

- thiazolidinediones for diabetes
- long-term heparin
- excessive thyroid hormone replacement
- prostate or breast cancer hormone therapy

Prolonged immobilisation

---

## Investigations

---

- Plain radiography is of limited value except in detecting fractures. Osteoporosis is not detectable until 40–50% of bone is lost.
- 25-hydroxy vitamin D: normal range 75–250 nmol/L.
- Plasma calcium, phosphate and alkaline phosphatase, parathyroid hormone (usually Page 938 normal).
- Thyroid stimulating hormone.
- Parathyroid hormone.
- Consider tests for multiple myeloma in an osteoporotic area.
- Densitometry can predict an increased risk of osteoporosis and fracture, the best current modality being dual energy X-ray absorptiometry (DEXA scan) in a facility with high-standard quality control.<sup>3</sup> The spine and femoral neck are targeted: the femoral neck is the most useful index.

### DEXA, T scores and Z scores<sup>5</sup>

DEXA is the current gold standard for the diagnosis of osteoporosis. It assesses both whole-body and regional bone mass (lumbar spine and proximal femur). Bone mass is measured as bone mineral density (BMD) in g/cm<sup>2</sup> and the lower the BMD, the higher the risk of fracture. Each bone and each type of DEXA measuring machine has its own normal range of values.

The BMD ‘T score’ is the number of standard deviations (SD) away from the mean BMD of a 30-year-old adult (see TABLE 81.2). Osteopenia (low bone density) is 1–2.5 SDs below the young adult standard mean. Osteoporosis is >2.5 SD below this mean. This is a strong indicator of bone fragility. Consider treatment if T score is <-2.5.

**Table 81.2** Interpretation of T scores (WHO criteria)

T score	Interpretation
≥-1.0	Normal
-1 to -2.5	Osteopenia
≤-2.5	Osteoporosis
<-2.5 with fracture	Severe osteoporosis

The BMD ‘Z score’ is the number of SDs away from the age- and sex-matched mean BMD. The Z score is used to express bone density in people <50 years, premenopausal women, younger men and children. If low (<-2) it indicates prompt investigation for underlying causes of a bone deficit.

BMD is subsidised under the MBS<sup>6</sup> for:

- people over the age of 70 years (2 or 5 yearly screening, depending on first T score)
- diagnosis of osteoporosis following a low-impact fracture
- screening for people with specific medical conditions or treatments likely to cause osteoporosis (annual)
- subsequent monitoring of low BMI (minimum interval of either 1 or 2 years)

Page 939

The decision whether to measure BMD in non-subsidised situations, and whether to treat a low BMD, may also be guided by an assessment of absolute fracture risk. The FRAX tool is commonly used, although somewhat controversially was developed by manufacturers of osteoporosis medication.<sup>7</sup>

## Treatment

---

The management of osteoporosis starts with restoring mobility and instituting measures to prevent falls. Underlying diseases that may be responsible for increased bone fragility should be identified and treated where possible. Carefully consider deprescribing medications adding to the risk of osteoporosis and falls.

The goal of drug treatment is to prevent osteoporosis or reduce further loss. Eliminate risk factors where possible and focus on optimal lifestyle measures as a baseline for management. No treatment has been shown to replace lost bone effectively. Anabolic agents such as nandrolone decanoate may reduce further loss but the side effects are problematic. The list of recommendations from the American College of Physicians is noteworthy.

## Recommendations of American College of Physicians<sup>5</sup>

- Treat women who have known osteoporosis with alendronate, risedronate, zoledronic acid or

denosumab to reduce the risk for hip and vertebral fractures.

- Treatment should last 5 years (oral) or 3 years (annual IV), then usually cease unless recent fracture.
- Menopausal hormone therapy should not be prescribed to treat osteoporosis in women.
- BMD monitoring during the 5-year treatment period is not advised as evidence suggests that women see fracture reduction benefits regardless of BMD changes.
- Offer bisphosphonate therapy to men with clinically recognised osteoporosis.
- For osteopenic women  $\geq 65$  at high fracture risk, decisions to treat should take into account patient preference, fracture-risk profile, benefits, harms and price of medications.
- Denosumab can cause hypocalcaemia, which could lead to heart failure.

## Medications of value in decreasing further loss<sup>3</sup>

The following medications may be valuable in preventing further bone loss, possibly reversing the osteoporosis process and preventing further fractures.

- HRT (long-term use is not recommended but weigh potential benefits versus harms in females)<sup>8</sup>

*or*

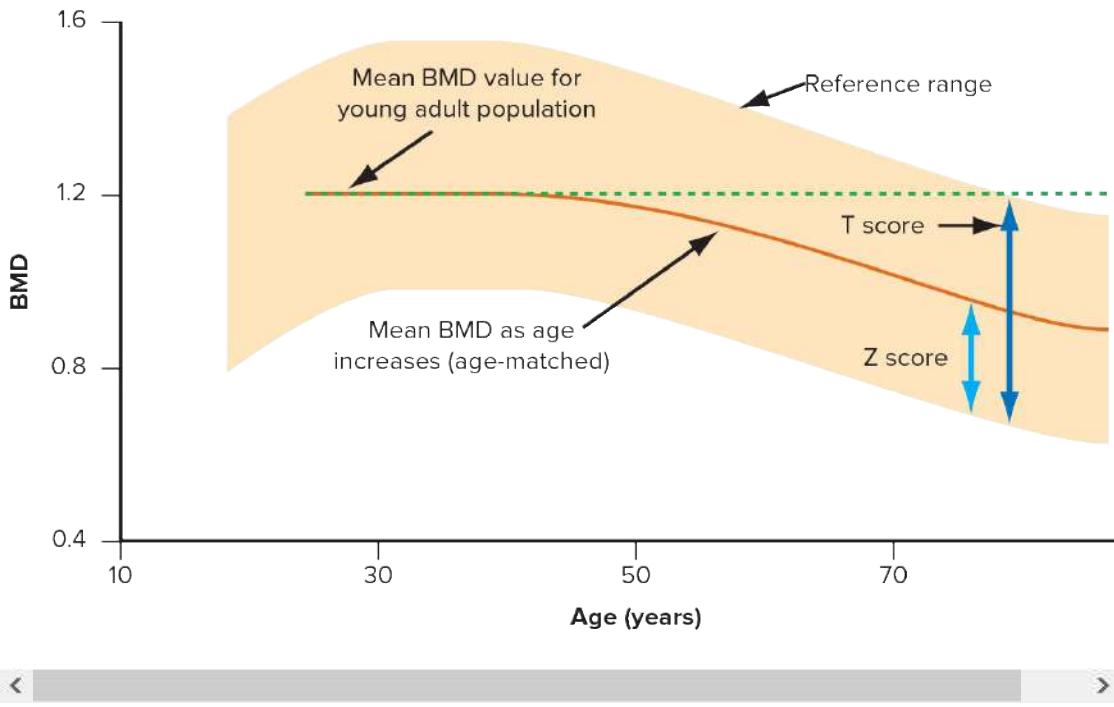
- bisphosphonates (decrease bone absorption)<sup>3</sup>—can be used alone or combined with other agents (take care with potential adverse effects of oesophagitis and osteonecrosis of jaw):

alendronate 70 mg (o) once weekly on an empty stomach (take care with potential side effect of oesophagitis)

risedronate 150 mg (o) once monthly or 35 mg (o) once weekly or in combination Page 940 therapy with calcium carbonate  $\pm$  vitamin D

zoledronic acid, single annual IV injection

- raloxifene (a selective oestrogen-receptor modulator) (SERM) 60 mg (o) daily
- teriparatide (second-line agent: a synthetic form of human parathyroid hormone) increases bone formation—give 20 mcg SC once daily
- denosumab (a monoclonal antibody) 60 mg SC, once every 6 months, once calcium intake and vitamin D levels are optimal—a potential risk factor for osteonecrosis of the jaw, especially in patients with bone cancer



**FIGURE 81.2** Illustration of T scores and Z scores

The choice depends on the clinical status, such as age and the extent of disease, the individual's tolerance of drugs and further clinical trials of these drugs.

### Recommendations for prevention<sup>3,7,8,9</sup>

- Lifestyle factors: stop smoking, limit caffeine and alcohol (2 SDs/day)
- Maintain adequate nutrition: aim for ideal body weight with recommended waist measurements (preferable) or BMI 18–25
- Adequate dietary intake of calcium:
  - at least 1000 mg/day in women <50 years and men <70 years; 1300 mg in women >50 years and men >70 years, and anyone on osteoporosis therapy
  - dairy food is the main source of dietary calcium and people should meet their requirements with a good diet; supplementation in non-institutionalised people is not required.
  - oral calcium supplements may be necessary where a person's diet does not meet their daily calcium requirements, particularly in postmenopausal women
- Calcium citrate is better absorbed than carbonate<sup>3</sup>—recommend:
  - calcium citrate 2.38 g (= 500 mg elemental calcium) daily
  - or
  - calcium carbonate 1.5 g (= 600 mg elemental calcium) daily with food

- Calcium-rich foods include low-fat calcium-enriched milk (500 mL contains 1000 mg, around double normal milk), other low-fat dairy products (e.g. yoghurt or cheese), fish (including tinned fish such as salmon with the bone), citrus fruits, sesame and sunflower seeds, almonds, brazil nuts and hazel nuts
- Vitamin D deficiency and sunlight:<sup>9,10</sup> there is evidence we need significant exposure to sunlight of the face, bare arms and hands to produce natural vitamin D (e.g. for those at risk—in summer 6–7 minutes mid-morning or mid-afternoon; in winter 7–40 minutes at noon with as much bare skin as possible). Refer to regional recommendations.<sup>11</sup> Measure serum 25-hydroxy vitamin D and ideally maintain it at >50 nmol/L. Mild deficiency is 30–49 nmol/L, moderate 12.5–29, severe <12.5. If supplementation is required use cholecalciferol 25–50 mcg (1000–2000 IU) (o) daily.<sup>3</sup>
- Exercise: moderate exercise against gravity—walking (brisk walking for 30 minutes 4 times a week) or jogging may make a small contribution to retarding bone loss, but also help reduce falls. Highly osteogenic exercise includes basketball, tennis, dancing and gymnastics.
- Attention to falls prevention, including avoiding falls (refer to [CHAPTER 125](#) ).<sup>12</sup>
- ‘Hip protectors’ for osteoporotic patients at increased falls risk have some weak evidence, but adherence can be poor.

## Natural remedies

---

An Australian review investigating the effect of natural remedies on BMD commented that there is good evidence that exercise increases BMD in postmenopausal women with osteoporosis, little good-quality empirical evidence to support the use of natural progesterone cream and insufficient evidence to support the use of boron, cod liver oil or chelated calcium supplements (as opposed to calcium carbonate).<sup>13</sup>

There is no evidence that complex mineral preparations have added benefit and often they contain less elemental calcium than simple preparations.<sup>3</sup>

## Monitoring osteoporosis treatment<sup>3</sup>

---

Recommendations are to measure BMD at the lumbar spine and hip:

- 2 years after therapy begins
- 1–2 years after therapy changes significantly or where high risk of bone loss (long-term glucocorticoids or post-transplant)

## Osteoporosis in children

---

The main problem in children is secondary osteoporosis, which is usually related to chronic inflammatory disorders which require treatment with corticosteroids and/or cause reduced mobility. Other medical causes are malignancy, malabsorption syndromes, poor nutrition, anorexia nervosa and hypogonadism. Osteogenesis imperfecta is a rare primary cause.

Use DEXA to assess and monitor BMD and Z scores. Refer for specialist treatment, which may be based on bisphosphonates.

## Osteoporosis in men

---

Refer to [CHAPTER 102](#).

## When to refer

---

- Children and young adults with osteoporosis
- Postmenopausal women and older men if they have an individual need
- Osteoporosis is secondary to an underlying illness that complicates normal management
- Advice is required about managing pathological osteoporotic fractures or loss of height

## Patient education resource

---

Hand-out sheet from *Murtagh's Patient Education* 8th edition:

- Osteoporosis

## Resource

---

NICE Fragility fracture risk (2012). Available from: <https://www.nice.org.uk/guidance/CG146>, accessed April 2021.

## References

---

- 1 Australian Institute of Health and Welfare. Estimating the prevalence of osteoporosis. Cat. no. PHE 178. Canberra: AIHW.
- 2 Phillips P. Osteoporosis. Check Program 366. Melbourne: RACGP, 2002: 5–31.
- 3 Osteoporosis [published 2016]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2016. [www.tg.org.au](http://www.tg.org.au), accessed September 2017.

- 4** Porter RS, Kaplan JL. *The Merck Manual* (19th edn). Whitehorse Station: Merck Research Laboratories, 2011: 356.
- 5** Gupta A, March L. Treating osteoporosis. Aust Prescr, 2016; 39: 40–6.
- 6** Department of Health. Bone densitometry. Available from: <http://www.health.gov.au/internet/main/publishing.nsf/content/diagnosticimaging-bd.htm>, accessed March 2021.
- 7** Cassels A. WHO exposes deceptive promotion of industry-supported FRAX osteoporosis screening tool. Health News Review, 2016. Available from <https://www.healthnewsreview.org/2016/12/frax-osteoporosis-screening-tool/>.
- 8** Ensrud KE, Grandall CJ. Osteoporosis. Ann Intern Med, 1 Aug 2017; 167(3): 17–32.
- 9** Newson CA et al. Vitamin D and health in adults in Australia and New Zealand: a position statement. Med J Aust, 2012; 196(11): 656–7.
- 10** Diamond TH et al. Working Group of the Australian and New Zealand Bone and Mineral Society, Endocrine Society of Australia and Osteoporosis Australia. Vitamin D and adult bone health in Australia and New Zealand: a position statement. Med J Aust, 2005; 182: 281–4.
- 11** Ebeling PR et al. An evidence-informed strategy to prevent osteoporosis in Australia. Med J Aust, 2013; 198(2): 90–1.
- 12** Gillespie LD et al. Interventions for preventing falls in older people living in the community. Cochrane Database Syst Rev, 2012; (9): CD007146.
- 13** Del Mar CB et al. Natural remedies for osteoporosis in postmenopausal women. Med J Aust, 2002; 176: 182–3.

## 82 Chronic pain

*The natural healing force within each of us is the greatest force in getting well.*

---

HIPPOCRATES, 400 BCE

In modern medicine the successful management of chronic pain poses a great challenge. Not only does the doctor need to address the patient's suffering of pain, but also their interpretation of the pain's significance and subsequent functional impairment.

Chronic pain's management or mismanagement is a yardstick of the excellence of that important bond—the doctor–patient relationship. GPs naturally want to alleviate patients' pain and have historically used analgesic agents (notably opioids) that have ultimately caused harm. Evidence is increasingly proving that medication has a reduced role in chronic pain management, in favour of non-pharmacological therapies and active self-management.

### Key facts and checkpoints<sup>1,2</sup>

---

- Twenty per cent of GP consultations in Australia involve chronic pain
- Chronic pain affects 1 in 5 Australians aged 45 and older
- In 2020, the financial cost of chronic pain was estimated to be \$144 billion (approximately 10% of Australia's GDP)
- The majority (68%) of Australians with chronic pain are of working age
- Fifty-six per cent of people with chronic pain have functional restrictions as a result
- Forty-five per cent of people with chronic pain also have depression and anxiety
- Suicide is reported to be two to three times higher in people with chronic pain
- Best practice does not support long-term use of medication for chronic pain management

- Australian data in 2018 revealed that opioids accounted for 3 deaths per day, the majority of which were unintentional and due to prescription opioids

## Definitions

Pain is defined as ‘an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage’.

It is worth noting that pain and nociception are different phenomena. The International Association for the Study of Pain has added that individuals learn the concept of pain, which is a personal experience influenced by biological, psychological and social factors. A person’s report or experience of pain should be respected.

The box below defines the variety of types of pain.

### Glossary of terms

**Allodynia** Pain due to a stimulus that does not normally provoke pain.

Mechanical—light touch feels painful.

Temperature—hot/cold stimulus (normally not painful) is painful.

**Anaesthesia dolorosa** Pain in an area or region that is anaesthetic.

**Analgesia** Absence of pain in response to stimulation that would normally be painful.

**Breakthrough pain** Pain which occurs between regular doses of analgesics and reflects increase in pain level above set baseline.

**Causalgia** A syndrome of sustained burning pain, allodynia and hyperpathia after a traumatic nerve lesion, often combined with vasomotor and sudomotor dysfunction and later trophic changes (now known as complex regional pain syndrome II).

**Central pain** Pain associated with a lesion of the central nervous system.

**Central sensitisation** Increased responsiveness of nociceptors in the central nervous system resulting in hypersensitivity to stimuli.

**Dysaesthesia** An unpleasant abnormal sensation, whether spontaneous or evoked (e.g. formication—a feeling like ants crawling on the skin, burning, tingling).

**Hyperaesthesia** Increased sensitivity to stimulation, excluding the special senses.

**Hyperalgesia** An increased response to a stimulus that is normally painful (i.e. painful stimulus feels much more painful than expected, such as firm finger pressure).

**Hyperpathia** A painful syndrome, characterised by an increased reaction to a stimulus, especially a repetitive stimulus, as well as an increased threshold for sensory detection.

**Hypoesthesia** Decreased sensitivity to stimulation, excluding the special senses. Page 943

**Hypoalgesia** Diminished pain in response to a normally painful stimulus.

**Incident pain** Pain that occurs on, or is exacerbated by, an activity (e.g. coughing, wound dressing, movement, weight-bearing).

**Neuralgia** Pain in the distribution of a nerve or nerves.

**Neuritis** Inflammation of a nerve or nerves.

**Neuropathic pain** Pain caused by a lesion or disease of the somatosensory nervous system (peripheral or central).

**Neuropathy** A disturbance of function or pathological change in a nerve.

**Nociceptive pain** Pain arising from stimulation of normal superficial or deep tissue pain receptors (nociceptors) from tissue injury or inflammation. From Latin ‘nocere’, to injure.

**Nociplastic pain** Pain arising from altered function of the nociceptive pathways or cerebral cortex in the absence of a nociceptive stimulus or neuropathic lesion.<sup>3</sup>

**Paraesthesia** Abnormal sensation, whether spontaneous or evoked.

**Phantom pain** The sensation of the presence of a missing body part.

**Somatoform pain** Pain that has the qualities of pain arising from a physical (somatic) cause but not attributable to any objectively demonstrable organic causation (i.e. the expression of psychological distress as physical symptoms).

**Visceral pain** A type of nociceptive pain that originates from activation of nociceptors of internal viscera (organs).

## Origins of pain<sup>3</sup>

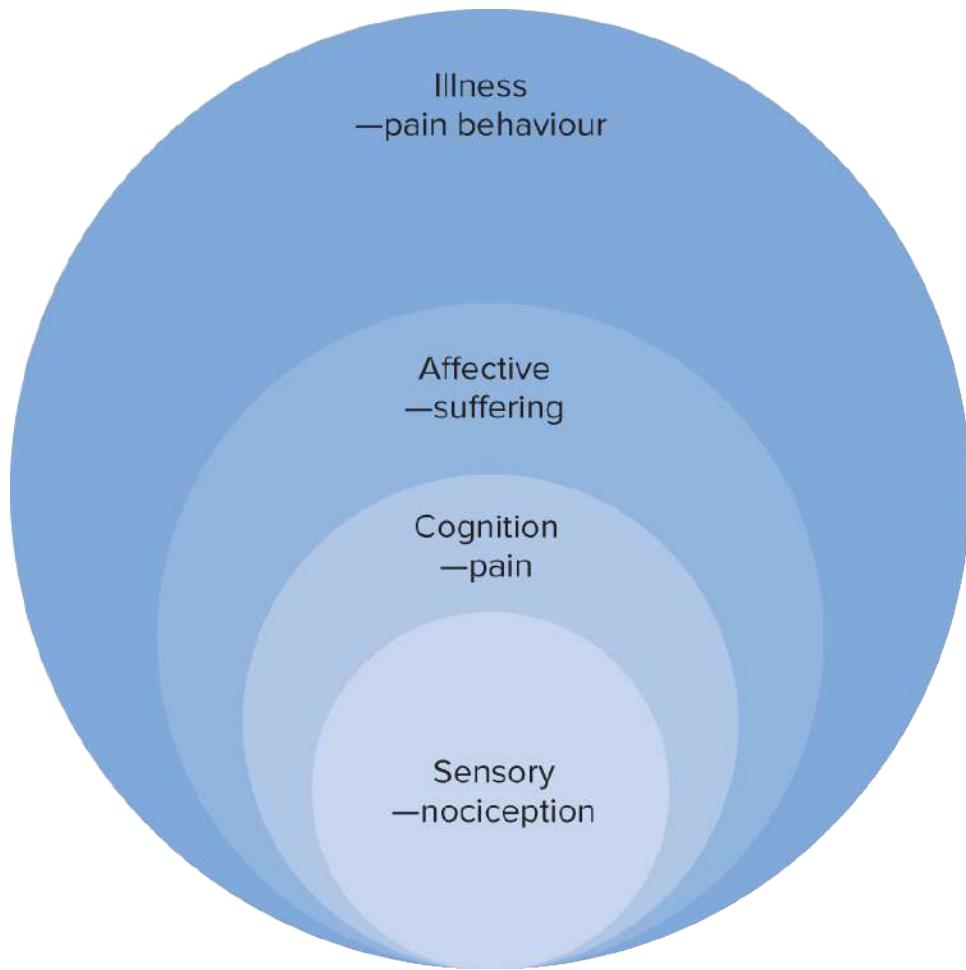
In general terms, the origin of conscious pain can be subdivided into three broad types—

nociceptive, neuropathic and nociplastic.

