Management of patients with fracture

By:

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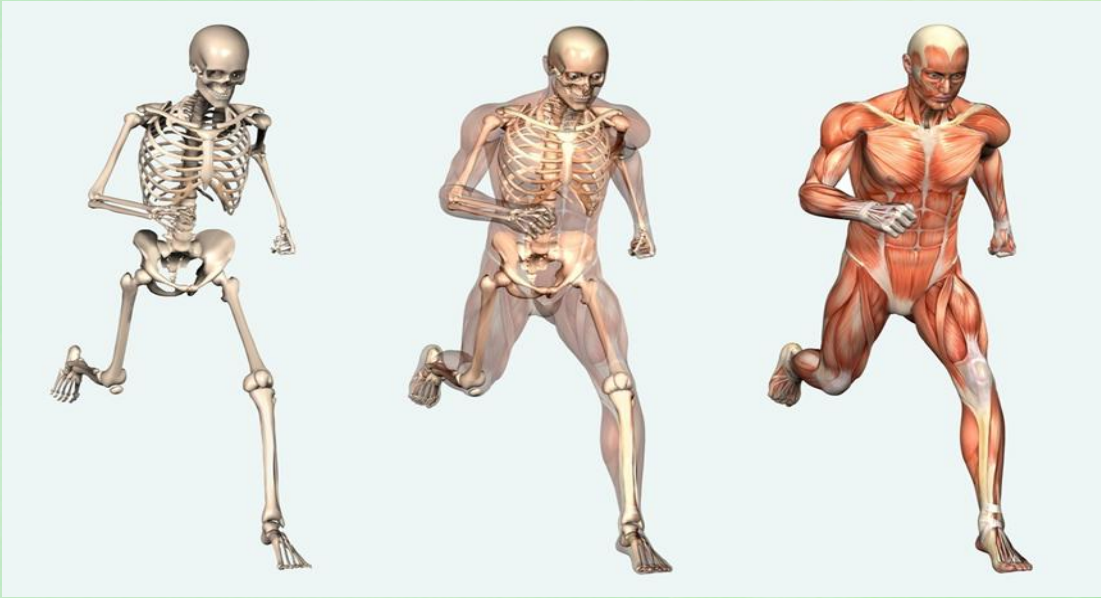


Out lines

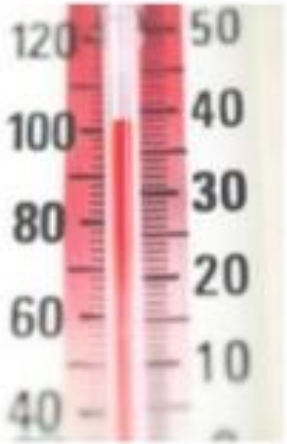
- Introduction
- Function of the skeletal system
- Fractures
- Musculoskeletal Care Modalities
- External fixation.
- Internal fixation.

Introduction

- The human musculoskeletal system (the locomotor system) is made up of the bones of the skeleton, muscles, cartilage, tendons, ligaments, joints, and other connective tissue that supports and binds tissues and organs together. Musculoskeletal diseases and injuries can significantly affect overall productivity, independence, and quality of life in people of all ages.

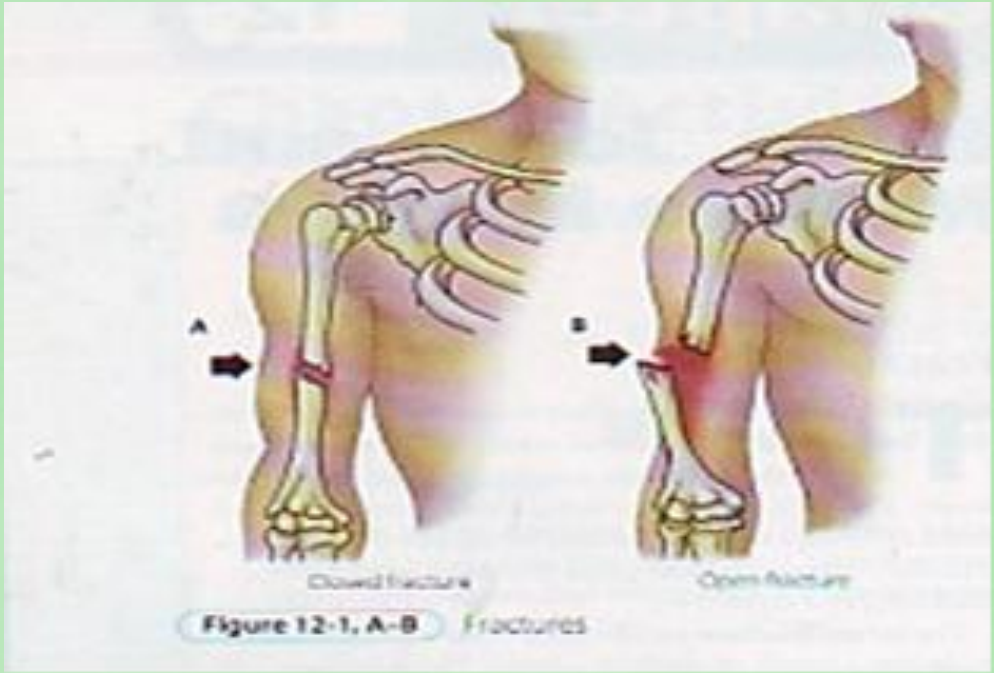
Functions of the Musculoskeletal System

- Support
- Movement
- Protection
- Production
- Stability
- Temperature Regulation
- Storage



