

17

Orthopaedic Techniques

Key Points



17.1 TRACTION

- Use an appropriate method of traction to treat fractures of the extremities and cervical spine
- Apply extremity traction to the skin or to the skeleton using a pin inserted through the bone distal to the fracture
- Apply traction to the cervical spine using a head halter chin sling or skull tongs



17.1 TRACTION contd.

- The weight applied through the traction system counteracts the muscle force pulling across the fracture, keeping the bone in proper alignment and length.
- Do not apply traction to skin with:
 - abrasions,
 - lacerations,
 - surgical wounds,
 - ulcers,
 - loss of sensation or
 - peripheral vascular disease.



17.1 TRACTION

Skin traction

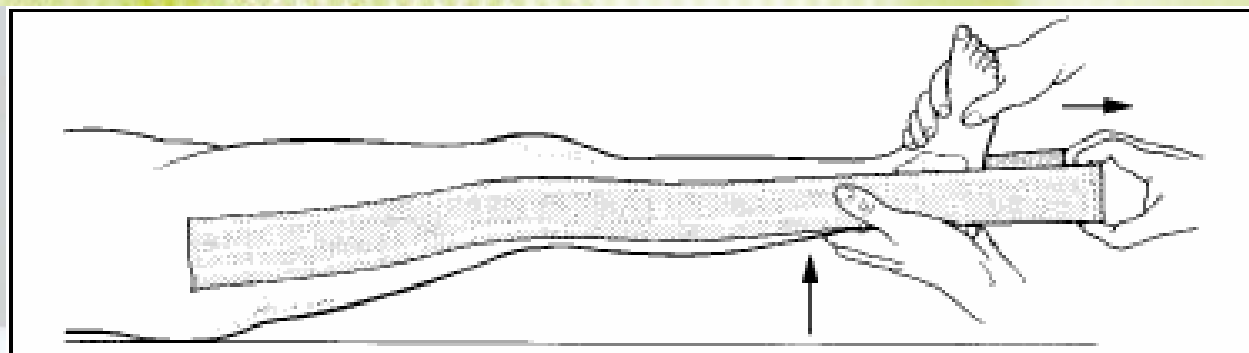


Figure 17.2

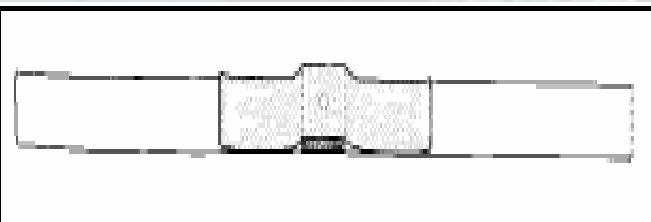


Figure 17.1

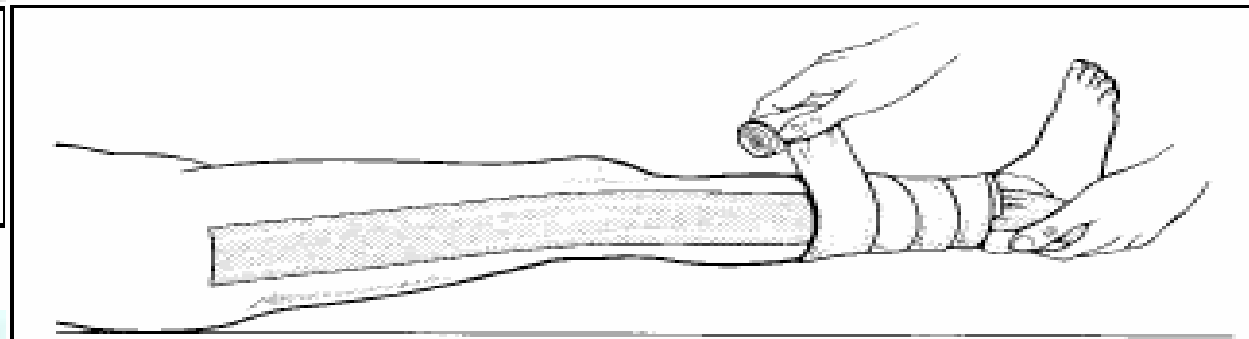


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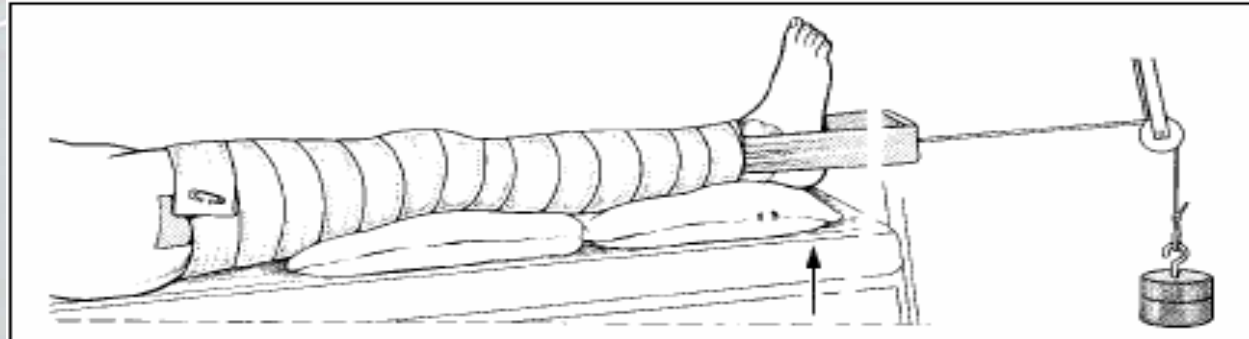


Figure 17.4

17.1 TRACTION

Skeletal Traction

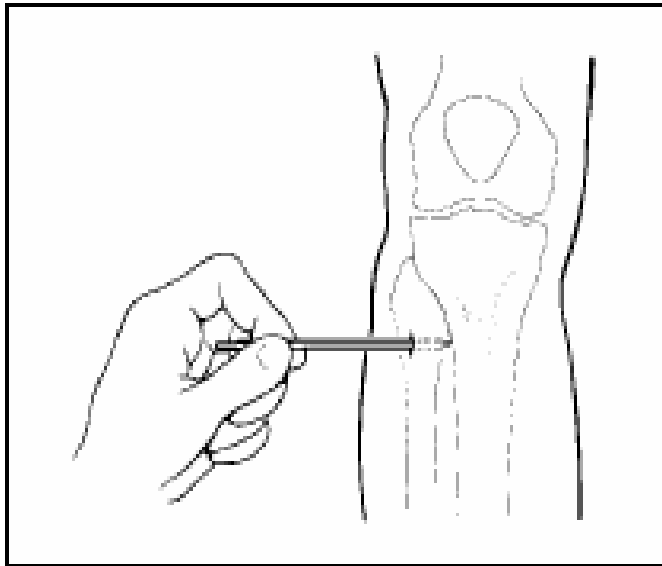


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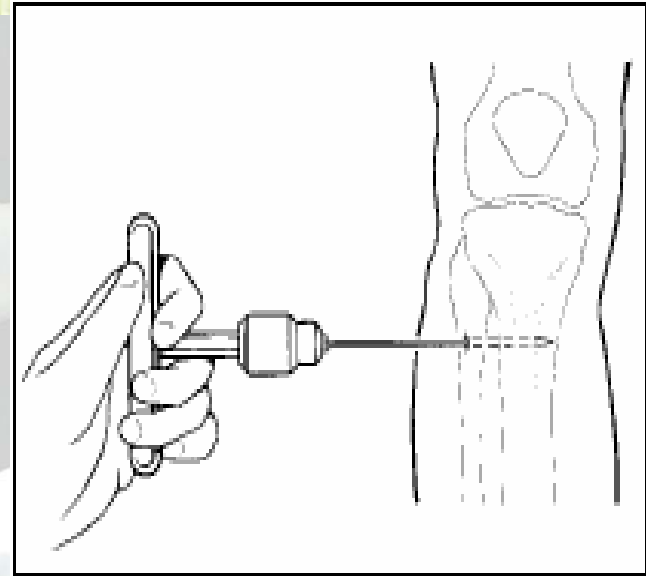