1. *Nociceptive pain* is pain arising from stimulation of superficial or deep tissue pain receptors (nociceptors) in response to a noxious stimulus. It requires an intact nervous system.  
*Nociception* is stimulation of peripheral nociceptors (i.e. nerve endings sensitive to a noxious stimulus).
2. *Neuropathic pain* is pain caused or initiated by a primary lesion or dysfunction (i.e. damage) in the peripheral or central nervous system. It can be subdivided into central pain, when the primary lesion is in the central nervous system, or peripheral pain. Neuropathic pain is a form of neurogenic pain in which there is actual nerve cell or axonal damage due to inflammation, trauma or degenerative disease. It is typically a constant burning, episodic shooting or electric pain.
3. *Nociplastic pain* is pain that arises from altered nociception despite no evidence of a nociceptive stimulus or lesion of the somatosensory system. It is a diagnosis of exclusion and central sensitisation is the key contributor. The experience of nociplastic pain depends on the affected pathways—it can be variable and non-specific, localised or widespread.

It should be emphasised that these types overlap and patients usually have more than one type of pain.

A conceptual approach to the components of pain is illustrated in [FIGURE 82.1](#) .



**FIGURE 82.1** A conceptual approach to the components of pain: a biopsychosocial model

Developing an understanding of pain depends on the knowledge of relationships between nociception, pain, suffering and pain behaviour. The first three components cannot be measured or completely understood in individuals and only the pain behaviour can be observed and measured by parties other than the patient.

## Categories of pain

---

Pain can be subcategorised as:

- acute pain
- cancer/palliative pain
- chronic non-cancer pain (CNCP)

## Acute pain

Acute pain is pain of recent onset and short duration that usually has an obvious pathological cause and typically resolves with resolution of the primary cause.

## Transition from acute to chronic pain<sup>4</sup>

The transition from acute to chronic pain is a complex, multifactorial process.

Page 944

It is unclear why chronic pain develops in some patients with an acute injury, illness or trauma, but doesn't develop in others. Risk factors are outlined in TABLE 82.1 .

Early and appropriate acute pain management by GPs, with patient education and support, may reduce the transition from acute to chronic pain.

**Table 82.1** Risk factors associated with the transition from acute to chronic pain.<sup>4</sup>

- Female gender
- Smoking
- Obesity
- Sedentary behaviour
- Low education level
- Low socioeconomic status
- Receiving compensation for a work-related injury or illness
- Disability
- Multimorbidity
- Genetic predisposition
- Pre-existing chronic pain
- Pre-existing opioid use
- Catastrophising
- Depression/anxiety
- Stress
- Poor coping skills

## Chronic non-cancer pain (CNCP)

Chronic pain may be defined as pain present for a period greater than 3 months, or pain present

for 4 weeks more than the expected time of recovery.

Chronic non-cancer pain, in itself, can be classified as a disease state. Over time, the experience of pain can shift from a peripheral sensory experience to a central nervous system response.<sup>5</sup> This process is called central sensitisation, which occurs as a result of upregulation of receptors in neurones from persistent stimulation. The process can continue even after healing of the original trigger.<sup>3</sup> Central sensitisation causes long-term central nervous system changes which present clinically as hyperalgesia and allodynia.

Central sensitisation is usually a feature of chronic pain, which presents clinically as hyperalgesia or allodynia.<sup>3</sup>

Chronic pain is a complex condition that is best understood using a sociopsychobiomedical framework. Chronic pain affects, and is affected by, multiple dimensions of a patient's life, including:

- social environment
- thoughts and emotions
- physical health and deconditioning
- sleep
- nutrition

## Underlying pathology

When it becomes apparent that a patient's pain has become chronic, it is critical to ensure that underlying pathology has been appropriately assessed and management optimised. Continue to review the nature of the pain and monitor for new pathology.

Common causes of CNCP include:

- musculoskeletal injuries
- arthritis
- migraines
- endometriosis

Conditions that have a higher rate of resulting in chronic pain include:

- nerve injuries
- herpes zoster
- chronic inflammatory conditions (e.g. spondyloarthropathies)

## Cancer/palliative care pain

Pain occurs in the majority of patients with advanced cancer and is often a significant symptom for patients with life-limiting illnesses. Treatment of cancer pain and pain in the palliative care setting requires a unique approach (see [CHAPTER 126](#) ).

## Assessing and measuring pain

---

A key component of chronic pain management is a comprehensive assessment. Pain is a subjective symptom and generates considerable emotion and frustration, and thus can be difficult to assess.

### The history

The classic historical approach is still an important approach. Patients can use the PQRST approach to describe their pain, namely, P—provoking factors (and palliative), Q—quality, R—radiation, S—severity and T—timing. Most practitioners use the SOCRATES approach to pain, namely:

**S** Site

**O** Onset and offset

**C** Character

**R** Radiation

**A** Associated symptoms

**T** Timing

**E** Exacerbating and relieving factors

**S** Severity

### Use of body charts

To assist with diagnosis and ongoing management of pain, it is helpful to get patients to [Page 945](#) chart the site and radiation of their pain on body charts—either total body charts or regional charts (e.g. the head). This is particularly helpful for spinal pain with referral patterns and fibromyalgia.

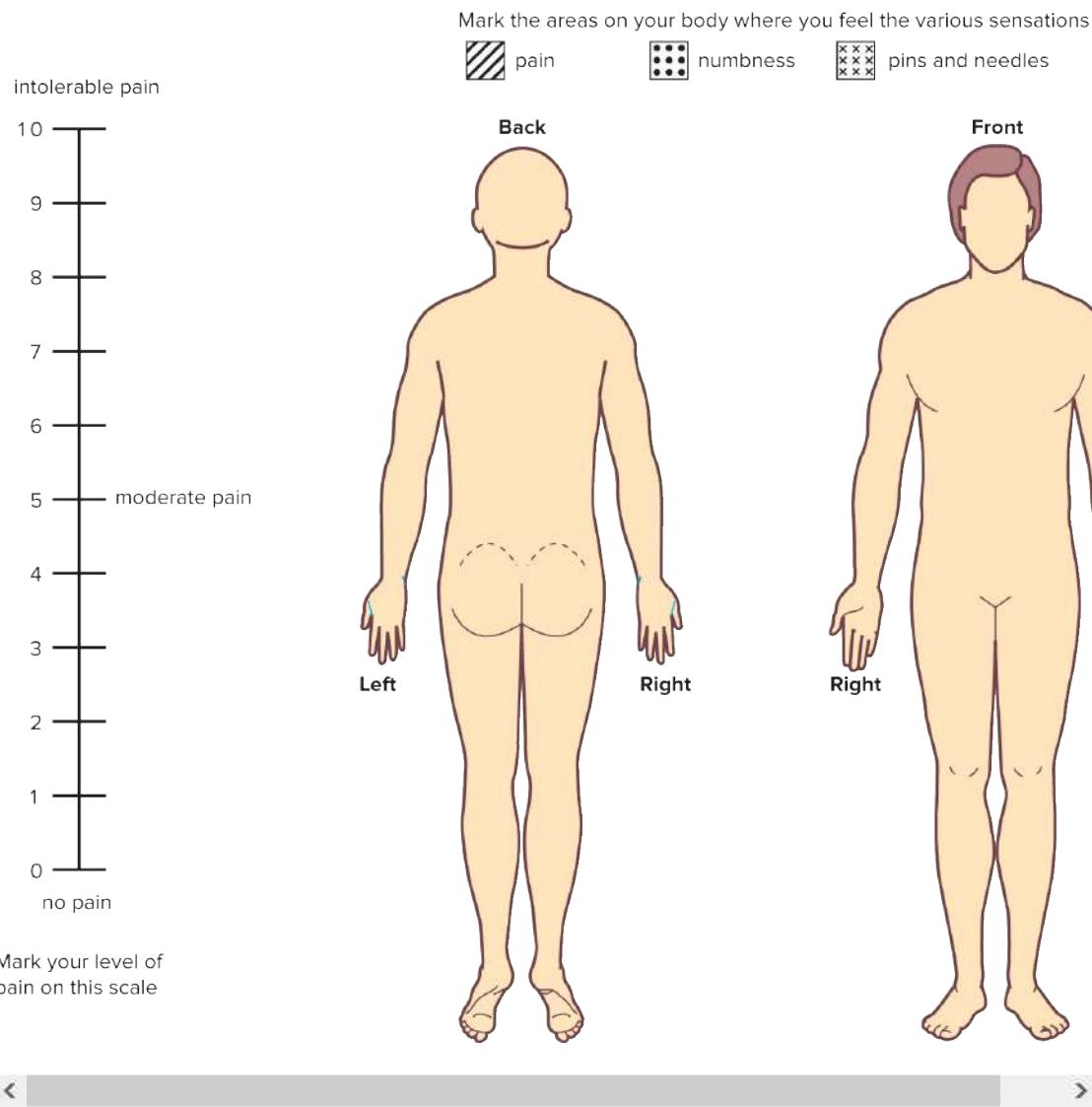
### Measurement of pain

Despite its subjective nature, it is good to record some type of repeatable measurement,

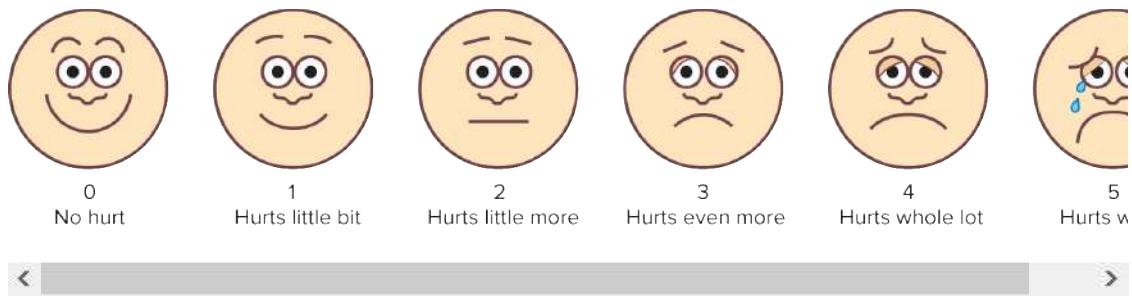
especially for chronic pain requiring treatment outcomes. This involvement also helps the patient.

## Unidimensional scales

Visual analogue scales (VAS), which are used as a research tool and well validated, can be useful in recording both acute and chronic pain levels. An example of a simple VAS linear scale on which the patient indicates the severity of their current pain is shown in [FIGURE 82.2](#) . A pictorial (faces) scale applicable to children is shown in [FIGURE 82.3](#) .



**FIGURE 82.2** Assessing pain using a visual analogue scale and body chart: ideal for lumbosacral pain



**FIGURE 82.3** Visual analogue scale: a faces pain rating scale ideal for children

### Multidimensional scales

These scales, which are usually employed for chronic pain, take into account several aspects of pain perception in addition to assessing functional effects and levels of disability. Examples include the:

- McGill Pain Questionnaire
- Pain Disability Index
- Form 36 Health Survey (SF-36)
- Oswestry low back pain questionnaire

## The holistic approach to chronic pain management

Management of chronic pain usually requires a multidimensional approach in which biological (pathological), psychological and social contributions to pain behaviour are evaluated and managed.

### Patient education

The most powerful therapy is adequate explanation, emphasising the complex interaction between the biological, psychological and social components that contribute to the experience of pain (see TABLE 82.2<sup>6</sup>).

If central sensitisation has occurred, it may be helpful to explain that pain is generated by the brain and that central sensitisation can produce severe symptoms that are real but not generally due to structural issues.<sup>7</sup>

Establish realistic expectations early in the treatment process:

- chronic pain is difficult to cure but can be successfully managed
- the role of medication is considered small
- the most successful therapies are non-pharmacological

**Table 82.2** Factors that influence the experience of pain<sup>8</sup>

**Increasing factors**

Fatigue  
Anger  
Depression  
Loneliness  
Challenging home or work environments

**Reducing factors**

Happy or contented disposition  
Drive to return to work  
Receiving empathy  
Companionship  
Adequate sleep  
Pleasant diversions  
Good home support

## Active self-management

Studies have indicated that the best care for chronic pain involves self-management by the patient with the support of a multidisciplinary team.<sup>9</sup> Self-management should include a multidimensional approach to improve function despite pain, which in turn may lead to reduced pain intensity.<sup>10</sup>

Motivational interviewing techniques are appropriate to assist patients in identifying their own treatment goals and then working to achieve these goals.

## A multidimensional approach

Assessing how pain affects a patient's life can help to consolidate their understanding that the goals of pain management should go beyond pain relief alone.

When making treatment goals, consider the following areas:<sup>10</sup>

- thinking patterns/emotional health
- physical activity
- social connection
- sleep
- nutrition
- work/study

## Non-pharmacological therapies

Appropriate non-pharmacological therapies for CNCP are listed in TABLE 82.3 .

**Table 82.3** Non-pharmacological therapies for chronic non-cancer pain<sup>9</sup>

Physical therapies	<ul style="list-style-type: none"><li>• general strengthening and aerobic exercise (graded up slowly)</li><li>• hydrotherapy</li><li>• physiotherapy</li><li>• occupational therapy</li><li>• tai chi</li><li>• yoga</li></ul>
Psychological therapies	<ul style="list-style-type: none"><li>• acceptance commitment therapy (ACT)</li><li>• attentional techniques (distraction from the pain)</li><li>• biofeedback</li><li>• cognitive behavioural therapy (CBT)</li><li>• counselling</li><li>• mindfulness-based stress reduction</li><li>• relaxation training</li></ul>
Other treatment options	<ul style="list-style-type: none"><li>• activity pacing to regulate activity levels of everyday tasks</li><li>• acupuncture</li><li>• attending a group pain management program</li></ul>

Source: Reproduced with permission from Medicinewise News: If not opioids, then what? NPS Medicinewise, 2 October 2019. Available from: <https://www.nps.org.au/news/if-not-opioids-then-what>, accessed April 2021.

## Multidisciplinary management

Once goals are agreed upon, a management plan can be formulated and, where possible, involve collaboration between the GP, allied health professionals and specialist services.

Page 947

### Allied health

- Psychologists—address negative thinking, mood and behaviour
- Physiotherapists—manage physical contributors to pain
- Exercise physiologists—support an increase in physical activity
- Occupational therapists—address functional restrictions
- Nurses—provide education and support
- Pharmacists—provide medication counselling if medication is used
- Dietitians—encourage healthy diet

### Multidisciplinary pain clinics<sup>10</sup>

Referral to specialist pain management services may be warranted when there is patient complexity or lack of progress with GP-based care. Referral is also appropriate for patients experiencing a high level of psychological distress and major functional impairment.

Multidisciplinary pain clinics vary and may involve pain specialists, psychiatrists and several allied health teams.

## Medication used in chronic pain<sup>11</sup>

Medication is a second-line strategy for management of chronic non-cancer pain (CNCP) and should only be used in conjunction with social, psychological and physical management techniques.

Medication options include analgesics and adjuvants. Adjuvants are drugs with analgesic properties, although pain is not their primary indication.

*Note:* Be mindful that prescribing medication may encourage a passive approach to pain management.

Medication used to treat CNCP include:

- Analgesics

paracetamol

NSAIDs, including aspirin and cyclo-oxygenase-2 (COX-2) specific inhibitors

opioids

- Adjuvants

antidepressants, TCAs (e.g. amitriptyline), SNRIs

gabapentinoids ( gabapentin, pregabalin)

NMDA blockers (ketamine)

alpha<sub>2</sub> agonists (clonidine)

cannabinoids

## Choice of medication

CNCP often involves more than one pain type. Irrespective of underlying nociceptive or neuropathic pathology, central sensitisation is usually a major contributor to chronic pain. Medications are less effective at managing the central sensitisation component of chronic pain.

- Paracetamol and NSAIDs are indicated for nociceptive pain
- Adjuvants are indicated for neuropathic pain
- Opioids have a limited role in chronic pain, regardless of pain type

There is no clear evidence for the use of combination drug therapy (i.e. multimodal analgesia) in CNCP.

## Analgesics used in chronic pain

If analgesics are used, they are usually required in the short- to medium-term until a patient has achieved self-management. Once self-management strategies have been achieved, the goal is to deprescribe analgesics.

### Paracetamol

Paracetamol is metabolised by the liver and has an excretion half-life of approximately 4 hours. Adverse effects are uncommon but gastrointestinal discomfort such as dyspepsia and nausea can occur occasionally. It should be administered with caution in patients with kidney or hepatic dysfunction.

Usual dosage:

1 g (o) 4 hourly (max. 4 g/day)

or

1.33 g modified release (o) 8 hourly (max. 4 g/day)

## NSAIDs

NSAIDs inhibit synthesis of prostaglandins by inhibiting cyclo-oxygenase (COX) present in COX-1 and COX-2. They can be used instead of or in addition to paracetamol.

Unfortunately, the use of NSAIDs involves a high incidence of side effects, ranging from the trivial to the lethal, with many deaths from bleeding ulcers, especially in the elderly. Other adverse effects include abdominal pain, renal impairment, bronchospasm, fluid retention, hypertension and cardiovascular events. It should be noted that naproxen does not appear to increase the risk of cardiovascular events.

TABLE 82.4 shows the classification of NSAIDs.

**Table 82.4** Classification of NSAIDs<sup>12</sup>

Action	Example
Non-selective inhibitors of COX-1 and COX-2, mainly in CNS	Paracetamol
Non-selective inhibitors of COX-1 and COX-2, acting in both CNS and periphery	Aspirin Ibuprofen Naproxen Diclofenac
<b>Selective NSAIDs</b>	
Specific inhibitors of COX-2	Celecoxib Etoricoxib Parecoxib
Preferential inhibitors of COX-2 over COX-1	Meloxicam

Note: COX = cyclo-oxygenase

The coxibs are a group of NSAIDs synthesised to inhibit COX-2 specifically. They are Page 948 on a par as an analgesic with the COX-1 inhibitors. Their gastrointestinal adverse reactions are less, but they have all the other adverse effects and drug interactions of COX-1 inhibitors. The

cardiovascular problems, including increased blood pressure, thrombosis (fatal myocardial infarction and stroke) and impairment of kidney function experienced with rofecoxib (withdrawn for safety reasons in 2004) indicate the potential problems of these agents.

## Prescribing recommendations

First-line options include:

celecoxib 100–200 mg (o) bd

*or*

ibuprofen 200–400 mg (o) tds

*or*

naproxen 250–500 mg (o) bd

If no pain relief has occurred after one week, cease treatment and consider other management strategies. If the NSAID has provided adequate relief, attempt deprescribing at regular intervals to reduce the risk of adverse effects.

## Aspirin

Aspirin has both analgesic and anti-inflammatory activity and has an extremely short half-life. The major problems with aspirin are gastrointestinal discomfort, ulceration and bleeding.

Usual dosage:

600 mg (o) 4 hourly (max. 4 g/day)

## Opioids

Opioids provide little, if any, benefit for CNCP and all have similar efficacy. Pain intensity may actually reduce if opioids are discontinued.

Opioids include codeine, tapentadol, oxycodone, buprenorphine, tramadol—and stronger ones—morphine, fentanyl, hydromorphone and methadone. Tapentadol is a new centrally acting opioid with some benefits for neuropathic pain.

Adverse effects, which are common (approximately 80%), include nausea and vomiting, constipation, dysphoria and hyperalgesia. Harmful effects include dependence, falls, cognitive effects, motor vehicle accidents, respiratory depression, accidental overdose and death.

Before prescribing opioids, assess the patient's risk of opioid misuse. A written agreement is highly recommended.

If a short-term trial is appropriate, initially use:

buprenorphine 5 mcg/hour patch, every 7 days (max. 20 mcg/hour)

*or*

morphine (modified release) 5–10 mg (o) daily or bd (max. 40 mg/day)

*or*

oxycodone (modified release) 5 mg (o) daily or bd (max. 30 mg/day)

*or*

tapentadol (modified release) 50 mg (o) daily or bd (max. 300 mg/day)

*or*

tramadol (modified release) 50 mg (o) daily or bd (max. 400 mg/day)

Review regularly and cease treatment if ineffective. Opioids should not be prescribed for longer than 12 weeks, unless under specialist advice.

## Adjuvants

There is evidence for the use of adjuvants for neuropathic pain, although limited evidence for their use for nociceptive pain. Target doses for neuropathic and nociceptive pain are similar; however, slower dose titration is required for patients with nociceptive pain because they often experience increased drug sensitivity.

Antidepressants including tricyclic antidepressants (TCAs) and SNRIs appear to relieve pain independently of their mood-altering effects.

Although there is limited evidence for combination therapy, it may be necessary to use two adjuvants concurrently. Trial deprescribing every 3 to 6 months.

### TCAs

amitriptyline *or* nortriptyline 5–12.5 mg (o) nocte (max. 150 mg/day)

### SNRIs

duloxetine 30 mg (o) daily (max. 120 mg/day)

*or*

venlafaxine (extended release) 37.5–75 mg (o) daily (max. 225 mg/day)

### Gabapentinoids

gabapentin 100–300 mg (o) nocte initially (max. 3600 mg/day in divided doses)

or

pregabalin 25–75 mg (o) daily initially (max 300 mg bd)<sup>16</sup>

Note: Regarding pregabalin and gabapentin:

Page 949

- They are renally excreted, therefore use with caution in the elderly and renally impaired.
- Try a small test dose at night in the elderly.
- Side effects include drowsiness, dizziness and generalised fatigue.
- Benefit has been shown to be limited, while side effects are common.
- They have potential for misuse and dependence, and can cause withdrawal symptoms if ceased suddenly.