3. Fractures:

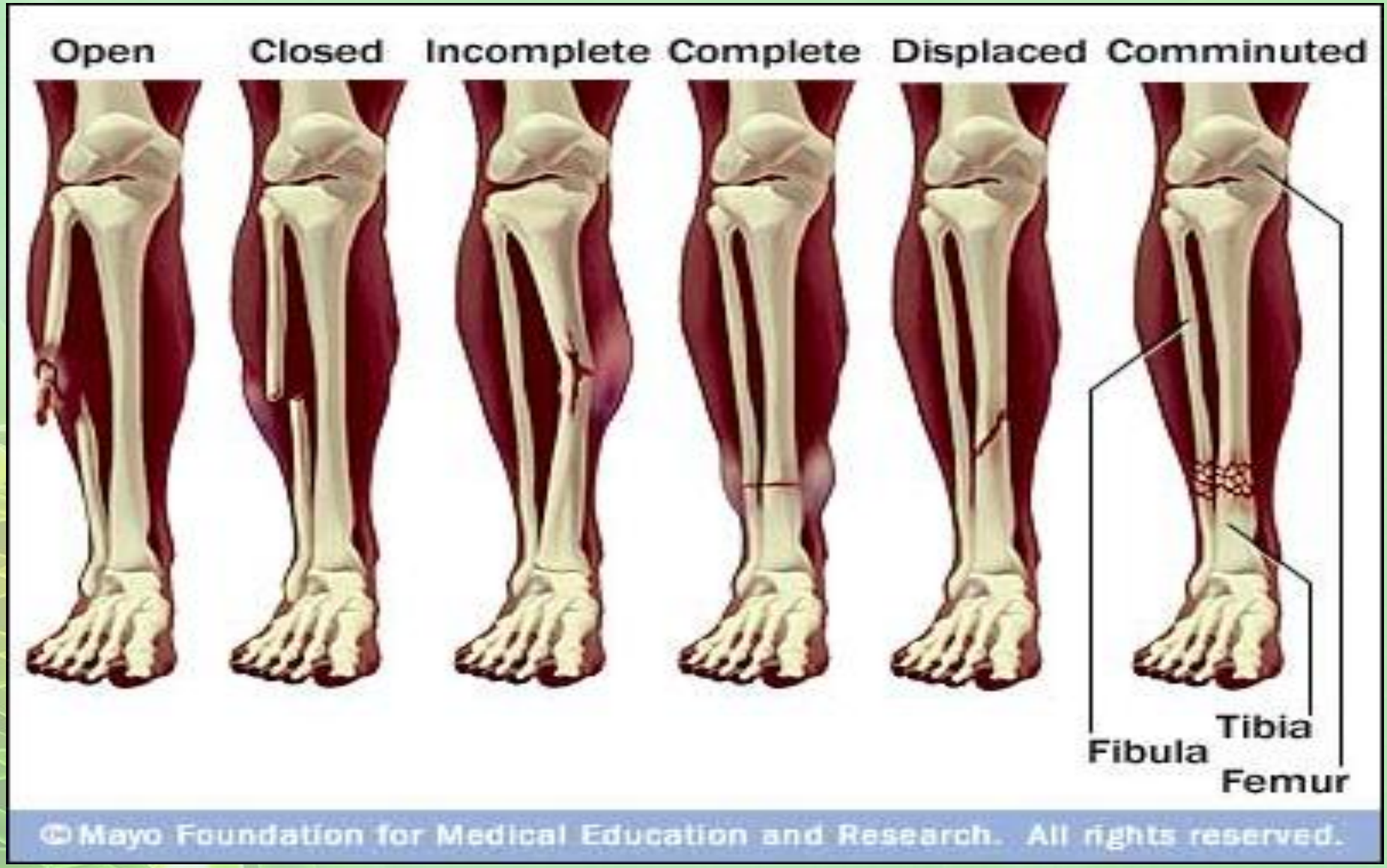
- A fracture is a break in the continuity of a bone. Fractures may affect tissues or organs near the bones as well. Fractures are classified according to type and extent.

