มหาวิทยาลัยราชภัฏนครปฐม
Nakhon Pathom Rajabhat University

มหาวิทยาลัยราชภัฏนครปฐม

มหาวิทยาลัย
ราชภัฏนครปฐม

Musculoskeletal disorder

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Learning outcomes

- 1. Describe abnormalities related to the musculoskeletal system.
- 2. Describe the pathology, signs and symptoms of patients with musculoskeletal disorders.
- 3. Describe the principles of treatment for bone fractures and musculoskeletal diseases.
- 4. Correctly explain nursing diagnosis and nursing in the musculoskeletal system.

Musculoskeletal disorder : overwiew

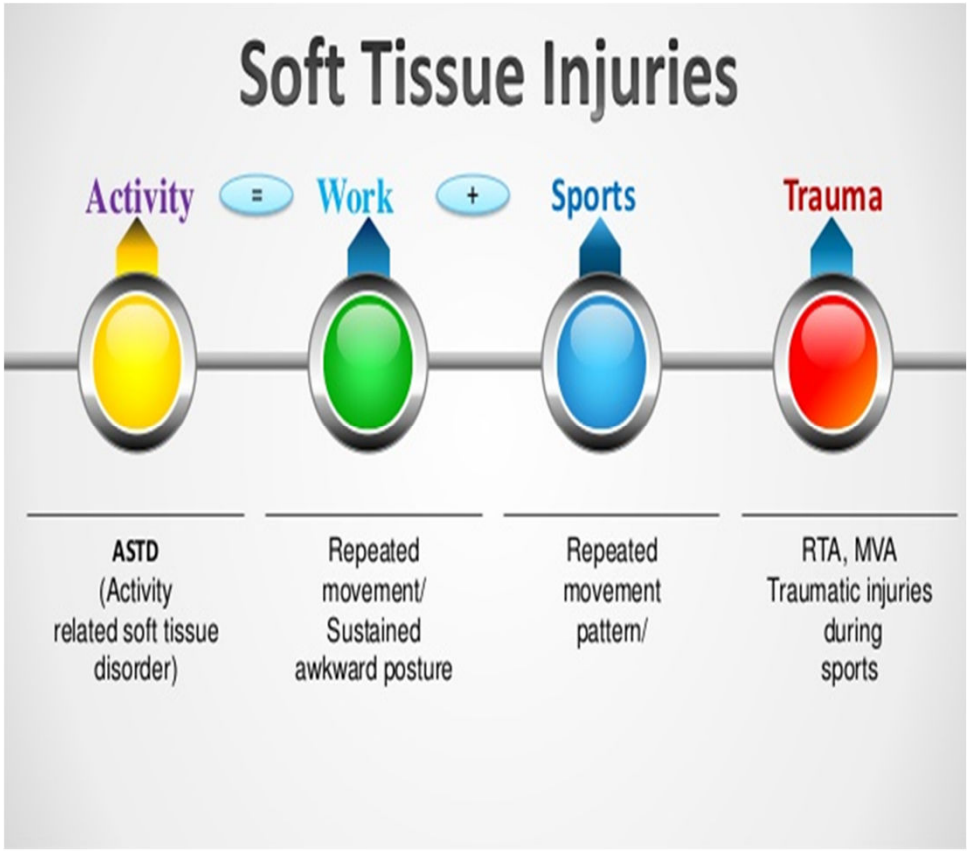
มหาวิทยาลัย
ราชภัฏนครปฐม

- soft tissue injuries
- Dislocation and Subluxation
- Carpal Tunnel Syndrome
- Fracture
- Amputation

