasia	CIN 3	HSIL
7	Carcinoma in situ	CIS	HSIL

8	Invasive carcinoma	Invasive carcinoma	Invasive carcinoma

ASCUS = **A**typical **s**quamous **c**ells of **u**ndetermined **s**ignificance

CIN = **C**ervical **i**ntraepithelial **n**eoplasia

CIS = **C**arcinoma **i**n **s**itu

HSIL = **H**igh-grade **s**quamous **i**ntraepithelial **l**esion

LSIL = **L**ow-grade **s**quamous **i**ntraepithelial **l**esion

Clinical presentation

Many patients with cervical cancer are asymptomatic and when early symptoms do arise they are often dismissed as of little consequence.

Symptoms, if present, may be:

- irregular vaginal bleeding, especially postcoital or intermenstrual bleeding
- postmenopausal bleeding
- vaginal discharge
- symptoms of advanced disease (e.g. back pain, fatigue, vaginal fistula)

Screening recommendations

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Cervical screening test[10]

In December 2017, the National Cervical Screening Program changed from the 2–yearly Papanicolaou smear (or Pap test) to a 5–yearly cervical screening test. The cervical screening test uses a primary HPV test with partial genotyping. This test will separately identify oncogenic HPV types 16 and 18, and 12 other oncogenic HPV types (not 16/18). All women who have oncogenic HPV types detected will have ‘reflex’ liquid-based cytology (LBC) performed on the cervical sample, to guide further management.

Who should be screened?[4]

- Women are invited to commence cervical screening at 25 years (or 2 years after first sexual intercourse, whichever is later).
- Both HPV-vaccinated and non–vaccinated women should be screened.
- An exit test can be performed at age 70–74 years.

- Women aged 75 years or older may request screening.
- Screening applies only to asymptomatic women. Women with postcoital or persistent intermenstrual bleeding require a co-test (both HPV test and diagnostic LBC), and referral for an appropriate investigation to exclude malignancy should be considered.[10]

- For women who experienced first sexual activity at a young age (<14 years) and who had not received the HPV vaccine before sexual debut, a single HPV test between 20 and 24 years of age could be considered on an individual basis.[10]

Screening in particular groups[10]

Hysterectomy. Cervical screening is still required if the cervix was not completely removed. Vaginal vault co-tests (HPV and LBC) may be indicated if there is a history of gynaecological dysplasia or malignancy.

Pregnancy. Cervical screening can be safely performed at any time during pregnancy, provided that the correct sampling equipment is used. An endocervical brush or Cervex–Brush Combi should not be inserted into the cervical canal because of the risk of associated bleeding, which may distress the patient.

Postmenopausal women. Postmenopausal women may benefit from a short course of topical vaginal oestrogen before their cervical screening test. This may improve the quality of the test and comfort of the examination. Treatment should be stopped approximately 3 days before the test to ensure it does not interfere with the test interpretation.

Immune-deficient women. Woman with HIV or who are solid organ transplant recipients should be screened every 3 years with HPV testing.

Exposure to diethylstilboestrol (DES) in utero. An annual co-test (HPV and LBC) and colposcopic examination of both the cervix and vagina should be offered indefinitely.

Women with abnormal vaginal bleeding. A co-test is indicated and should not be delayed due to the presence of blood. Women with postcoital bleeding or persistent and/or unexplained intermenstrual bleeding require referral for colposcopy regardless of the result. However, premenopausal women who have a single episode of postcoital bleeding, a clinically normal cervix and negative co-test do not need to be referred for colposcopy. Postmenopausal women with any vaginal bleeding should be referred for a specialist gynaecological assessment to exclude genital tract malignancy.

Underscreened populations[8]

Special attention should be focused on screening the following women:

- Aboriginal and Torres Strait Islander women (mortality of cervical cancer five times that of other women in Australia)

- Women from culturally and linguistically diverse backgrounds
- Women in rural and remote areas
- Women with disabilities
- Women who have experienced sexual trauma and/or domestic violence
- Those who identify as lesbian, gay, bisexual, transgender, queer or questioning and intersex (LGBTQI)

The Cervical Screening Test consultation

The Cervical Screening Test consultation provides an excellent opportunity to perform a general women's health check. For women of reproductive age, it is important to take a focused menstrual history, specifically enquiring about intermenstrual or postcoital bleeding. Consider discussing contraception use and the need for STI screening, especially for women aged under 30 years. Opportunistic discussions regarding family planning, breast awareness and breast screening are often appropriate.

Enquire about previous cervical screening results and whether the woman has found cervical screening difficult. Some women may be highly anxious, and identifying this early allows the clinician to address fears sensitively and discuss strategies that may help them feel more comfortable. Women with atrophic vaginitis often benefit from topical oestrogen in the immediate weeks prior to cervical screening.

Clinician-collected samples

The optimal cervical screening test contains:

- sufficient mature and metaplastic squamous cells to indicate adequate sampling from the whole of the transformation zone
- sufficient endocervical cells to indicate that the upper limit of the transformation zone was sampled; and to provide a sample for screening of adenocarcinoma and its precursors

Optimal timing of specimens

- Avoid performing a cervical screening test during menstruation.
- Avoid in the presence of obvious vaginal infection.
- Avoid within 48 hours of use of vaginal creams or pessaries or douching.

Communicating with the pathologist

Good communication with the pathologist is essential. It is important to provide basic

details and the clinical history on the pathology form sent to the laboratory. It is especially important to include whether the patient is symptomatic, as this changes the testing procedure. Include the patient's age; current hormonal state, such as pregnancy, the postpartum period or if they are postmenopausal; the presence of an IUD; previous abnormal results; and clinical findings.

The method

1. *Explanation and history*

   Take time to explain the reason for the cervical screening test, especially if it is the first. Anatomical models are useful in describing the procedure. Explain that it usually does not take long, that it may be uncomfortable but should not be painful. Slow, deep breathing often helps relax the pelvic floor, allowing for easier speculum insertion. Take a brief history as previously outlined, enquire about previous cervical screening results (if any), as well as direct questions about any intermenstrual or postcoital bleeding. Verbal consent should be obtained.[5]

   Encourage the woman to empty her bladder if she desires and ensure privacy before asking her to undress below the waist. A gown or cover sheet should be provided.

   Check if the woman would like a chaperone to be present during the examination.

2. *Equipment*[6]

   Wash hands and prepare the following equipment:

   - adequate light source
   - appropriate-sized speculum (small for women having a first test, wider for women with poor vaginal tone)
   - water-based lubricant if using a plastic speculum
   - non-sterile gloves for both hands
   - vial of liquid medium
   - swabs for STI screening if required
   - cervical screening implements; choose from:

     cervical sampler broom

     endocervical brush

     Cervex-Brush Combi

     spatula

(refer to FIG. 91.2 for recommended choice)

Special notes:

- pregnancy—avoid use of the endocervical brush and the Cervex-Brush Combi
- eversion—take care to sample the squamocolumnar junction

3. *Positioning*

The supine position is usually best (see FIG. 91.4). The left lateral position can be used if smears are difficult to obtain (e.g. older women with lax anterior vaginal walls, older women with poor hip mobility). The Sims exaggerated left lateral position (see FIG. 91.5) provides better exposure of the vulva but requires more manipulation of the patient. Better visualisation of the cervix is obtained if the patient elevates her buttocks with her fists, a small pillow or towel.