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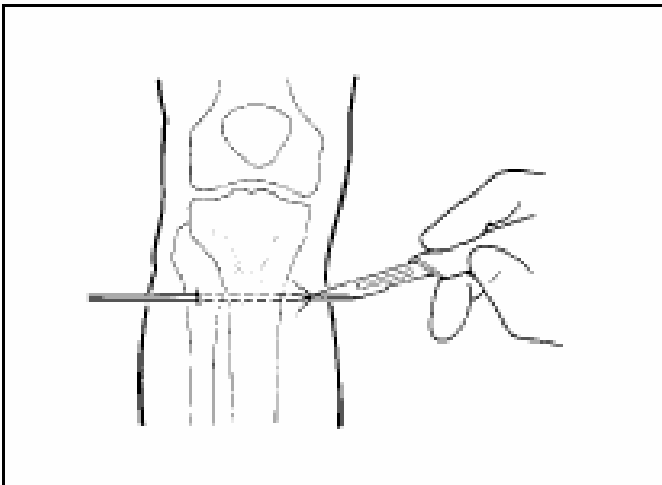


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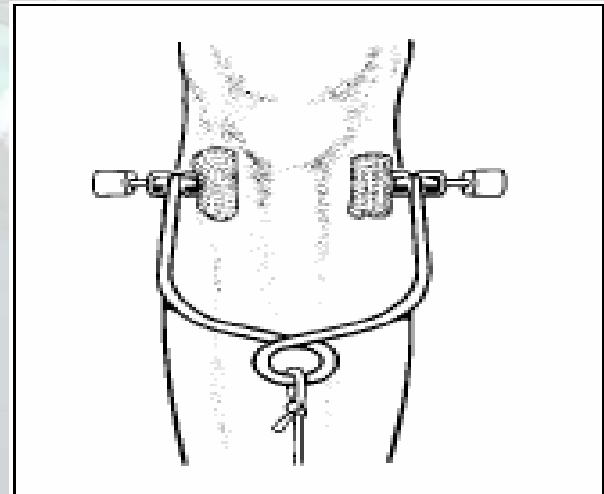


Figure 17.8



17.1 TRACTION

Sites of pin placement

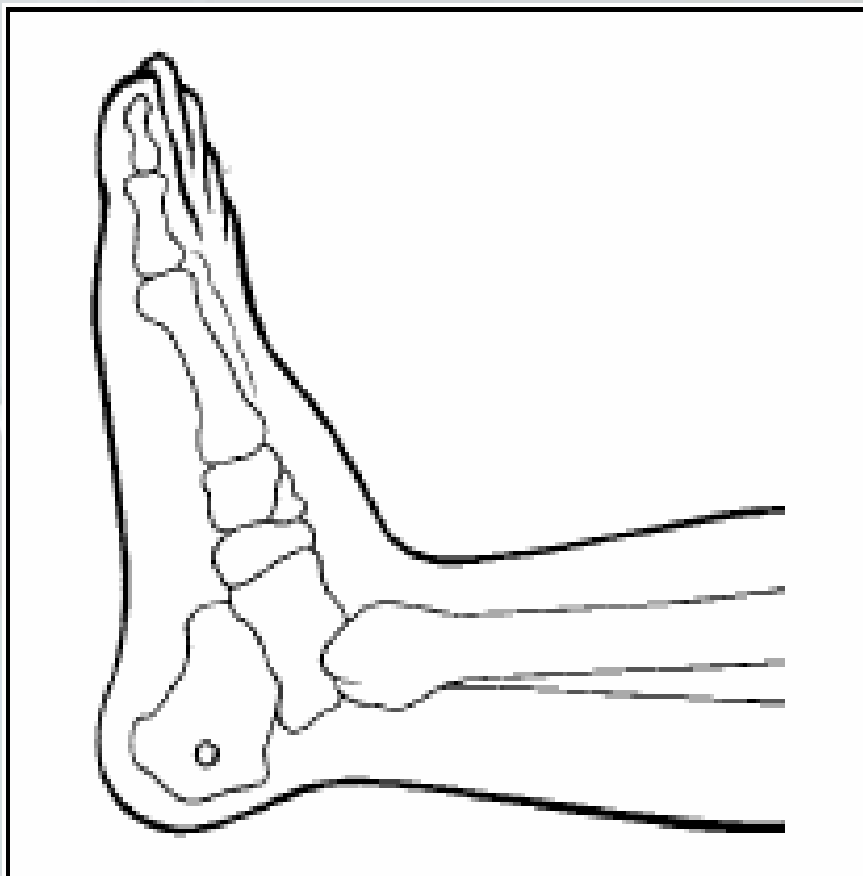


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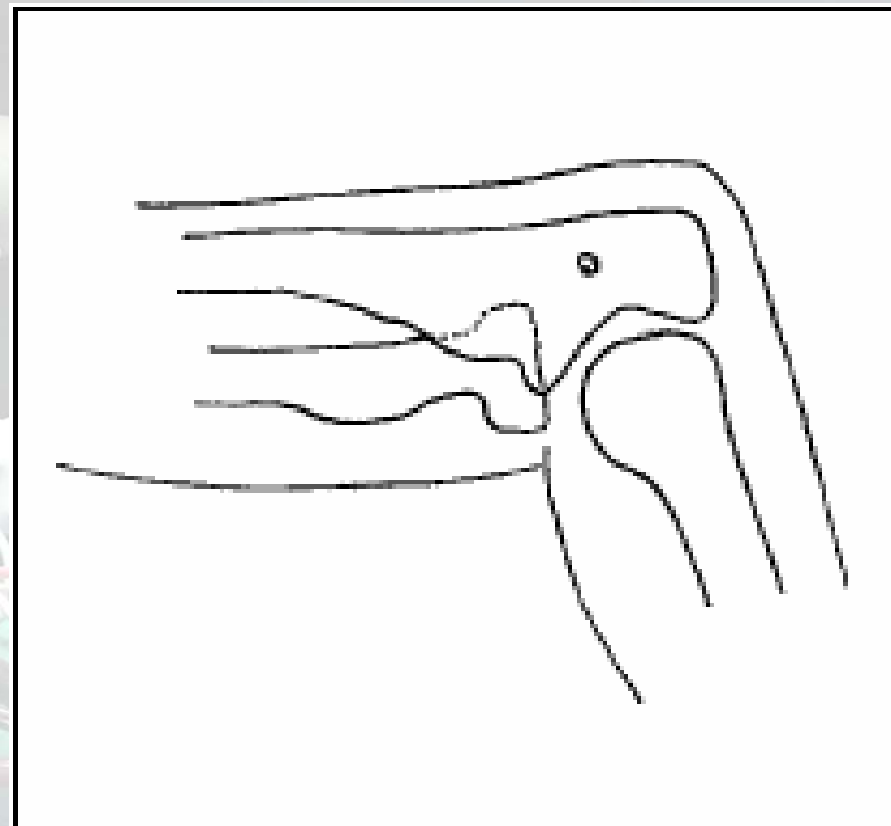