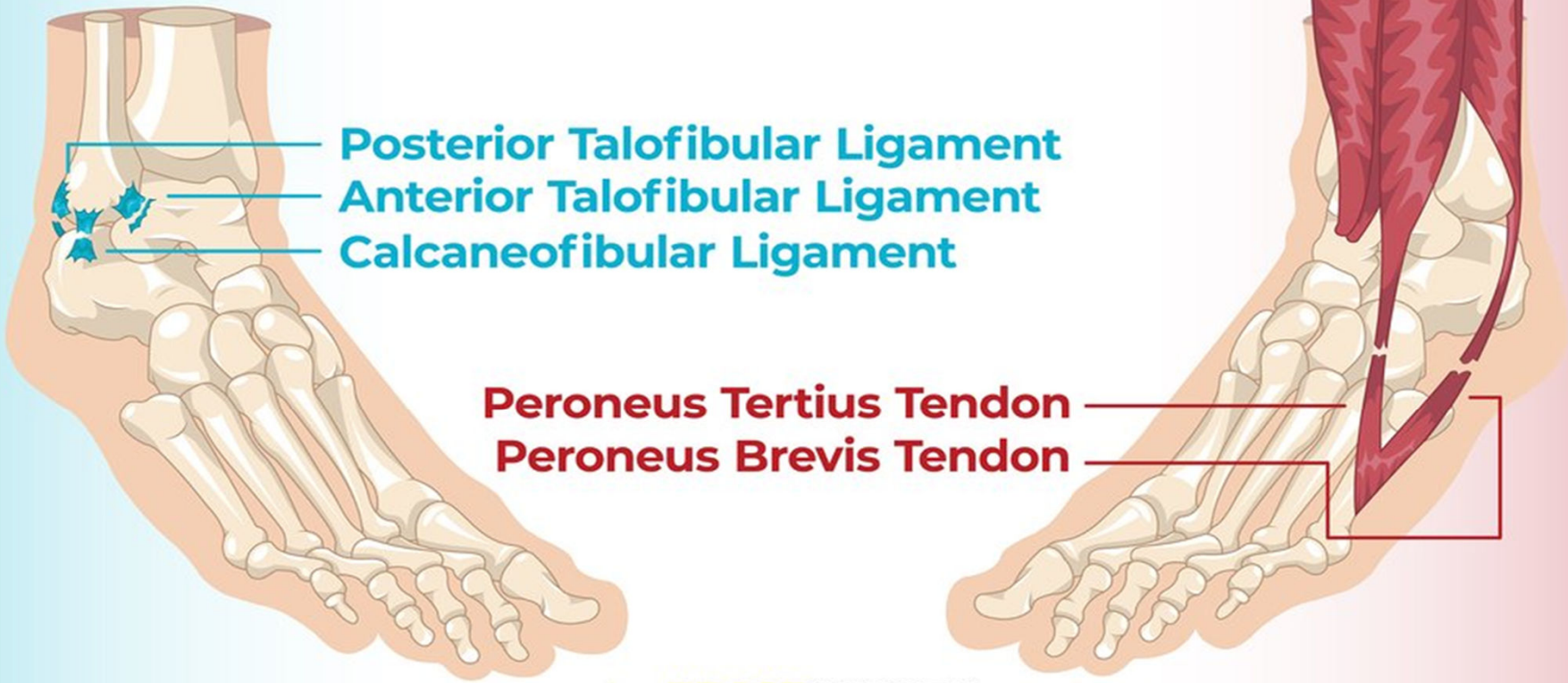
- Rheumatoid arthritis
- Gouty Arthritis
- Osteoarthritis septic arthritis
- Osteoporosis
- Osteomyelitis

soft tissue injuries

muscle injury Muscle ligaments, joint ligaments, joint sacs or cartilage, ligaments, joints, muscles, and bones from a sprain or muscle tear Joint dislocations and dislocations