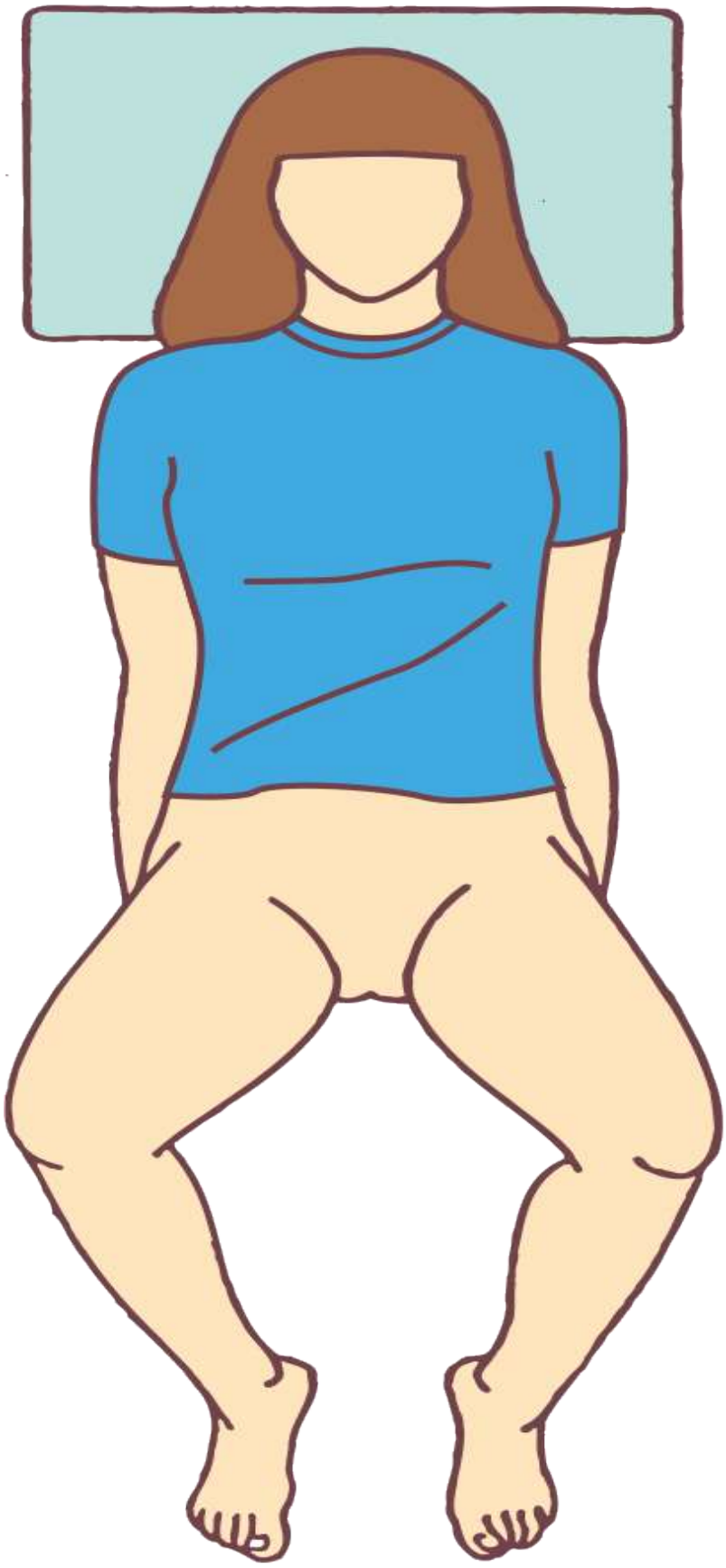

FIGURE 91.4 The supine or dorsal position is the best position for the speculum examination and subsequent bimanual palpation (patient should be appropriately clothed and/or draped)

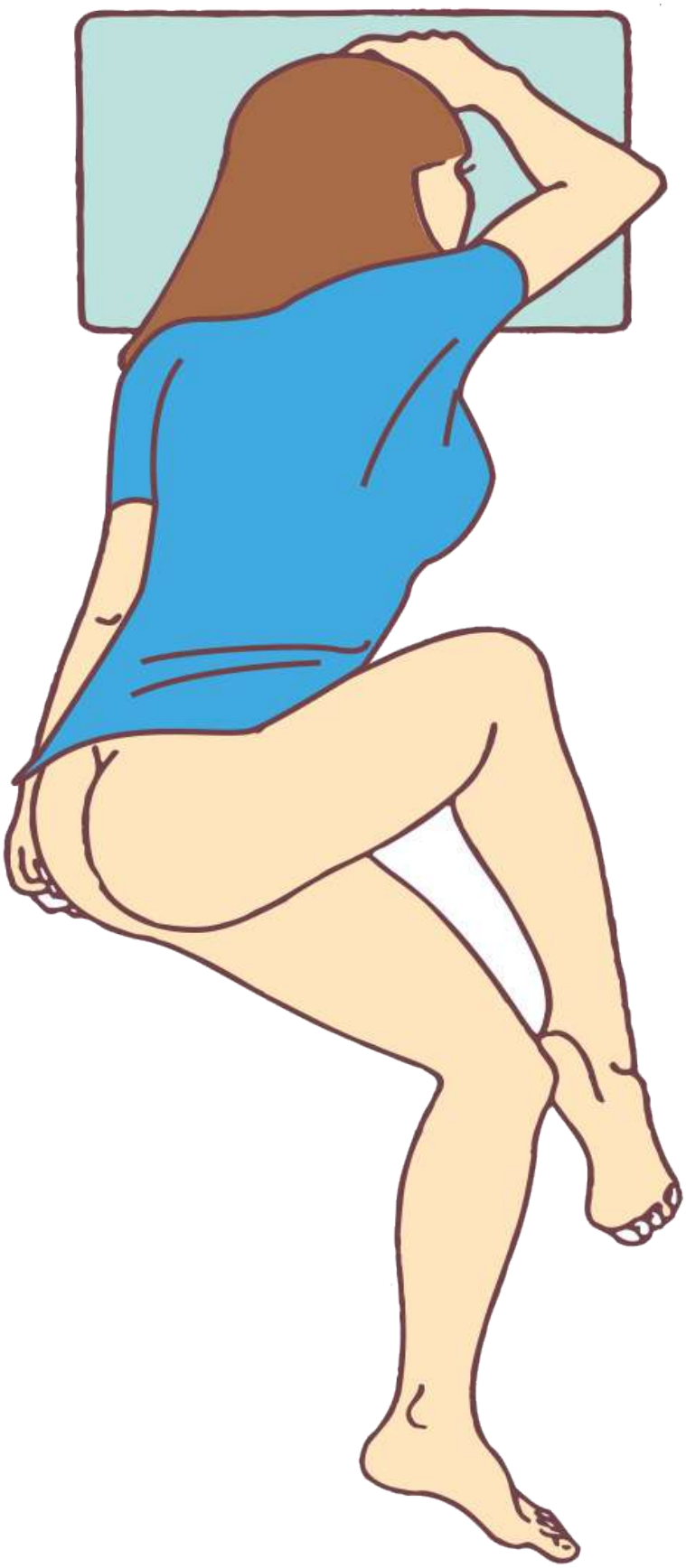

FIGURE 91.5 The Sims exaggerated left lateral position

4. *Inspection of external genitalia*

   Observe any skin conditions or lesions, any bleeding or vaginal discharge.

5. *Inserting the speculum*

   A metal speculum should be warmed with lukewarm water. A small amount of water-based lubricant is appropriate for a plastic speculum. Gently spread the labia with a gloved hand and introduce the speculum with the blades remaining horizontal and closed. Gently advance the speculum into the vagina guided by the posterior wall. Open the blades of the speculum slightly to guide the visual location of the cervix. Remember that the cervix is situated in the upper sixth of the anterior vaginal wall (not in the apex of the vagina).

6. *Visualising the cervix*

   When the cervix is visualised, lock the blades to keep the speculum in position. Good lighting and exposure of the cervix is essential. Note any significant features or abnormalities of the cervix. A cervical ectropion is normal in most premenopausal women.

7. *Taking the sample*

   There are a variety of sampling instruments to choose from.

   Cervical sampler broom: can be used alone if the transformation zone is visible. Insert the central part of the brush into the os and rotate for 3–5 turns (FIG. 91.6A).

   Spatula: take care to keep contact with the ecto-cervix and rotate once or twice. Use with the endocervical brush to maximise endocervical sampling.

   Endocervical brush should be advanced until only the lower bristles are still visible, then rotated for a quarter of a rotation (see FIG. 91.6B). The endocervical brush should be avoided in pregnant women as it tends to cause bleeding.

   Cervex-Brush Combi combines features of the cervical broom and endocervical brush. Insert the central part of the brush into the os and rotate for two turns. It is not advised in pregnancy.

   It is common practice to use either the cervical sample broom or spatula first, followed by the endocervical brush. Use of the Cervex-Brush Combi alone is an alternative.

   After removing the speculum, perform a bimanual pelvic examination if appropriate. A bimanual examination may assist in locating the cervix if it could not be visualised at the initial speculum examination.[5]