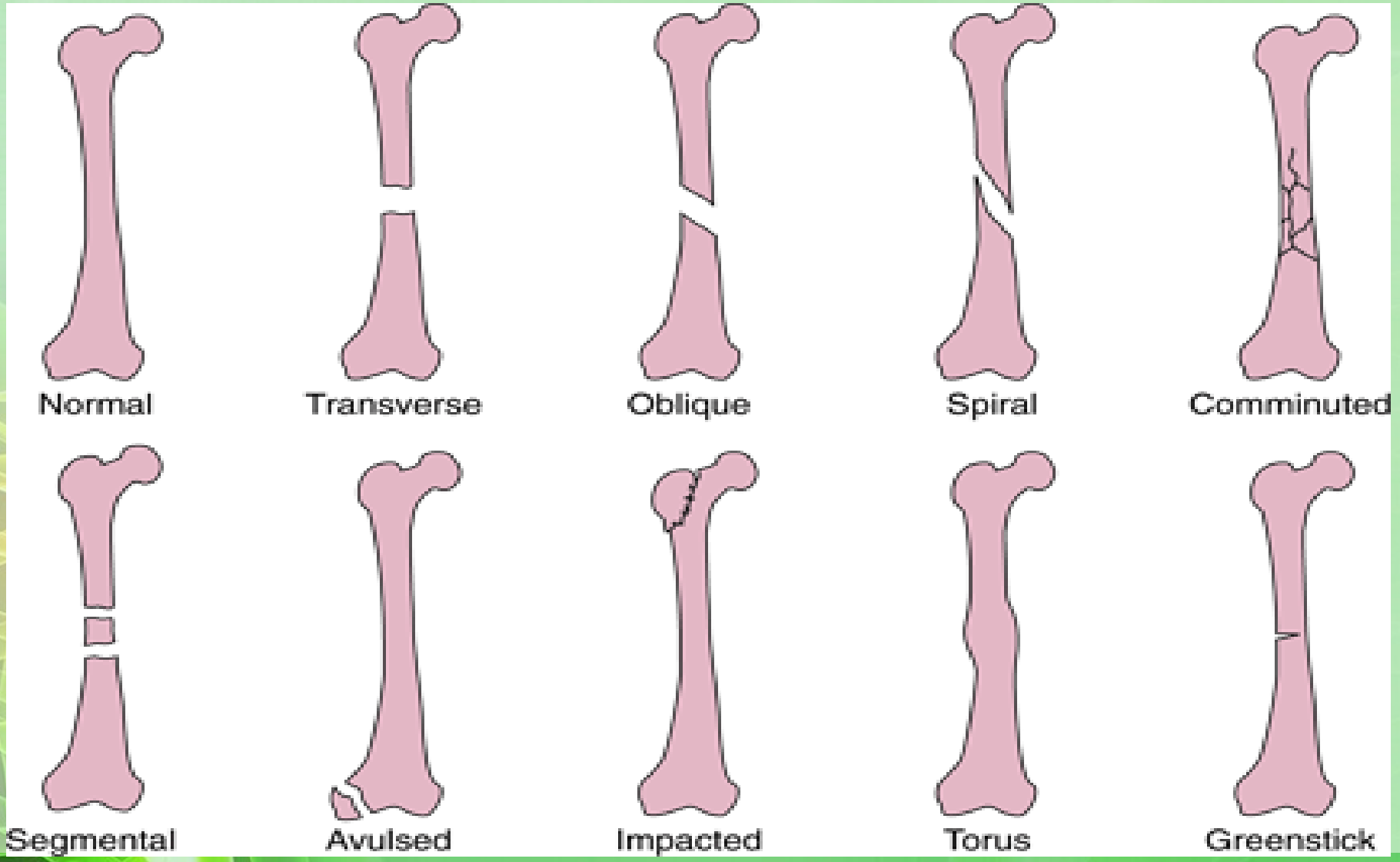


Classification of fractures:

- **A complete fracture** involves a break across the entire cross-section of the bone. **An incomplete fracture** (eg, greenstick fracture) involves a break through only part of the cross-section of the bone.
- **A simple or closed fracture:** is one that does not cause a break in the skin.
- **A compound or open fractures:** is one in which the skin or mucous membrane wound extends to the fractured bone.

Classification of fractures

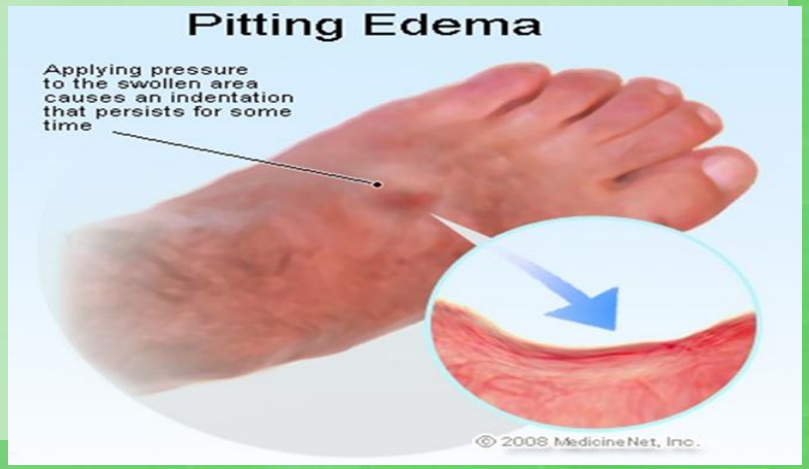



Normal
Transverse
Oblique
Spiral
Comminuted
Segmental
Avulsed
Impacted
Torus
Greenstick

Signs and symptoms

- **Pain:** The pain is continuous and increases in severity until the bone fragments are immobilized.
- **Loss of function:** After a fracture, the extremity cannot function properly because normal function of the muscles depends on the integrity of the bones to which they are attached.
- **Deformity:** Displacement, or rotation of the fragments in a fracture of the arm or leg causes a deformity

- **Crepitus:** When the extremity is gently palpated, a crumbling sensation, called **crepitus,** can be felt.
- **Localized Edema and Ecchymosis:** Localized edema and ecchymosis occur after a fracture as a result of trauma and bleeding into the tissues.
- **Shortening of the extremity:** In fractures of long bones, there is actual shortening of the extremity because of the compression of the fractured bone.