Evidence for other anti-epileptic drugs such as lamotrigine, topiramate and valproate in chronic pain is very limited. Carbamazepine has been used in trigeminal neuralgia.<sup>6</sup>

## Ketamine

Ketamine (by oral, IM and IV routes) has been used by pain specialists for CNCP but evidence of benefit is limited. Neuropsychiatric adverse effects can be very disturbing. Effects on vital signs or consciousness levels have been reported.<sup>13</sup>

## Clonidine

Clonidine modulates noradrenergic inhibition of pain transmission and has been used by specialists as an adjuvant for CNCP. If used in the long term, abrupt cessation can result in rebound hypertension.

## Cannabinoids

The general public has shown increasing interest in the role of cannabinoids for CNCP. Currently, there is insufficient evidence to justify endorsement of their clinical use. There are also concerns about adverse events, including impaired respiratory function, psychotic symptoms and cognitive impairment.<sup>14</sup>

## Deprescribing opioids

Opioids cause significant harm, and deprescribing opioids should be attempted even in long-term legacy patients.

Deprescribing opioids requires a combination of strong patient motivation and support by the

practitioner with close observation.

Side effects vary depending on the rate of dose reduction and include a short-term increase in pain and opioid withdrawal effects (agitation, sleep disturbance, nausea/vomiting, diarrhoea, sweating, lacrimation).

Deprescribing can take months. As a general guide, perform a weekly stepwise dose reduction. A weekly reduction of 10% of the original opioid dose is usually handled well by patients. When a third of the original dose is reached, slow the taper to half the previous rate.

Adjuvants may assist with withdrawal symptoms such as agitation and sleep disturbance.

## Procedural interventions for chronic pain

---

Only consider an invasive procedure for patients who have realistic treatment goals and have used first-line management strategies without significant improvement. Expert advice is recommended.

Procedural interventions for chronic pain include:

- percutaneous radiofrequency neurotomy
- neuromodulation (spinal cord stimulation)
- epidural block

## Pain in children

---

The management of pain in children requires considerable sensitivity and wisdom. The principles of CNCP treatment for children are the same as for adults, with active self-management including the child's contribution as well as the family's.

The most important measures of progress are school attendance and participation in physical activities with peers.

## Assessment of pain

This is very important in children of all ages and should involve a careful history and examination. Self-reporting of pain is reliable in children over 4 years of age.

Scaling strategies can be used—the modified faces pain scale (see FIG. 82.3 ) is useful in younger children, while older children and teenagers can use a visual analogue scale.

## Medication used for children with CNCP

As for adults, medication is considered a second-line therapy in the management of CNCP in children.

A short-term trial of paracetamol or an NSAID may be considered for children struggling to achieve active self-management. When considering other medication such as opioids or adjuvants, specialist input is advised.

There is insufficient evidence that gabapentinoids, TCAs or SNRIs are effective for pain management in children. If an adjuvant is trialled, gabapentin is generally preferred.

## CNCP management in the elderly

---

Management of chronic pain in the elderly is particularly challenging. Elderly patients [Page 950](#) experience both higher rates of chronic pain, as well as increased medication adverse effects. The principles of management are the same as that for adults, with added awareness of the risk of medication harm.

### Some general rules and tips

- Start with 25–50% of the usual dose and titrate upwards according to response.
- Regularly monitor your patient's analgesic requirements and promptly deprescribe any ineffective medication.
- Avoid using combined drug therapy where possible.

## Complex regional pain syndrome<sup>14</sup>

---

Complex regional pain syndrome (CRPS) is a chronic pain syndrome in which the severity of pain is disproportionate to the injury.

CRPS affects the limbs—upper limbs more frequently in adults and lower limbs more frequently in children. The most common trigger is fracture, while other triggers may be trivial or difficult to identify.

Clinical features include vasomotor changes (skin colour or temperature), oedema, sweating asymmetry, motor dysfunction and trophic changes (hair, nail, skin).

First-line treatment is rehabilitation aimed at restoring function to the affected limb. If self-management is not achieved, consider referral to allied health providers or multidisciplinary pain service.

Ascorbic acid (vitamin C) 500–1000 mg (o) daily for 50 days may be considered following injury for those at increased risk.<sup>14</sup>

## Practice tips

---

- It is vital to establish a therapeutic alliance and acknowledge the distress caused by symptoms.
- Educate that chronic pain is a disease state in itself, with central sensitisation a common feature.
- Consider scheduling regular appointments to support patients as they achieve self-management.
- Recommend non-pharmacological therapies as first-line treatment.
- Set treatment goals that address sociopsychobiomedical factors affecting the patient's pain.
- Avoid prescribing opioids, which rarely justify the risk of dependence and overdose.
- Beware the 'set and forget' approach to prescription, whereby repeat prescriptions are issued without considering the possibility of inefficacy and a trial of deprescribing.

## Resources

---

Hunter Integrated Pain Service (HIPS): [www.hnehealth.nsw.gov.au/Pain/Pages/Pain.aspx](http://www.hnehealth.nsw.gov.au/Pain/Pages/Pain.aspx).

painHEALTH: [www.painhealth.csse.uwa.edu.au](http://www.painhealth.csse.uwa.edu.au).

## References

---

- 1 Painaustralia. Painful Facts (2020). Available from: [www.painaustralia.org.au/about-pain/painful-facts](http://www.painaustralia.org.au/about-pain/painful-facts), accessed April 2021.
- 2 Australian Institute of Health and Welfare. Chronic Pain in Australia. Cat. no. PHE 267. Canberra: AIHW, 2020.
- 3 Understanding pain [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. [www.tg.org.au](http://www.tg.org.au), accessed April 2021.
- 4 The transition from acute to chronic pain [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. [www.tg.org.au](http://www.tg.org.au), accessed April 2021.

- 5 Medicinewise News: Chronic pain. NPS Medicinewise, 1 June 2015. Available from: [www.nps.org.au/news/chronic-pain](http://www.nps.org.au/news/chronic-pain), accessed April 2021.
- 6 Cohen ML. Principles of prescribing for persistent non-cancer pain. Aust Prescr, 2013; 36: 113–15.
- 7 Bruggink L, Hayes C, Lawrence G, Brain K, Holliday S. Chronic pain: overlap and specificity in multimorbidity management. Aust J General Practice, 2019; 48(10): 689–92.
- 8 Cramond T. Pain relief. In: *MIMS Disease Index* (2nd edn). Sydney: MIMS Publishing, 1996: 380–5.
- 9 Medicinewise News: If not opioids, then what? NPS Medicinewise, 2 October 2019. Available from: <https://www.nps.org.au/news/if-not-opioids-then-what>, accessed April 2021.
- 10 General principles of chronic pain management [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. [www.tg.org.au](http://www.tg.org.au), accessed April 2021.
- 11 The role of analgesics in chronic non-cancer pain [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. [www.tg.org.au](http://www.tg.org.au), accessed April 2021.
- 12 Pain and Analgesia [updated 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. [www.tg.org.au](http://www.tg.org.au), accessed January 2018.
- 13 Porter KM et al. The role of inhaled methoxyflurane in acute pain management. Open Access Emerg Med, October 2018; 10: 149–64.
- 14 Faculty of Pain Medicine. Statement on ‘Medicinal Cannabis’ with particular reference to its use in the management of patients with chronic non-cancer pain. Australian and New Zealand College of Anaesthetists, 2019. Available from: [www.anzca.edu.au/getattachment/d1eb1074-ef9c-41e6-a1af-31d82b70bcfa/PM10-Statement-on-Medicinal-Cannabis-with-particular-reference-to-its-use-in-the-management-of-patients-with-chronic-non-cancer-pain](http://www.anzca.edu.au/getattachment/d1eb1074-ef9c-41e6-a1af-31d82b70bcfa/PM10-Statement-on-Medicinal-Cannabis-with-particular-reference-to-its-use-in-the-management-of-patients-with-chronic-non-cancer-pain), accessed April 2021.
- 15 Managing specific pain syndromes [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. [www.tg.org.au](http://www.tg.org.au), accessed April 2021.
- 16 Bashford GM. The use of anticonvulsants for neuropathic pain. Australian Prescriber, 1999; 22(6): 140–1.



## Part 6 Child and adolescent health

### 83 An approach to the child

Page 952

*In every child who is born, under no matter the circumstances, and of no matter what parents, the potentiality of the human race is born again; and in him, too, once more, and of each of us, our terrific responsibility towards human life; towards the utmost idea of goodness.*

JAMES AGEE (1909–1955)

Seeing a child as a patient means you are dealing with at least one extra person in the room. Communication and rapport building need to be undertaken with both the child and those who have brought the child (usually the parents). By engaging the child, you will usually win over the parent. Parents are often apprehensive about bringing their child to the doctor, concerned the child might misbehave or do or say something to embarrass them. By displaying a natural interest in and ease with the child, a tolerance of child behaviour (or misbehaviour) and being generally ‘child friendly’, the consultation is more likely to be successful.

Engaging children can be done from the moment they are called from the waiting room. All of the usual rapport-building skills we use for adults (see [CHAPTER 3](#)) can be utilised with children. Respect, genuine interest in them, active listening and use of body language all matter with children, perhaps even more so than for adults as children naturally have less developed communication skills.

There is also a different style of communication required and this is age dependent. Infants will be dominated by emerging object permanence skills (e.g. playing peek-a-boo), attachment (they will constantly refer to their parent), separation and stranger anxiety. Toddler and preschooler communication is dominated by play, particularly ‘pretend’ or ‘imaginative’ play. Pretending to be a scary bear, to see animals in their ears when you examine them or to believe they are a different age from what they actually are will fire their imagination and make them curious in and more comfortable with you.

Primary school-aged children are old enough to have conversations about their pets, favourite toys, TV shows or movies (merchandised clothing they are wearing or accessories they are holding can give clues to these), their friends, teachers or school. Other rapport-building strategies include:

- greeting children as well as parents
- asking their name (even though you already know it) and/or what they like to be called
- asking their age (even though you already know it)
- asking about their pets
- if present, engaging the siblings too (e.g. asking a small child whether he or she is helping Mummy with the new baby)
- talking at their level, not down to them (e.g. child sitting on parent's knee, or the doctor squatting down or sitting on the floor)
- having a vague idea of current children's films, TV shows and their characters (e.g. Disney movies, Thomas the Tank Engine, The Wiggles)
- having toys in the room, both displayed for them to play with and for you to bring out as a surprise
- having special stickers or stamps (e.g. for the backs of hands)
- blowing bubbles (particularly to distract post-vaccination)<sup>1</sup>
- showing them and letting them hold examination equipment before you use it
- treating them as individuals to be engaged, not clinical puzzles to be solved (this is especially important for children with special needs, who may have greater communication challenges and may also be more used to being treated as a medical condition)

All of this effort will help set the scene for easier history taking and physical examination.

## Parent–child interaction

---

It is advisable to observe carefully the parent–child interaction at all times, including in the waiting room (sometimes you will hear a dysfunctional parent–child interaction before you see it!). The parent's manner in talking to and handling the child will provide useful clues about any possible problems in terms of the parent's ability to nurture the child adequately, and how well they are coping, especially in the postnatal period.<sup>2</sup>

## An approach to the parent

---

Parenting has recently become a lot more complicated. Controversies have arisen and flourished, such as those over vaccination and supposed adverse reactions or parenting styles (e.g. 'attachment parenting'). Much of this is driven by information on the internet, with mothers in particular increasingly spending time on 'mummy blogs' and parenting websites.

Cultural backgrounds also often strongly influence attitudes to aspects of parenting such as how to communicate with children, diet, discipline and punishment, and the role of the mother or father.

Being a parent is laden with intense emotion, and this intensity can lead to very concrete beliefs about different parenting issues (e.g. that MMR vaccination causes autism, that hitting a child improves behaviour). Being aware of these possibilities and not ‘putting your foot in it’ by making assumptions about parenting attitudes can help avoid communication breakdowns with the parents of your paediatric patients.

## History

---

Obtaining information in the following sequence is recommended:

- *presenting problem* or problems (focus on this first):

allow the parents to elaborate without interruption

be a listener

never judge a parental concern as trivial (especially with a new parent)

- *past history*:

medical and surgical history

pregnancy, birth and neonatal history

vaccination history, medications and allergies

- *family history* (e.g. inherited disorders)

- *growth* (percentiles) and feeding/diet

- *development*:

gross motor

fine motor

speech and communication

social skills

- *family and social function* (relationships, behaviour, sleep)

## Physical examination

---

As mentioned above, the approach to the child and parent from the waiting room will help determine the ease or difficulty of examining a child. A good aphorism is ‘Win the child, win the mother (parent)’.

## Observation

As always, observation is critical. Not only looking at the parent–child interaction, but closely observing the appearance and behaviour of a child can give a multitude of clues as to how unwell the child is. What is the child’s general appearance? How active and alert is the child? How interactive is he or she with you and the parents? Is he or she breathing comfortably? Does the child look distressed? This information should be recorded in the medical record as the first line of examination (i.e. above the ‘obs’).

Growth and development should always be assessed when seeing a child (see below) and the growth parameters are part of the general measurable observations. Temperature should be recorded, but the presence of fever, the degree of fever and the response to antipyretics are poor predictors of serious disease.<sup>3</sup> Also, the thermometers parents and GPs use are often unreliable—tympanic and per axilla thermometers miss a lot of raised temperatures found on PR measurement.<sup>4</sup> A raised temperature tells you something is going on, and not much else. Caveats to this are children in the first 3 months of life, or those in special circumstances (such as those who are immunocompromised) or the worrying presentation of fever combined with drowsiness and pallor (see [CHAPTER 89](#) ).

Increasingly, oxygen saturation measurement is being incorporated into the general observations of children in general practice, especially in children with a significant respiratory infection.

Observations of the child, parents and their interactions are also important in picking up clues concerning psychosocial issues, such as family dysfunction (e.g. marital issues, drug and alcohol abuse in parents, mental health issues in parents), attachment issues, neglect or child abuse (see [CHAPTER 88](#) ).

## Achieving cooperation of small children

---

Children, especially if they are sick and irritable, can be very difficult to examine and may be most uncooperative, particularly if distressed by past experiences. However, they can be readily distracted, a characteristic that the family doctor can use effectively to achieve some degree of cooperation.

It is generally better to examine younger children on their parent’s lap. An older child can be made to feel ‘grown up’ and important by being examined on the couch (a good strategy if unsure is to ask them what they would prefer first).

## Distraction and humour

A variety of techniques can be used to distract the small child or make a game of the

physical examination. Individual doctors will often develop their own repertoire of jokes, pretend play and sleight of hand to get the job done without distressing child and parent. Apart from the distress, it is easier to get a good look at an eardrum or to hear a heart murmur when a child is not crying or fighting your invasion of their personal space.

Techniques include:

- tickling games
- peek-a-boo
- using pretend animal noises
- looking for/hearing animals, fairies, monsters, trains (or whatever the child is most interested in at the time) in the child's ears, mouth, chest or abdomen
- getting the older child to block the non-examined ear with a finger to stop the light going through his or her head
- toys (including those that make a noise) being held by your non-examining hand, the parent, a nurse or medical student
- bubbles (and games popping bubbles)
- animal images on stethoscope heads
- images drawn on the unused end of spatulas<sup>5</sup>
- a musical or moving toy above an examination couch
- distracting conversation while examining an abdomen ('how old are you *really*?')
- distracting images (such as a home page of their favourite TV or film character) on your computer screen

Despite your best efforts, sometimes it just doesn't work, especially with a sick child. In these circumstances, you should give clear instructions in advance to the parent (who will often be flustered) on how to best restrain the distressed child. Talk slowly, simply and, if necessary, loudly (if the child is crying), so the parent can understand. Don't ask the child for permission in these circumstances; the answer will be no! The doctor's tone of voice and body language should display to both parent and child that he or she is calm, in charge and not bothered by crying, screaming or lashing out by the child. Getting angry at the child can make the situation worse.

## Growth and development

---

Checking a child's growth and development is a core role of the GP, as we will generally see an infant in our practice quite frequently. By definition, the neonatal period is 28 days post-birth,

while infancy is 1–12 months of age. The immunisation visits, routine baby and child checks in the Personal Health Record (PHR, see below) and other visits for viral URTIs and other presentations provide perfect opportunities for GPs to assess appropriate growth and development over time.

This longitudinal monitoring is more reliable at picking up issues than screening programs, which are a mere snapshot. That is why growth parameters (weight, height/length and head circumference, known as anthropometric data) and a quick developmental check at each visit should be done.

In terms of growth, if there are concerns—either of crossing growth percentiles, or worse, of decreasing growth parameters—then obviously further exploration and possible investigation is warranted (see the section on failure to thrive in [CHAPTER 84](#) ).

Development is normally thought of in four domains: gross motor, fine motor, speech/communication and social development. Even if not doing a formal screening check from the PHR or other sources, a few screening questions from each domain will help pick up developmental concerns (see [TABLE 83.1](#) ). Gross motor and fine motor are grouped together, as are speech/communication and social development for simplicity, and useful screening questions at each visit for the Australian Immunisation Program are suggested. A useful standardised screening tool to use for further evaluation in a GP setting, if there are concerns regarding development, is the Denver-II Developmental Screening Test,<sup>6</sup> and any significant concerns regarding development should have specialist review.

**Table 83.1** Developmental milestones to check at vaccination visits

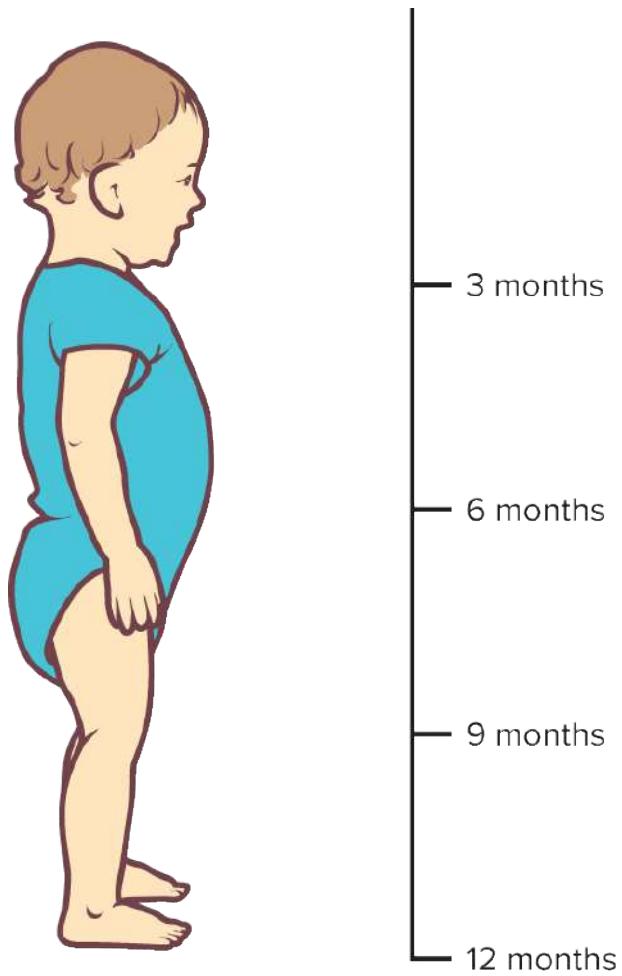
Age	Gross motor/fine motor milestones	Social/speech/communication milestones
<b>6 weeks</b>	<ul style="list-style-type: none"><li>• Eyes mostly moving together</li><li>• Some head control—not flopping everywhere</li><li>• Symmetrical movements of limbs</li></ul>	<ul style="list-style-type: none"><li>• Cooing (vowels) emerging</li><li>• Starting to smile (probably)</li><li>• Some brief eye contact</li></ul>
<b>4 months</b>	<ul style="list-style-type: none"><li>• Hands to midline and then to mouth</li><li>• Has hand regard</li><li>• Lifts knees</li><li>• Tracks objects through 180 degrees</li><li>• Lifts head up 90 degrees when lying</li></ul>	<ul style="list-style-type: none"><li>• Cooing well established</li><li>• Social smiling (smiling in response to a smile) and laughs</li><li>• Eye contact more prolonged at times</li><li>• Babble (consonants)</li></ul>

	prone	emerging (possibly)
	<ul style="list-style-type: none"> <li>• Grasps objects handed to him or her</li> </ul>	
<b>6 months</b>	<ul style="list-style-type: none"> <li>• Propped-up sitting (independent sitting 7–8 months)</li> <li>• Hands down in front of him or her, hands to feet</li> <li>• Keeping head level with body when pulled to a sitting position</li> <li>• Rolling-up on extended arm when placed in prone and creeping when placed in prone</li> <li>• Possibly bangs objects on a surface</li> </ul>	<ul style="list-style-type: none"> <li>• Babbling well established</li> <li>• Quiets and attends when spoken to (listening)</li> <li>• 'Vocal play'— experimenting with new sounds (e.g. blowing raspberries)</li> <li>• Enjoys interactive games</li> <li>• Smiles when sees parent</li> <li>• Laughs/squeals with delight</li> <li>• Friendly to people</li> </ul>
<b>12 months</b>	<ul style="list-style-type: none"> <li>• Takes weight on feet when feet plonked on ground in standing position (parachutes them) or standing holding onto furniture</li> <li>• Transitions by moving in and out of positions</li> <li>• Cruising (probably) and crawling</li> <li>• Points and follows a point (possibly)</li> <li>• Grasps with index and thumb</li> <li>• Claps hands</li> <li>• Waves goodbye</li> </ul>	<ul style="list-style-type: none"> <li>• Lots of conversational babble</li> <li>• A couple of words ('Mum', 'Dad', other) probably</li> <li>• Possible separation and/or stranger anxiety</li> <li>• Looks for objects out of direct line of vision (dropped toy)</li> <li>• Co-looking at pictures in books or objects (shared attention)</li> <li>• Possible pointing or following a point ('look at the ...')</li> <li>• Waves bye-bye</li> </ul>
<b>18 months</b>	<ul style="list-style-type: none"> <li>• Walks well and probably holding hand upstairs</li> <li>• Climbs on and off everything</li> </ul>	<ul style="list-style-type: none"> <li>• Follows 1-step commands (when he or she wants to)</li> <li>• Does pretend play—</li> </ul>