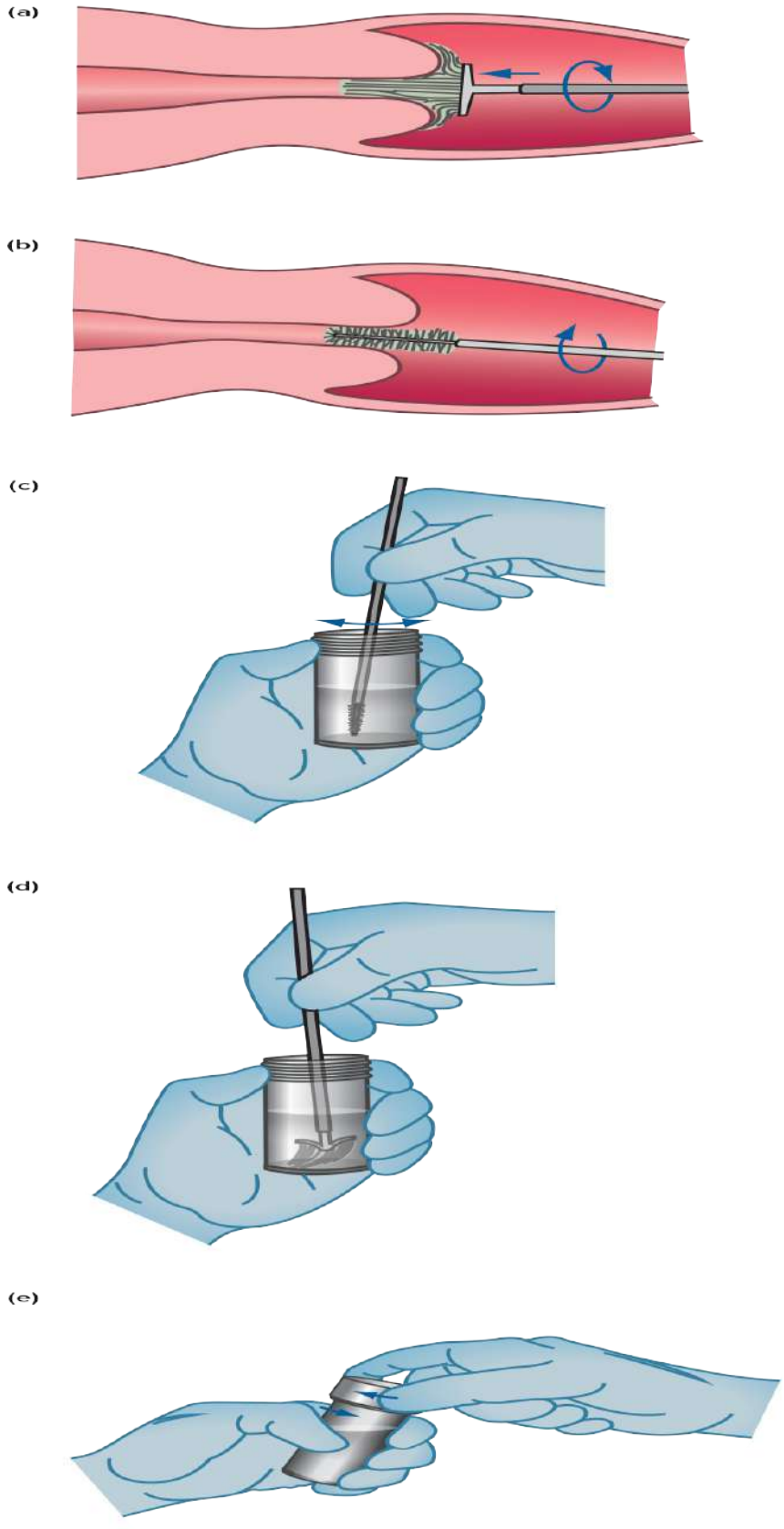
(a)
(b)
(c)
(d)
(e)

FIGURE 91.6 Method of taking and transferring an endocervical sample[11]

3. *Transferring the sample*

Transfer the sample to the liquid medium as quickly as possible, swirling the device vigorously 10 times (see FIG. 91.6C). The cervical sample broom and Cervex-Brush Combi should hit the base, forcing the bristles apart (see FIG. 91.6D). Remove the device from the vial and ensure the cap is secured tightly (see FIG. 91.6E).

Follow-up

Discuss mutually suitable arrangements to ensure that the woman obtains the result of the test, whether it is positive or negative. Inform her when her next test is likely to be due (special cards are available) and have a system in place to send a reminder note.

The explanation of the results and follow-up required, especially if there is an abnormality present, should be crystal-clear to the patient. Common medicolegal claims made against GPs include poor communication regarding cervical screening tests and failure to arrange adequate specialist referral for women with abnormal results or a clinically suspicious cervical lesion.

Management of results

Follow the guidelines in TABLE 91.2 for management of results.

Table 91.2 Guidelines for positive cervical screening tests[10]

Cervical screening test result	Investigation and management
HPV not detected	Repeat in 5 years
Unsatisfactory HPV test	Repeat test in 6–12 weeks
HPV not 16/18 detected	
Negative cytology	Repeat HPV test in 12 months
Possible low-grade intraepithelial lesion (pLISIL) and definite LSIL	Repeat HPV test in 12 months
High-grade epithelial lesion (HSIL)	Refer for colposcopy
Unsatisfactory cytology result	Repeat test in 6–12

	weeks
HPV 16/18 detected	
All cytology results	Refer for colposcopy

Post-treatment assessment of HSIL[10]

A woman treated for HSIL should complete a test of cure surveillance to confirm her treatment has been successful. Test of cure surveillance is a co-test (HPV and liquid-based cytology test) performed 12 months after treatment, and annually thereafter, until the patient receives a negative co-test on two consecutive occasions. She should then return to 5-yearly screening.

Self-collected samples[10,12]

Data shows that more than 80% of women diagnosed with invasive cervical cancer have never been screened or were more than 6 months overdue for a screening test at the time of diagnosis. Providing HPV self-collection kits to never-screened and underscreened women has been shown to improve screening participation in international studies. HPV tests using self-collected samples are considered to have moderate-to-high sensitivity and comparably high specificity for detecting CIN 2+.

Under the renewed National Cervical Screening Program, HPV testing on self-collected samples is available to women aged 30 years and over and either:

- never participated in cervical screening
- overdue for cervical screening by 2 years or longer

Women should be advised that a clinician-collected sample is preferred because it is more effective and reflex LBC can be performed on the same sample. If the woman declines the clinician-collected sample, she will be able to submit a self-collected sample. Self-collection is nonetheless preferred compared to non-participation in cervical screening.

Self-collection will not be available to women who are pregnant, symptomatic, have undergone hysterectomy with a history of HSIL and women exposed to DES in utero.

If HPV (not 16/18) is detected on a self-collected sample, a clinician-collected liquid-based cytology is advised. If HPV 16 or 18 is detected, the patient should be referred directly for colposcopy and a cervical sample for LBC will be collected at that visit. Follow-up is otherwise the same as for clinician-collected samples.

HPV vaccination[10]

In 2007, Australia led the world with its national publicly funded HPV vaccination program,

using a quadrivalent HPV vaccine that protects against HPV types 16 and 18 (high risk for cervical cancer) and types 6 and 11 (which cause genital warts). Vaccination ideally occurs before first sexual activity. Currently, a 9-valent HPV vaccine (Gardasil 9) is administered through the National Immunisation Program to males and females aged 12–13 years. The 9-valent vaccine, which targets five additional oncogenic HPV types (31, 33, 45, 52 and 58), is expected to prevent up to 90% of cervical cancers.

Since 2007, reductions in the prevalence of HPV types 16 and 18, anogenital warts and histologically confirmed HSIL have already been documented in young women, including unvaccinated young women. Maximal reductions of approximately 90% for HPV 6/11/16/18 infection, 90% for genital warts, 45% for low-grade cytological cervical abnormalities and 85% for high-grade cervical abnormalities have been reported.[5] Women who have been immunised still require cervical screening because the vaccine does not prevent all HPV types that cause cervical cancer.

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92 Family planning

The Membranous Envelope (condom) is prepared from the bladder of a fish caught in the Rhine. Its extreme thinness does not in the least interfere with the pleasure of the act … [its use] *is of the greatest utility because, while it is a sure preventive of conception, it also prevents either party from contracting disease.*

EDWARD BLISS FOOTE, *MEDICAL COMMON SENSE*, 1864

The classic family planning consultation is the presentation of a young woman for contraceptive advice. It is a very critical visit and provides an excellent opportunity to develop a good rapport with the patient and provide education on important health concerns, such as sexual health, fertility, pregnancy prevention, STI prevention, immunisation and cervical screening.

In counselling and treating patients, especially teenagers, confidentiality is of paramount importance. Keep in mind the Gillick test of competency for patients aged under 16 (see CHAPTER 90). Contraceptive methods can be confusing, so careful education using charts and other aids is recommended to enhance the therapeutic relationship and ensure the patient understands the best options available to them.

Fertility control

The choice of contraceptive methodology will be determined not only by individual needs, personal preference and resources but also by its effectiveness, safety and incidence of side effects.

In developed countries of the Western world, the most widely used methods are the male condom, combined oral contraceptive pill, intra-uterine device (IUD), sterilisation and withdrawal.[1]

The past decade has seen a wider availability of long-acting reversible contraception (LARC). LARC methods are defined as non-permanent contraception administered less frequently than once a month. They include implants and IUDs (hormonal and copper). LARC methods are the most effective reversible contraceptives, with failure rates for typical use virtually the same as for perfect use. For this reason, LARC plays an important public health role in reducing unintended pregnancies.[2] Approximately half the pregnancies in the US are unintended and

occur because of non-use of contraception, failure of a specific method or discontinuation of contraception.[3] While many women are satisfied with oral contraceptives or barrier methods, it is important to check their awareness of LARC proactively.[4]

A comparison of the failure rates of the various contraceptive methods is presented in TABLE 92.1 .

Table 92.1 Effectiveness of contraceptive methods[5]

Contraceptive method	Effectiveness (%)	
	Typical use	Perfect use (consistent and correct)
Implant (etonogestrel)	99.95	99.5
Intra-uterine contraceptive device:		
• copper	99.5	99.5
• levonorgestrel	99.7–99.9	99.7–99.9
Sterilisation (male and female)	99.5	99.5
Depot medroxyprogesterone	96	99.8
Combined oral contraceptive pill	93	99.5
Vaginal ring	93	99.5
Progestogen-only pill	93	99.5
Barrier:		
• female:		
diaphragm	82	86
condom	79	95
• male:		
condom	88	98
Withdrawal	80	96
Fertility awareness-based methods	76–93	95–99.6

Source: Adapted from Effectiveness of contraceptive method [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. www.tg.org.au, accessed April 2021.