Figure 17.10

17.1 TRACTION

Skull Traction

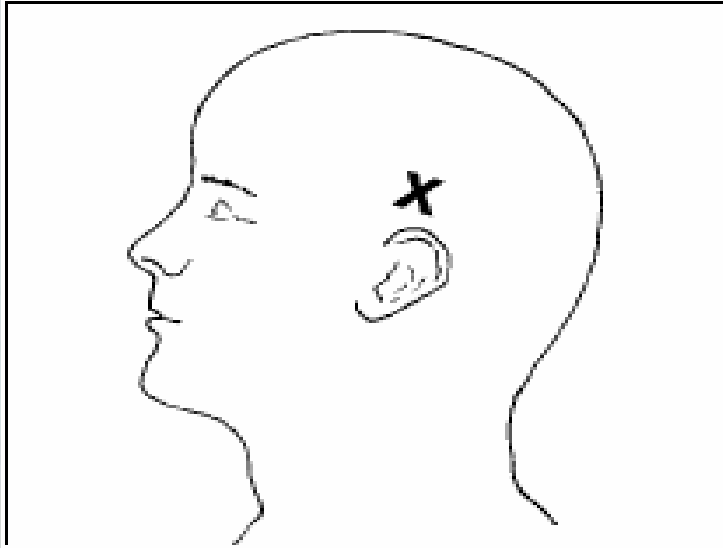


Figure 17.13

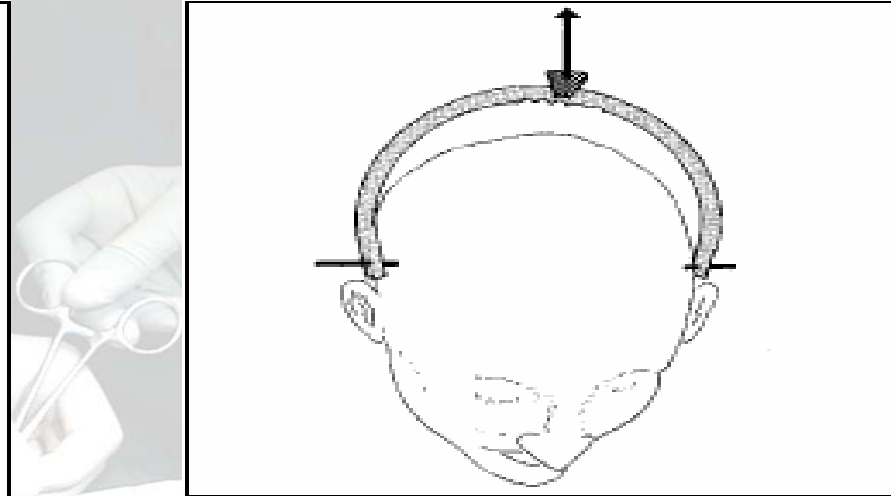


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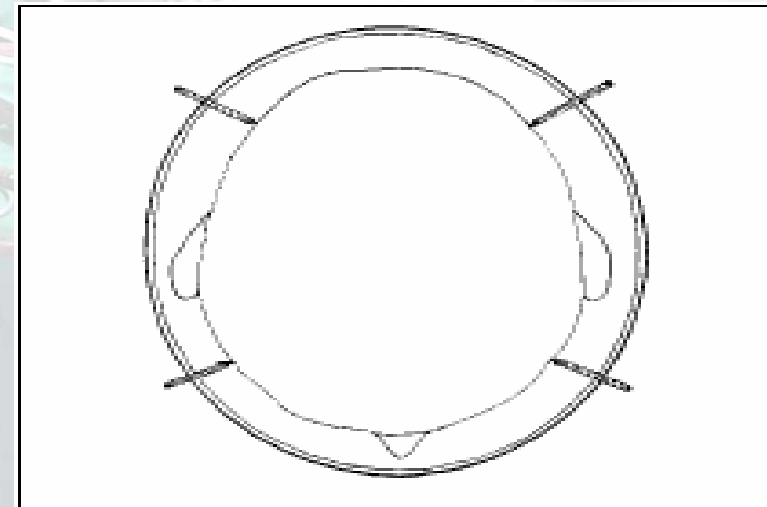
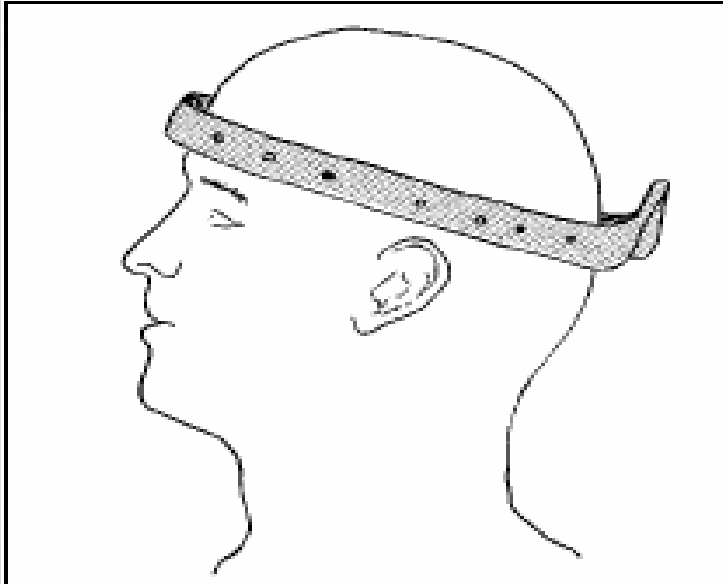


Figure 17.14

17.1 TRACTION

EXTREMITY TRACTION

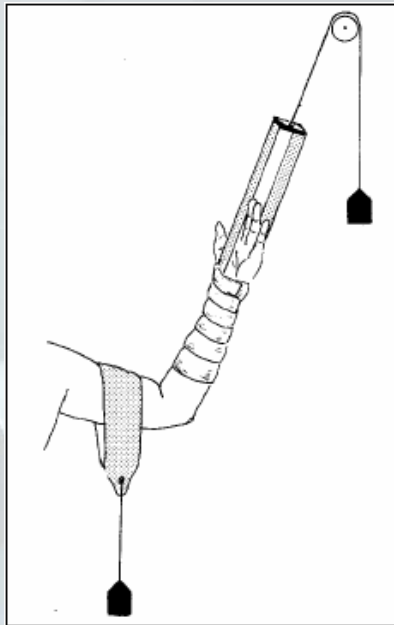


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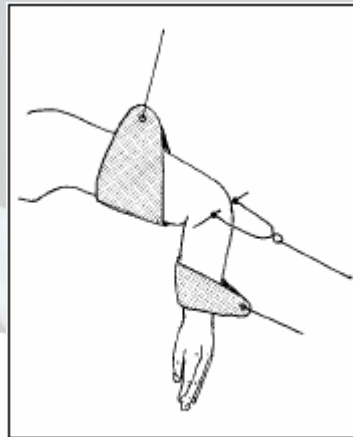