	<ul style="list-style-type: none"> <li>• Attempts a jump</li> <li>• Isolated 'tip to tip' pincer</li> <li>• Bilateral play—hands doing different things</li> <li>• Eyes point, focus and track a moving object</li> <li>• Posting objects into containers</li> <li>• Builds tower of two blocks</li> </ul>	<ul style="list-style-type: none"> <li>tea sets, dolls, kitchen toys</li> <li>• Interested in everything, especially people</li> <li>• Pointing and following a point well established</li> <li>• Good understanding of what is said, may be developing lots of words (or soon)</li> <li>• Points to body parts</li> <li>• Uses at least 2 words by 16.5 months</li> </ul>
<b>3.5–4 years</b>	<ul style="list-style-type: none"> <li>• Moves towards learning to ride a bike</li> <li>• Catches a ball onto chest</li> <li>• Catches a larger ball with the hands</li> <li>• Throws a ball overarm</li> <li>• Hops</li> <li>• Washes and dries hands</li> <li>• Does puzzles independently</li> </ul>	<ul style="list-style-type: none"> <li>• Clear and intelligible speech</li> <li>• Able to have a long reciprocal (back and forth) conversation with parents and siblings/peers</li> <li>• Plays with siblings/peers</li> <li>• Unwanted behaviours not standing out among peers (e.g. childcare, preschool)</li> </ul>

## Gross motor development

The neurological control of the infant's body travels from the top down (caudo-equinal) and the inside out (see FIG. 83.1). It is analogous to a flag unfolding. If you are in an art class drawing an adult, you will draw the hips at the halfway point, the nipple line a quarter of the way down and the knees three-quarters of the way down. If you divide the first 12 months of a child's life into quarters, you will quite conveniently find the gross motor development roughly progressing down at these points (see FIG. 83.1). That is, at 3 months a baby should have control of his or her chest, at 6 months the hips (sitting usually happens at 7–8 months; see FIG. 83.2), at 9 months the knees (e.g. crawling, bum-shuffling or commando crawling), and at 1 year the feet (standing holding on, not necessarily walking).<sup>7,8</sup>



**FIGURE 83.1** With gross motor development, at 3 months you are at the chest, at 6 months the hips, at 9 months the knees and at 12 months you have control of the feet



**FIGURE 83.2** Normally a child will sit without support at 7–8 months

Source: PeopleImages/iStock/Getty Images

Beyond 12 months, children will expand this neurological connection into increasingly complex activities (see TABLE 83.2 ).

**Table 83.2** Gross motor skills we want to see emerge (12 months to 6 years)

- **2 years**—walking up stairs holding onto an adult hand, and possibly attempting alternating feet with each stair
- **2½ years**—observing a child being able to jump
- **3 years**—starting to try and to use a tricycle
- **5–6 years**—weaning the trainer wheels off the bike
- **6 years**—skipping

Note: Any loss of gross motor (or any other developmental) skill is a red flag.

## Fine motor development

Fine motor development mimics that of gross motor, with a steady progression down the body over the first year of life, then an ‘unfolding’ pattern of control of movement with extension and opening out of joints (particularly hands and fingers), followed by an increasing complexity of movements. An easy way to remember the principles of fine motor development is to think of the first 9 months in terms of whole-hand activity, and the second 9 months (9–18 months of age) as individual digit activity<sup>7,8</sup> (see TABLE 83.3 ).

Page 955

Page 956

**Table 83.3** Fine motor skills we like to see emerge over the first 18 months

#### Whole-hand activities (0–9 months)

- **3–6 months**—includes grasping objects passed to the child, looking at objects he or she is holding ('object regard') and banging objects onto a surface, such as a tray in a high chair.
- **6–9 months**—banging objects together. By 9 months, babies should be doing hand-to-hand transfers and purposefully releasing objects.

#### Individual finger activities (9–18 months)

- **Pinching** (pulp-to-pulp), **pincing** (tip-to-tip with curled fingers) and **pointing**, all of which can emerge progressively.
- **Pointing** is an important milestone, and is often there by 12 months and should be there by 18 months. Prior to children developing their own point, they will reach out towards things, straightening out their fingers as they reach. This action will be followed by the index finger being straightened in isolation while the other fingers are curled. We start in the first year of life by ‘following a point’; that is, looking at an object when someone says ‘look at the ...’ As well as following a point, children will often point at themselves by 12 months. A young child points for several different reasons. Sometimes it is to share something interesting with another person, sometimes it is to get something they want and sometimes it is to find out what something is called.

## Speech and communication development

Newborns squawk, squeak and cry. At around 1–2 months, cooing (vowels that use the vocal cords) will start to appear, much to the parents’ delight. Between 3 and 6 months, babble (using consonants—that is, involving the tongue and lips to change sounds) will appear. The babble then becomes something the baby starts to play with, and then banter back-and-forth with the parent and others. This ‘conversational babble’ becomes more sophisticated over the second half of the first year. Into this conversational babble, the first words appear, usually at the end of the first year.

In the second year, there is frequently a rapid expansion in vocabulary around the middle of the year, with girls often having this expansion earlier than boys. Receptive language usually

precedes expression, so at the 18-month check, even if a child is not saying many words, his or her increasing understanding of speech should be evident.

Between 18 months and 3 years, the combination of words and small sentences and increasingly reciprocal (back-and-forth) conversation expand markedly. Articulation also improves over this time, with around 25% of articulation intelligible at 18 months, 50–75% intelligible at 2 years and 75–100% at 3 years. Other articulation issues such as lisps and stutters can also be important.

Page 957

## Social development

As a species, human beings are very socially immature at the time of birth. We are completely dependent on our carer, and remain so for a long time. Soon, though, through attachment, a baby will learn social skills from his or her parents by having a *shared understanding*. This is where the baby's and (usually) the mother's thoughts connect—a ‘meeting of minds’.<sup>2</sup>

At around 6 months of age, separation anxiety<sup>9</sup> will usually appear. Separation anxiety is a normal developmental phenomenon as the infant becomes more aware of object permanence (something existing when it is out of sight). Parents, particularly mothers, may worry that they are doing something wrong by causing distress through separation (e.g. leaving the baby in the cot to self-settle), though this is something that we want the child to learn to handle. A stepladder approach (gently increasing the exposure to separation as the child increases the skill to cope) will help. Separation anxiety often peaks around 14–18 months and then decreases through the preschool years.

Stranger anxiety,<sup>10</sup> usually appearing around 7–9 months and reducing after 14 months of age, is similar in many ways to separation anxiety. It too is best managed through a gradual exposure, especially when the child is feeling comfortable.

Tantrums,<sup>11</sup> which are common between 18 months and 3 years (or older), occur because the child lacks the skills to deal with an emotionally challenging event. If a child is not developing some coping skills through this period, his or her social development should be assessed.

In the second year of life, two emerging skill sets dominate social development: speech and play, particularly pretend play.<sup>2,7,8</sup> Play is far more important than children simply acting out their wishes. It’s the training ground for life, it’s how children learn to interact with others and the world. Deficits in the social use of speech and pretend play should alert the GP to consider autism<sup>12</sup> (see Red flags for autism box, and [CHAPTER 87](#) ).

## Guidelines for feeding infants

---

### The benefits of breastfeeding

For the infant, the benefits include a potential lower risk of:

- gastrointestinal and respiratory infections
- asthma
- otitis media
- urinary tract infections
- necrotising enterocolitis
- insulin-dependent diabetes
- inflammatory bowel disease
- lymphoma
- atopy

The benefits for the mother include:

- a potential lower risk of postpartum bleeding
- delayed resumption of ovulation
- improved bone mineralisation postpartum
- potential lower risk of ovarian and postmenopausal breast cancer

Breastfeeding also improves bonding, is less costly and is beneficial to the environment. Most (96%) Australian women initiate breastfeeding, but almost a third will have introduced formula or stopped breastfeeding by 3 months, and few will achieve the ideal goal of exclusive breastfeeding to 6 months (EBF6). This goal is recommended in the WHO and NHMRC guidelines and endorsed by the RACGP,<sup>13</sup> but other guidelines suggest exclusive breastfeeding to 4–6 months (EBF4–6), with the introduction of solids at this age. It is also recommended that the woman continues to breastfeed while introducing appropriate solid food until 12 months of age and beyond, and for as long as the mother and infant desire. Exclusively breastfed infants do not require additional fluids up to 6 months of age.

---

Page 958

## Formulas

If formula is used, a cow's milk-based type should be used up until 12 months (note: all infant formulas available in Australia are iron-fortified). Specialty formulas are indicated only for confirmed pathology. If a woman cannot or chooses not to breastfeed, it is important that she does not feel that she is being judged, as postpartum women are vulnerable to suggestions of lactation failure, which is a risk factor for postnatal depression.

Cow's milk itself should not be given as the main drink to infants under 12 months, though small amounts may be used in the preparation of solid foods. The only other fluid besides breast milk

and formulas suitable to be given to infants is boiled and cooled tap water (i.e. no bottled water, juice, cordial or other beverages).

## Starting solid foods<sup>14</sup>

Taking into account allergic considerations and best research evidence, the Murdoch Children's Research Institute recommends:

- solid foods should be introduced at around 6 months, preferably not before
- these should include cooked egg, peanut butter, dairy and wheat products
- this advice applies to all babies, including those at risk of allergy, as research shows that early exposure may reduce the risk of eczema and food allergies<sup>15</sup>
- women are advised against hypoallergenic hydrolysed formula to prevent allergy

Solids should be introduced one at a time. They should be offered after a feed or between feeds of milk.

Examples of solid foods for beginners are:

- baby rice cereal mixed with the usual milk or cooled boiled water
- fruits such as banana, cooked apple or pear
- pureed meat and poultry dishes

The texture should be pureed (no lumps) at first. Introduce a new food only after 3–4 days, early in the day. Start with 1–2 teaspoons of solids and build up to three meals a day at your baby's own pace. Lumpy foods can be introduced at 6–9 months, as by this time babies learn to chew.

By 9–10 months, more solids should be eaten each mealtime and the milk gradually decreased. Foods with poor nutritional value and high saturated fats, added sugars (which will increase risk of dental caries) and added salt should be avoided. Honey should be avoided because of the risk of botulism. Hard, small, round (e.g. whole nuts) and/or sticky foods are not recommended because of choking and aspiration risk. Low-fat milks should not be used in the first 2 years of life, and soy and other milks (e.g. goat's milk, sheep's milk, coconut milk, almond milk) are inappropriate alternatives to breast, formula or pasteurised whole cow's milk.

From 12 months onwards, cow's milk can be introduced and more solid foods, especially meats, vegetables and fruits. From 12 months, milk and other drinks should be offered in a cup rather than a feeding bottle (i.e. no need for sipping cups or transitional bottles) and toddler milks and supplements are not required for healthy children.

## Toilet training<sup>16</sup>

---

As a rule, children will learn to use the toilet when they are ready.

The ages by which most children are fully trained are:

- daytime—between 2½ and 4 years
- night-time—by 8 years of age

Once they start training it can take weeks to months to achieve dryness or the ability to open their bowels on the toilet.

## General rules for parents

- Be relaxed about toilet training.
- Avoid rushing toilet training.
- Do not force your child to go to the toilet.
- Nagging does not work; a positive-reinforcement approach is far better. This can include reward systems such as reward charts and stickers.
- Punishing will not work.

## Indications that a child is ready to start toilet training

- Interest in others going to the toilet
- Has a dry nappy for 1–2 hours or more
- Tells you when they have wet or soiled their nappy or are about to go
- Doesn't like wearing a nappy, especially when it is wet or soiled
- Has the motor skills to pull training pants up and down and get on and off the toilet Page 959

## Best times to sit children on the toilet<sup>17</sup>

- First thing in the morning
- After meals
- When you sense their need to go
- Before going out
- Upon returning home

## Key points for parents

- Consider using a potty or toilet with a seat ring and a step.
- Explain the process in simple terms (there are good resources available, such as books suitable for children of this age).
- Sit both boys and girls on the toilet to pass urine.
- Do not force them if they refuse to use it.
- Help the child relax on the toilet (e.g. using distraction, or having favourite toys).
- Stop using nappies (except when sleeping).
- Don't make a fuss if there are any accidents.
- If the training upsets them, wait for a month and try again.

## Child safety

---

Parents will often be bombarded with child safety messages, many of them valid but many of them not. An excellent resource to point them towards is [www.kidsafe.com.au](http://www.kidsafe.com.au), which gives reliable advice on child safety issues.

## Personal health record

---

Many children have a personal health record (PHR), which is given to the child's parents or carers as a means of improving health care delivery, including the enhancement of preventive care. The PHR is a small, loose-leaf booklet with a sturdy plastic cover that can be easily carried around by the parent. The contents can vary from one state to another (as does the colour of the cover) and from edition to edition but generally it contains:

- records of birth details and newborn examination
- percentile charts for weight gain
- visual check
- hearing check
- developmental check
- immunisation schedules and recordings
- progress notes

- advice on accident prevention (see TABLE 83.4 )
- other health educational material

**Table 83.4** Accidents don't have to happen: key points

- Have cupboards in which medicines and household chemicals are stored made child-resistant. Pesticides and petroleum products should be locked away in the shed. Don't store them in ordinary food and drink containers.
- Fires and radiators should be adequately guarded.
- Cords on electrical food and drink heaters need to be shortened or hooked up out of toddlers' reach. Do not use tablecloths. Put hot food and drinks into the centre of the table.
- Fit dummy plugs in unused power points.
- Restrain children in cars according to child-restraint guidelines.
- Infants are safest if they remain in a rear-facing restraint as long as they still fit into it.
- Supervise your toddler at all times in or near water. The swimming pool needs to be adequately fenced in (on all four sides and with a secure gate), and never leave a child alone in the bath.
- Keep matches and lighters locked away and out of reach. Put scissors, knives, needles and pins well out of reach, too.
- Have the play yard safely fenced in, away from the street.
- Parents: walk right round your car before reversing down the drive, or place your child in the car first.

The PHR provides a very practical method of promoting communication between various health professionals involved in the child's care and also between the family and their doctor. It promotes the concept of self-care by encouraging a sense of responsibility in parents for the child's health and is also a medium for enhancing preventive care, especially with regard to immunisation, growth and development.

## Immunisation schedule

Refer to CHAPTER 6 and [www.health.gov.au](http://www.health.gov.au) for updates.

## Diagnostic triads for children

The following is a selection of childhood disorders. The arrow represents a pointer to a possible diagnosis and is, of course, not conclusive.

## Acute–subacute onset

Page 960

**DxT** arthralgia (lower limbs) + rash (buttocks, legs) ± abdominal pain → Henoch–Schönlein purpura

**DxT** pallor + drowsiness + fever → meningitis

**DxT** pallor + abdominal pain (severe and intermittent) + inactivity → intussusception

**DxT** (<12 months): drowsiness + cough + wheezing → bronchiolitis

**DxT** (<3 months, usually male): weakness + weight loss + vomiting (severe, intermittent) → pyloric stenosis

**DxT** (neonate): vomiting (after first feeds) + drooling + abdominal distension → oesophageal or duodenal atresia

**DxT** malaise + pallor + bone pain → acute lymphatic leukaemia



**DxT** malaise + pallor + oral problems (gingival hypertrophy, bleeding, ulceration) → acute myeloid leukaemia

**DxT** abdominal pain + pallor + a/n/v → acute appendicitis

**DxT** abdominal pain + malar flush + fever ± URTI → mesenteric adenitis

**DxT** drowsiness + tachypnoea + chest wall recession → pneumonia

**DxT** drowsiness + fever + purpuric rash → meningococcal infection

**DxT** URTI + brassy cough + inspiratory stridor → croup

**DxT** coughing + wheezing + chest wall recession → asthma or aspirated foreign body

**DxT** fever + conjunctivitis + skin changes (cracked red lips, maculopapular rash, erythema of palms/soles, desquamation of fingertips) → Kawasaki syndrome

## Congenital syndromes

**DxT** large ears + long narrow face + large genitals → fragile X

syndrome

**DxT** small extremities (hands, feet, genitals) + narrow forehead + eating disorder → Prader–Willi syndrome



**DxT** ‘elfin’ face + low-set ears + cardiac murmur → Williams syndrome

**DxT** (female): short + webbed neck + pigmented naevi ± cardiac disorder → Turner syndrome

**DxT** short + webbed neck + facial disproportion (broad forehead, ptosis, low-set ears, etc.) ± cardiac disorder → Noonan syndrome

## Chronic



**DxT** malaise + abdominal pain (vague) + abnormal behaviour → lead poisoning

**DxT** (<2 years): lethargy + irritability + pallor → iron deficiency anaemia

**DxT** fever + malaise (extreme) + a/n/v ± anaemia → neuroblastoma

**DxT** headache + a/n/v + ataxia → medulloblastoma

**DxT** speech communication skills + poor socialisation + repetitive/obsessive behaviour/restriction of interests → autism spectrum disorder

## Older children



**DxT** (male): snorting, blinking, etc. + oral noises (e.g. grunts, hisses) ± loud expletives → Tourette syndrome

**DxT** mid to low back pain/discomfort + inability to touch toes + kyphosis → Scheuermann disorder

**DxT** knee pain (after activity) + tender knee ‘lump’ + pain on kneeling → Osgood–Schlatter disorder

**DxT** (adolescent): limp + knee pain + hip pain → slipped capital femoral epiphysis

---

## Patient education resources

---

Hand-out sheets from *Murtagh's Patient Education* 8th edition:

- Feeding your baby
- Normal development in children
- Toilet training your child

## Resources

---

The Australasian Society for Clinical Immunology and Allergy (ASCIA) Guidelines:

<https://allergy.org.au/>

The 'Red Flag' Early Intervention Referral Guide for Children 0–5 years, RACGP *Guidelines for prevention activities in general practice* (9th edn), Appendix 3A:

<https://www.racgp.org.au/download/Documents/Guidelines/Redbook9/Appendix-3A-%E2%80%98Red-flag%E2%80%99-early-intervention-referral-guide.pdf>

## References

---

- 1 Harrison D et al. Pain management strategies used during early childhood immunisation in Victoria. *J Paediatr Child Health*, 2013; 41(4): 313–18.
- 2 Berk LE. *Awakening Children's Minds*. New York: Oxford University Press, 2001.
- 3 Royal Children's Hospital. Clinical Practice Guidelines: Fever, October 2011. Available from: [www.rch.org.au/clinicalguide/guideline\\_index/Febrile\\_Child/](http://www.rch.org.au/clinicalguide/guideline_index/Febrile_Child/), accessed 15 June 2014.
- 4 Canadian Paediatric Society. Temperature measurement in paediatrics. *Paediatr Child Health*, 2000; 5(5): 273–6. Page 961
- 5 Malcher G. Spatula sketches for children. *Aust Fam Physician*, 1990; 19: 1441.
- 6 Glascoe F et al. Accuracy of the Denver-II in developmental screening. *Pediatrics*, 1992; 89(6): 1221–5.
- 7 The Developmental Medicine Center, Children's Hospital Boston. Development screening tool kit for primary care providers. Available from: [www.developmentalscreening.org/](http://www.developmentalscreening.org/), accessed 23 June 2014.