It should be noted that condoms are the only contraception that protect against STIs. For those at risk of acquiring STIs, dual protection should be recommended. This involves use of condoms in addition to an effective form of contraception, offering both STI and pregnancy protection.[6]

Practice tip

Long-acting reversible contraception (LARC) methods include implants and IUDs. LARC methods are the most effective reversible contraceptives and have the potential to reduce unintended pregnancy rates.

Safe prescribing[4]

Most women of reproductive age can safely use all contraceptive methods. However, there are some conditions, risk factors and concurrent medications that make a particular method unsuitable. Medical Eligibility Criteria (MEC) tables for contraceptive use are an internationally recognised system to guide clinicians in the safe provision of contraceptive methods. Conditions affecting eligibility are classified under one of four categories: MEC 1—no restrictions; MEC 2—the benefits generally outweigh the risks; MEC 3—the risks generally outweigh the benefits; MEC 4—an absolute contraindication. A full listing of the UK MEC is available at: http://ukmec.pagelizard.com/2016.

Hormonal contraception

Methods of hormonal contraception include:[5,7]

- Progestogen-only contraceptives:
  - etonogestrel implant (Implanon NXT)
  - levonorgestrel-releasing IUD (Mirena, Kyleena)
  - depot medroxyprogesterone acetate (DMPA) injection
  - progestogen-only pill (POP or ‘mini-pill’)
- Combined hormonal contraceptives:
  - combined oral contraceptive pill (COC or ‘the pill’)
  - vaginal ring (NuvaRing)

- Emergency contraception:

  levonorgestrel emergency contraceptive pill (ECP)

  ulipristal acetate

Progestogen-only contraception[5,7]

Progestogen-only methods include the progestogen-only pill, implant, IUD and injection. These methods are generally safe in women who are breastfeeding or have a contraindication to taking oestrogen. Progestogen-only contraception is contraindicated in women with active breast cancer within the past 5 years (MEC 4), but has relatively few other contraindications. The harms outweigh the benefits in the following conditions (MEC 3): past breast cancer, antiphospholipid antibodies with systemic lupus erythematosus, unexplained vaginal bleeding, ischaemic heart disease or stroke, severe cirrhosis or hepatocellular carcinoma/adenoma.

Use of progestogen-only contraception is not associated with an increased risk of venous thromboembolism. Women taking liver enzyme-inducing drugs are not advised to use the POP or etonogestrel implant due to reduced effectiveness. DMPA and the levonorgestrel IUD are appropriate for use with liver enzyme-inducing drugs. If emergency contraception is required, a double dose of the levonorgestrel-ECP is recommended.

Etonogestrel implant (Implanon NXT)[7]

This is a subdermal contraceptive implant lasting up to 3 years, consisting of a single rod containing the progestogen etonogestrel. It inhibits ovulation and affects cervical mucous to prevent sperm reaching the upper genital tract. Irregular bleeding is the most common side effect, with 1 in 5 women experiencing frequent or prolonged bleeding episodes. Twenty-two per cent of women are amenorrhoeic within 12 months. Several treatments (e.g. COCP; mefenamic acid; tranexamic acid) are safe to use to reduce troublesome bleeding in the short term. Approximately 20–25% of women request the implant to be removed within 12 months and it is important to provide information about expected bleeding patterns prior to insertion. It requires a minor surgical procedure to insert it and also to remove it. The pregnancy rate is the lowest of all contraceptives at <1:1000 over 3 years of use.

Injectable contraceptives

Depot medroxyprogesterone acetate

Depot medroxyprogesterone acetate (DMPA) is the only injectable intramuscular contraceptive available in Australia. It is very effective for up to 14 weeks.

- Dose: 150 mg by deep IM injection in first 5 days of the menstrual cycle. The same dose is given every 12 weeks ± 2 weeks to maintain contraception.

- Effectiveness: perfect use 99.8%; typical use 96%.

Side effects include a disrupted menstrual cycle (amenorrhoea rate 50–70% by 12 months), weight gain (average 2–6%), breast tenderness, mood changes and a delay in return of fertility (mean time 8 months).[7] Long-term use is associated with accelerated bone loss, but this is not clinically significant and does not translate into fracture risk. However, for this reason it is not recommended as a first-line contraceptive for women less than 18 and more than 45 years.

Progestogen-only contraceptive pill

The POP (mini-pill) is most commonly prescribed for breastfeeding women for whom an oestrogen contraceptive was previously not recommended. POP is safe from 6 weeks after delivery.

The two common formulations are:

- levonorgestrel 30 mcg/day
- norethisterone 350 mcg/day

The primary mechanism of action is cervical mucus thickening, preventing sperm penetration. In addition, POPs prevent ovulation in up to 60% of cycles.[5]

Efficacy is 99.5% in perfect use and 93% in typical use.[7] The failure rate is lower in women >40 years compared to younger women. The POP is considered to have a more vulnerable efficacy, and it is important that the woman strictly adheres to taking the pill within a daily 3-hour timeframe. The POP is effective after 3 tablets have been taken.[4]

Compliance can be a problem because of cycle irregularity. Twenty per cent of women will be amenorrhoeic on the POP, 40% will have regular bleeding and 40% will have irregular bleeding.[7]

Intra-uterine contraceptive devices[5,7]

IUDs are highly effective LARCs that are increasingly used worldwide by women of all reproductive ages, including young and nulliparous women. They are made of an inert material to which may be added a bioactive substance such as copper (e.g. Load 375) or a progestogen (e.g. Mirena, Kyleena). All IUDs prevent pregnancy by inhibiting sperm migration and ovum transport and preventing implantation. The levonorgestrel IUD also causes endometrial suppression and cervical mucus thickening and may prevent ovulation.

Efficacy:

- copper IUDs: 99.5% perfect and typical use
- 52 mg levonorgestrel IUD (Mirena): 99.9% perfect and typical use

- 19.5 mg levonorgestrel IUD (Kyleena): 99.7% perfect and typical use

Absolute contraindications include active PID, undiagnosed abnormal genital tract bleeding and current or past history of breast cancer for those considering levonorgestrel IUD (MEC 4).

Recommended use time: copper IUD 5–10 years depending on brand; Mirena and Kyleena IUDs 5 years.

Side effects and complications of IUD use

The biggest difference between copper and hormonal IUDs is the effect on bleeding patterns and pain. Women with a copper IUD will have their usual menstrual periods, usually with an increase in menstrual loss and dysmenorrhoea. Spotting, heavier and prolonged bleeding are common in the first 3–6 months but usually decrease with time.

The levonorgestrel IUD results in a reduction of blood loss. The higher dose 52 mg levonorgestrel IUD is more likely to cause amenorrhoea or infrequent bleeding than the 19.5 mg levonorgestrel IUD, and is therefore licenced for women with heavy menstrual bleeding.

Persistent light vaginal bleeding and/or spotting are common initially for the first 3–5 months.

The lower dose 19.5 mg levonorgestrel IUD is smaller in size and may be easier and less painful to insert and remove, especially for nulliparous women. The lower progesterone dose may also result in a higher number of bleeding/spotting days than the 52 mg levonorgestrel IUD.

Menstrual bleeding and pain are the most common reason for IUD discontinuation. Discontinuation rates for both copper and hormonal IUDs are similar.

Pregnancy/ectopic pregnancy

If pregnancy occurs there is an increased risk of abortion and intra-uterine sepsis during the second trimester. Early removal of the IUD is essential. Since the IUD prevents intra-uterine rather than tubal pregnancies, the proportion of ectopic pregnancy is higher in the case of IUD failure, although the absolute risk is low compared to the risk for women using no contraception.

Pelvic inflammatory disease

There is a small increased risk of PID in the first 20 days post-insertion. Subsequent risk of PID reverts to baseline and is related to the risk of STIs.

Extrusion, perforation of uterus and translocation

Spontaneous extrusion occurs in 3.7%–5% with the highest risk within the first year. Perforation of the uterus occurs in up to 2.3 in 1000 insertions.[7] Factors that increase risk of perforation include breastfeeding, first 6 months postpartum and previous caesarean section. If translocation of the IUD outside the uterus is proved by X-ray and pelvic ultrasound, referral for removal is mandatory. The woman should attend for a follow-up visit between 3–6 weeks after insertion

specifically to exclude infection, perforation or expulsion.

Combined hormonal contraception (CHC)[7]

Combined hormonal contraceptives contain an oestrogen and progestogen, and their main mode of action is inhibition of hypothalamic and pituitary function leading to anovulation. They are available as a combined oral contraceptive pill (COC) and the vaginal ring. COCs and vaginal rings work in the same way and are treated similarly in terms of contraindications, complications, side effects and drug interactions.