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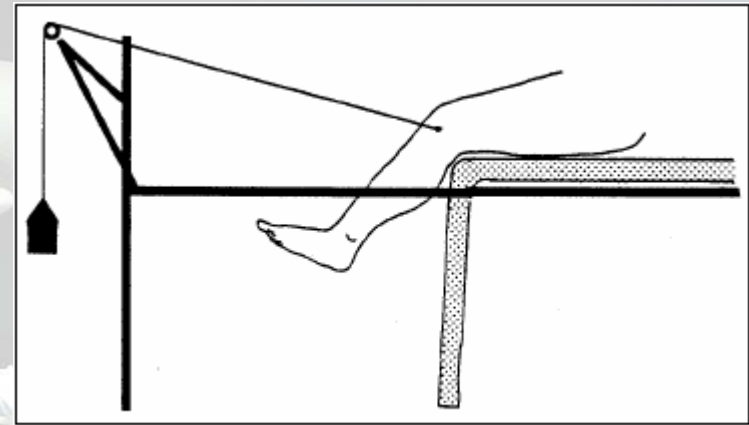


Figure 17.17

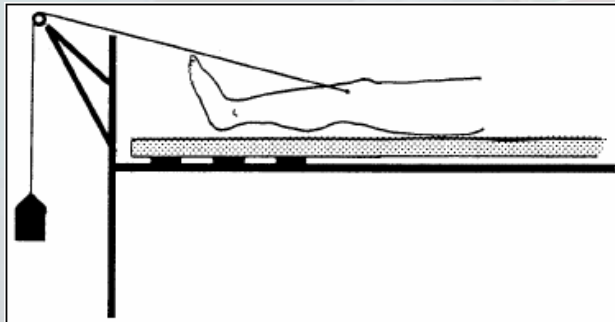


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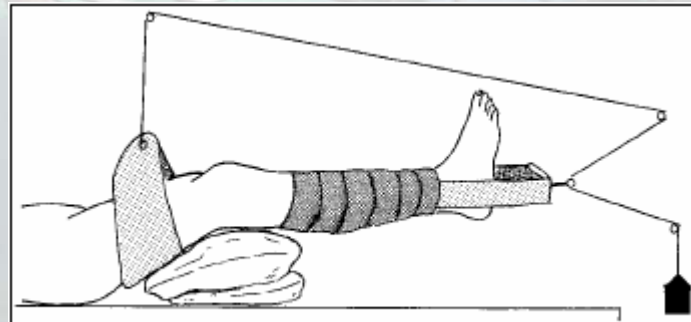


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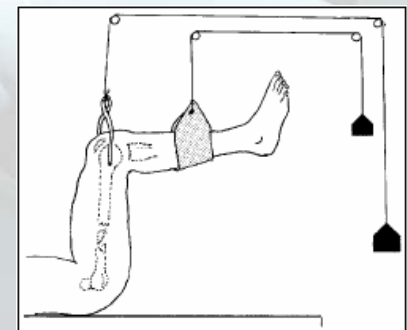


Figure 17.20

17.2 CASTS AND SPLINTS

Plaster of Paris bandage

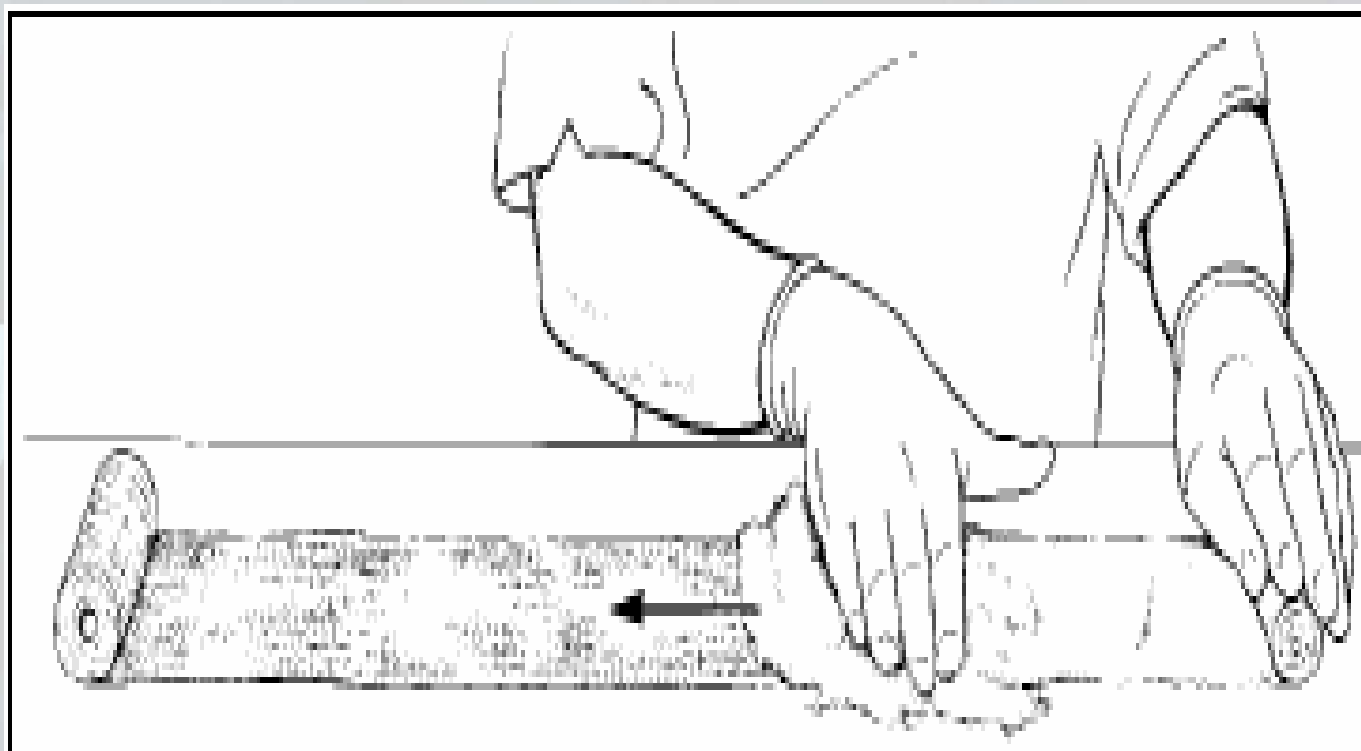


Figure 17.21

17.2 CASTS AND SPLINTS

- Casts and splints provide immobilization of the extremities or spine following injuries, or in cases of other abnormalities of bone or soft tissues
- Use plaster or fibre glass to construct casts and splints
- If necessary, wood and cardboard will serve as temporary splints
- Casts are wrapped circumferentially around the extremity, providing more rigid fixation than splints
- Use a splint for acute injuries to allow room for swelling.