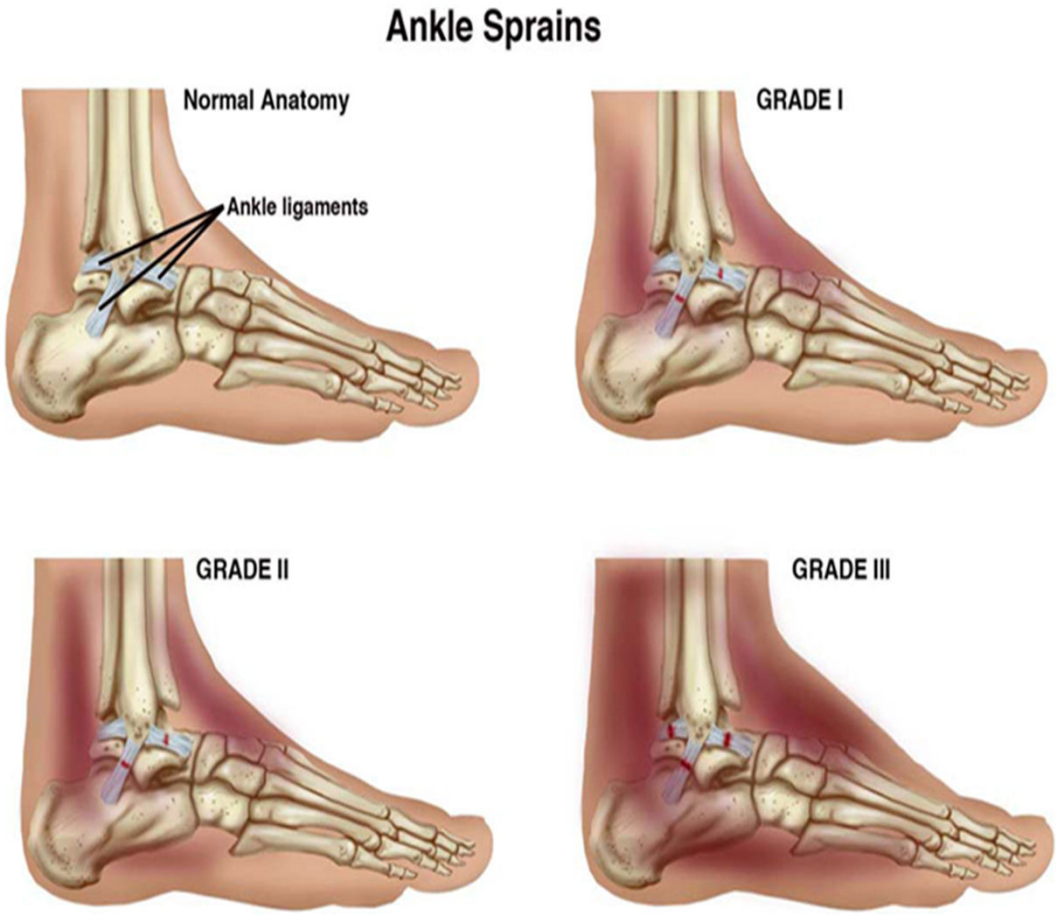


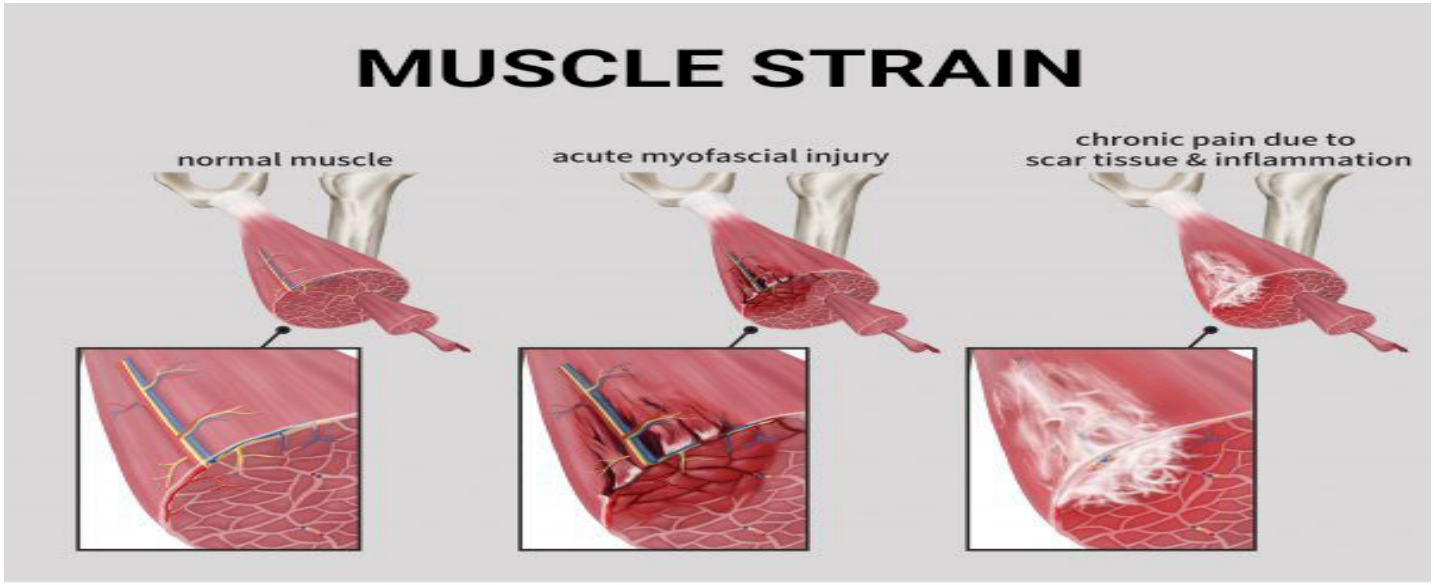
SPRAIN vs. STRAIN

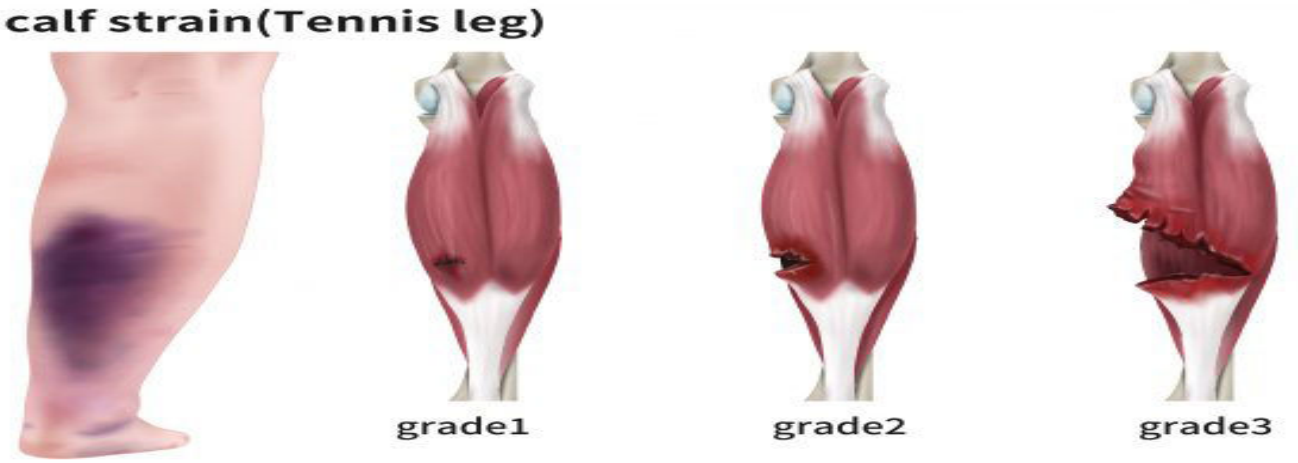


BRACEABILITY

Ankle Sprains