- 8** Raising Children Network. Your guide to child development, 27 June 2014. Available from:  
[www.raisingchildren.net.au/articles/grow\\_and\\_learn\\_together\\_child\\_development\\_guide.html](http://www.raisingchildren.net.au/articles/grow_and_learn_together_child_development_guide.html), accessed 3 July 2014.
- 9** Women and Children's Health Network. Parenting and child health: separation anxiety, 3 October 2013. Available from: [www.cyh.com/HealthTopics/HealthTopicDetails.aspx?p=114&np=141&id=1848](http://www.cyh.com/HealthTopics/HealthTopicDetails.aspx?p=114&np=141&id=1848), accessed 23 June 2014.
- 10** Raising Children Network. Stranger anxiety, 24 August 2011. Available from:  
[www.raisingchildren.net.au/articles/fear\\_of\\_strangers.html](http://www.raisingchildren.net.au/articles/fear_of_strangers.html), accessed 23 June 2014.
- 11** Women and Children's Health Network. Parenting and child health: tantrums, 30 January 2014. Available from: [www.cyh.com/HealthTopics/HealthTopicDetails.aspx?p=114&np=141&id=1775](http://www.cyh.com/HealthTopics/HealthTopicDetails.aspx?p=114&np=141&id=1775), accessed 23 June 2014.
- 12** Wray J, Knott H, Silove N. Language disorders and autism. *Med J Aust*, 2005; 182(7): 354–60.
- 13** Royal Australian College of General Practitioners. Position statement on breastfeeding, 2007. Available from:  
[www.racgp.org.au/download/documents/Policies/Clinical/breastfeeding\\_position\\_statement.pdf](http://www.racgp.org.au/download/documents/Policies/Clinical/breastfeeding_position_statement.pdf), accessed 29 June 2014.
- 14** National Health and Medical Research Council. Eat for health: infant feeding guidelines: information for health workers, summary, 2013. Available from:  
[www.nhmrc.gov.au/\\_files\\_nhmrc/publications/attachments/n56b\\_infant\\_feeding\\_guideline\\_summary.pdf](http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/n56b_infant_feeding_guideline_summary.pdf), accessed 29 June 2014.
- 15** Australian Society of Clinical Immunology and Allergy. Infant feeding advice, 2010. Available from:  
[www.allergy.org.au/images/stories/aer/infobulletins/2010pdf/ASCIA\\_Infant\\_Feeding\\_Advice\\_2010.pdf](http://www.allergy.org.au/images/stories/aer/infobulletins/2010pdf/ASCIA_Infant_Feeding_Advice_2010.pdf), accessed 29 June 2014.
- 16** Raising Children Network. Toilet training, 25 October 2010. Available from:  
[www.raisingchildren.net.au/articles/toilet\\_training.html](http://www.raisingchildren.net.au/articles/toilet_training.html), accessed 29 June 2014.
- 17** NHS choices. Potty problems and toilet training tips, 4 February 2013. Available from: [www.nhs.uk/Conditions/pregnancy-and-baby/pages/potty-training-tips.aspx#close](http://www.nhs.uk/Conditions/pregnancy-and-baby/pages/potty-training-tips.aspx#close), accessed 29 June 2014.

## 84 Specific problems of children

*Children are not simply micro-adults, but have their own specific problems.*

BELA SCHICK (1877–1967)

The family doctor usually treats children for common minor complaints such as non-serious viral respiratory infections and minor skin problems, offering parental advice and reassurance. Many of these everyday problems are discussed in this chapter, while immunisations (see [CHAPTER 6](#)) and more complicated problems such as anaemia, diarrhoea and chronic cough are covered elsewhere (see [PART 3](#), PRESENTING SYMPTOMS AND PROBLEM SOLVING IN GENERAL PRACTICE).

### Crying and fussing in infants

Crying and fussing, and sometimes distress, is a very common concern in the infant in the first few months. The term ‘colic’ (which is still widely used) needs to be used with caution, as it infers something is wrong with the gut of the infant, when most of the time this is not the case (see [CHAPTER 24](#)).<sup>1</sup>

The normal pattern is for crying to start increasing around two weeks of age, to peak around two months, and then settle down around three to four months of age, perhaps five. On average, a baby cries or fusses for 3 hours a day. The amount of crying varies from baby to baby, but all babies cry—and not just human babies; in the early months babies of other mammal species cry as well. This is a survival instinct, to get the full attention of the carer and to establish attachment. It can also cause a great deal of distress for a mother or other carer, so active listening, careful assessment to exclude other causes and advice and reassurance are important. Common causes of crying are hunger (usually underfeeding), wet or soiled nappies, loneliness (usually ceases when picked up) and possibly ‘colic’.

### Management

- History—crying pattern and duration, assessment of the child’s temperament and parents’ coping abilities.
- Perform careful physical examination, including growth parameters, feeding and settling pattern and development.

- Reassure parents that extra attention will not affect the baby but overstimulation should be avoided.
- Give parental reassurance and education (including advice on soothing techniques and coping strategies).

## Practice tip—the period of purple crying<sup>1</sup>

A useful term developed by specialists in this area is ‘the period of PURPLE crying’ (see: [www.purplecrying.org](http://www.purplecrying.org)). The letters of the word ‘purple’ stand for characteristics of this period of crying, namely:

**P** = **P**eak—your baby may cry more each week, the most at 2 months, then less at 3–5 months

**U** = **U**nexpected—crying can come and go and you won’t know why

**R** = **R**esists soothing—your baby may not stop crying no matter what you try

**P** = **P**ain-like face—babies may look like they are in pain, even when they’re not

**L** = **L**ong-lasting—crying can last as much as 5 hours a day, or more

**E** = **E**vening cluster—your baby may cry more in the late afternoon or evening

## Causes (to exclude)

- Cow’s milk intolerance
- Lactose intolerance
- Gastro-oesophageal reflux
- Pain from UTIs and other infections, bowel obstruction/hernias, other causes

## Soothing techniques

- Gentle stroking and cuddling
- Providing close contact or skin-to-skin contact
- Talking to them, singing to them, smiling at them and rocking them
- Repetitive rocking movements help calm an overstimulated baby’s brain

## Coping strategies<sup>1</sup>

- Increase carry, comfort, walk and talk responses—the baby may still continue to cry, but there is a reasonable chance the parents may be able to soothe him or her.
- It's okay to walk away—it's important for parents to calm themselves before trying [Page 963](#) to calm their baby.
- Never shake or hurt a baby—advise that shaking a baby is a critically dangerous thing to do.

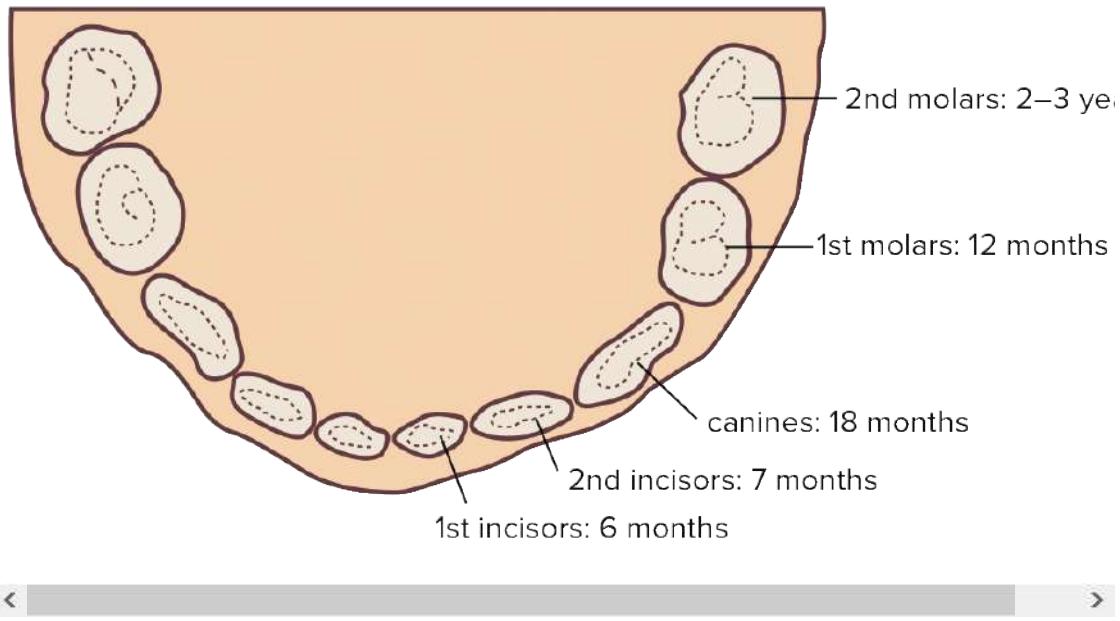
It is also useful to advise a parent to try and learn their baby's signals and body language, which are unique for every infant. Some typical body language patterns include:

- tired—stiff, jerky movements, being quiet or still, blank faced, rubbing eyes, moodiness, droopy eyelids or slow blinking and crying
- hungry—open mouth, eager expression and crying
- ready for action—wide open eyes, alert expression and kicking legs
- upset—jerky movements, turning away and crying

## Teething

### Baby teeth (milk or deciduous teeth)

- Babies usually cut their teeth from age 6 months until 2–3 years.
- The first teeth to appear (which seldom cause discomfort) are usually the lower incisors (during the first year).
- The first and second molars (ages 1–3) tend to cause problems.
- Usually the first set (20 teeth) is complete soon after the second birthday (see [FIG. 84.1](#) ). These are usually lost between 6 and 12 years.



**FIGURE 84.1** The lower set of primary teeth with average times of eruption

## Symptoms

- The gum is slightly swollen and red
- This may cause little or no discomfort but may be quite tender, even painful
- The child may be more clingy and fretful, and dribbling more than usual
- Chews and mouths (though mouthing fingers, hands and other objects is a normal infant behaviour, especially from 4 months onwards)
- Irritability and crying (on and off for no more than a few days)

## Treatment

Parents are often misinformed about the importance and consequences of teething pain. Reassure parents that teething rarely results in anything more than minor distress, that it does not cause fever, rashes or diarrhoea, and that it will usually settle quickly.

## Soothing methods

- Gentle massaging of the gum with the parent's forefinger wrapped in a soft cloth or gauze pad is comforting.
- or*
- Allow the baby to chew on a clean, cold, lightly moistened facewasher (a piece of apple can

be placed inside the facewasher).

or

- Give the baby a teething ring (kept cold in the refrigerator) or a teething biscuit.

## Medication

Medicine is usually not necessary for teething. Paracetamol should be used only for significant discomfort. Teething gels are salicylate-based and are not recommended.

## Pitted dark teeth and bruised teeth

Some children who are breastfed for long periods (e.g. 3 years) may develop unsightly pitting of the front surface of their teeth. This will not go away but parents should be reassured that the adult teeth will be normal when they appear.

Bruised teeth can result from minor trauma, with the tooth appearing a grey-brown colour. While a cosmetic issue for some parents, these too are not a concern and the adult tooth will appear and develop normally.

Page 964

## Thumb sucking

Thumb sucking involves placing the thumb or finger on the roof of the mouth behind the teeth (hard palate) and sucking with the mouth closed. Sucking is a normal and soothing behaviour for the infant, but it can become an entrenched habit. It occurs in children up to the age of 12 years but is most common under the age of 4 years. It usually settles by the early primary school years, and will sometimes stop if the child becomes self-conscious because other children notice. It can cause problems with the child's bite, especially as the adult teeth appear, at about age 7. One effect is that the pressure on the front teeth may cause protrusion of the front teeth (i.e. buck teeth); another is a narrowing of the bite with a gap between the top and bottom incisors, referred to as an open anterior bite. This can also happen with pacifiers. The best approach is for parents to notice when the child is doing it less, and to comment on how grown up the child is becoming, rather than scolding or overly drawing attention to the behaviour.

## Advice to parents

- No special diet or medication is necessary. Unpleasant-tasting topical applications to the pacifier or thumb are counter-productive.
- For a child over 6 years, carefully observe trigger factors and find ways of avoiding them. Provide distractions.
- Help the child explore other solutions to soothe themselves.
- Give praise and rewards for efforts to stop.

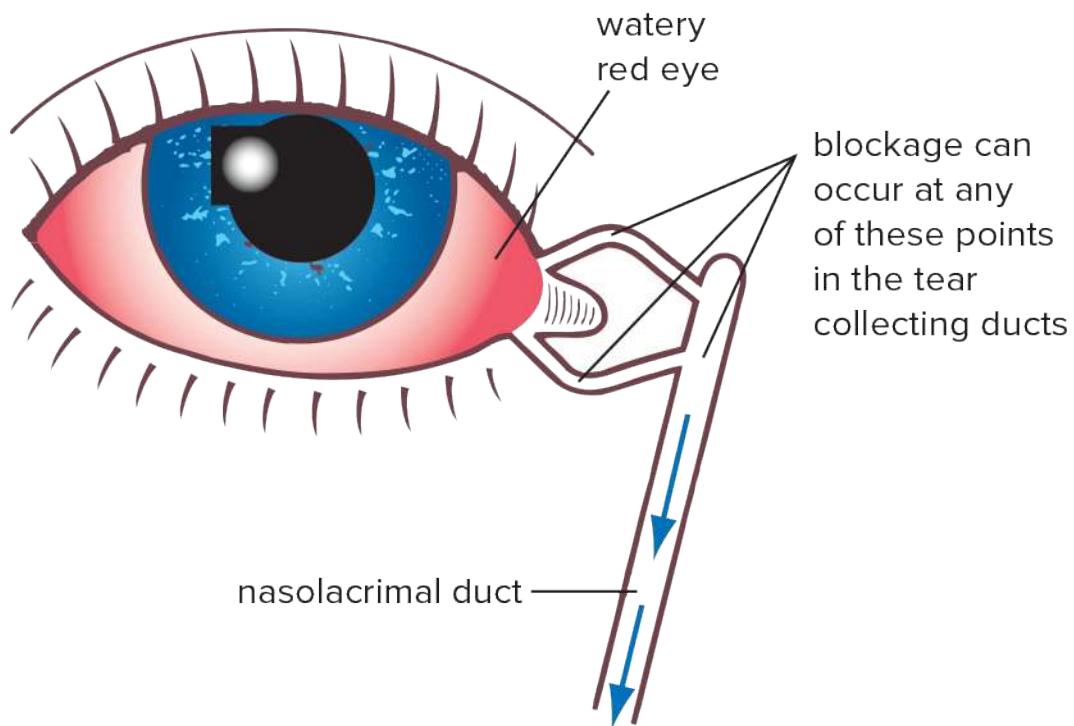
## ⌚ Snuffling infants

Snuffling frequently occurs in normal babies in the few weeks after birth and is not a problem unless it affects feeding. Infants and small children have particularly small noses, which block easily.

Snuffling in older infants is usually caused by rhinitis due to an intercurrent viral infection. The presence of yellow or green mucus should not be a cause for concern and is not an indication for antibiotics. Give reassurance, and advise that using a saline nasal solution to clear congestion is reasonable.

## ⌚ Blocked nasolacrimal duct

About 20% of infants develop watery eyes, but most resolve by 12 months. Excessive eye watering in infants is the key sign that there is inherited narrowing of the nasolacrimal ducts (see FIG. 84.2 ). It usually becomes obvious in infants between 3 and 12 weeks and affects one or both eyes. Mucus and mucopus may appear in the tears. The discharge is worse on waking. In some infants, watering and discharge soon after birth indicate that the ducts have failed to open. Infection may intervene (refer to CHAPTER 40 ) and conjunctivitis can be problematic.



**FIGURE 84.2** Blocked nasolacrimal duct

## Outcome

In most cases the problem improves spontaneously. Self-correction usually occurs from 6 months of age onwards or even earlier. It remains a matter of controversy whether massage helps or not.

Minor infection can be treated with warm cotton-wool soaks. For more severe blockage, recurrent conjunctivitis or when eye watering has not settled by 12 months, referral to an ophthalmologist for consideration of whether probing is warranted.

## Failure to thrive (FTT)<sup>2,3</sup>

It is essential to monitor growth of children, particularly infants (see [CHAPTER 83](#)). The sequential plotting of the weight, length and head circumference (anthropometric criteria) on growth charts (see [APPENDICES I-IV](#)) in the personal health record (PHR) and/or the doctor's medical file on the child enables appropriate monitoring of this growth. The growth charts mean little without considering the context of the baby's growth (e.g. premature babies, children of small parents). Correcting for prematurity (under 37 weeks) should be done until the age of 24 months.

Also, growth charts themselves have reliability issues. They are based on Caucasian children and are not fully representative for some other groups (e.g. Asian children tend to be smaller). Growth charts can also vary depending on whether they use data based on populations of exclusively breastfed infants or include formula-fed infants (who tend to grow faster).

Classically, failure to thrive (FTT) has been defined as children whose weight <3rd Page 965 percentile on ≥2 occasions, or whose weight crosses two centile lines over time. These criteria, however, are met by 5% of infants at some stage, many of whom do not have concerning growth progression; they will also fail to pick up all children who may not be growing adequately. It is therefore important to consider the contextual issues of measurement mentioned above, as well as taking into account the overall clinical picture of the growth over time (e.g. how quickly is the percentile change happening) and the general health and development of the child. While FTT is a useful term to help identify and describe infants and children that may have growth issues, it is not a diagnosis in itself.

Average weight gain/week:

0–3 months	180 g/week
3–6 months	120 g/week
6–9 months	80 g/week
9–12 months	70 g/week

Weight gain slows further after 12 months of age.

## Causes

Traditionally, FTT was divided into organic and non-organic causes. It is becoming increasingly recognised that in many cases the cause is multifactorial, including biological, psychosocial and

environmental contributors. A practical way of considering potential causes is looking at caloric intake, absorption and expenditure. In many cases (>80%) no cause is found.

## History

- Antenatal/birth/postnatal history—including growth parameters
- Feeding history (most important aspect)

Infants—BF/attachment, formula feeding, timing, volumes (e.g. weigh infant before and after, mother expressing and measuring breast milk), vomiting?, solids introduction (see [CHAPTER 83](#) )

Toddlers—types and amounts of foods/liquids (see [CHAPTER 83](#) ), especially iron-containing foods, food intake inside and outside home, mealtime battles, distractions, food refusal, milk volume, parental food attitudes

- Medical history
- Developmental history (e.g. regression, specific known syndromes)
- Family history (e.g. mid-parental height, parents' or siblings' childhood weight gain)
- Social history (e.g. finance, supports)

**Table 84.1** Failure to thrive: causes to consider<sup>2</sup>

### Inadequate caloric intake/retention (most common)

- Inadequate amount of food provided
- Breastfeeding issues
- Physical reasons baby can't feed well (e.g. cleft palate)
- Persistent vomiting
- Chronic disease causing anorexia

### Inadequate absorption

- Coeliac disease
- Chronic liver disease
- Pancreatic insufficiency (e.g. CF)
- Chronic diarrhoea (e.g. protein-losing enteropathy)
- Lactase deficiency (lactose intolerance)

### Excessive caloric utilisation

- UTIs
  - Chronic respiratory disease (e.g. severe asthma, bronchiectasis)
  - Congenital heart disease
  - Diabetes mellitus
  - Hyperthyroidism
- 

### Other medical causes

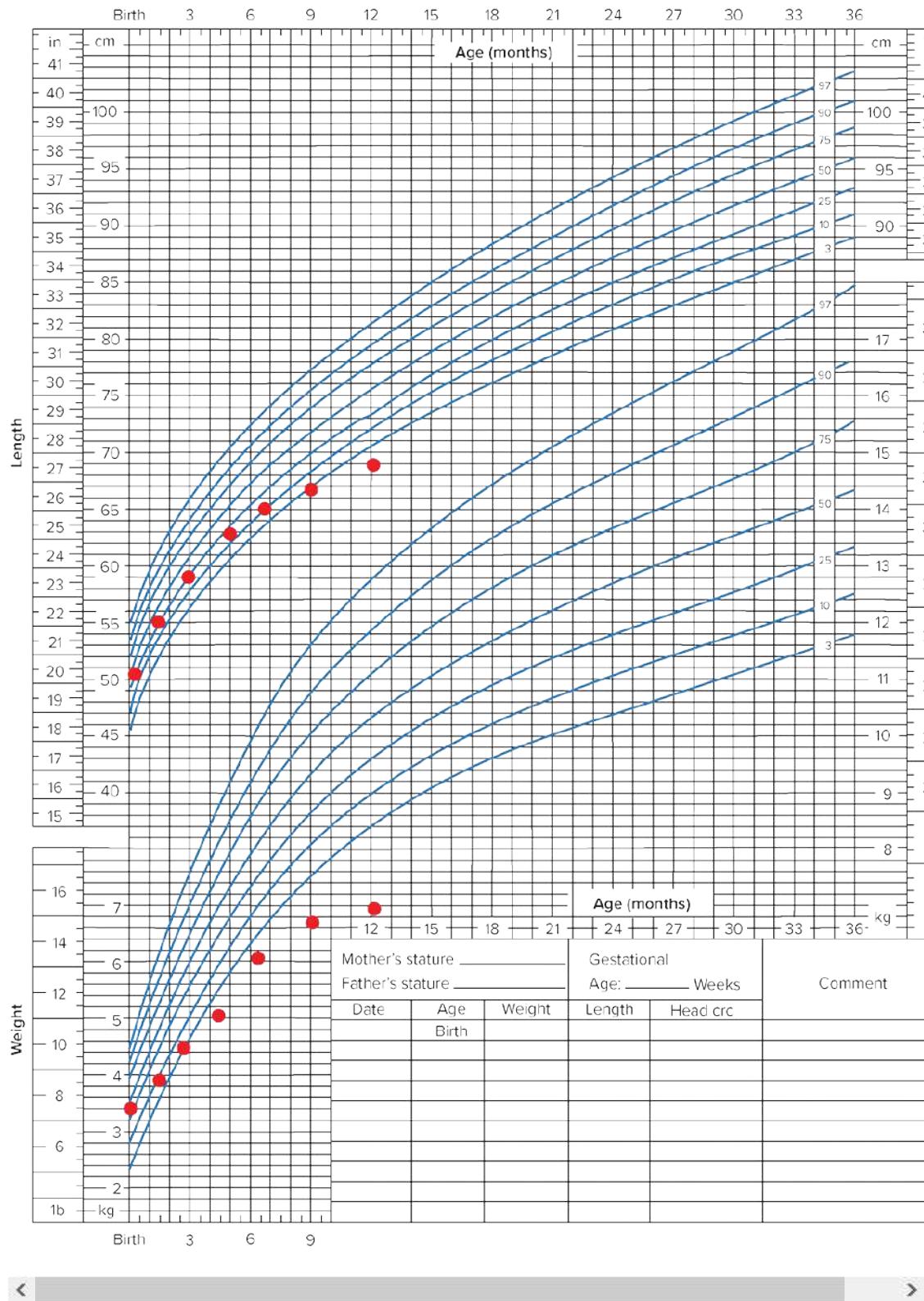
- Genetic disorders
  - Inborn errors of metabolism (e.g. galactosaemia)
- 

### Psychosocial factors

- Parental depression
  - Coercive feeding (feeding becomes a battle)
  - Distractions at meal times
  - Poverty (the single biggest risk factor in both developed and developing countries)
  - Behavioural disorders
  - Poor social support
  - Neglect and abuse (risk of child abuse is 4x higher in children with FTT)
- 

## Examination

- Growth charts (refer to FIG. 84.3 )



**FIGURE 84.3** Example of growth chart with FTT from inadequate calorie intake (the red dots indicate FTT). Note how the weight drop is more marked

than the length drop.