Combined oral contraception (COC)[5]

COCs in Australia contain ethinyloestradiol (EE), oestradiol valerate (EV), oestradiol (E2) or mestranol and one of a range of progestogens. Efficacy is 99.5% with perfect use, 93% with typical use.

Which oestrogen to use[7]

Type

EE is the most commonly used oestrogen. The active oestrogen in the newer E2 and EV pills is structurally identical to the E2 produced by the ovaries. They have a theoretical but unproven benefit in terms of venous thromboembolism (VTE) risk, and it will be some years before there is any evidence of VTE rates in women using these pill preparations. Both E2 and EV are associated with a moderately high rate of amenorrhoea during the hormone-free break.

Dose

It is recommended to use a dose of 35 mcg EE or less. There is an association between increasing EE dose and risk of venous thromboembolism (VTE). Formulations containing 50 mcg EE are no longer recommended because there is no known additional benefit from their use and they are associated with an increased risk of VTE. Women starting on a 20 mcg EE pill are likely to have fewer hormonally related side effects such as headaches or mood swings, but have a higher chance of discontinuation due to breakthrough bleeding.

Which progestogen to use[7]

The early progestogens include levonorgestrel and norethisterone. Newer progestogens have been developed over recent decades to reduce androgenic side effects and to minimise the effect EE has on lipids. Nomegestrol acetate, gestodene, desogestrel and etonogestrel are less androgenic, while cyproterone acetate, drospirenone and dienogest are anti-androgenic. Drospirenone is an analogue of spironolactone and has a mild diuretic effect. There is insufficient data to initially prescribe newer progestogens in preference to older versions.

Various COC preparations available in Australia are listed in TABLE 92.2 .

Table 92.2 Combined oral contraceptive pill formulations available in Australia[5,7]

Oestrogen	Dose (mcg)	Progestogen	Dose (mcg)	Trade name
Monophasic				
Ethinyloestradiol	20	Drospirenone	3000	YAZ
Ethinyloestradiol	20	Levonorgestrel	100	Femme-Tab ED 20/100, Lenest 20, Loette, Microgynon 20, Microlevlen, Micronelle 20
Ethinyloestradiol	30	Levonorgestrel	150	Eleanor 150/30, Evelyn 150/30, Femme-Tab 30/150, Lenest 30, Levlen, Microgynon 30, Micronelle 30, Monofeme, Nordette
Ethinyloestradiol	10, 30	Levonorgestrel	150	Seasonique*
Ethinyloestradiol	30	Dienogest	2000	Valette
Ethinyloestradiol	30	Gestodene	75	Minulet
Ethinyloestradiol	30	Desogestrel	150	Marvelon, Madeline
Ethinyloestradiol	35	Cyproterone acetate	2000	Chelsea-35, Diane-35, Estelle-35, Juliet-35, Laila-35, Jene-35
Ethinyloestradiol	35	Norethisterone	500	Brevinor, Norimin
Ethinyloestradiol	35	Norethisterone	1000	Brevinor-1, Norimin-1, Primella
Ethinyloestradiol	30	Drospirenone	3000	Yasmin, Petibelle
Ethinyloestradiol	50	Levonorgestrel	125	Microgynon 50
Mestranol	50	Norethisterone	1000	Norinyl-1

Oestradiol	1500	Nomegestrol acetate	2500	Zoely
Triphasic				
Ethinyloestradiol	30, 40	Levonorgestrel	50, 75, 125	Logynon, Trifeme, Triphasil, Triquilar
Quadriphasic				
Oestradiol valerate	1000–3000	Dienogest	2000, 3000	Qlaira

*Seasonique has an extended regimen, with each pack consisting of 91 tablets—made up of 84 hormonal tablets containing 30 mcg EE and 150 mcg levonorgestrel plus 7 10 mcg EE tablets

Starting the pill: which COC to use[7]

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The past menstrual and medical history of the woman should be documented and contraindications excluded.

A suitable first choice is a monophasic pill containing 30 mcg or 35 mcg ethinyloestradiol (EE) with levonorgestrel or norethisterone (e.g. Nordette, Microgynon 30, Monofeme, Levlen ED, Brevinor).

Education and counselling are very important for the woman starting the pill. Suitable patient education should be given. Pill swatches produced by manufacturers are a useful aid. Cover starts immediately if a hormone (active) pill is commenced on day 1–5 of the menstrual cycle (except the quadriphasic pill Qlaira—refer to product information).

Note: A ‘quick-start’ technique, described by Westhoff, can be used to start the COC on the day of the consultation. If commenced at any time other than day 1–5 of the menstrual cycle, abstinence/condoms are required for the first 7 days after the start.[8]

Specific patient groups[4,7]

Adolescents. There is no lower age limit if the young woman has started menstruating.

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Acne and hirsuitism. The oestrogen in any CHC may improve acne and hirsuitism via increased sex hormone binding globulin (SHBG) levels and reduction of free testosterone. COCs containing an anti-androgenic progestogen have a theoretical advantage for women who request management of androgenic symptoms. Any beneficial effect may take up to 6 months.

Women over 35 years. CHC use is safe for healthy non-smoking women until 50 years (MEC 2 for women over 40). CHC is not recommended if a woman is over 35 years and has cardiovascular risk factors, including obesity, smoking, diabetes and hypertension (MEC 3/4).

Women taking liver enzyme-inducing drugs. Alternative contraception is strongly advised. The only hormonal contraceptives not affected by liver enzyme-inducing drugs are DMPA and IUDs. Current evidence suggests that most antibiotics do not interact with combined hormonal contraceptives. The only exceptions are liver enzyme-inducing rifabutin and rifampicin. Other liver enzyme-inducing drugs include many of the older anti-epileptics (e.g. phenytoin, carbamazepine), St John's wort and protease inhibitors. For women who still request the use of COC, an extended or tricycling regime of a higher dose pill (e.g. containing at least 50 mcg EE) may be effective. Further guidance on drug interactions is provided by the UK Faculty of Sexual Health and Reproductive Healthcare (available from: https://www.fsrh.org/standards-and-guidance/documents/ceu-clinical-guidance-drug-interactions-with-hormonal/).

Contraindications to CHC usage are shown in TABLE 92.3 .

Table 92.3 Contraindications for the use of COC[5,7]

Absolute (MEC 4)
First 3 weeks postpartum if VTE risk factors, 6 weeks if breastfeeding
≥35 years and smoking ≥15 cigarettes/day
History of thromboembolic disease, including known thrombophilia
Cerebrovascular disease
Ischaemic heart disease
Uncontrolled hypertension
Complicated valvular heart disease
Cardiomyopathy
Migraine with aura
Malignancy of the breast or genital tract
Severely impaired liver function, hepatocellular adenoma/tumour
Major surgery with prolonged immobilisation
Positive antiphospholipid antibodies
Relative (MEC 3)
BMI >35 kg/m^2
≥35 years and smoking <15 cigarettes/day
Multiple risk factors for cardiovascular disease
First-degree relative who had a VTE <45 years
Undiagnosed abnormal vaginal bleeding
Past history of migraine with aura, none for 5 years
Known gene mutation associated with breast cancer
Gall bladder disease
Controlled hypertension

Long-term immobilisation

Note: Adapted from UK Medical Eligibility Criteria (UKMEC) 2016 for CHCs. Full listing available from: http://ukmec.pagelizard.com/2016.

Non-contraceptive advantages of CHCs[7]

A number of significant beneficial effects arising from the use of COCs have now been documented:

- Reduction in most menstrual cycle disorders, including dysmenorrhoea, symptoms of endometriosis and heavy menstrual bleeding
- Reduction in the incidence of functional ovarian cysts and benign ovarian tumours
- Reduced incidence of ovarian and endometrial cancer
- Can reduce acne
- Can be useful in managing symptoms of polycystic ovarian syndrome
- Can assist with perimenopausal symptoms
- Can be used to manage premenstrual syndrome (PMS) and its more severe form (PMDD) in some women
- Can reduce the risk of bowel cancer

Serious side effects of CHCs

The most serious side effects to be considered are the effects of COCs on the circulatory system and the incidence of cancer.

The following circulatory disorders have been linked with pill usage.

- Venous deep vein thrombosis, pulmonary embolism, *rarely:* mesenteric, hepatic and kidney thrombosis
- Arterial myocardial infarction, thrombotic stroke, haemorrhagic stroke, *rarely:* retinal and mesenteric thrombosis

The risk of circulatory disease has not been related to duration of use and there is no increased risk in perpetual users.

The oestrogen content of the pill is considered to be the aetiological factor and the problem is increased in women taking high oestrogen-content COCs, but now that the oestrogen content of each pill has been reduced to 35 mcg EE or less, these risks of morbidity and mortality have been reduced.

The progestogen effect on lipid metabolism is not considered significant in the aetiology of circulatory disease. Circulatory diseases have now been recognised as occurring predominantly in certain high-risk groups—the ‘at-risk female’, particularly the smoker over 35 years of age.