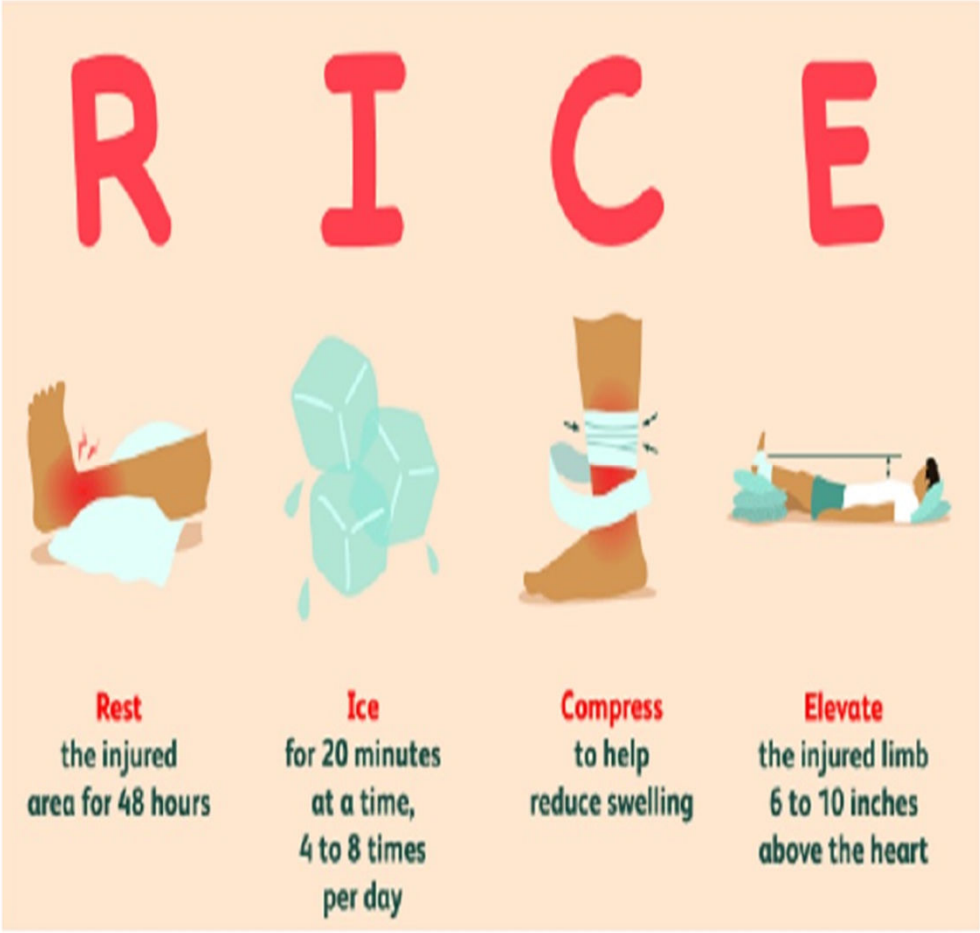






https://www.physicaltherapistsnyc.com/physical-therapy-services/muscle-strain/

Medical Management of Sprains