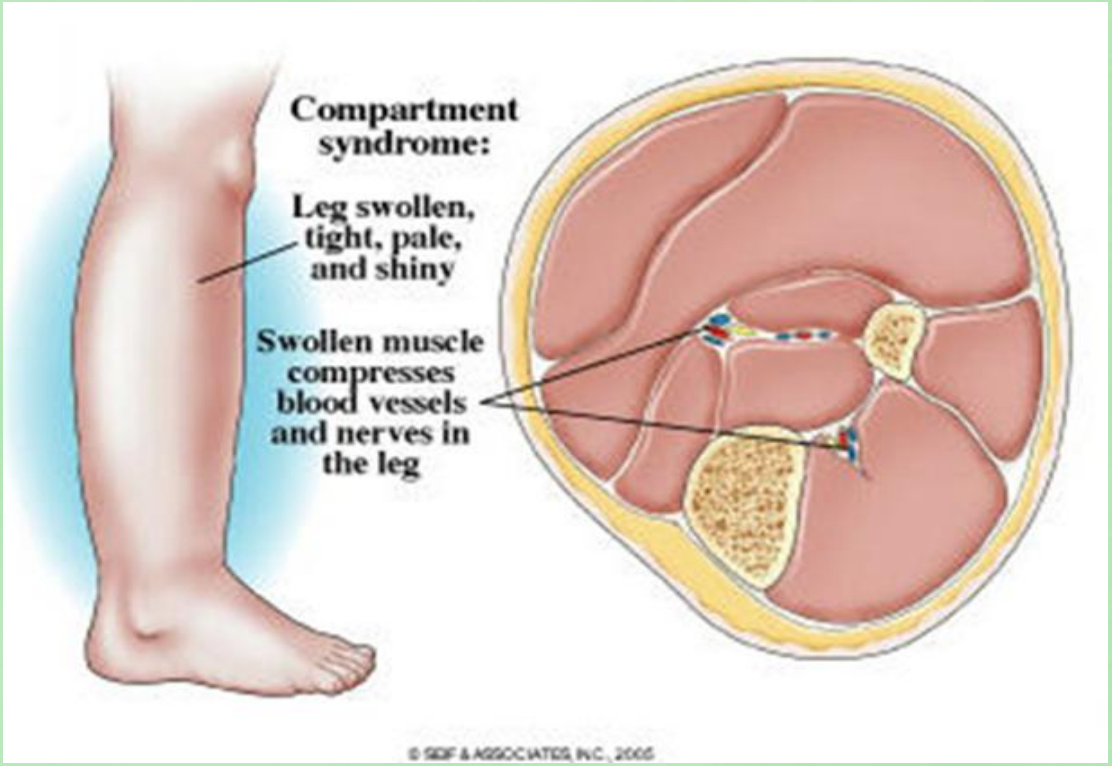


Complications

Early Complications

- Hypovolemic shock: resulting from hemorrhage and from loss of intravascular volume into the interstitial space, particularly within damaged tissues
- **Fat embolism:**
- At the time of fracture, fat globules may diffuse into the vascular compartment because the marrow pressure is greater than the capillary pressure. The fat globules (emboli) may occlude the small blood vessels that supply the lungs, brain, kidneys, and other organs.

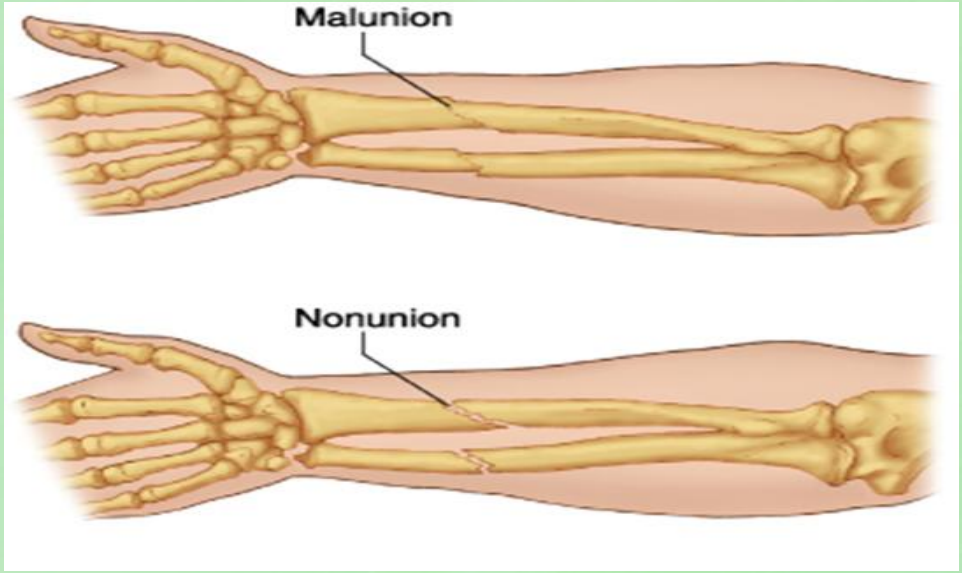
- Compartment syndrome: is a complication that develops when pressure within a compartment is greater than normal. Acute compartment syndrome involves a sudden and severe decrease in blood flow to the tissues distal to an area of injury that results in ischemic necrosis