17.2 CASTS AND SPLINTS

CAST APPLICATION



Figure 17.22



Figure 17.23

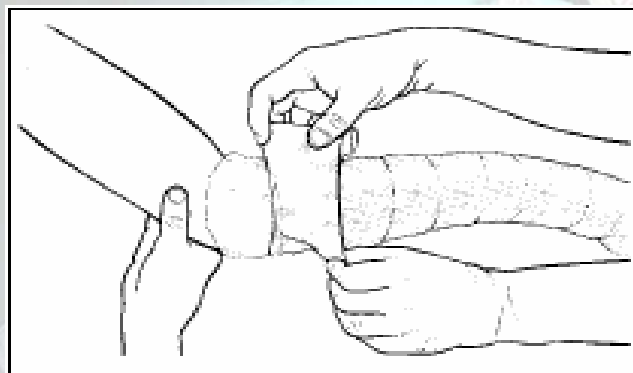


Figure 17.24



Figure 17.25

17.2 CASTS AND SPLINTS

SPLINT APPLICATION

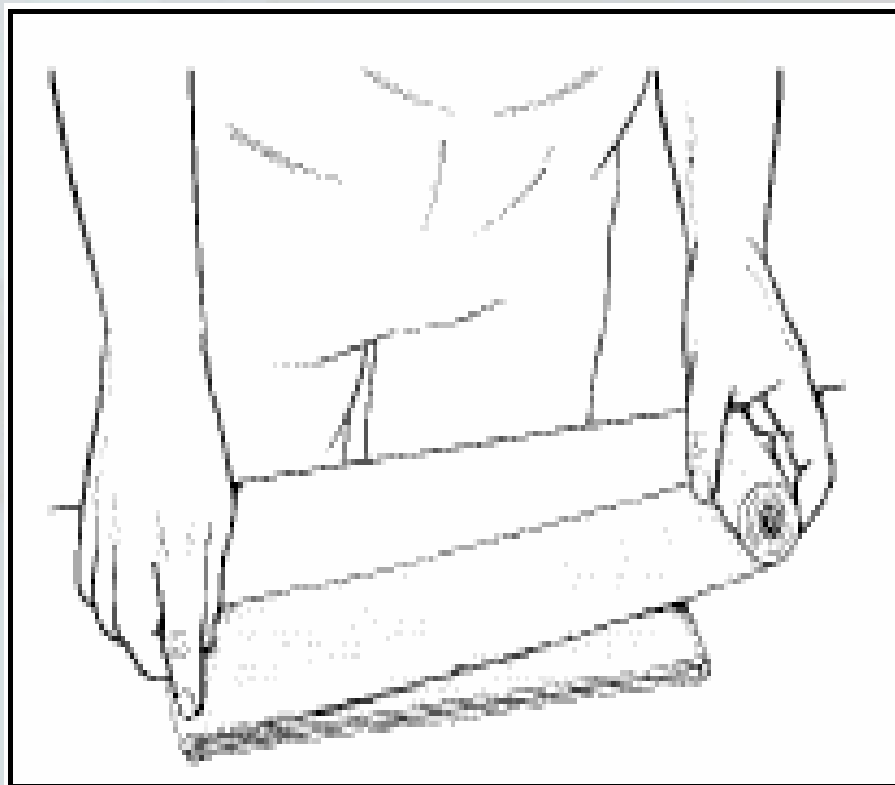


Figure 17.26

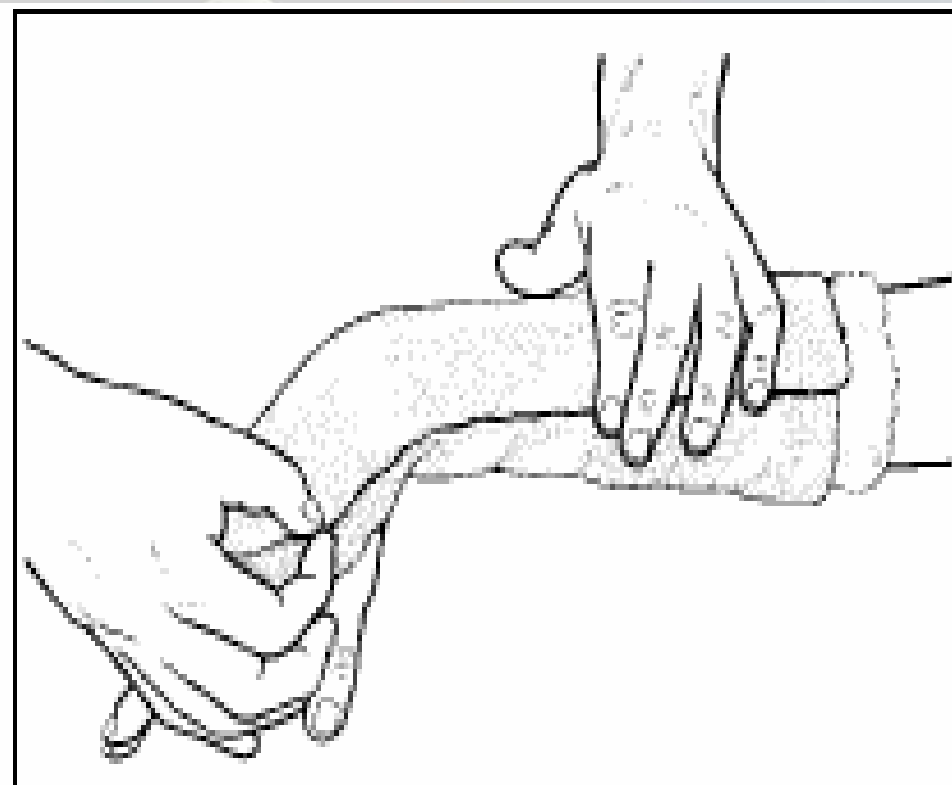


Figure 17.27

17.2 CASTS AND SPLINTS

Patient instructions

- Give oral and written instructions to the patient and/or to accompanying relatives or other attendants.
- Give the instructions in non-technical language that the patient can understand.



17.2 CASTS AND SPLINTS

Caring for a cast or splint

- Keep the cast or splint dry at all times
- Do not try to scratch your skin under the cast or splint with a sharp or blunt object
- Allow the cast to dry for 24 hours before putting weight on it or resting it on a hard surface
- For acute injuries, elevate the injured part for 24–48 hours and wiggle your fingers or toes frequently
- Return to the health clinic immediately if:
 - Your cast or splint gets wet or becomes soft or broken
 - You have increasing pain
 - You experience numbness or tingling, or have difficulty moving your fingers or toes
 - You see a change in skin colour of the extremity
 - Your cast or splint has a foul odour.