Rest — helps limit movement that can worsen the injury;

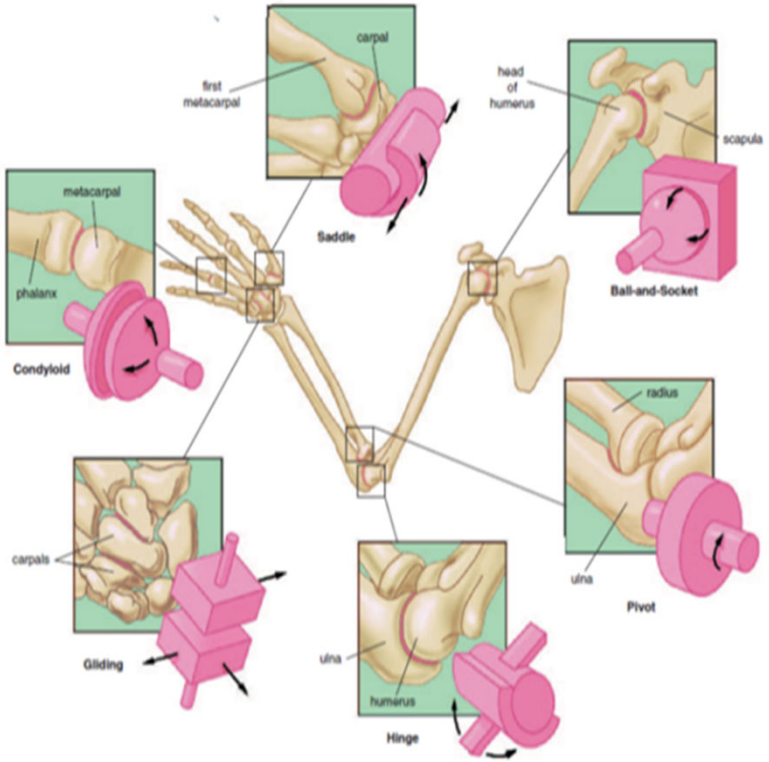
Ice — applied to the area reduces swelling and helps stop any bleeding (heat has the opposite effect);