Delayed Complications

- **Delayed Union, Malunion, Nonunion**

Delayed union occurs when healing does not occur at a normal rate for the location and type of fracture. Nonunion results from failure of the ends of a fractured bone to unite, whereas malunion results from failure of the ends of a fractured bone to unite in normal alignment.



Avascular necrosis of bone

- Avascular necrosis (AVN) occurs when the bone loses its blood supply and dies. It may occur after a fracture with disruption of the blood supply. It is also seen with dislocations, bone transplantation, prolonged high-dose corticosteroid therapy, chronic renal disease, sickle cell anemia, and other diseases.

Emergency Management

- Immobilize the body part before the patient is moved.
- Immobilize long bones of the lower extremities by bandaging the legs together.
- In an upper extremity injury, arm may be bandaged to the chest
- Joints proximal and distal to the fracture must be immobilized.
- Assess neurovascular status before and after splinting to determine the adequacy of peripheral tissue perfusion and nerve function.
- With an open fracture, the wound is covered with a sterile dressing to prevent contamination of deeper tissues.

Medical management:

- ***Reduction***

- Fracture reduction refers to restoration of the fracture fragments to anatomic alignment and positioning.
- Physician reduces a fracture as soon as possible to prevent loss of elasticity from the tissues through infiltration by edema or hemorrhage.
- Consent for the procedure is obtained, and an analgesic is administered as prescribed. Anesthesia may be administered.

Closed Reduction

- Closed reduction by bringing the bone fragments into anatomic alignment through manipulation and manual traction.
- Traction (skin or skeletal) may be used until patient is physiologically stable to undergo surgical fixation.

Open Reduction

- Some fractures require open reduction. Through a surgical approach, the fracture fragments are anatomically aligned.
- Internal fixation devices (metallic pins, wires, screws, plates, nails, or rods) to hold the bone fragments in position until solid bone healing occurs.

- ***Immobilization***
- After the fracture has been reduced, the bone fragments must be immobilized and maintained in proper position and alignment until union occurs.
- Immobilization may be accomplished by external or internal fixation. Methods of external fixation include bandages, casts, splints, continuous traction, and external fixators.

Maintaining and Restoring Function

- Edema is controlled by elevating injured extremity & applying ice.
- Neurovascular status (circulation, motion and sensation) is monitored routinely.
- Anxiety, and discomfort are controlled with reassurance, position changes, and pain relief strategies, including analgesics.
- Isometric and muscle-setting exercises are encouraged to minimize atrophy and to promote circulation.
- Participation in activities of daily living (ADLs) is encouraged to promote independent functioning and self-esteem.

Musculoskeletal Care Modalities

➲ *External Fixation*

- A procedure that stabilized and joins the ends of fractured bones

Methods of external fixation:

1. **Cast:** is a rigid external immobilizing device that is molded to the contours of the body.

A cast is used to:

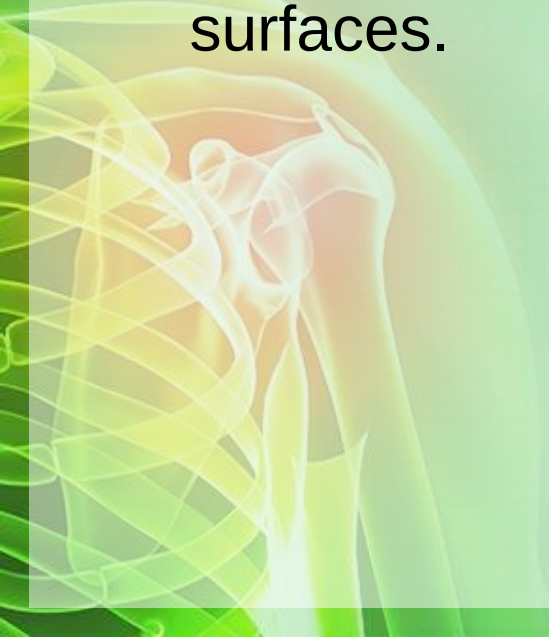
- Immobilize a reduced fracture.
- Correct a deformity.
- Apply uniform pressure to underlying soft tis
- support and stabilize weakened joints

Nursing care of Patient with Cast

- To control swelling, the immobilized arm is elevated.
- Assess circulation by observing the color, temperature, and capillary refill.
- Nerve function is assessed by observing the patient's ability to move the fingers or toes and by asking about the sensations.
- The nurse and physical therapist teach the patient how to transfer and ambulate safely with assistive devices (eg, crutches, walker).