17.2 CASTS AND SPLINTS

Removing a cast

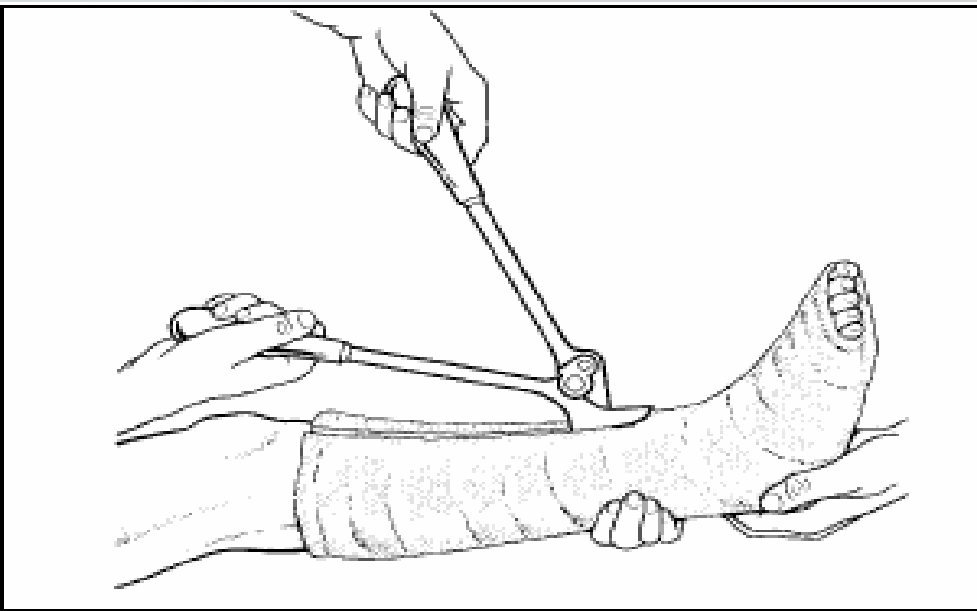


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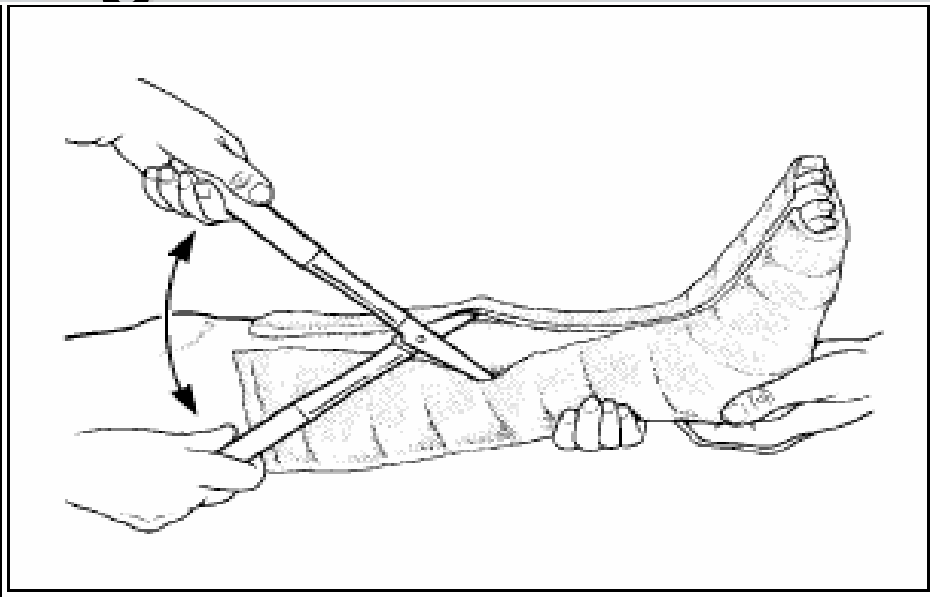


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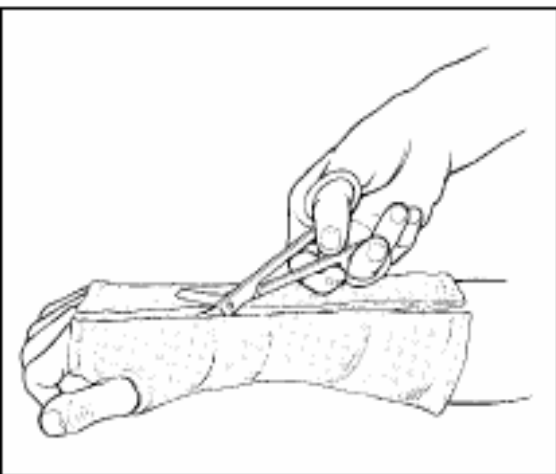


Figure 17.30

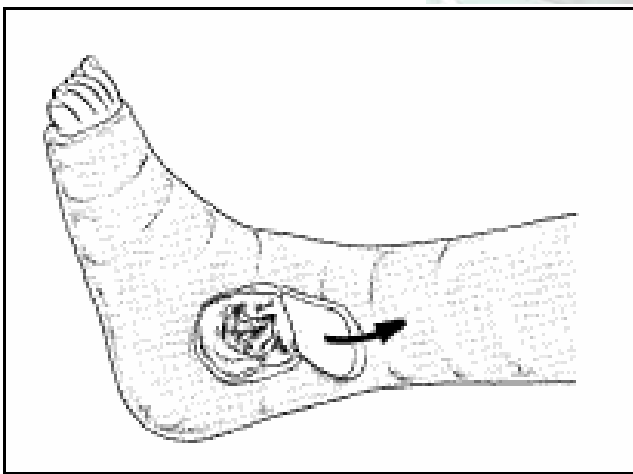


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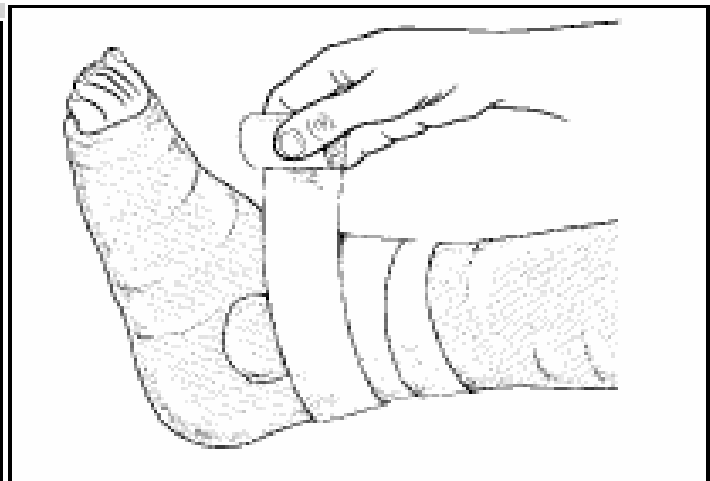


Figure 17.32

17.2 CASTS AND SPLINTS

Typical casts and splints

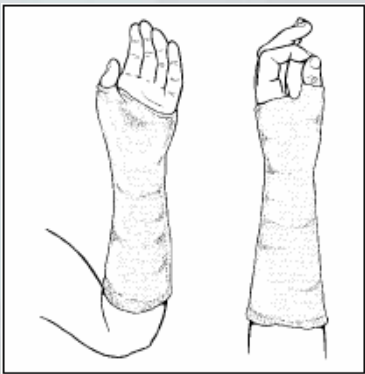


Figure 17.33

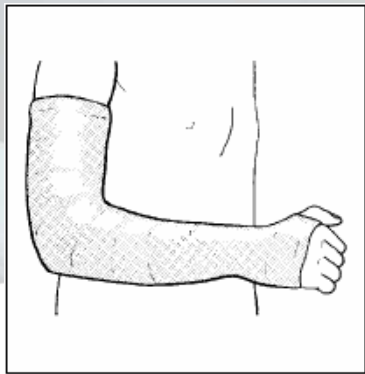


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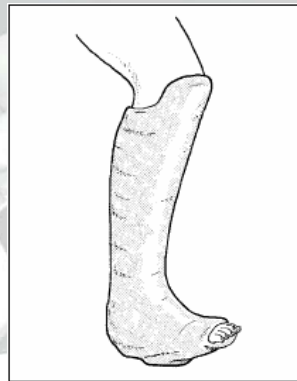