- General appearance (does the child look sick/irritable/lethargic? dehydration? loss of subcutaneous fat? pallor? inappropriate bruising or affect?)
- Observation of infant feeding and child–parent interaction (a home visit, or assessment by a lactation consultant/early childhood nurse may be useful here)
- Dysmorphic features
- Developmental assessment
- Jaundice/bruising/scratches
- Skin, hair and nails
- ENT
- Cardiac/respiratory
- Abdomen (e.g. distention, organomegaly)
- Endocrine (e.g. goitre, urinalysis, finger-prick glucose)
- Lymphadenopathy

---

Page 966

---

Page 967

## Investigations

In a healthy infant with no concerns found on history and examination, no investigations are required, and reassuring the family and further monitoring is appropriate. If concerns are found, targeted investigation for these should be done. Simple first-line investigations may include:

- FBC, CRP
- iron studies
- UEC/LFTs
- urine MC&S
- coeliac screen
- stool fat globules/fatty acid crystals

## Other issues to consider

Frequent weighing of children may exacerbate parental anxiety. Babies under 3 months of age should not be weighed more than weekly, and not more than fortnightly after that. A paediatric review may be required in more significant FTT situations, and occasionally admission to

hospital to further assess feeding, psychosocial aspects and other medical causes. In difficult cases, a team-based approach potentially using paediatricians, lactation consultants, dietitians, early childhood nurses, speech pathologists or psychologists as well as the family doctor can be utilised.

## ⌚ Short stature<sup>4,5,6</sup>

Short stature is considered to be below the 3rd percentile. In general, it is important to differentiate between normal physiological variants of growth and pathological causes.

### Causes

- 1. Familial short stature—this follows the family trend of a genetically small family.
- 2. Constitutional delay in maturation—a common and normal variant in which the growth spurt is later than average. Bone age is delayed.
- 3. Pathological causes—of the many causes, some are rare but serious conditions, such as coeliac disease, Crohn disease and chronic kidney failure. These may present with slow growth as the only abnormal sign.

### Rough rule for expected adult height based on parental height

- Boys—mean of parents' heights + 5 cm
- Girls—mean of parents' heights – 5 cm

Recombinant human growth hormone treatment for those children with idiopathic short stature (ISS, a diagnosis of exclusion) increases height in some children, with the range of benefit usually between 3 cm and 7 cm. It is expensive, and while considered safe in the short term, long-term safety is lacking. Specialist advice is recommended.

## ⌚ Tall stature

Tall stature is considered to be above the 97th percentile. It is not a common presenting childhood problem in general practice. The estimated mature height is:

- females: 182.9 cm
- males: 193.1 cm

### Causes

- Familial (predicted final height should roughly match mid-parental height)
- Precocious puberty
- Growth hormone excess (pituitary gigantism)
- Hyperthyroidism
- Syndromic: Marfan, Klinefelter, homocystinuria

## Management

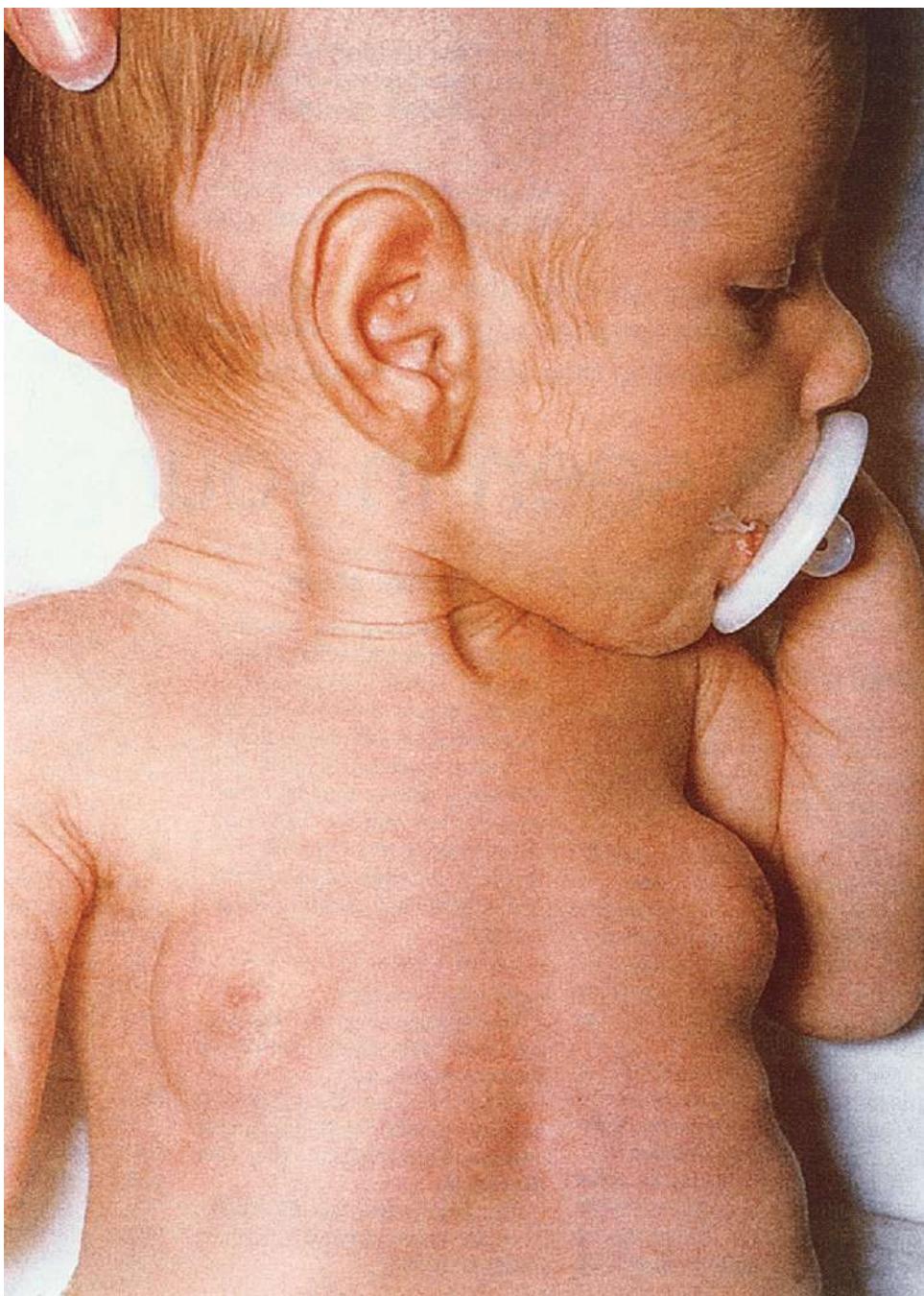
As tall stature is generally socially acceptable, reassurance, counselling and education may alleviate the family's concerns. If treatment is considered appropriate, high-dose oestrogen is used in very tall girls (accelerates epiphyseal maturation and reduces final height) while high-dose testosterone is used for boys. The management should be undertaken by endocrinologists. The ideal time to commence hormone therapy is just after the appearance of the first pubertal changes.

## Asymmetrical breast development<sup>7</sup>

This may occur in both sexes—in males being a variant of pubertal gynaecomastia and Page 968 in females part of a normal development process—and reassurance that the breast sizes will usually normalise in time is all that is required. If the discrepancy persists and is causing psychological problems, further strategies, such as prostheses or reconstructive surgery, may be advised by specialists.

## Infant breast hyperplasia

A breast 'bud' is common in most term babies and may enlarge with breastfeeding (see FIG. 84.4 ). Milk may discharge from some ('witch's' milk) but reassurance is all that is required (see CHAPTER 93 ).



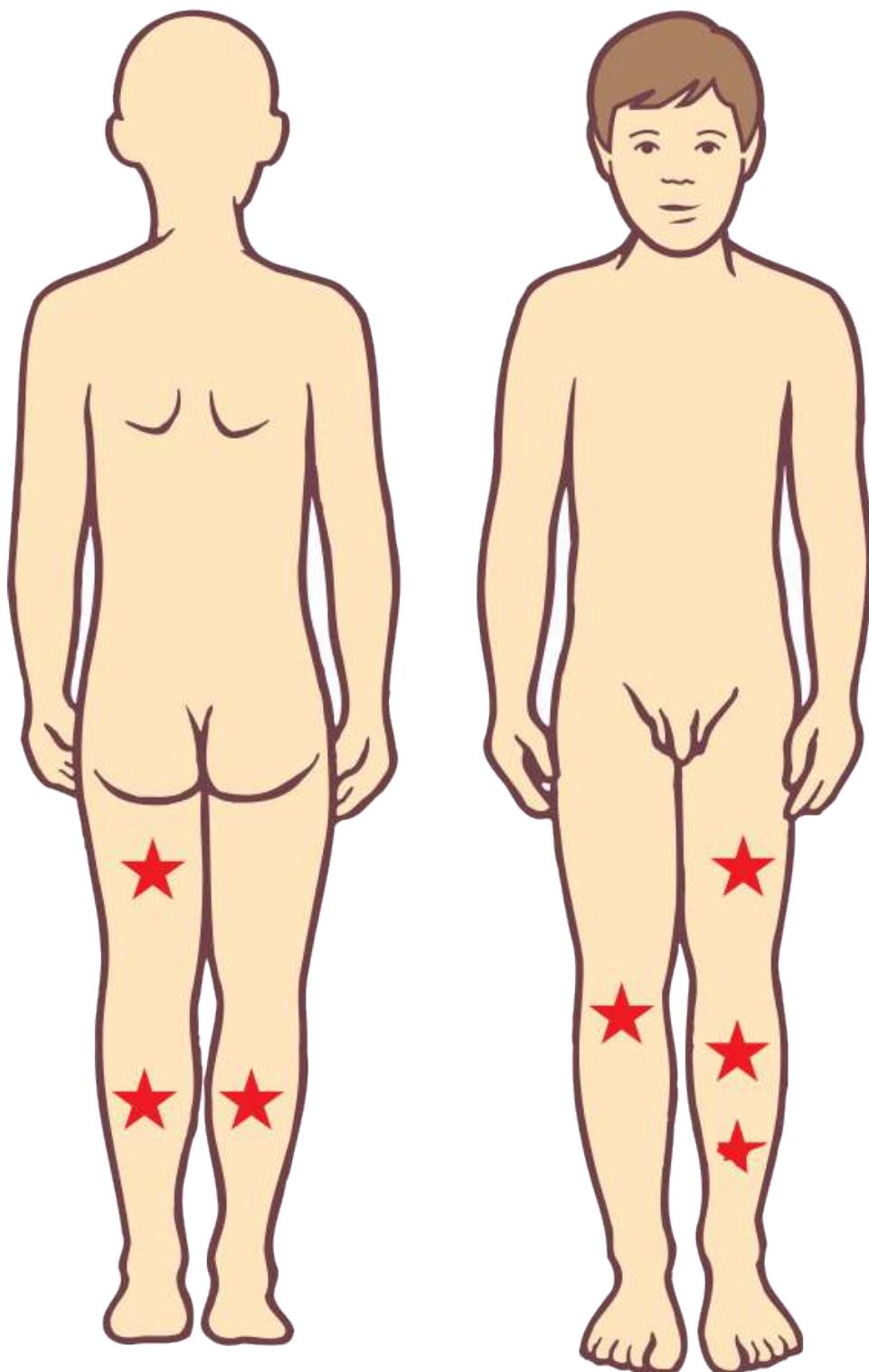
**FIGURE 84.4** Breast hyperplasia in a 15-week-old child

## ⌚ Growing pains<sup>8,9</sup>

Growing pains (benign nocturnal limb pains) are real and common (around 1 in 5 children).

### Features

- Typical age 3–12 years
- Positive family history
- Usually bilateral and non-articular
- Poorly localised in leg—typical sites include shins, calves, thighs, popliteal fossa (see FIG. 84.5 )



**FIGURE 84.5** Growing pains: typical sites of pain

- Episodic, with pain-free intervals from weeks to months

- Last minutes to hours, regardless of treatments, and usually gone by the morning
- Usually occur late in the day or during the night
- Normal examination
- No associated symptoms
- No pain or disability next morning (runs okay)
- Very active days or being moody may lead to a ‘bad’ night

## Management

- Problem resolves spontaneously in time
- Reassurance
- Consider analgesic and heat packs (usually unsuccessful)
- Massage is a reasonable option—appears to help
- Check ESR if in doubt

# Childhood cardiac murmurs

---

Many children and infants will be found to have systolic murmurs on routine examination, especially in the presence of a fever, anxiety or fear. The majority, which will be innocent or physiological, are found in asymptomatic children and due to normal turbulence of flow within the heart and great vessels.

## Innocent murmurs<sup>10</sup>

An innocent murmur can be diagnosed in children over 12 months of age if the following 4 criteria are met:

Page 969

- there are no other abnormal physical findings
- the child is asymptomatic (e.g. no dyspnoea, palpitations, fatigue, nausea/vomiting, ongoing cough)
- no history of risk factors for structural heart disease (e.g. family history, maternal gestational DM/alcohol abuse, previous Kawasaki disease/rheumatic fever, genetic disorders, prematurity)
- auscultatory features typical of an innocent murmur (see 7 Ss below)

In murmurs heard in infants under 12 months of age, the risk of asymptomatic structural heart disease is higher, and further assessment is warranted.

The 7 Ss of innocent murmurs:

1. Sensitive (changes with child's position or with respiration)
2. Short duration (not holosystolic)
3. Single (no associated clicks or gallops)
4. Small (murmur limited to a small area and non-radiating)
5. Soft (low amplitude)
6. Sweet (not harsh sounding; musical vibratory quality)
7. Systolic (occurs during and is limited to systole)

Other: normal second heart sound

## Investigation

Chest X-rays and ECGs rarely assist in the diagnosis, and can give false reassurance. When a murmur cannot be definitively diagnosed as innocent, the child should be referred for echocardiography, paediatric cardiologist review or both. Also refer if there is a family history of cardiomyopathy or sudden unexplained death, or if the child has a chromosomal disorder or other congenital disorder.

## Nocturnal enuresis<sup>11,12</sup>

Nocturnal enuresis (NE), or bedwetting, is urinary incontinence occurring during sleep in a child with a developmental age of 5 or older, when micturition control is usually achieved. An absence of other urinary symptoms (e.g. frequency, urgency, straining or daytime wetting) is referred to as monosymptomatic NE, but if present then the term non-monosymptomatic NE is used. Primary enuresis (80% of cases) occurs in a child who has never had urinary continence for 6 months, and secondary enuresis (20%) occurs after 6 months or more of day and night dryness, and is more commonly associated with organic or psychological causes.

### What is normal?

Prevalence:

- 15–20% of 5 year olds
- 5% of 10 year olds
- 1–2% of 15 year olds

The spontaneous resolution of NE is 15% per year. Boys are affected 3 times as much as girls, and there is a strong familial tendency (75% have an affected first-degree relative, with maternal enuresis a greater risk factor than paternal enuresis). Twenty per cent of children with NE will also have daytime symptoms.

## Aetiology

The causes of NE are not fully understood, but are thought to be multifactorial, including:

- disturbance in arousal—children with NE often do not wake adequately in response to a full bladder
- overactive bladder—which leads to a reduced bladder capacity. Children in this situation will often have daytime symptoms or other urinary symptoms (e.g. urgency, frequency)
- nocturnal polyuria—this is caused by reduced nocturnal vasopressin (which normally reduces nocturnal urine production)

Other common contributing factors include constipation (more than a third of patients) and obstructive sleep apnoea. Both of these should be carefully enquired about in the history. UTIs, diabetes and psychopathology (e.g. behavioural problems, ADHD, stress or trauma, depression, anxiety) can also contribute to and/or are associated with NE.

## Assessment

As well as assessing for the above contributing factors, a detailed history of the urinary symptoms and pattern should be taken. This is greatly assisted by getting the parents (and child if old enough) to complete a 48-hour time and volume chart of fluids and urine (including urine symptoms).

Physical examination should include ENT examination (looking for large tonsils or nasal obstruction causing OSA), abdominal examination (large bladder, faecal loading) and a focused neurological examination.

Urinalysis and culture can help detect infection. Blood tests, imaging and urodynamics Page 970 are not usually required for uncomplicated primary NE. If there are daytime symptoms, significant other urinary symptoms, history or diagnosis of UTIs, structural abnormalities of the urinary system or genitals, secondary enuresis or refractory problems, then further investigations and/or specialist review is warranted.

## Advice for parents/child: ‘they/you will very likely grow out of it’

Both the parents and child should be reassured that primary NE is common, unlikely to be a medical concern, not the child’s fault and will nearly always resolve by itself with time. If the issue is not bothering the child, then treatment is not needed. If conducted, treatment should be delayed until the child is able and willing to comply, which is generally around age 7 years.

## Tips to help the family deal with the situation

- Do not scold or punish the child.
- Praise the child if achieving dryness.
- Use absorbent ‘pyjama pants’ or mattress protectors (absorbent underlays), which can help reduce distress for parents and child, and will not contribute to the enuresis.
- Make sure the child has a shower or bath before going to kindergarten or school (to avoid teasing).
- Do not wake the child at night to visit the toilet.
- Use a night-light to help the child who wakes.
- Consider a star chart diary with a star for a dry night.
- Encourage regular fluids and toileting during the day and just before bedtime.
- Advise against fluid restriction in evening; avoid caffeine drinks.

## Treatment

The treatment of primary monosymptomatic NE requires educated and motivated child and parents. Guilt, shame and punishment need to be avoided. The child should be involved in the treatment (even though the child didn't cause the problem, he or she has a role in treating it).

### Urotherapy

Urotherapy, or improving urination habits, includes increasing daytime fluid intake (to increase bladder capacity and awareness of bladder fullness). Six to eight reasonable-sized drinks spaced throughout the day (not just after school) are recommended (50 ml/kg/day). Regular voiding every 2–3 hours will help the child become more cognitively aware of the bladder sensations.

Promptly and aggressively treating constipation will help bladder capacity and control.

### Alarm therapy

Alarms can be obtained through enuresis clinics, pharmacies and community health clinics. They can be body-worn, or pad-and-bell bed alarms, and work on operant conditioning. The buzzer goes off and wakes the child when urine is passed.

Alarms take effort and commitment. It takes around 3 weeks for the child to recognise the sensation of a full bladder, and around 12 weeks to achieve dryness (success is measured as 14 consecutive dry nights). If dryness is achieved it is either through the child waking to urinate (a third of children) or sleeping through dry (two-thirds).

The success rate is around two-thirds of children, and half of these remain dry. ‘Overlearning’ (giving additional fluids at bedtime to those who achieve dryness) can improve the child’s response to a full bladder signal and reduce the risk of relapse, especially in those who are sleeping through dry. If bedwetting restarts after stopping treatment, alarm training can be retried.

## Medications

*Desmopressin acetate*: while this vasopressin analogue is very effective, it has a high relapse rate. It comes in tablets, melts and nasal spray, with the tablets and melts preferable as they have a lower risk of hyponatraemia. Fluids need to be restricted from 1 hour before taking to 8 hours after the dose. It is very useful for children in school camps or having sleepovers.

Other treatment options include using anticholinergics, antidepressants (despite a favourable Cochrane review, the WHO advises against imipramine because of the risk of death from overdose), combinations of alarms and medications, or combinations of medications. These options should be undertaken by a specialist or through an enuresis clinic.

## ⌚ Constipation in children<sup>13,14,15</sup>

Constipation is quite common in children, although no cause has been discovered in 90–95% of cases. Constipation usually appears between 2 and 4 years of age, and up to a third of primary school-aged children will report constipation over a 12-month period. In toddlers, the gender distribution is equal, but by age 5, boys are more likely to get constipation than girls, with the frequency of faecal incontinence three times higher in boys. The most common factor is diet. Organic causes of chronic constipation are rare.

Refer to [CHAPTER 31](#) for detailed information.

## Common skin problems<sup>16,17,18</sup>

---

Many of the common problems (e.g. acne, psoriasis, atopic dermatitis, seborrhoeic dermatitis) are covered in more detail in [CHAPTER 113](#). The following are specifically (or usually) disorders of the neonatal period and early infancy.

Page 971

## ⌚ Toxic erythema of newborn

This benign self-limiting condition occurs in around half of babies, usually 1–2 days after birth (but may appear up to 2 weeks later) with 2–3 mm erythematous macules and papules developing into pustules, with a surrounding blotchy area of erythema, described as a ‘flea-bitten’ appearance. The rash starts on the face and spreads to the torso and proximal limbs, and spares the palms and soles. The rash usually fades over a week, but may recur for a few weeks. No treatment is required.