Compression — means applying pressure to the area (or wrapping with a cloth or bandage) to help stop the bleeding;

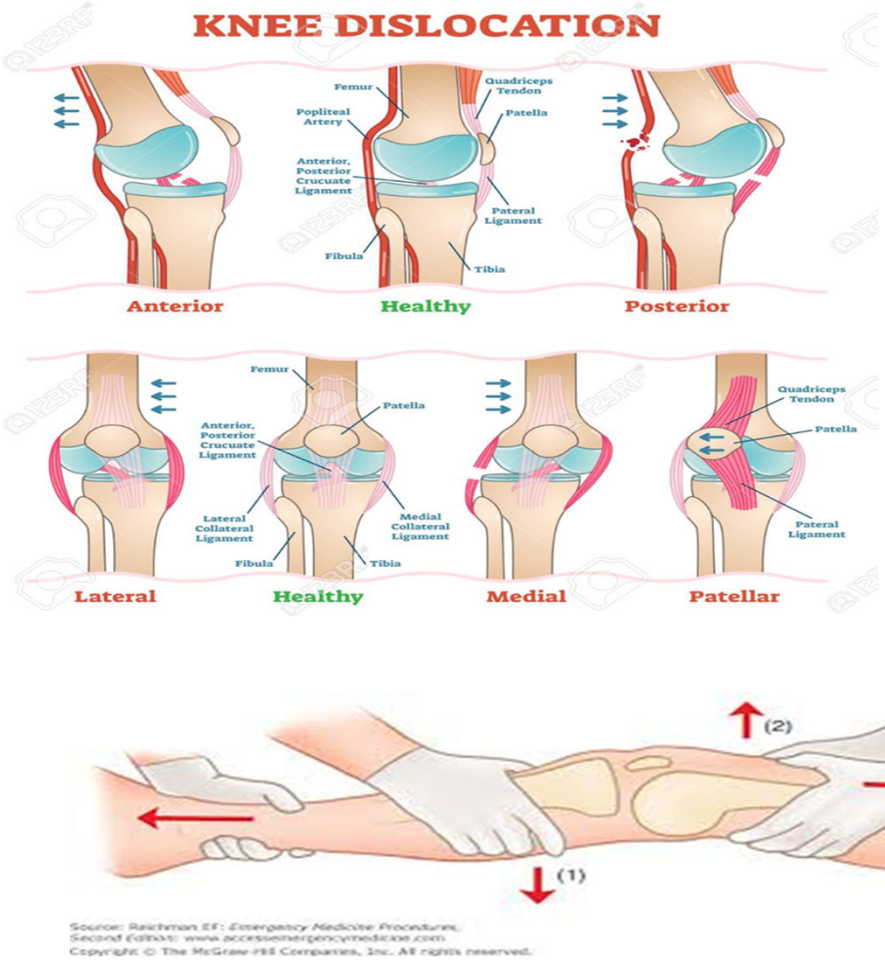
Elevation — means raising the injured area above the rest of the body as a way to reduce swelling.

