Fractures and contractures | Ngā whati me ngā kukuti uaua

Risk factors for fractures

- Falls
- Osteoporosis
- Advanced age
- Previous fracture
- Living in residential care
- Glucocorticoid therapy
- Parental history of hip fracture
- Low body weight
- ETOH overuse
- Rheumatoid arthritis
- Diabetes mellitus
- Cognitive impairment
- Psychotropic medication use
- Low serum vitamin D
- Bowel or bladder incontinence
- High serum phosphate
- Current smoker.

Acute fracture presentations

- Acute pain
- Decreased range of movement
- Decreased circulation
- Deformity of limb, shortness, rotation
- Haematoma/oedema.

Action plan

- Go to hospital (call 111 for ambulance). Notify GP/NP/family/EPOA.
- Immobilise site.
- Monitor swelling, neurovascular observations.
- Minimise pain at the fracture site during and after immobilisation.
- Provide adequate analgesic.
- Treat shock.
- Provide a calm and secure environment for the patient/resident.
- Open fractures (those open to air) represent to orthopaedic emergencies.

Risk factors for contractures

- Advanced age
- Neurological conditions such as stoke or brain injury
- Orthopaedic injury
- Spinal cord injury
- Diabetes.

Contracture presentations

Joint contractures are restrictions in full range of motion of any joint due to deformity, disease or pain. They are common in frail older adults, especially those in residential care facilities. They can cause:

- reduced motion and stiffness of the joint
- loss of physical function and ability to perform ADLs
- increased risk of falls, immobility and bed confinement
- pain
- increased risk of pressure injury.

Action plan

Multidisciplinary team coordination for ongoing management of contracture:

- Referral to physiotherapist for functional assessment EARLY for prevention and management. Advice on joint exercise, mobility, handling techniques and positioning
- Occupational therapy for pressure-relieving equipment and/or equipment to help with ADLs. Advice on daily activities of living and promotion of independence
- Continued nursing assessment of skin, continence and pain management. Encourage high-energy diet. Nurse patients/residents using pillows to minimise flexion at the hip and knee and adduction and internal rotation at the shoulder. Wheelchair positioning should maintain normal lumbar curvature. Frequent repositioning prevents skin breakdown and pressure injury as well as further contractures
- Consideration of referral to orthotics for splints or other orthotic devices.

Potential complications of fractures

- Severe haemorrhage, especially from hip and pelvic fractures
- Deep vein thrombosis and pulmonary contusion, especially from hip and multiple rib fractures. Thromboprophylactic treatment is indicated in most cases of orthopaedic trauma
- Acute compartment syndrome, especially from long bone fractures
- Damage to vascular structures, nerves or soft tissue as a result of trauma
- Osteomyelitis
- Non-union (where the normal process of bone healing is interrupted or stalled)
- Post-traumatic osteoarthritis.

Non-pharmacological approaches to fracture prevention

- Falls risk screening with regular follow-up
- Hip protectors
- Exercise
- Environmental assessment to maintain safety
- Avoid restraint
- Increased dietary calcium.

Pharmacological approaches to fracture prevention

- Vitamin D supplementation is recommended for all people in residential care facilities.
- Bisphosphonate therapy is the first choice pharmacological agent for fracture prevention in older adults at high risk.
- De-prescribing of medicines that can increase the risk of falls.

Bisphosphonate therapy

- Bisphosphonate therapy can be used for both primary and secondary prevention of osteoporotic fractures.
- Bisphosphonate therapy can be administered orally or via intravenous infusion.
- Oral treatment available in New Zealand includes Risidronate (does not require special authority and fully subsidised) and Alendronate. IV treatment is Zoledronic acid 5 mg given 18–24 months.