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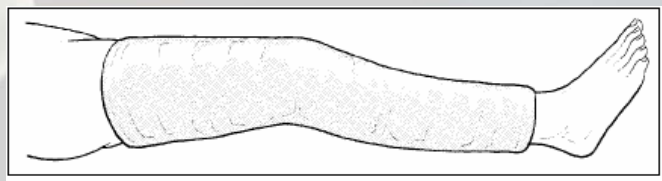


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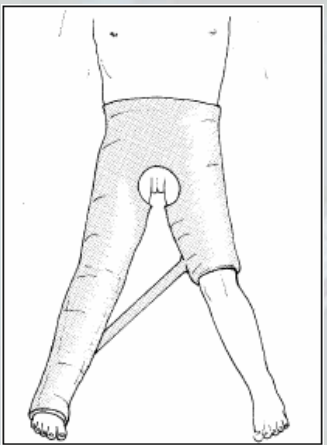


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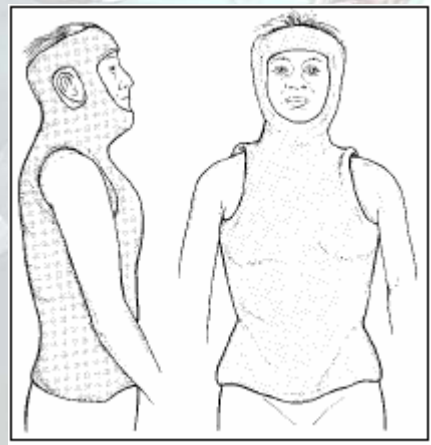


Figure 17.38



Figure 17.39

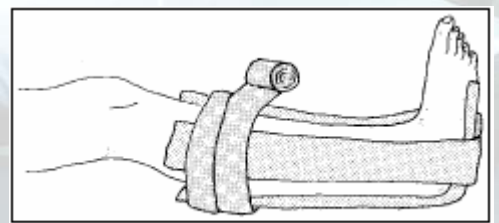


Figure 17.40



17.3 APPLICATION OF EXTERNAL FIXATION

- External fixation is a technique for immobilizing fractures by placing pins into the bone above and below the fracture and connecting the pins to an external device
- The fracture position is adjusted by making changes to the external components in an outpatient setting
- Wounds are accessible for dressing changes, debridement and secondary closure or skin grafting.



17.3 APPLICATION OF EXTERNAL FIXATION

Materials

- Arrange the fixation frame to best accommodate the fracture pattern and the stability needed
- Partially threaded pins, 3–6 mm diameter, work best but smooth pins will work if threaded ones are not available.



17.3 APPLICATION OF EXTERNAL FIXATION

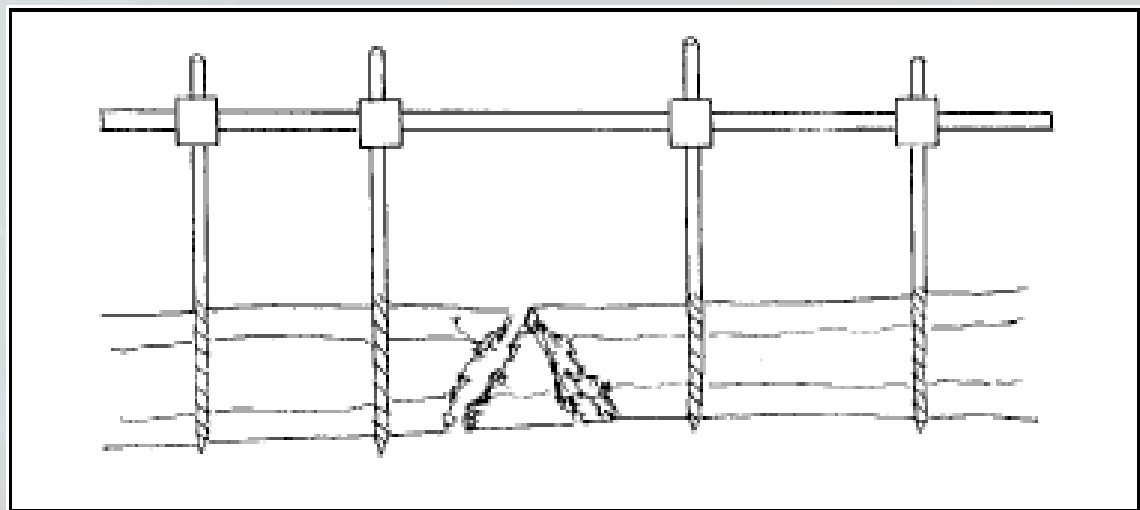


Figure 17.41

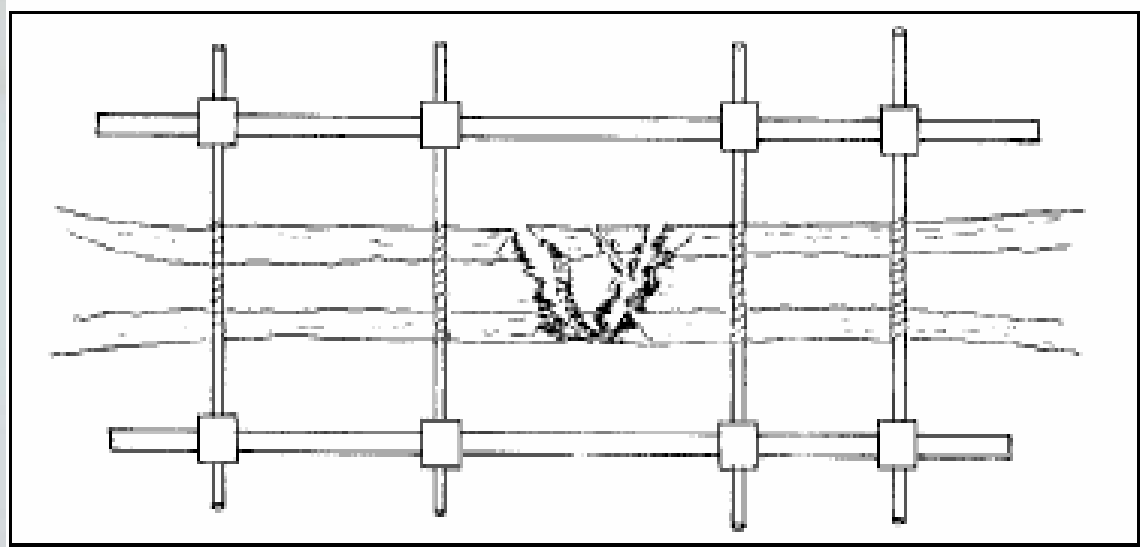


Figure 17.42

Half pins are threaded on the end

Transfixation pins are threaded in the middle



17.4 DIAGNOSTIC IMAGING

- **Diagnostic imaging refers to a variety of graphic techniques:**
 - routine X-ray images,
 - ultrasound,
 - nuclear bone scans,
 - MRI scans,
 - CT scans
- **X-ray is the most common imaging technique available at the district hospital**
- **X-ray images are a useful additional aid for diagnosis and treatment, but practitioners must be able to provide care without them**
- **The most useful and common X-ray examinations include the chest, spine, pelvis and the extremities.**



17.4 DIAGNOSTIC IMAGING

- Skull radiographs are often of limited value as they neither exclude nor confirm possible life threatening intracranial damage
- In patients with acute abdominal disorders, including trauma injuries, ultrasound examination is the first method of choice, where available
- When performed by well-trained operators, the sensitivity of ultrasound for detecting intraperitoneal bleeding is about 90% and the specificity is close to 100%.