2. Traction

- Traction is the application of a pulling force to a part of the body. Traction is used to minimize muscle spasms; to reduce, align, and immobilize fractures; to reduce deformity; and to increase space between opposing surfaces.



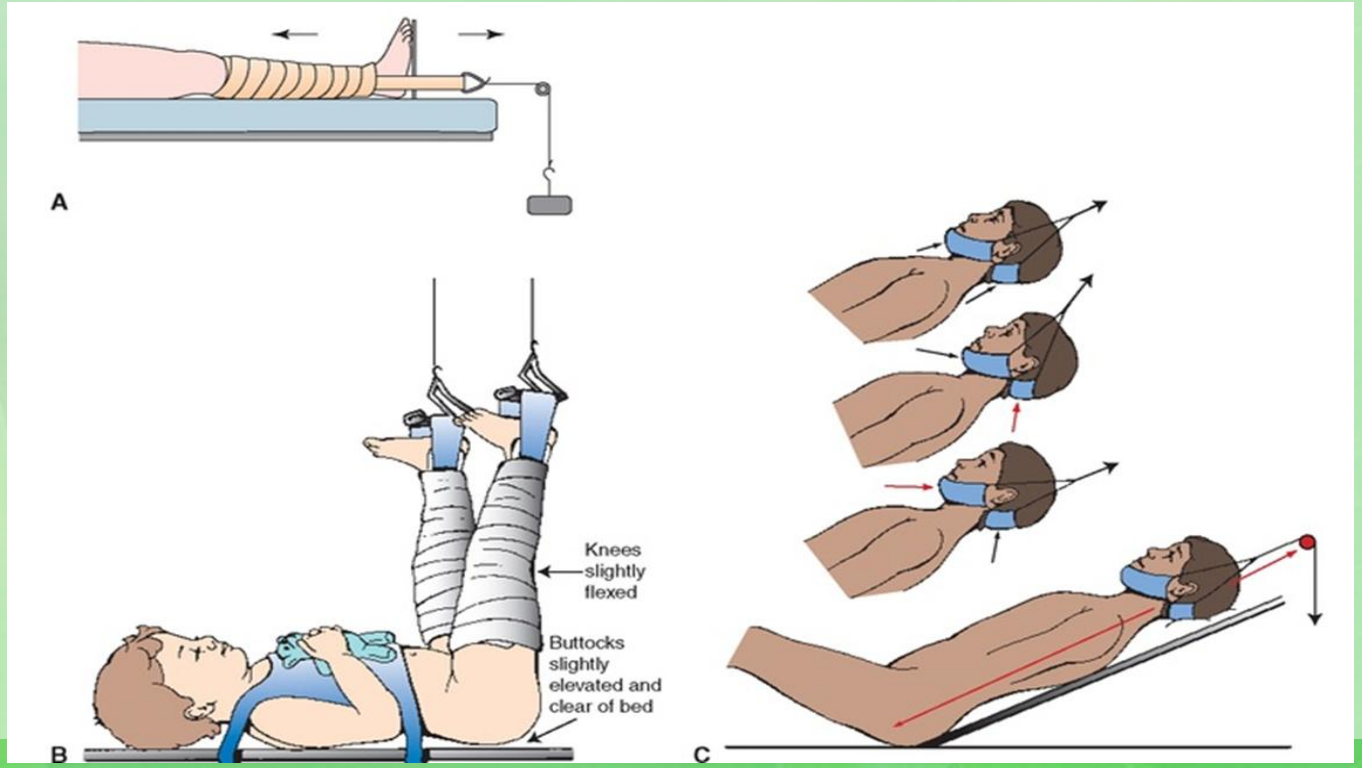
Types of traction

Skin Traction

- Skin traction is used to control muscle spasms and to immobilize an area before surgery. Skin traction is accomplished by using a weight to pull on traction tape or on a foam boot attached to the skin.