Other at-risk groups include those with thrombophilia, hyperlipidaemia, diabetes, hypertension and a family history of cardiovascular disease or immobilisation.

Venous thromboembolism[5]

Venous thromboembolism (VTE) risk is increased 2–3 times in users of CHCs compared to non-users, with an increase of between one and three extra cases per 10 000 women in a year. The risk is highest in the first 4 months of use and gradually decreases with duration of use. Studies have shown that COCs containing cyproterone, desogestrel, drospirenone or gestodene have a higher risk of VTE than COCs containing levonorgestrel or other progestogens. However, the absolute risk of VTE in users of any CHC is very low and much lower than the risk associated with pregnancy and the postpartum period. Women who are eligible for an oestrogen-containing method of contraception can safely use any pill on the market with 35 mcg EE or less.

CHC and cancer[7]

Women who have used CHC have an overall lower risk of cancer compared to women who have not.

- Possible very small increased risk:

  cervix (benefits of use outweigh the risk with a low- or high-grade squamous intraepithelial lesion)

  breast

- Protective effect:

  endometrial

  epithelial ovarian

  bowel

Common side effects

The relatively minor side effects listed in TABLE 92.4 may discourage women from persisting with oral contraception in the absence of appropriate explanation and reassurance. Management of these side effects is listed in the same table. It is useful in practice to have this list available as a ready reference for manipulating the COC if necessary. A common nuisance side effect is breakthrough bleeding in the first 2 months.

Table 92.4 Management of common side effects of COC[4,5]

Symptom	Change
Acne	Change to a pill containing an anti-androgenic (drospirenone, dienogest or cyproterone acetate) or less androgenic (gestodene, desogestrel or etonogestrel) progestogen
Breakthrough bleeding	Exclude underlying causes (e.g. chlamydia, pregnancy, missed pills, malabsorption, diarrhoea or vomiting, concurrent medications) Increase oestrogen if taking a pill with 20 mcg EE to a maximum of 35 mcg EE Change progestogen if already taking a pill with 30 or 35 mcg EE Consider vaginal ring
Breast tenderness	Decrease oestrogen and/or progestogen dose Consider change of formulation Consider using pill containing drospirenone
Chloasma	Change to non-oestrogen-containing contraception Avoid direct sun (use blockout)
Amenorrhoea	Exclude pregnancy Absence of withdrawal bleed is not harmful and occurs in 6% of cycles with EE and 20–30% of EV or E2 pills Switch to a pill with a more predictable bleeding pattern
Lowered libido, mood changes	No evidence of a difference between COCs Trial a change of formulation
Headache	Any new headache or marked changes in headache should be evaluated Reduce oestrogen dose If occurs in pill-free week, consider a pill with a reduced number of placebo pills, an extended regimen, running packs together or giving an oestrogen supplement in the pill-free weeks (100 mcg oestrogen patch or 2 mg or 4 mg oestradiol)
Nausea/vomiting	Reduce oestrogen Take the pills at night
[illegible]	[illegible]

Weight gain	Evidence does not support an increase in weight related to COCs Drospirenone pills are associated with a small, unsustained average weight loss of 0.5 kg in the first year and may be useful for some women

Important advice for the patient

- Diarrhoea and vomiting may reduce the effectiveness of the pill. If a woman vomits within 2 hours of taking an active pill, she should take an additional active pill.
- Withdrawal bleeds can be skipped for a woman's convenience, by going straight from the last active pill in the cycle to the first active pill in the next cycle. Running packs of multiphasic pills together can result in unpredictable bleeding as a result of the fluctuating dose of hormones.[9] A Cochrane Review did not demonstrate any additional safety concerns for women taking CHCs continuously without placebo breaks for up to 12 months.[10] An extended-regimen pill with 84 active pills plus 7 inactive pills is now available.

Missed pills

A missed pill is defined as one that is taken more than 24 hours late (>48 hours since last pill was taken). The advice is to take the missed pill as soon as possible, even if it means taking two pills in one day. Any previously missed pills should be discarded and the usual pill-taking schedule resumed. Condoms or abstinence should be used for 7 days (the 'Seven-day rule'). This advice does not apply to the quadriphasic pill Qlaira and the product information should be consulted. Refer to FIGURE 92.1 .

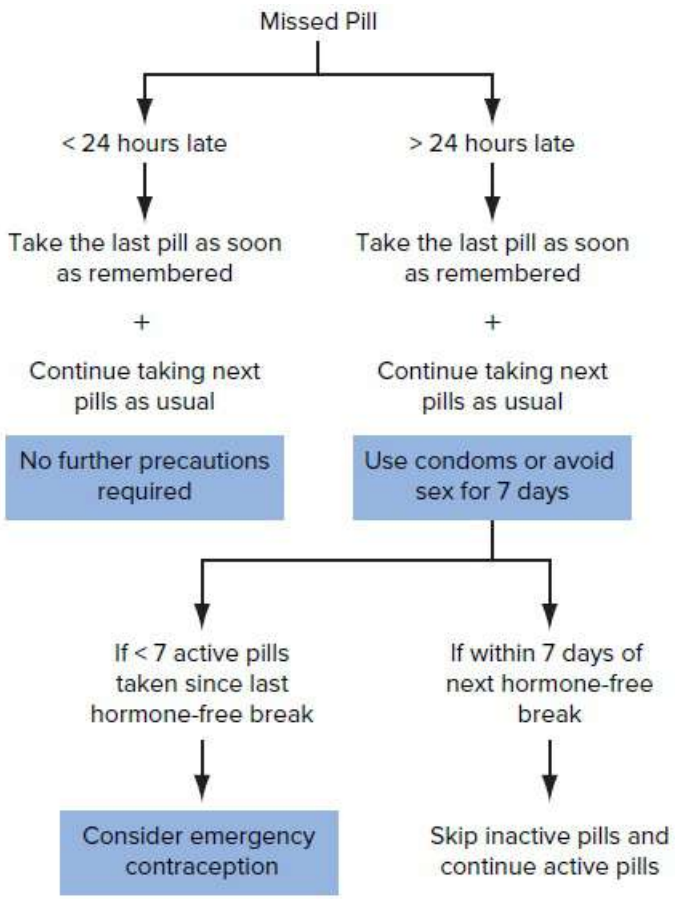

FIGURE 92.1 Missed combined oral contraceptive pill

If the pill is missed with <7 pills left before the next placebo break, skip placebos and continue active pills.

If <7 active pills were taken before the missed pill, consider emergency contraception if unprotected sex took place in the past 5 days. If ulipristal acetate emergency contraception is used, the woman needs to wait 5 days before restarting the pill.

Pill failure[7]

Causes of oral contraceptive failure include errors in administration, decreased absorption, missed pills and use of liver enzyme-inducing drugs. For women who have experienced pill failure and would prefer to use a CHC, consider tricycling the COC or vaginal ring packs and having a shorter placebo break.

Vaginal ring[7]

The first available contraceptive vaginal ring is NuvaRing®, a flexible polymer ring with 15 mcg EE and 120 mcg etonogestrel being released per 24 hours. Metabolic effects and side effects are

virtually the same as for the COC. It is immediately protective when inserted on days 1–5 of the menstrual cycle. It is then removed after 21 days with a break of 7 days or can be used 'back-to-back'. The cycle control is good, with a reduced incidence of irregular bleeding. This method may be useful for women who prefer the COC but are prone to missing pills, or women with inflammatory bowel disease or other malabsorption syndromes. It is recommended that the vaginal ring is not removed for intercourse.

Practice tip

Delaying a period:

- prescribe norethisterone 5 mg bd or tds for 3 days prior to expected period
- period resumes 2–3 days after stopping tablets

Emergency contraception[7]

- Ulipristal acetate 30 mg orally as a single dose within 5 days
- Levonorgestrel 1.5 mg as a single dose (double dose if >70 kg or BMI >26) within 4 days
- 25 levonorgestrel POPs (25 × 30 mcg) as an initial dose, repeating the same dose 12 hours later
- Copper IUD inserted within 5 days

Uliprisital acetate is a selective progesterone receptor modulator that acts by preventing or delaying ovulation. It does this more effectively than the levonorgestrel emergency contraceptive pill (LNG-ECP), which is licensed for use only up to 72 hours after intercourse. Effectiveness for both is improved the earlier they are taken.

The copper IUD is highly effective at 99% and can provide very reliable ongoing contraception. It may be appropriate to advise the woman seeking postcoital contraception to return for pregnancy testing in 3–4 weeks, depending on her risk. STI screening and the need for ongoing contraception should be considered.

Barrier methods[7]

Barrier methods include male and female condoms and vaginal diaphragms. If used correctly, male condoms are very effective contraceptives with an efficacy of 98% with perfect use and 88% with typical use.

Condoms are also very effective in preventing the spread of STIs, including HIV infection. The main disadvantage is that they are mainly reliant on the cooperation of the user.

Diaphragms are inserted at any convenient time before intercourse and removed after 6 hours have elapsed since the last act of intercourse. Efficacy is 82% and support may be required to ensure correct insertion and coverage of the cervix.

