

# Bone Pain

[Disclaimer](#)

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## Red Flags

- Neoplastic disease – benign, primary, or metastatic
- Infection
- Fracture – traumatic and non-traumatic
- Non-accidental injury in children and older persons

## Background – About Bone Pain

Bone pain can present a dilemma with many serious causes requiring laboratory, radiology, and scanning services to diagnose. Conditions such as sarcoma, myeloma, osteomyelitis, stress fracture, and osteoporotic fracture may all be diagnosed late.

## Assessment

1. Take a careful **history**.

### **History**

- *Nature and quality of pain*
  - *Bone pain is a deep somatic pain and is often experienced as dull and poorly localised by the patient. This may help differentiate bone pain from pain arising from joints or soft tissue.*
  - *Bone pain that is unrelenting overnight can indicate infection or malignancy*
- *Associated symptoms*
  - *sweats and fever*
  - *recent/recurrent infections*
  - *weight loss*
  - *neurological symptoms or radiculopathy*
- *Ancestry and country of origin – certain ethnic groups have an increased prevalence of genetic factors associated with certain types of anaemia*
- *Family or personal history of haematological conditions e.g., sickle cell anaemia, Lyme disease*
- *Recent travel*
- *Increase in activity or new exercise*
- *History of recent trauma*

2. Perform an **examination**.

### **Examination**

- *Look for deformity*
- *Palpate and percuss areas of bone pain for tenderness. Confirm tenderness is bony and not from overlying soft tissue or neighbouring joint.*
- *Haematological examination including:*
  - *lymph nodes and spleen for splenomegaly.*
  - *skin for bruising – note unexplained bruising in children may raise suspicion of [non-accidental injury](#).*
- *Peripheral signs of anaemia*
- *Check for signs of infection e.g., fever, rash, erythema*
- *Breast or prostate examination if concerned about bone metastases from primary underlying malignancy*
- *Neurological examination of limbs if suspicion of spinal infection*

3. Consider possible differential diagnoses:

- **Haematological malignancy**

*Bone pain in association with more common presenting symptoms of haematological malignancy including:*

- *Fatigue, peripheral signs of anaemia*
- *Increased bleeding or bruising*
- *Repeated or persistent infections*
- *Unexplained weight loss*

- **Osteoporotic fractures without injury**

- *Occur typically in the hip, sacral, lumbar, or thoracic spine.*
- *Often occur in an older patient presenting with continuing pain.*

- **Osteomyelitis**

- *Can present at any age, acutely or with gradual onset of local bone pain, [limp](#), loss of use of a limb, inconsistent fever, or malaise.*
- *Children may present with signs e.g., fever or limp, but not symptoms of pain.*
- *May occur deep to lower leg ulcers particularly in people with diabetes. CRP is nearly always elevated but white count, ESR, and plain radiology may be normal.*

- **Stress fractures**

- *Occur in the metatarsal bones of athletes, those new to exercise, and the obese. There are stress fractures common in specific sports including spinal fractures in cricket bowlers and gymnasts.*
- *Fracture may be caused by abnormal stress on normal bones and normal stress on abnormal bones (insufficiency).*
- *Consider [atypical fractures of the femur](#) in patients on bisphosphonate or denosumab therapy.*
- *Consider insufficiency stress fracture in anyone with bone pain not resolving promptly.*
- *See images:*
  - [SPECT CT](#)
  - [Stress fracture metatarsal bone isotope scan](#)

- **Paget's disease**

- *Causes gradual onset of bone pain in older adults, usually not severe, and can be associated with arthritis, deformity, and fracture.*
- *Alkaline phosphatase is frequently elevated with normal liver function.*
- *Diagnosis is by plain [radiology](#) and [bone isotope scan](#).*

- **Growing pains in children**

- *Are bilateral, occur in a well child, and tend to occur in the late afternoon and evening. Pain may occasionally wake a sleeping child.*
- *Pain is most commonly in the calf, behind the knee and anterior thighs.*
- *Consider other causes e.g., tumours or infection, if:*
  - *any other symptoms, including [limp](#), are present.*
  - *the pain is unilateral.*
  - *Daytime activity is limited.*
- *Have a high index of suspicion for non-accidental injury.*

4. Perform investigations as directed by the history:
  - If **red flags** are present, urgent referral may be more appropriate than further investigation in primary care, but if diagnosis is uncertain consider:  
**Red flags**
    - *Neoplastic disease – benign, primary, or metastatic*
    - *Infection*
    - *Fracture – traumatic and non-traumatic*
    - *Inflicted (non-accidental) injury in children and older persons*
    - *urgent [plain radiology](#).*
    - *laboratory tests (may include FBE/ESR, CRP, LFT (especially ALP, GGT and ALT), PSA, serum protein electrophoresis, calcium, and phosphate).*
  - Following negative plain radiology, the next investigation could include [bone isotope scan](#), SPECT CT, or MRI.

## Management

Management will depend upon underlying cause.

1. If concerned about infection, refer early for infectious disease or orthopaedic advice via the [emergency department](#).
2. If suspected spinal infection with neurological compromise, refer urgently to neurosurgery via the [emergency department](#).
3. If suspected non-accidental injury in children, notify [child protection](#) and consider referral to [emergency department](#) or seek urgent advice from a [paediatrician](#).
4. If concerned about neoplastic disease, seek [urgent haematology](#) or [oncology advice](#).
5. If osteoporotic fracture, provide analgesia and
  - arrange [orthopaedic referral](#) for fracture management.
  - for continued management of osteoporosis, see the [Osteoporosis](#) pathway.
6. If Paget's disease, arrange [urgent or routine endocrinology referral](#).
7. If stress fractures are diagnosed, conservative management including analgesia, rest, and weight loss are appropriate. If required, consider [physiotherapy](#) or [exercise physiology referral](#), and [orthopaedic](#), or [podiatry](#) referral.

## Referral

- If concerned about infection, refer early for infectious disease or orthopaedic advice via the [emergency department](#).
- If suspected spinal infection with neurological compromise, refer urgently to neurosurgery via the [emergency department](#).
- If suspected non-accidental injury in children, notify [child protection](#) and consider referral to [emergency department](#) or seek urgent advice from a [paediatrician](#).
- If concerned about neoplastic disease, seek [urgent haematology](#) or [oncology advice](#).
- If osteoporotic fracture, provide analgesia and for fracture management refer for [orthopaedic referral](#).
- If Paget's disease, arrange [urgent or routine endocrinology referral](#).
- If required, consider [physiotherapy](#) or [exercise physiology referral](#), and [orthopaedic](#), or [podiatry](#) referral.

## For health professionals

### Further information

- Australian Family Physician (2012) – [Paget Disease of Bone](#)
- Australian Journal of General Practice – [Overuse Injuries in the Athlete](#)
- Cancer Council – [Optimal Cancer Care Pathway for People With Acute Myeloid Leukaemia](#)
- Diagnostic Imaging Pathways – [Bone Pain](#)

## For patients

- Better Health Channel – [Paget's Disease of Bone](#)
- [Osteoporosis Australia](#)
- Raising Children Network – [Growing Pains](#)

### [Disclaimer](#)

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