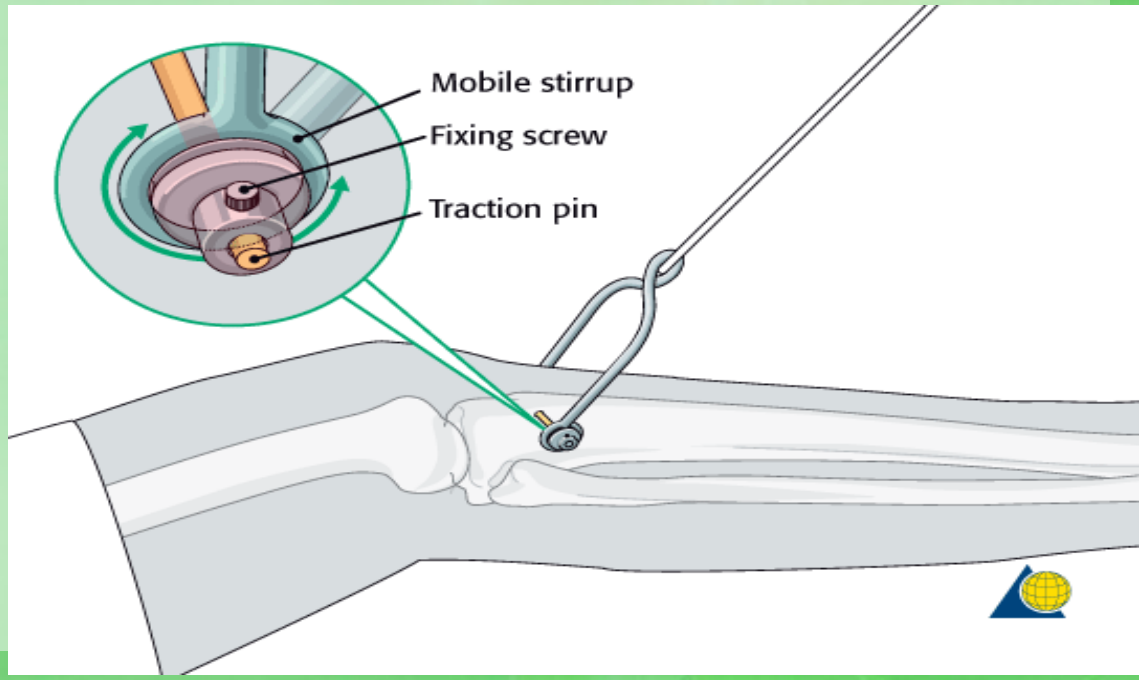
Buck's Extension Traction

- Buck's extension traction (unilateral or bilateral) is skin traction to the lower leg. It is used to immobilize fractures of the proximal femur before surgical fixation.



Skeletal Traction

- Skeletal traction is applied directly to the bone. This method of traction is used occasionally to treat fractures of the femur, the tibia, and the cervical spine.



CARE OF CLIENT IN TRACTION

T Temperature < Extremity Infection

R Ropes Hang Freely

A Alignment

C Circulation Check (5 P's)

T Type & Location of Fracture

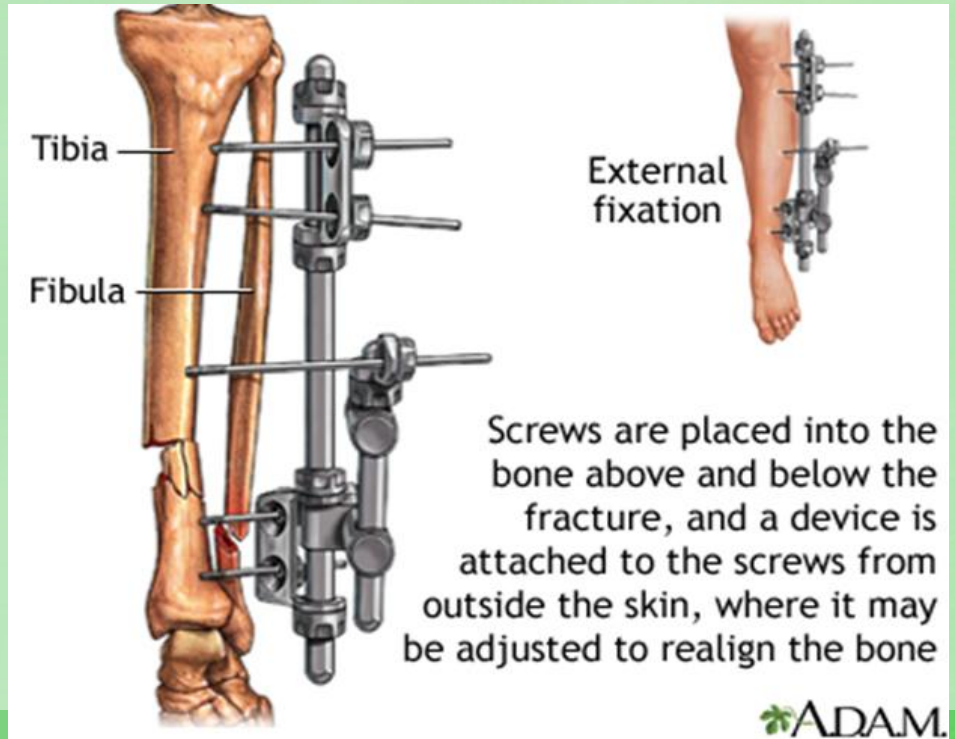
I Increase Fluid Intake

O Overhead Trapeze

N No Weights On Bed Or Floor

3. External Fixator

- External fixators are used to manage open fractures with soft tissue damage. They provide stable support for severe comminuted (crushed) fractures while permitting active treatment of damaged soft tissues



Nursing Interventions

- Prepare the patient psychologically.
- The extremity is elevated to reduce swelling.
- If there are sharp points on the fixator or pins, they are covered with tape to prevent device-induced injuries.
- Monitor the neurovascular status of the extremity.
- Provide pin care as prescribed to prevent pin tract infection. (cotton-tipped applicators soaked in chlorhexidine solution.)
- Encourage isometric and active exercises as tolerated.