## ⌚ Salmon patch (naevus flammeus nuchae)

These are flat patches of pink or red skin, due to dilated capillaries, with poorly defined borders on the face and eyelids. They occur in 40% of all newborns, and are seen at the nape of the neck ('stork bite') or between the eyebrows/on the eyelids ('angel's kiss') (see FIG. 84.6 ). They are more prominent when the child is crying. They fade over 6–12 months but neck patches may persist into adult life. No treatment is required.



**FIGURE 84.6** Salmon patch on the upper eyelid: called an 'angel's kiss'

## ❶ Infantile haemangioma

Infantile haemangiomas can be superficial ('strawberry haemangioma', flat or lumpy, resembling strawberry jam splashed on the skin, see FIG. 84.7 ) or deep ('cavernous haemangioma', a bluish swelling). They usually appear after birth as a pinpoint lesion, and occur in 10% of infants.



**FIGURE 84.7** Strawberry haemangioma on the face of a child

Some 80% occur on the head and neck and 80% of their growth occurs in the first 3 months (most stop by 5 months, though some continue until 18 months). Reassure the parents and give advice on stopping any bleeding. They usually involute and disappear (50% by 5 years, 70% by 7, 90% by 10), though regression of bulky ones tends to be incomplete, and they often leave an atrophic 'dented' scar. Large, deep or multiple haemangiomas can be associated with malformations of organs, and referral of these, those causing cosmetic issues (such as being prominent on the face), those that impair vision/hearing/breathing or feeding, or that are in other important locations (e.g. perineum or sacrum) is recommended. Active non-treatment is the rule,

but beta blockers have proven effectiveness. Propanolol is useful, especially if used early in the growth phase, and is now usually preferred over oral steroids. Preparations include oral propanolol (with caution) and topical timolol drops or gel.<sup>19</sup> Refer multiple lesions and those on the eyelids.

## ⌚ Capillary vascular malformation ('port wine stain')

These dark red to purple lesions (a type of naevus flammeus) are present from birth and [Page 972](#) affect 3 in 1000 neonates. They are usually flat at birth, though they can become lumpy. There is an association with vascular syndromes, including Sturge–Weber syndrome, where a port wine stain on the skin supplied by the ophthalmic division of the trigeminal nerve is accompanied by glaucoma and seizures, and patients are at increased risk of developmental delay and hemiplegia; refer these patients. Port wine stains will often respond well to pulse dye laser (the treatment of choice). Cosmetic camouflage is useful.

## ⌚ Lymphatic malformation (lymphangioma)

These are present at birth but can subsequently grow. They can vary from large fluid-filled spaces (cystic hygromas) down to clusters of small firm blisters resembling frogspawn. They can be skin-coloured, red or purple (if associated vascular involvement) or brown or black. Surgical excision may be required.

## ⌚ Dermal melanocytosis ('Mongolian spot')

This condition presents as blue-grey discolouration of the skin over the lower back and sacrum in babies of east Asian and other dark-skinned ethnic backgrounds. These are of no clinical significance but may be mistaken for bruising or non-accidental injury. They usually disappear by 4 years of age.

## ⌚ Sebaceous hyperplasia

Hyperplastic sebaceous glands appear as tiny yellow-white papules on the nose or forehead. They disappear in several weeks.

## ⌚ Nevus sebaceous

This is a variant of sebaceous hyperplasia. It is a congenital yellow-orange hairless plaque that typically occurs on the face and scalp. No treatment is usually required, but monitor for complications, especially suspicious lumps.

## ⌚ Milia

Blocked sebaceous glands, leading to pearly-white lumps under the skin, especially on the face, are present in 50% of neonates. The firm, white papules are about 1–2 mm in diameter and differ

from the yellowish papules of sebaceous hyperplasia. These also disappear after several weeks, and usually no treatment is required (see FIG. 84.8 ).



**FIGURE 84.8** Milia on the face of a 2-week-old infant

### ⌚ Miliaria ('sweat rash')

This is related to overheating and occurs in skinfolds such as around the neck and armpits, but also on the face. It appears as two types:

- ‘crystallina’—beads of sweat trapped under the epidermis with surrounding erythema
- ‘rubra’—itchy red papules

It is a benign condition that disappears after a few weeks.

If problematic:

- keep skin dry and cool (e.g. fan, air-conditioner)
- dress in loose-fitting cotton clothing
- avoid frequent bathing and overuse of soap
- mild topical steroids (e.g. hydrocortisone) can help if inflamed

## Treatment

Salicylic acid 2%, menthol 1%, chlorhexidine 0.5% in alcohol (zinc oxide powder to prevent flares)

## Prevention

Prickly heat powder

---

Page 973

## § Suckling ‘blisters’

These are a hyperplastic response to suckling, and are common on the upper lip. Reassure that these will settle.

## § Umbilical discharge

When the umbilical stump first separates, some granulation and mild exudate can be present until healing occurs. If the umbilicus is discharging pus and there is surrounding erythema in the neonate, infection should be considered, and a bacterial swab taken and appropriate antibiotics given. Be watchful for urine or faecal discharge.

## Bleeding umbilical cord

Small amounts of bleeding may occur as the cord is separating and requires no treatment unless it is more profuse (if so, consider infection or a bleeding disorder).

## § Umbilical granuloma

These common fleshy pink-red growths can cause a persisting seropurulent discharge after the separation of the umbilical stump. The granuloma is often seen only by carefully examining the

base of an ‘innie’ umbilicus. Drying out of the granulomatous tissue and healing can be achieved by the parent airing regularly, applying salt twice a day at home for a week or two (followed by irrigation), or the GP using a silver nitrate stick or copper sulphate crystals every few days until healing occurs. Protect the surrounding skin with Vaseline. Large pedunculated and persistent granulomas may be helped by applying a double ligature to the neck of the granuloma.

## ⌚ Frey syndrome

This is a benign flushing and sweating of skin in front of the ear that occurs with eating, and incorrectly is often attributed to food allergy. It is considered to be caused by trauma to the auriculotemporal nerve or parotid gland, usually from instrumental (forceps) delivery.

## ⌚ Pityriasis alba

- These are round or oval pale skin patches usually on the face of children and adolescents, and are more visible in tanned or dark-skinned patients.
- They can occur on the neck and upper limbs, occasionally on the trunk.
- Full repigmentation occurs after a couple of years
- They may start out pale pink then fade to white, and can leave slight depigmentation.

## Treatment

- Reassurance
- Simple emollients
- Restrict use of soap and washing
- Mild steroids if scaly and itchy (rarely necessary)

## ⌚ Atopic dermatitis (eczema)

See [FIGURE 84.9](#).



**FIGURE 84.9** Atopic dermatitis (eczema) in a 3-year-old child with widespread distribution and severe pruritus

This common condition may appear typically in infants on the cheeks of the face, the folds of the neck and scalp and extensor surface of the limbs. For further information on its manifestation in

children and management refer to [CHAPTER 113](#) .

## **Seborrhoeic dermatitis**

See [FIGURE 84.10](#) .



**FIGURE 84.10** Seborrhoeic dermatitis in a 10-week-old child, showing a red, scaly rash affecting the scalp, forehead, face, axillae and nappy area. Both cradle cap and nappy rash are present.

This scaly rash usually presents in the first few months of age as cradle cap or napkin dermatitis and tends to resolve at about 12 months. It is usually yellowish to red and a greasy scale. Itching tends to be absent or minimal.

Page 974

This is quite different from adult seborrhoeic dermatitis and appears in the first 2 to 3 months.

Refer to [CHAPTER 113](#).

## Nappy rash

Nappy rash occurs under the nappy in response to wetness. The most common cause is contact dermatitis from urine and faeces, which will inevitably cause a rash if left on the skin for long enough. This will lead to the dull red rash being most prominent where the nappy contacts the skin, and sparing the folds. Sometimes ammonia is formed, resulting in a chemical burn (hence the alternative term ammoniacal dermatitis).

Nappy rash in the folds is more commonly found in infants with cradle cap and seborrhoeic dermatitis. Thrush can also coexist, with the rash appearing more bright red, and often having satellite lesions or pustules around the main rash. Bacterial superinfection (impetigo, see later in this chapter) can occur, with crusting, pustules and irregular blisters. Swabs should be taken for this if suspected. Other conditions such as psoriasis and atopic dermatitis also need to be considered, especially for resistant or recurrent nappy rash.

### Advice to parents

- Keep the area dry. Air dry when possible (e.g. lying on towel without a nappy).
- Do not use powder, which can irritate the skin.
- Change wet or soiled napkins promptly—disposable ones with their absorbent hydrocellulose gel are very effective.
- If using cloth nappies, nappy liners can help keep the skin dry. Do not use plastic pants around them.
- Give evening fluids early to reduce night-time wetting, and change the nappy before parents go to bed.
- Wash gently with warm water and pat dry (do not rub).
- Avoid excessive bathing and soap.
- Use moisturisers to keep skin lubricated (e.g. zinc oxide and castor oil cream). Silicone barrier creams can also help.

### Treatment

- Hydrocortisone and/or antifungal cream while rash is present.
- Antifungal can be continued for a few more days if thrush suspected.
- Do not use strong steroid creams on baby's bottom.

## Cradle cap

Cradle cap is infantile seborrhoeic dermatitis confined to the scalp. The seborrhoeic dermatitis may also involve other areas (see [CHAPTER 113](#)). Cradle cap is very common, usually occurring in the first 6 weeks of life and settling over the next few weeks to months, but it sometimes takes much longer.

Greasy yellow scales are formed in response to sebum combining with old skin cells as they try to dry and fall off. The yeast *Malassezia furfur* may be involved. It is not usually itchy or distressing to the child.

### Treatment

- Reassurance and watchful waiting (if not too bad, given the natural history is to improve with time)
- Use vegetable oil overnight to soften scales and then gently brush off (not olive oil; this encourages *Malassezia*)
- Baby shampoos and then gentle brushing off of scales
- 2% ketoconazole shampoo (Nizoral) twice weekly
- Apply the intermittent use of a mild topical steroid such as hydrocortisone cream to red and inflamed areas

---

Page 975

## Molluscum contagiosum in children<sup>20</sup>

Molluscum is usually diagnosed by its distinct pink pearly appearance and central punctum (see [CHAPTER 116](#)). It is very common in children (up to 10% of the paediatric population have it at any given time), and is usually spread by direct contact, sharing towels and bath toys, or through water (e.g. sharing baths or swimming).

The rash lasts weeks to months, or occasionally a couple of years. Molluscum rarely leaves tiny pit-like scars. It can have a reactive dermatitis surrounding the lesions (especially in children prone to atopic dermatitis) and hydrocortisone cream can be used to help this.

### Advice to parents

- Give the child a shower instead of a bath (the bath can spread the virus to other parts of the body).

- Don't share baths.
- Wash and dry bath toys after use.
- After showers/baths/swimming, dry areas with molluscum last and don't share/re-use towels.
- Wash hands after touching molluscum.
- Don't exclude children from school or playing together.
- If swimming, reasonable precautions include covering the lesions with waterproof tape and having personal kick-boards.

## Treatment

The most common approach in children is to leave the rash alone and wait for it to clear. Treatments designed to irritate the lesion can make the rash clear more quickly (see [CHAPTER 116](#)) but can be distressing to the child and so are not normally done.

## Warts in children<sup>21</sup>

Warts affect about 10% of children. Even without treatment, 50% of them will go in 6 months, and 90% in 2 years. It is therefore best to avoid painful treatments unless the parent and child are motivated (e.g. for cosmetic reasons, or uncomfortable plantar warts). A reasonable option that can help the wart disappear faster is to cover with occlusive tape (e.g. duct tape) 24 hours a day.

Refer to [CHAPTER 57](#) (plantar warts) or [CHAPTER 116](#) (general warts) for more active treatment options.

## Hair problems in children

Refer to [CHAPTER 118](#).

## Lead poisoning<sup>22</sup>

- Young children are susceptible to lead poisoning. They are more likely than adults to be exposed to lead because of their exploratory and mouthing behaviour and because they absorb more of any ingested dose. The most common source seen in general practice is home renovation, involving paint removal in houses built before the 1980s.
- All Australians should have a blood lead level below 10 mcg/dL (though there is no known safe level of lead).
- Some communities are more susceptible to lead exposure due to industrial or mining activity, and some occupations and hobbies can also increase risk to household members. These include home and furniture restoration, soldering, burning of plastics and paints and cigarette

smoking. Other potential sources include imported toys containing lead or coated with lead-based paints, some ‘traditional’ medicines and improperly fired ceramic cookware (e.g. imported tagines).

- Levels of lead have increased in the biosphere 1000-fold in the past 300 years, especially during the second half of the twentieth century, but the elimination of lead in petrol has helped reduce the exposure risk.
- Levels above 10 mcg/dL are associated with adverse neurocognitive effects including decreased IQ levels and behavioural issues, and it is uncertain whether levels below this also cause problems, but >5 mcg/dL is considered unsafe.
- When symptoms appear, they are usually non-specific and may include lethargy, intermittent abdominal pain, irritability, headache, abnormal behaviour and, in acute high-level exposure (rare), encephalopathy. Page 976
- High blood lead levels should be considered in the presence of unexplained iron-deficiency anaemia.
- Advise parents or parents-to-be to reduce exposure to lead by testing paint (particularly old or peeling paint) in houses (testing kits are readily available in paint shops), painting over old paint, being careful with old furniture and imported toys, and avoiding exposure to smoking or other sources.

## Treatment

Check with poisons information centre and remove source.

- If symptomatic or high level:  
dimercaprol IM, then calcium disodium edetate IV
- If asymptomatic:  
infusion of calcium disodium edetate

## Patient education resources

---

Hand-out sheets from *Murtagh's Patient Education* 8th edition:

- Atopic eczema in children
- Child accident prevention in the home
- Constipation in children
- Cradle cap

- Bed-wetting (enuresis)
- Birthmarks
- Crying and unsettled baby
- Dyslexia and other SLDs
- Faecal incontinence in children (encopresis)
- Feeding your baby
- Growing pains
- Infant colic (periods of infant distress)
- Nappy rash
- Seborrhoea in infants
- Snuffling infant
- Tear duct blockage
- Teething
- Thumb sucking
- Toilet training your child

## References

---

- 1** The National Center on Shaken Baby Syndrome. The period of purple crying. Available from: [www.purplecrying.org](http://www.purplecrying.org), accessed 5 July 2014.
- 2** The Royal Children's Hospital, Melbourne. Failure to thrive—initial management, May 2014. Available from: [www.rch.org.au/clinicalguide/guideline\\_index/Failure\\_to\\_thrive\\_initial\\_management/](http://www.rch.org.au/clinicalguide/guideline_index/Failure_to_thrive_initial_management/), accessed 5 July 2014.
- 3** Cole S, Lanham J. Failure to thrive: an update. *Am Fam Physician*, 2011; 83(7): 829–34.
- 4** Cohen L. Idiopathic short stature: a review. *JAMA* 2014; 311 (17): 1787–96.
- 5** Allen D. Short stature in childhood—challenges and choices. *N Engl J Med*, 2013; 368(13): 1220–8.
- 6** Nwoso B, Lee M. Evaluation of short and tall stature in children. *Am Fam Physician*,

2008; 78(5): 597–604.

- 7 Australian Paediatric Endocrine Group. Hormones and me: puberty and its problems, 2011. Available from: <https://apeg.org.au/patient-resources/hormones-me-booklet-series/>, accessed March 2021.
- 8 Uziel Y, Hashkes P. Growing pains in children. *Pediatr Rheumatol*, 2007; 5: 5.
- 9 Raising Children Network. Growing pains, June 2011. Available from: [www.raisingchildren.net.au/articles/growing\\_pains.html](http://www.raisingchildren.net.au/articles/growing_pains.html), accessed 12 July 2014.
- 10 Frank J, Jacobe K. The evaluation and management of heart murmurs in children. *Am Fam Physician*, 2011; 84(7): 793–800.
- 11 Hahn D, Caldwell P. Nocturnal enuresis. *Medical Observer*, August 2013. Available from: [www.medicalobserver.com.au/news/nocturnal-enuresis](http://www.medicalobserver.com.au/news/nocturnal-enuresis), accessed 12 July 2014.
- 12 Ramakrishnan K. Evaluation and treatment of enuresis. *Am Fam Physician*, 2008; 78(4): 489–96.
- 13 The Royal Children's Hospital Melbourne. Clinical practice guidelines: constipation, December 2013. Available from: [www.rch.org.au/clinicalguide/guideline\\_index/Constipation\\_Guideline/#fu](http://www.rch.org.au/clinicalguide/guideline_index/Constipation_Guideline/#fu), accessed 12 July 2014.
- 14 Biggs W, Dery W. Evaluation and treatment of constipation in infants and children. *Am Fam Physician*, 2006; 73(3): 469–77.
- 15 The Royal Children's Hospital Melbourne. Constipation management. Available from: [www.rch.org.au/uploadedFiles/Main/Content/clinicalguide/guideline\\_index/CONSTIPATION%20HOME%20MANAGEMENT%20-%20poomeds%20revised.pdf](http://www.rch.org.au/uploadedFiles/Main/Content/clinicalguide/guideline_index/CONSTIPATION%20HOME%20MANAGEMENT%20-%20poomeds%20revised.pdf), accessed 12 July 2014.
- 16 DermNet NZ: the dermatology resource. Available from: [www.dermnetnz.org/](http://www.dermnetnz.org/), accessed 12 July 2014.
- 17 O'Conner N, O'Gloughlin M, Ham P. Newborn skin, part 1: common rashes. *Am Fam Physician*, 2008; 77(1): 47–52.
- 18 O'Conner N, O'Gloughlin M. Newborn skin, part 2: birthmarks. *Am Fam Physician*, 2008; 77(1): 56–60.
- 19 Parker SL, Hildebrand GD. Review of topical beta blockers as treatment for infantile hemangiomas. *Surv Ophthalmol*, 2016; 61(1): 51–8.
- 20 Center for Disease Control. Recommendations: patients with molluscum contagiosum and swimming pool safety, March 2013. Available from: [www.cdc.gov/ncidod/dvrd/molluscum/swimming/swimming\\_recommendations.htm](http://www.cdc.gov/ncidod/dvrd/molluscum/swimming/swimming_recommendations.htm),

accessed 12 July 2014.

- 21 The Royal Children's Hospital Melbourne. Fact sheet: warts, November 2010. Available from: [www.rch.org.au/kidsinfo/fact\\_sheets/Warts/](http://www.rch.org.au/kidsinfo/fact_sheets/Warts/), accessed 12 July 2014.
- 22 National Health and Medical Research Council. Information paper—blood lead level for Australians, July 2014. Available from: [www.nhmrc.gov.au/guidelines/publications/eh55](http://www.nhmrc.gov.au/guidelines/publications/eh55), accessed 12 July 2014.

## 85 Surgical problems in children

*A surgeon should have three diverse properties in his person. That is to saie, a harte as the harte of a lyon. His eyes like the eyes of a hawke, and the handes of a woman.*

JOHN HALLE (1529–1568)

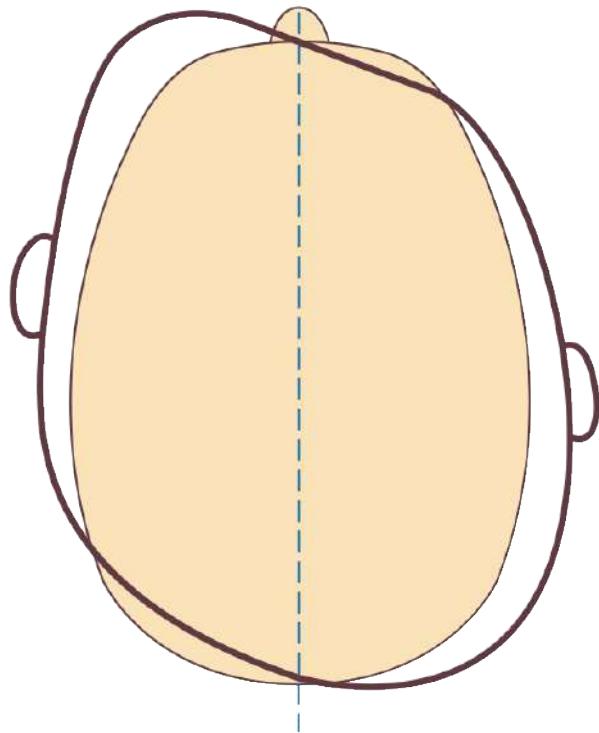
An imperative task for the GP is not only to diagnose surgical conditions in infancy and children as early as possible, but to be aware of the degree of urgency and the optimal times for intervention. In many instances the emphasis should be placed on a non-surgical solution using natural resolution with time and simple ‘tricks of the trade’.

### Head deformity

The neonate’s head may become distorted because of the position in utero or after the passage through the birth canal. The head shape can recover to a normal shape within about 8 weeks following birth. If the abnormal shape persists consider deformational plagiocephaly or craniostenosis.