Administration of bisphosphonates

- Oral bisphosphonates are usually given weekly.
- Oral bisphosphonates must be given by themselves and on an empty stomach. Early morning administration prior to other medication and food is best. Must be taken with a large glass of water. Person must be able to sit or stand upright 30 minutes post-administration. This allows for maximum absorption and reduced GI side effects. Consider IV administration if oral administration guidelines cannot be adhered to.
- Patients having IV Zolendronate – 25 percent will have an acute phase reaction post-administration. This presents as flu-like symptoms and can be managed with paracetamol.
- IV bisphosphonates are given 18–24 months and should be reviewed after 3 years. Oral bisphosphonates should be reviewed after 5 years and considered for a ‘drug’ holiday.
- Caution in renal impairment. Avoid bisphosphonates if creatinine clearance is less than 30–35 mL/min.
- Oral bisphosphonates should not be used in people with dysphagia.
- Adverse effects can include GI upset, as well as rare but serious side effects, such as atypical femoral fractures and osteonecrosis of the jaw.

Cast care

- Ensure the casted limb is maintained and supported in an appropriate position at all times.
- Adhere to written medical instructions.
- Observe and record where necessary in the clinical notes whenever there is a change in fracture management:
  - neurovascular state of the casted limb
  - check extremities for colour, warmth, sensation, capillary refill and distal pulses
  - check support and elevation as appropriate
  - check for painful pressure or movement
  - document findings.
- Observe the patient for signs and symptoms of compartment syndrome.
- Assess safety, elimination and skin integrity.
- Advise patients regarding toilet, hygiene and importance of keeping cast dry, refer to occupational therapist for equipment assessment if necessary.
- Offer supervision by careful positioning of patient, bedpan/urinal.
- Caution patients against the use of heaters and hair dryers on the cast due to the danger of burning underlying skin.
- Ensure mobility status is documented in notes, eg, NWB/PWB/FWB.
- Physiotherapy and occupational therapy are initiated as appropriate.
- Sling or collar and cuff used to support upper limb injuries.

Casts should be inspected at least once a shift:

- Assess skin integrity at the edges of the cast for signs of friction or rubbing.
- Observe for any of the following: localised burning, itching, swelling, odour and discharge.
- Check for any dents, cracks, soft spots or looseness.
- Back slabs may only be removed for wound observation and management following. consultation with the medical team.

Compartment syndrome

- The following signs and symptoms may indicate compartment syndrome, which is a medical emergency:
  - Increasing pain not relieved by analgesia
  - Sensory changes
  - Pain on passive movement
  - Pallor or cyanosis
  - Absent distal pulse.
- After consultation with medical team, split the cast through to the skin, lower the limb to the level of the heart and undertake 15-minute observations.

Send to hospital and notify GP/NP, orthopaedics and family/EPOA.

Cast repairs

- Cast repairs are managed through the orthopaedic outpatients, Monday to Friday 8 am to 5 pm.
- After hours repairs will be done in ED.

ROM braces

A range of motion/movement (ROM) brace provides knee immobilisation or range of movement limitations as prescribed by a medical practitioner. It may be used post injury, post operatively or throughout rehabilitation. Ascertain from the clinical notes the range of motion allowed. If the brace is to be locked in 'extension', set the dial on the side of the brace to 0 degrees extension and 0 degrees flexion. If the patient is only allowed a certain degree of flexion, lock the brace at that degree (as per doctor's instructions) on the two side dials/hinges.

Education and care for ROM braces

- Wash the soft, grey foam with warm soapy water in the washing machine. The foam can be dried in the drier with an anti-static sheet.
- Cover the brace with a plastic bag when the patient is showering.
- If the patient is able to keep their leg straight and non-weight bear, the brace can be removed during showering. This decision will be guided by the clinical assessment made by the team responsible for the patient.
- Can patients remove the brace overnight? This decision will be guided by the clinical assessment made by the team responsible for the patient.

Bibliography | Te rārangi pukapuka

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bpac[NZ]. 2016. *Vitamin D and calcium supplementation in primary care: an update.* URL: https://bpac.org.nz/BPJ/2016/July/docs/BPJ76-supplementation.pdf (accessed 16 June 2019).

bpac[NZ]. 2019. *Stay Independent Falls Prevention Toolkit.* URL: https://bpac.org.nz/falls/docs/Steadi_Falls_Clinicians_Resources_v3-7_Interactive.pdf (accessed 16 June 2019).

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