Fertility awareness methods

These methods require high motivation and some require regular menstrual cycles.

Basal body temperature method

Coitus should occur only after there has been a rise in basal body temperature of 0.2°C for 3 days (72 hours) above the basal body temperature measurement during the preceding 6 days, until the onset of the next menstrual period.

Calendar or rhythm method

The woman reviews and records six cycle lengths and then selects the shortest and longest cycles. She then subtracts 21 from the shortest cycle and 10 from the longest cycle to work out fertile and safe days (i.e. for a 26 to 30-day cycle: fertile days 5–20; for regular 28-day cycle: fertile days 7–18).

Billings ovulation method[7,11]

This method is based on keeping a daily record of the sensation at the vulva and the appearance of the mucus, so that ovulation can be recognised and intercourse, in the pre-ovulatory time, can be confined to when the record shows an unchanging pattern, signalling unchanging hormones and thus infertility. The fertile phase commences when there is a change in the sensation or mucus, correlating with a rise in oestrogen. This sensation at the vulva will become progressively more lubricative and will be followed by a definite change to being no longer slippery (caused by rising progesterone). The peak day of fertility is the last day of the slippery sensation, with or without the visual presence of mucus. The postovulatory infertile phase begins on the fourth day after the peak day. Regular cycles are not required for successful use of the Billings ovulation method.

Withdrawal method or coitus interruptus

Male withdrawal before ejaculation is still a widely used method of contraception and will continue to have a definite place in contraceptive practice.

Lactational amenorrhoea method (LAM)[5]

LAM is as reliable as hormonal methods of contraception if the baby is younger than 6 months, is exclusively breastfed with no long intervals between feeds (no more than 4 hours during the day or 6 hours at night) and the woman remains amenorrhoeic postpartum. Lactation is not a reliable contraceptive method once any of these criteria is not met. Since some women may ovulate prior to the onset of menses, an additional method of contraception should be advised to reduce the risk of another pregnancy.

Ceasing contraception and menopause[12]

Women using non-hormonal contraception (i.e. barrier, copper IUD, rhythm) can be advised that contraception is no longer required once they have been amenorrhoeic for 12 months over the age of 50 years and after 2 years before the age of 50.

Oestrogen-containing contraception and DPMA injections are not recommended after 50 years. After this age, women should switch to an alternative progestogen-only or non-hormonal method.

A 52 mg levonorgestrel IUD (Mirena) inserted from the age of 45 years can continue to be used for contraception until 55 years.

Women over the age of 50 who are amenorrhoeic for 12 months while using progestogen-only contraception may have a follicle stimulating hormone (FSH) level blood test. If it is >30 IU/L, contraception can be ceased after a further 12 months. If the FSH is 30 IU/L or less, repeat after 12 months. Contraception is not required beyond the age of 55 years.

Permanent contraceptive methods

Vasectomy[13]

A vasectomy involves interruption or occlusion of the vas deferens, preventing the passage of sperm from the testes to the penis. The procedure is generally performed in an outpatient setting under local anaesthesia. It is important to confirm the absence of spermatozoa in the ejaculate 3 months after the operation, before ceasing other contraceptive methods. It takes about 20 ejaculations to clear the remaining sperm from the semen.

For the average man undergoing vasectomy reversal, pregnancy rates range between 50 and 70%. This rate decreases as the interval between vasectomy and its reversal increases.

Tubal ligation

Female sterilisation is usually performed by mini-laparotomy or laparoscopy, at which time clips are applied to each fallopian tube. This is a potentially reversible method of contraception with 50% of women achieving pregnancy after reversal. Efficacy is >99.5%.[7]

Unintended pregnancy

One-third of Australian women experience an unintended pregnancy in their lifetime and 30.4% of these pregnancies will end in abortion (one in five Australian women).[14] It is important not to make assumptions about the 'wantedness' of a pregnancy.

Termination of pregnancy has been decriminalised in most states; however, the law is different in every state and territory. The main methods used are the traditional surgical methods such as suction evacuation and medical abortion. Surgical abortions can be performed from 6–7 weeks. There is an increased risk of continuing pregnancy if performed before 6 weeks.

Medical abortions are usually performed before 9 weeks using mifepristone, an anti-progesterone, and then the prostaglandin analogue misoprostol 36–48 hours later. Vaginal bleeding and cramping usually occur within 3–6 hours and declines over 10–16 days. Complications are rare, with one study reporting 4.8% of women required surgical intervention, most due to retained clot and 0.76% due to continuing pregnancy.

Prevention of unintended pregnancy is an important public health issue, with higher rates in women living in rural areas and those from poorer socioeconomic backgrounds. General practice is critical to increasing LARC uptake, as per guideline recommendations.

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93 Breast disorders

Neither the cause of breast cancer, one of the most feared and emotion-engendering diseases, nor the means of preventing it are absolutely known.

ANONYMOUS LECTURER ON BREAST CANCER

Breast symptoms are common and their discovery provokes considerable anxiety and emotion because, to many women, a change in their breast means cancer.

Many breast lumps are actually areas of thickening of normal breast tissue. Many others are due to fibrocystic disease with either fibrosis or cyst formation or a combination of the two producing a dominant (discrete) lump.

Breast pain (mastalgia) can vary from localised breast pain due to an infection or a breast cyst to diffuse bilateral pain. For both breast presentations, the possibility of cancer must always be considered.

Breast pain (mastalgia)

Mastalgia usually presents as a heaviness or discomfort in the breast or as a pricking or stabbing sensation. The pain may radiate down the inner arm when the patient is carrying heavy objects or when the arm is in constant use, as in scrubbing floors.

Key facts and checkpoints

- The typical age span for mastalgia is 30–50 years.
- The peak incidence is 35–45 years.
- There are four common clinical presentations:
  - diffuse, bilateral cyclical mastalgia

- diffuse, bilateral non-cyclical mastalgia
- unilateral diffuse non-cyclical mastalgia
- localised breast pain

- The specific type of mastalgia should be identified.
- The commonest type is cyclical mastalgia.
- Premenstrual mastalgia (part of type 1) is common.
- An underlying malignancy should be excluded.
- Less than 10% of breast cancers present with localised pain.
- Only about 1 in 200 women with mastalgia are found to have breast cancer.
- The problems, especially types 2 and 3, are difficult to alleviate.

A diagnostic approach

A summary of the diagnostic strategy model for mastalgia is presented in TABLE 93.1 .

Table 93.1 Mastalgia: diagnostic strategy model

Probability diagnosis
Pregnancy Cracked or inflamed nipple Cyclical mastalgia: • benign mammary dysplasia
Serious disorders not to be missed
Vascular: • acute coronary insufficiency • thrombophlebitis (Mondor disease) Infection: • mastitis • breast abscess Cancer: • breast (uncommon presentation)

- mastitis carcinomatosa

Pitfalls (often missed)

Pregnancy
Chest wall pain (e.g. costochondritis)
Pectoralis muscle spasm
Referred pain, esp. thoracic spine
Bornholm disease (epidemic pleurodynia)
Herpes zoster
Mechanical:

- bra problems
- pendulous breasts stretching Cooper ligaments
- weight change
- trauma

Rarities:

- hyperprolactinaemia
- nerve entrapment
- mammary duct ectasia
- sclerosing adenosis
- ankylosing spondylitis

Seven masquerades checklist

Depression
Drugs (e.g. OCP, HRT, marijuana)
Spinal dysfunction

Is the patient trying to tell me something?

Yes. Fear of malignancy. Consider psychogenic causes.

Probability diagnosis

In the non-pregnant patient, generalised pain, which may be cyclical or non-cyclical, is commonest. Typical patterns are illustrated in FIGURE 93.1 .

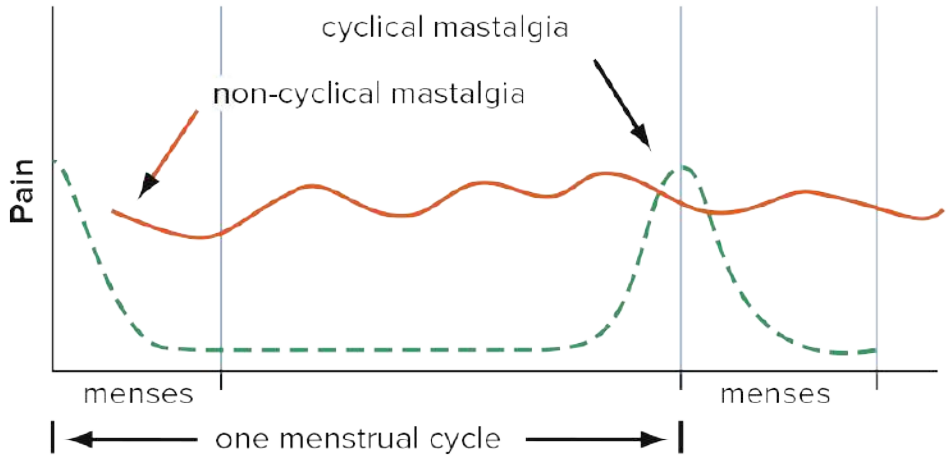

FIGURE 93.1 Pain patterns for cyclical and non-cyclical mastalgia

Cyclical mastalgia is the commonest diffuse breast pain. It occurs in the latter half of the menstrual cycle, especially in the premenstrual days, and subsides with the onset of menstruation. It obviously has a hormonal basis, which may be an abnormality in prolactin secretion. The main underlying disorder is benign mammary dysplasia, also referred to as fibroadenosis, chronic mastitis, cystic hyperplasia or fibrocystic breast disease.