17.5 PHYSICAL THERAPY

- Physical therapy keeps the musculoskeletal system functional while the injured bone, muscle or ligament heals
- Restoring movement early in the healing process helps to prevent venous thrombosis and pressure sores and enhances pulmonary function.



17.6 CRANIAL BURR HOLES

- Traumatic bleeding within the epidural and subdural spaces increases intracranial pressure and causes neurological impairment
- Clinical features of extremely increased pressure include:
 - decreased consciousness,
 - slow pulse rate,
 - dilated pupils,
 - seizures and
 - hemiparesis
- Release of the pressure with cranial burr holes is an emergency and life- saving procedure.



17.6 CRANIAL BURR HOLES contd.

- **Acute extradural** and **acute subdural** haematomas are the only two conditions that may benefit from burr holes.
- A history of trauma and a clear clinical diagnosis are essential before undertaking the procedure.



17.6 CRANIAL BURR HOLES

Acute Extradural Haematoma

- The signs classically consist of:
 - Loss of consciousness following an lucid interval, with rapid deterioration
 - Middle meningeal artery bleeding with rapid raising of intracranial pressure
 - Development of hemiparesis on the opposite side with a dilating pupil on the same side as the impact area, with rapid deterioration.



17.6 CRANIAL BURR HOLES

Acute Subdural Haematoma

- **Acute subdural haematoma, with clotted blood in the subdural space accompanied by severe contusion of the underlying brain, occurs from the tearing of bridging vein between the cortex and the dura.**
- **Management is surgical and every effort should be made to do burr-hole decompressions. The diagnosis can be made on history and examination.**
- **Creating burr holes through the skull to drain the haematoma is often an emergency and life-saving procedure.**



17.6 CRANIAL BURR HOLES

Technique

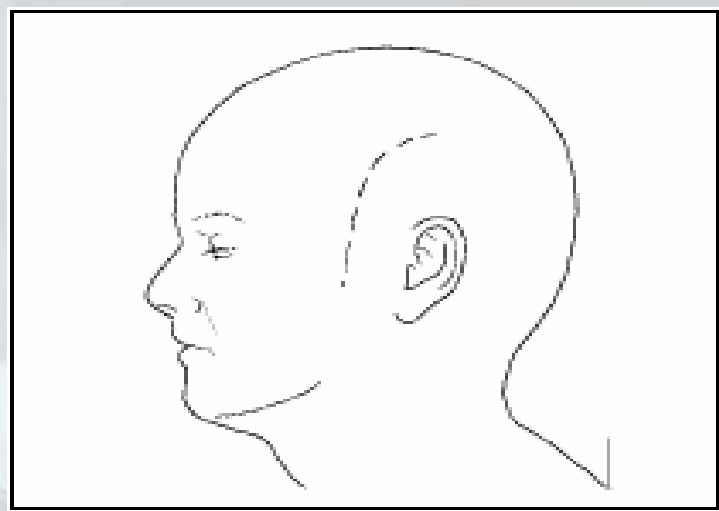


Figure 17.43

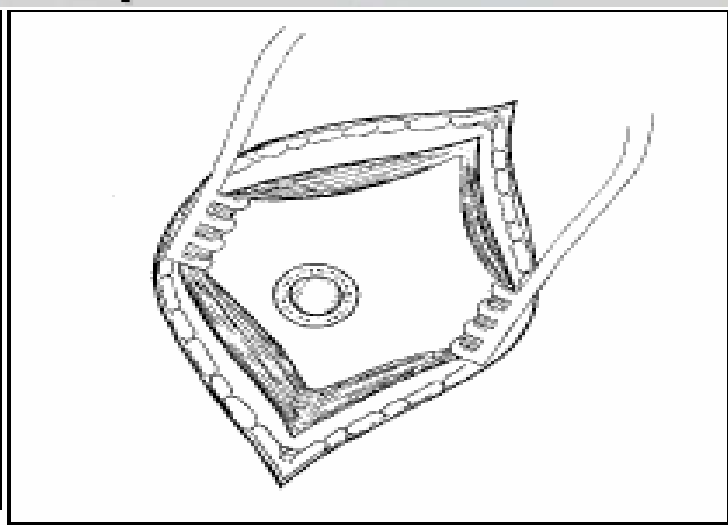


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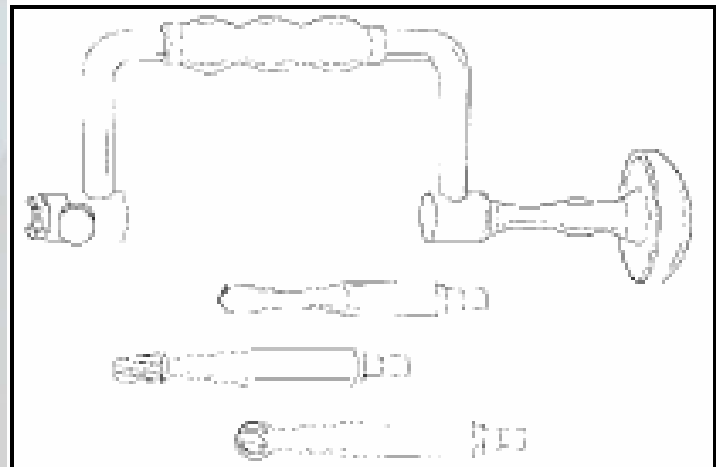


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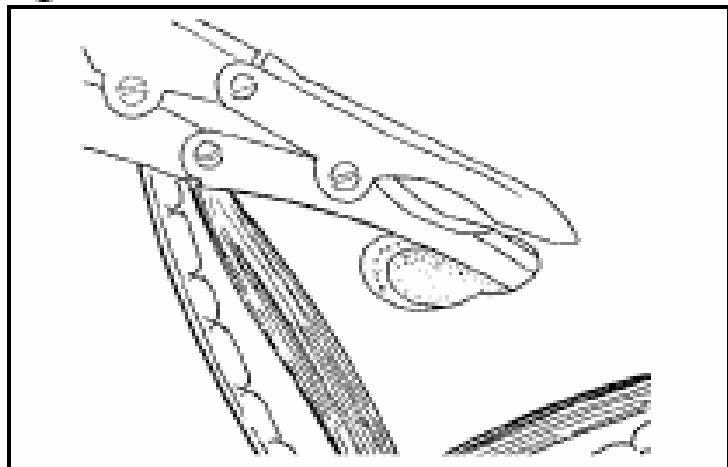


Figure 17.46