#### Plagiocephaly (flat head syndrome)

This is asymmetry of the skull with a normal head circumference. The shape can be likened to a tilted parallelogram (see FIG. 85.1 ); it is the most common cause of an abnormal head shape. On the side with the flat frontal area, the ear and the parietal eminence sit more posteriorly. It affects 1 in 5 infants and is either congenital or acquired and often results from the infant sleeping in one position, usually on their back. There is usually no impairment of cerebral development or intellect. If the sutures are ridged or the sleeping position causation is ruled out, a skull X-ray should be performed. Management involves initially changing the side to which the child usually faces for sleeping, then regularly changing sides and encouraging time in the prone position while awake. If not responsive, a cranial remodelling helmet can be tried—best from 4 to 8 months.<sup>1</sup>



**FIGURE 85.1** Plagiocephaly, congenital or acquired. The long axis is deflected from the saggital plane. In this case the right ear is more posterior.

## **Craniostenosis**

This is premature fusion of one or more sutures of the cranial vault and base, which act as lines of growth. The abnormality of head shape depends on the sutures involved. The diagnosis is confirmed by radiography. Prompt referral to a paediatric craniofacial surgeon is necessary as planning for possible complex surgery, best at 5 to 10 months, is required.

## **Hydrocephalus**

This condition, which is due to an imbalance between the production and absorption of CSF, usually caused by obstruction to circulation, requires early referral for diversion of ventricular fluid. Prognosis is generally good with early intervention and regular supervision.

## **Macrocephaly and microcephaly**

Macrocephaly and microcephaly are defined as a head circumference greater than the 97th percentile and less than the 3rd percentile respectively. Infants whose head circumference measurements cross these percentile lines require expert assessment and investigation. It is appropriate to undertake regular head circumference measurements in the early childhood years.

# Ears, nose, face and oral cavity

---

Page 978

## Prominent bat/shell ears

The ears are almost adult size and firmness by 5 to 6 years of age but the ear cartilage is not strong enough to cope with surgery under 3 years. For this reason, and because it is best to correct the problem when the child is in a position to support a decision to operate, the optimal time for surgical correction is after 5 to 6 years. It may be possible to correct an ear deformity by moulding the ear with tape or splinting within the first 6 months of life.<sup>1</sup>

## Facial deformity

It is best to refer any facial deformity as soon as it is detected.

## External angular dermoid

This dermoid cyst, which has a readily identifiable constant position, lies in the outer aspect of the eyebrow. It is noticed in infancy as it progressively enlarges. Excision is advisable, but check with ultrasound examination because of the possibility of an intracranial extension.

## Cleft lip and cleft palate

Congenital clefts of the lip and palate occur in approximately 1:600 of all births. It is very important that the simplest and least obvious form should be recognised in time for adequate repair. This is the submucus cleft, frequently not recognised in infancy because the palate appears to be intact.<sup>2</sup> The submucus cleft can be diagnosed on close inspection as the uvula is bifid and there is a deep groove in the midline of the palate covered only by mucous membrane. The ideal age for repair of the cleft lip is under 3 months of age. Secondary surgery can then be performed at various ages. The repair of the palate, which requires preliminary diagnostic ultrasound, is best performed before the child begins to speak. The optimal time is 6 to 12 months of age.

## Nasal disorders

Rhinoplasty is best deferred to late adolescence. If performed early there is a higher incidence of secondary surgery.

Choanal atresia may be unilateral, leading to delayed diagnosis, or bilateral, where there is no instinctive reaction to breathe through the mouth, leading to asphyxia. Since the obstruction is usually by a very thin membrane one side can be perforated with a urethral sound as an emergency procedure.

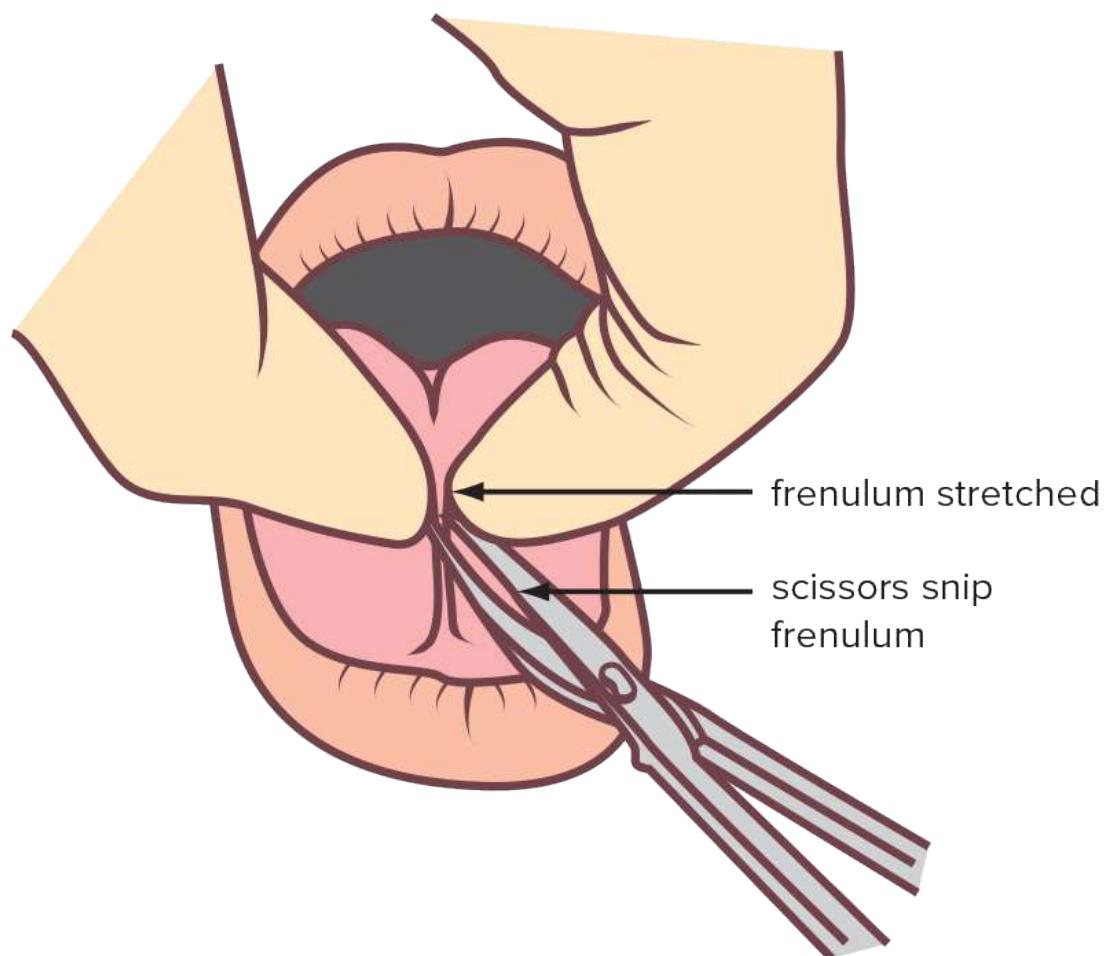
Septoplasty can be considered if the problem is symptomatic.

## ⌚ Tongue tie (ankyloglossia)

Early signs:

- tongue may appear heart-shaped
- infants unable to protrude the tongue over the lower lip
- breastfeeding problems

The ideal time to release the ‘tie’ is in infancy, under 4 months.<sup>3</sup> As the frenulum is thin and avascular, simple frenulotomy by snipping with sterile scissors (with care) is advisable (see FIG. 85.2). Otherwise surgery should be left until after 2 years of age. The condition may not be noticed until later in life. A useful guideline is a strong family history of speech problems corrected by tongue tie surgery.



**FIGURE 85.2** Tongue tie release in infant

## Pre-auricular sinus

This common condition can get recurrently infected with pus discharge from a small opening immediately anterior to the ear at the level of the meatus in front of the upper crus of the helix. It also causes cosmetic problems. It is not a branchial sinus. It can be associated with kidney abnormalities. Refer when diagnosed for surgical excision, although it can be left alone if it is causing no problems.

## Branchial sinus/cyst/fistula

This is a rare condition and is located inferior to the external auditory meatus or anterior to the sternomastoid muscle. The opening may discharge mucopus. A skin tag or cartilage remnant may be present. Refer when diagnosed for excision.

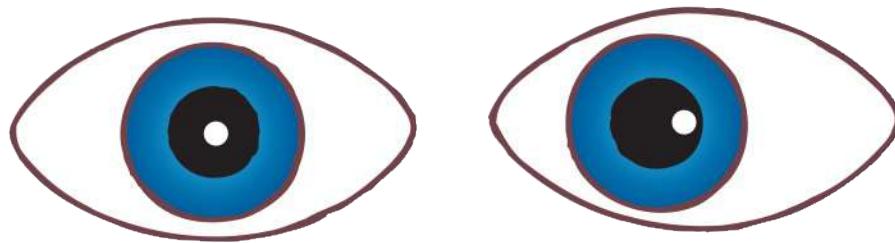
[Page 979](#)

## Strabismus (squint)

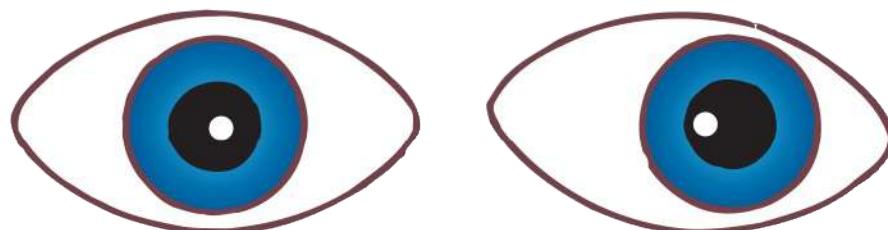
A squint is rarely obvious in the first weeks of life, but tends to show up when the baby learns to use the eyes, from about 2 weeks to 3 or 4 months of age. However, it may appear late, even as an adult. Vision, which is present at birth, continues to develop until 7–8 years of age.

### Main types of squint

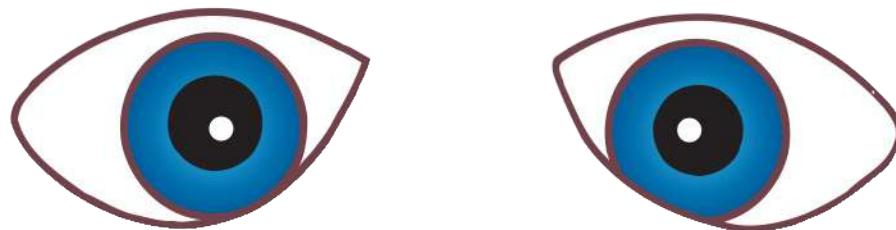
See [FIGURE 85.3](#).



convergent squint (affected eye on right of page)



divergent squint (affected eye on right of page)



pseudosquint (due to shape of eyelids)

### FIGURE 85.3 Types of squint

- *Constant or true squint* is one that is permanent—always present.
- *Latent squint* is one that only appears under stressful conditions such as fatigue.
- *Transient squint* is one that is noticeable for short periods and then the eye appears normal.
- *Alternating squint* is one that changes between the eyes so the child can use either eye to fix vision.
- *Pseudosquint* is not a true squint but only appears to be one because of the shape of the

eyelids, i.e. broad epicanthic folds.

A useful way to differentiate a true squint from a pseudosquint is to observe the position of the light in the eyes (corneal reflections) when a torch is shone into them from about 40 cm away. This light reflex will be in exactly the same position in both eyes in the pseudosquint but in different spots with the true squint.

- If one eye is ‘lazy’ (that is, not being used), it is standard practice to wear a patch (maybe on glasses) over the good eye for long periods in order to use the inactive eye and have both eyes eventually capable of vision.
- The two serious squints are the constant and alternating ones, which require early referral. Transient squint and latent squint usually are not a problem.
- Always refer children with strabismus (squint) when first seen to exclude ocular pathology such as retinoblastoma, congenital cataract and glaucoma, which would require emergency surgery.
- Children with strabismus (even if the ocular examination is normal) need specialist management because the deviating eye will become amblyopic (a lazy eye with reduced vision, i.e. ‘blind’, if not functioning by 7 years of age). The younger the child, the easier it is to treat amblyopia; it may be irreversible if first detected later than school age. Surgical correction of a true squint is preferred at 1–2 years of age.

## Blocked nasolacrimal duct

Refer to [CHAPTER 84](#) .

## Neck lumps

---

### Sternomastoid tumour/congenital muscular torticollis

Features in infants:

- hard painless lump or thickening (2–3 cm long) within sternomastoid muscle
- tight and shortened sternomastoid muscle
- usually not observed at birth
- appears at 20–30 days of age
- associated torticollis—head turned away from but tilted towards the tumour
- restricted head rotation to side of tumour

Most tumours resolve spontaneously within 1 year. The mother or baby's carer should be reassured and the child referred to a physiotherapist early. The mother or carer should frequently gently massage the lump, rotate the head to the side of the lesion and then side-flex (stretch) away from that side. Repeat several times twice daily. Encourage the baby to look towards the affected side. If surgery for a persistent fibrotic shortened muscle is required it is best before 12 months. Acute onset torticollis requires referral for prompt investigation.

Older children can present with torticollis and a tight, short fibrous sternomastoid muscle. It is associated with rotation of the head to the affected side, hemihypoplasia of the face and a wasted ipsilateral trapezius muscle. It requires surgical repair.

Page 980

## Thyroglossal cyst

This is the most common childhood midline neck swelling. It moves with swallowing and tongue protrusion. It is prone to infection, including abscess formation. The cyst and its tract are best excised before it becomes infected.

## Lymphatic malformation/lymphangioma/cystic hygroma

These usually present as soft cystic tumours of the neck, face or oral cavity. They resemble clusters of vesicles and are often poorly localised. Some have visible red dots due to haemangiomatous inclusions. If located in the floor of the mouth or peripharyngeal area, they endanger the airway and can precipitate an emergency requiring surgery. Surgery is advisable in the early years.

## Cervical lymphadenopathy

Refer to [CHAPTER 50](#).

## Birthmarks and skin tumours

### Infantile haemangioma (strawberry naevus)

See [CHAPTER 84](#). These start soon after birth as a red pinpoint lesion and grow rapidly for the first 6 months, then involute and become pale. Full resolution may take several years. Reassure parents and demonstrate how to stop any bleeding by applying pressure. Possible treatment options include oral or intralesional steroids, propanolol, vascular laser, interferon and surgery. Surgical intervention is usually not necessary. Exceptions are locations in critical areas such as periorbital, nose, lips and face. Refer lesions on the eyelid early since visual obstruction can lead to amblyopia. Stridor accompanying a haemangioma on the face is suggestive of laryngeal haemorrhage, so refer urgently.

## Capillary vascular malformation (port wine stain)

These are present from birth and surgical intervention is inadvisable. They may be treated by pulsed dye laser, which is best initiated as early as possible as the response is best in the first 2 years<sup>4</sup> (see CHAPTER 84 ).

## Venous malformations

These are aggregations of abnormal subcutaneous veins that may infiltrate deeper tissues. In the past these lesions were treated surgically, but now the emphasis is on specialised sclerosant agents injected under fluoroscopic guidance and specialised laser techniques. Referral to Vascular Malformation Clinics in larger centres is worthy of enquiry.

## Lymphatic malformation

These appear sometimes as skin lesions because of the red discolouration on the surface of the tumour. Management is as described above.

## Congenital naevi

These have to be treated on an individual basis. If giant naevi they can be dermabraded at ideally less than 6 weeks.

## Benign juvenile melanoma (Spitz naevus)

These pigmented lesions, which typically appear on the face, are usually surgically excised because of their rapid growth and family concerns.

## Chest and breast disorders

---

### Breast asymmetry

If necessary surgery should be performed in late adolescence after breast development is complete. It can take the form of a unilateral implant, different-sized bilateral implants or unilateral breast reduction.

### Macromastia

Reduction surgery should also be delayed until breast growth is complete, at late adolescence.

### Gynaecomastia

This is not to be confused with pseudogynaecomastia due to fat in obese preadolescents.

However, gynaecomastia in thin boys does occur and requires referral for assessment if it cannot be attributed to drugs such as oestrogen. If it develops in the pubertal stage, gynaecomastia may resolve spontaneously within 1 or 2 years. If necessary, simple mastectomy can be performed, if no cause can be found.

## § Subareolar hyperplasia in boys

This ‘breast bud’ presents as a firm discoid subareolar lesion similar to premature breast hyperplasia of girls and of babies. It typically occurs at about 12–14 years. There is no indication for surgical treatment. Give an explanation with reassurance that the problem will dissipate.

Page 981

## § Chest wall skeletal deformity

Surgical correction is best performed in adolescence.

## § Poland syndrome

This syndrome is an absent sternal head of pectoralis major with associated chest wall deformity plus a hypoplastic or absent breast and nipple–areolar complex. Surgical correction can be undertaken from 10 to 20 years.

# Congenital heart disorders

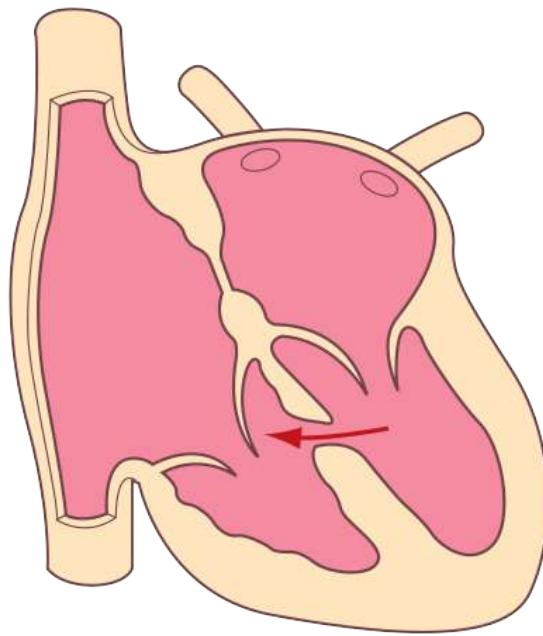
---

GPs have an important role in the diagnosis of congenital heart disorders as many of the affected infants develop cyanosis, murmurs or congestive heart failure. Early diagnosis and intervention helps prevent serious problems such as bacterial endocarditis and paradoxical emboli.

## § Ventricular septal defect (VSD)

VSD is the commonest congenital heart lesion (1:500 births).

The defect connects the two ventricles with a L → R shunt (see FIG. 85.4 ).



**FIGURE 85.4** Ventricular septal defect: defect in muscle wall

Symptoms and signs depend on the size of hole. All have a palpable thrill at the left sternal edge and a pansystolic murmur down right sternal edge.

Small VSD ('maladie de Roger'): harsh murmur, usually asymptomatic and closes spontaneously.

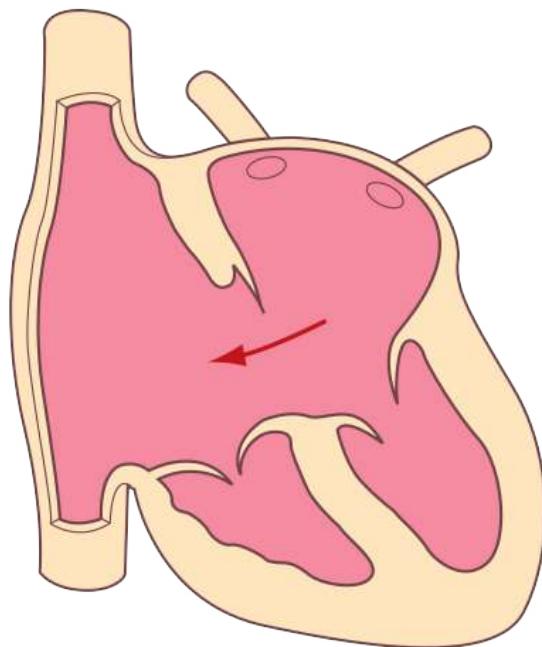
Larger VSD: symptoms appear in infancy.

- Breathlessness on feeding and crying (i.e. early CHF)
- Recurrent chest infections
- Failure to thrive
- Heart failure from about 3 months with large defects

Refer early, especially if failure—early surgery performed by 6 months but can be performed at any age from the newborn period. A patch can close the defect through open-heart surgery. Some may be closed by sealing with an occlusive device through a percutaneous cardiac catheter. A cardiologist will make the appropriate decision. As a general rule about 50% of all VSDs will close spontaneously. The membranous type, unlike the muscular type, is less likely to close spontaneously.

## Atrial septal defect (ASD)

In ASD the defect connects the two atria with two distinct types—ostium secundum with holes higher in the septum (most common) and ostium primum with holes lower in the septum (more serious) (see FIG. 85.5). Signs are a mid-systolic murmur in the pulmonary area, a split 2nd sound and a loud P2. An echocardiogram is diagnostic.



**FIGURE 85.5** Atrial septal defect: primum defect

Symptoms are uncommon in infancy and childhood with ostium secundum but heart failure with pulmonary hypertension develops early with ostium primum.

Refer these patients early. Prophylactic antibiotics are needed for patients with ostium primum. Follow other cases with regular echocardiograms and growth/development monitoring. Closure is advisable where there is evidence of a troublesome shunt. Options are repair by direct surgical suture or an insertion of a patch or a device closure using a self-expanding ‘double umbrella device’ manipulated into the defect via cardiac catheterisation.

All patients require prophylactic antibiotics before procedures.

## Patent ductus arteriosus

The ductus fails to close after birth. A loud, continuous machinery murmur is heard.

Page 982

Symptoms relate to shunt size. The child presents with a murmur with possible respiratory infections, failure to thrive and heart failure. Refer for possible surgical closure by ligation. Alternatives include device closure with placement of an occlusive device or by embolisation coils.