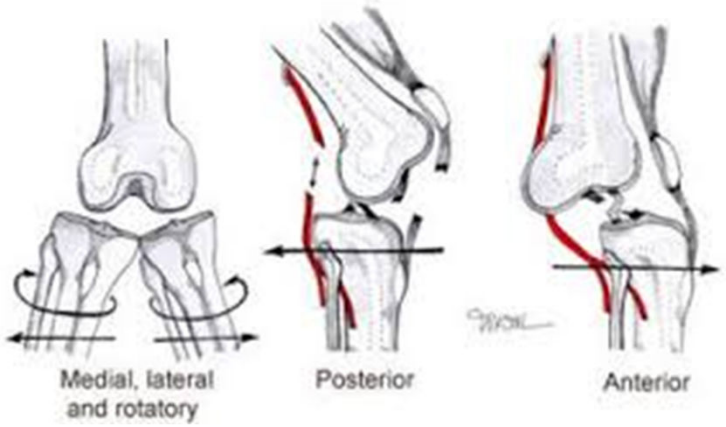
Dislocation and Subluxation

- Shoulder joint
- Elbow joint
- proximal interphalangeal joint : PIP joint
- Metacarpophalangeal Joint : MP joint
- hip dislocation
- Knee dislocation



Dislocation and Subluxation

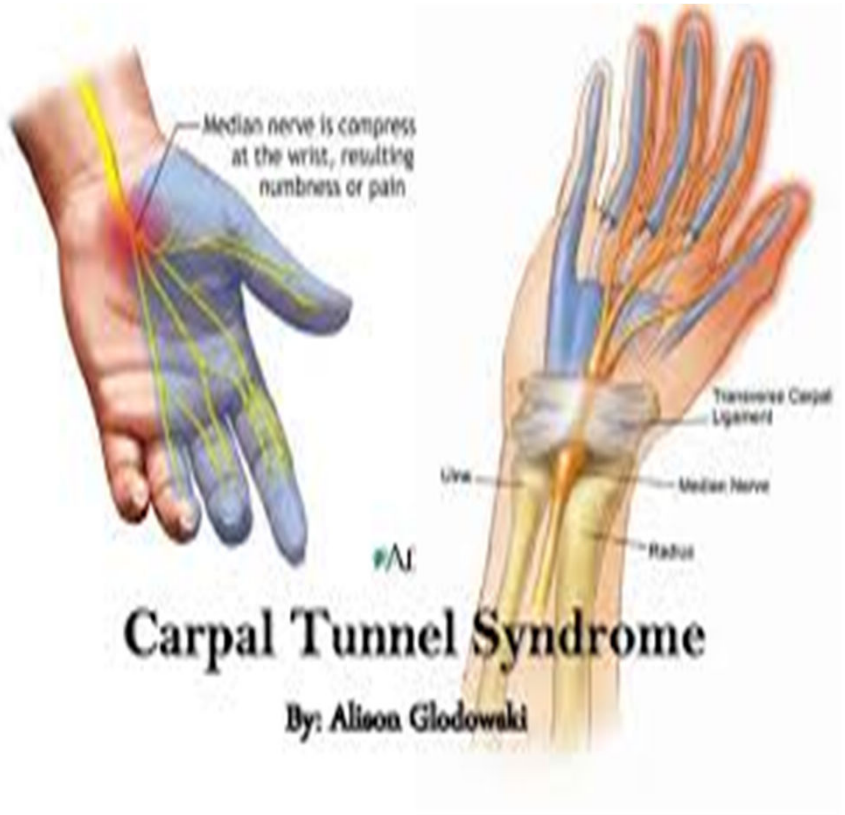




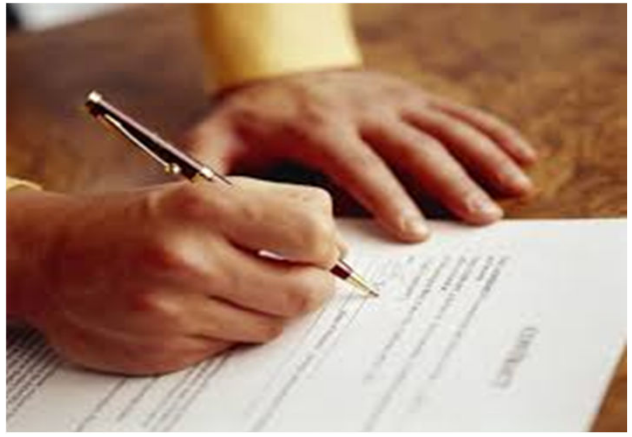
Emergency Nursing Management

- 1. Do not attempt to pull the dislocated joint into place yourself. Because it may cause damage to tendons, muscles, blood vessels, and soft tissues. Until it cannot be repaired to be as good as before.