Internal Fixation

- A surgical procedure that stabilizes and joins the ends of fractured (Broken) bones by mechanical devices

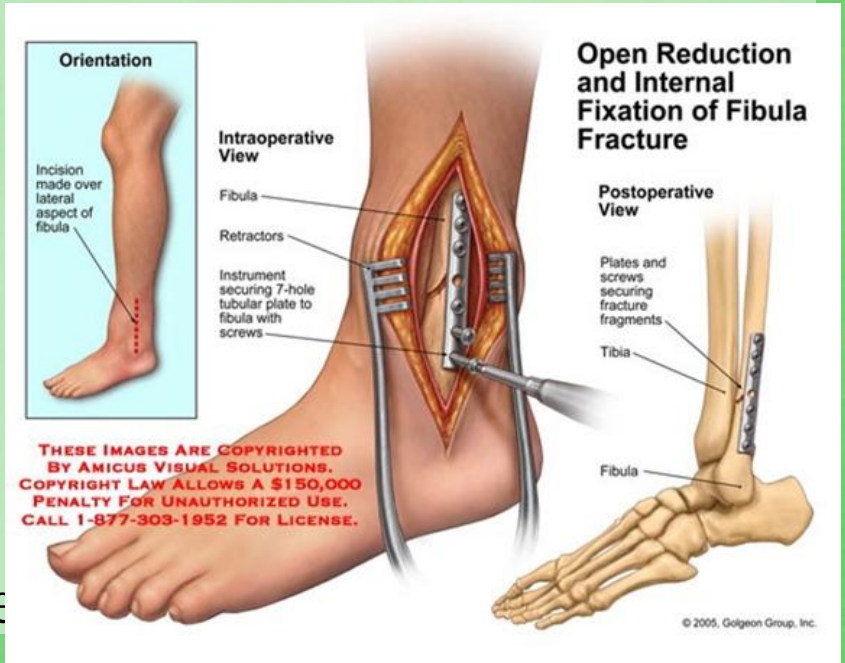
Types of internal fixation:

1. **Open reduction internal fixation (ORIF).**

ORIF are often used in cases involving serious fractures such as (Communicated or displaced Fractures).

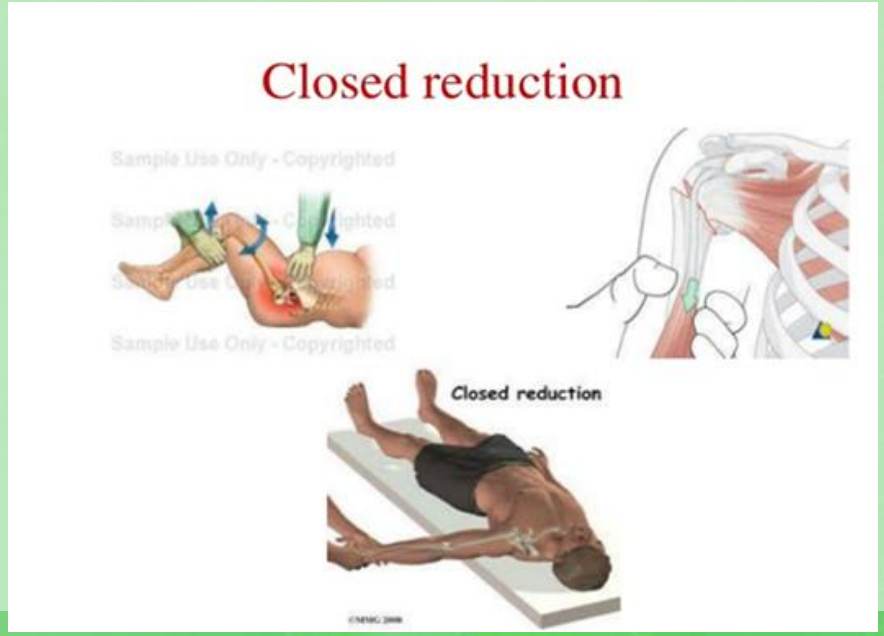
It is accomplished with a nail or an intramedullary rod (A rod inserted into the center of the bone with wires around the bone for stabilization).

It's done most frequently for hip fracture



2. Closed reduction internal fixation (CRIF):

- It’s reduction without any open surgery, followed by internal fixation. It appears to be an acceptable alternative in unstable distressed fractures of the hummers in children, but if fracture displacement after closed reduction exceeds 2mm, open reduction and internal fixation is recommended.



Complications:

1. Pin tract infection
2. Osteomyelitis.
3. Loss of fracture stabilization
4. Stiffness
5. Neurovascular injury

Nursing management:

1. Assess pain in the injured extremity using a standard pain scale.
2. Assess neurovascular status at least every 8 hours.
3. Provide wound dressing under complete aseptic technique.
4. Check skin color and temperature in the extremity.
5. Limited range of motion (ROM) may indicate such problem as nerve damage and paralysis.
6. Teach the patient to perform progressive ambulation, mobilization using crutches or walker appropriately.
7. With internal fixation, surgeon determines amount of movement and weight-bearing stress the extremity can sustain.


Thank you.