Non-cyclical mastalgia, which is pain that does not vary within the menstrual cycle, is also quite common and the cause is poorly understood. It may be associated with mammary duct ectasia.

Serious disorders not to be missed

The three important serious disorders not to be missed with any painful chest condition—neoplasia, infection and myocardial ischaemia—are applicable for breast pain.

Neoplasia

We must avoid the trap of considering that breast pain is not compatible with malignancy. Mastalgia can be a presenting symptom (although uncommon) of breast cancer. ‘Mastitis carcinomatosa’ (inflammatory breast cancer), which is a rare florid form of breast cancer found in young women, often misdiagnosed as mastitis during lactation, is red, hot and of rapid onset but not invariably painful or tender.[1] Pain may also be a symptom in juvenile fibroadenoma, a soft rapidly growing tumour in adolescents, and in fibroepithelial breast lesions (including fibroadenoma and phyllodes tumours) of adult women.

Infection

Mastitis is common among nursing mothers, although it can also occur in non-lactating women as idiopathic or granulomatous mastitis. It should be regarded as a serious and urgent problem because a breast abscess can develop quickly. Apart from bacterial infection, infection with

Candida albicans may occur following the use of antibiotics. *Candida* infection usually causes severe breast or nipple pain, producing a feeling like ‘hot cords’, especially during and after feeding. In non-lactating women, it is important to exclude inflammatory breast cancer.

Myocardial ischaemia

A constricting pain under the left breast should be regarded as myocardial ischaemia until proved otherwise.

Pitfalls

These include various causes of apparent mastalgia, such as several musculoskeletal chest wall conditions and referred pain from organs such as the heart, oesophagus, lungs and gall bladder and, in particular, from the upper thoracic spine.

Musculoskeletal conditions include costochondritis, pectoralis muscle strains or spasm, and entrapment of the lateral cutaneous branch of the third intercostal nerve. Ankylosing spondylitis can affect the chest wall under the breasts. Mastalgia may be the first symptom of pregnancy. Pregnancy should be excluded before commencing drug treatment.

Seven masquerades checklist

Of these, depression, drugs and spinal dysfunction are probable causes. Drugs that can cause breast discomfort include oral contraceptives, HRT and methylxanthine derivatives such as theophylline. Drugs that cause tender gynaecomastia (more applicable to men) include digoxin, cimetidine, spironolactone and marijuana.

Dysfunction of the upper thoracic spine and even the lower cervical spine can refer pain under a breast. If suspected, these areas of the spine should be examined.

Psychogenic considerations

The symptoms may be exaggerated as a result of an underlying psychogenic disorder, but with a symptom such as breast pain most women fear malignancy and need reassurance.

The clinical approach

History

It is important to relate the pain to the menstrual cycle and determine whether the patient is pregnant or not.

Key questions

- Could you be pregnant?
- When was your last period?
- Is the pain in both breasts or only one?
- Do you have pain before your periods (cyclical mastalgia) or all the time during your menstrual cycle?
- Do you have pain in your back or where your ribs join your chest bone?

Examination

The breasts should be systematically inspected for skin or nipple changes, deformities, dimpling or asymmetry, and palpated to check for soreness or lumps. The underlying chest wall and thoracic spine should also be examined, as well as the bilateral axillae for axillary lymphadenopathy.

Investigations

The following specialised tests could be considered.

Mammography should be considered in older women. It is less reliable in young women and should be used with caution in women under 35 years.

Ultrasound can be complementary to mammography as it is useful to assess a localised mass or tender area. It is inappropriate to use for generalised breast screening alone. It is more useful in premenopausal breast tissue.

FNA or core needle biopsy can be useful to diagnose an area of localised pain, especially in the presence of a possible mass. In large symptomatic cysts or abscesses, FNA can also be therapeutic.

Consider a chest X-ray and ECG.

Mastalgia in children

Breast pain is uncommon in children, including puberty, but it may be a presenting problem in the late teens. Pubertal boys may complain of breast lumps under the nipple (adolescent gynaecomastia) that may be tender (less common) but are often self-limiting and do not require specific treatment.

Types of mastalgia

Mastalgia in adults

Breast pain is rare after the menopause but can be associated with HRT use, where it tends to present as the diffuse bilateral type. If the problem is related to the introduction of HRT, the oestrogen dose should be reduced or an alternative preparation used. It is important to exclude malignancy as a cause of breast pain in postmenopausal women.

Cyclical mastalgia

The features of cyclical mastalgia are:

- the typical age is 30–40 years (mean 35)
- discomfort and sometimes pain are present
- usually bilateral but one breast can dominate (usually upper outer quadrant, due to the distribution of breast glands)
- related to the menstrual cycle, mainly premenstrual
- usually resolves on commencement of menstruation
- breasts may be diffusely nodular or lumpy
- variable relationship to the pill

Cyclical mastalgia is rare after the menopause.

Non-cyclical mastalgia

The features of non-cyclical mastalgia are:

- the typical age is the early 40s (median age 41 years)
- bilateral and diffuse
- continuous or intermittent
- pain present throughout the cycle
- no obvious physical or pathological basis

Management for mastalgia (both types)

After excluding a diagnosis of cancer and aspirating palpable cysts, various treatments are possible and can be given according to severity.[2]

Acknowledge the condition and its discomfort.

Approach to treatment[3]

- Reassurance—explain high remission rate
- Regular review and breast self-examination
- Proper brassiere support—expert fitting
- Cease smoking (if applicable)
- Aim at ideal weight
- Adjust oral contraception or HRT (if applicable)
- Analgesia (e.g. paracetamol 0.5–1 g (o) 4–6 hourly prn)
- Stress reduction strategies

Many products have been promoted and tried but there is no convincing evidence to support the use of vitamins B1, B6, B12 and E, diuretics, NSAIDs, narcotics, caffeine reduction and even evening primrose oil, which is a favoured product and has been helpful for many women.[4,5,6]

Evening primrose oil contains an essential fatty acid claimed to be lacking in the diet, and replacement allows for the production of prostaglandin E, which counters the effect of oestrogen and prolactin on the breast. However, according to the multicentred European RCT, it is no more effective than placebo,[7] but the placebo effect in these trials was strong.[5,6]

A dose of 1000 mg three times daily for 3–4 months is recommended if a trial of treatment is planned.[5] There is some evidence to support the use of a topical NSAID medication (e.g. diclofenac gel).[4]

Recent systemic reviews from RTCs assessed the effectiveness of danazol,[8] bromocriptine and tamoxifen and showed that all provided significant relief, but that all have the potential for severe adverse effects.

For very severe mastalgia it is recommended to refer to a breast specialist to consider prescribing tamoxifen or danazol.[5]

Non-cyclical mastalgia is very difficult to treat, being more refractory than cyclical mastalgia.

Focal lesions

Surgical excision may be required for local lesions. If there is no discrete lesion but a tender trigger point (including costochondritis), the injection of local anaesthetic and corticosteroid may relieve the problem.

Costochondritis (Tietze syndrome)

This is a common cause of referral to a breast pain clinic. The cause is often obscure, but the costochondral junction may become strained in patients with a persistent cough. The pain can appear to be in the breast with intermittent radiation round the chest wall and is initiated or aggravated by deep breathing and coughing.

Features:

- the pain is acute, intermittent or chronic
- the breast tissue is normal to palpation
- palpable swelling about 4 cm from sternal edge due to enlargement of costochondral cartilage
- X-rays are normal
- it is self-limiting, but may take several months to subside

Treatment. Infiltration with local anaesthetic and corticosteroid with care. Otherwise use NSAIDs or paracetamol.

Mastitis

Mastitis is basically cellulitis of the interlobular connective tissue of the breast. Mostly restricted to lactating women, it is associated with a cracked nipple or poor milk drainage, including poor infant positioning. The infecting organism is usually *Staphylococcus aureus*. Mastitis is a serious problem and requires early treatment. Breastfeeding from the affected side can continue as the infection is confined to interstitial breast tissue and doesn't usually affect the milk supply.

Clinical features

- A lump and then soreness (at first)
- A red tender area

  Possibly

- Fever, tiredness, muscle aches and pains

Note: Candida infection usually causes severe breast or nipple pain—a feeling like a hot knife or hot shooting pains, especially during and after feeding. It may occur after a course of antibiotics.

Prevention (in lactation)

- Maintain free breast drainage—keep feeding