- 2. Cold compress To reduce swelling and reduce pain within the first 24 hours.
- 3. Try to keep that part still. By wrapping it with an elastic bandage. Hurry and take him to the hospital quickly.

Carpal Tunnel Syndrome: CTS



Cause of Carpal Tunnel Syndrome



Pathophysiology

The tendons of the hands are wrapped with a lining that produce a synovium fluid which lubricates the tendons

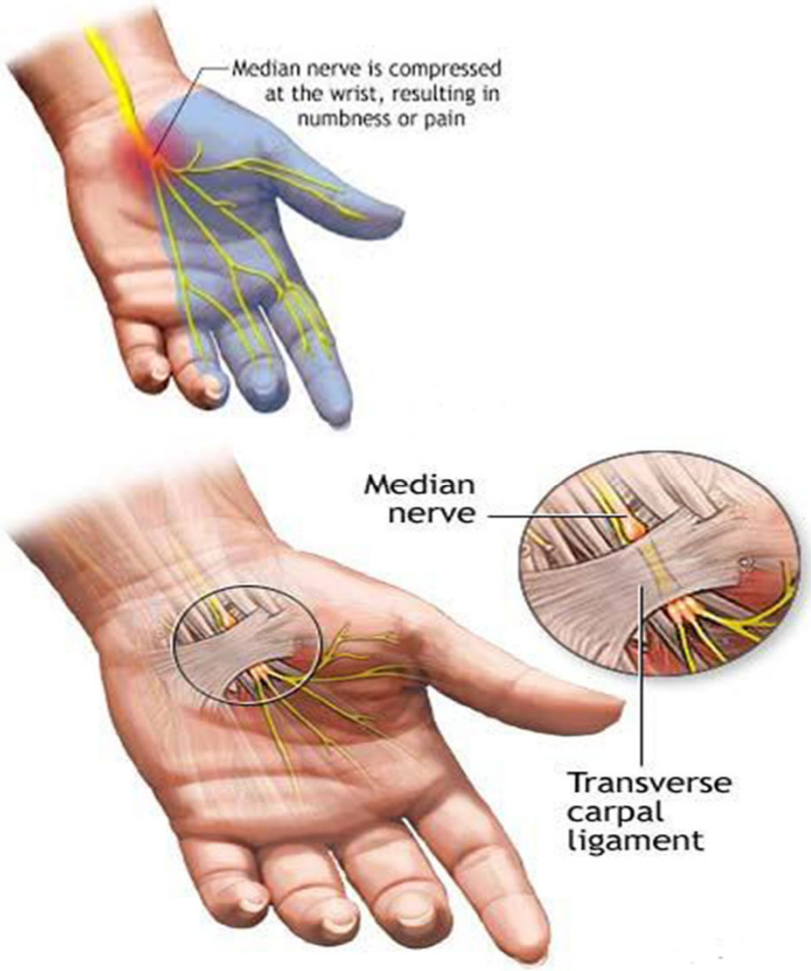
With repetitive movement of the hand, the lubrication system may malfunction

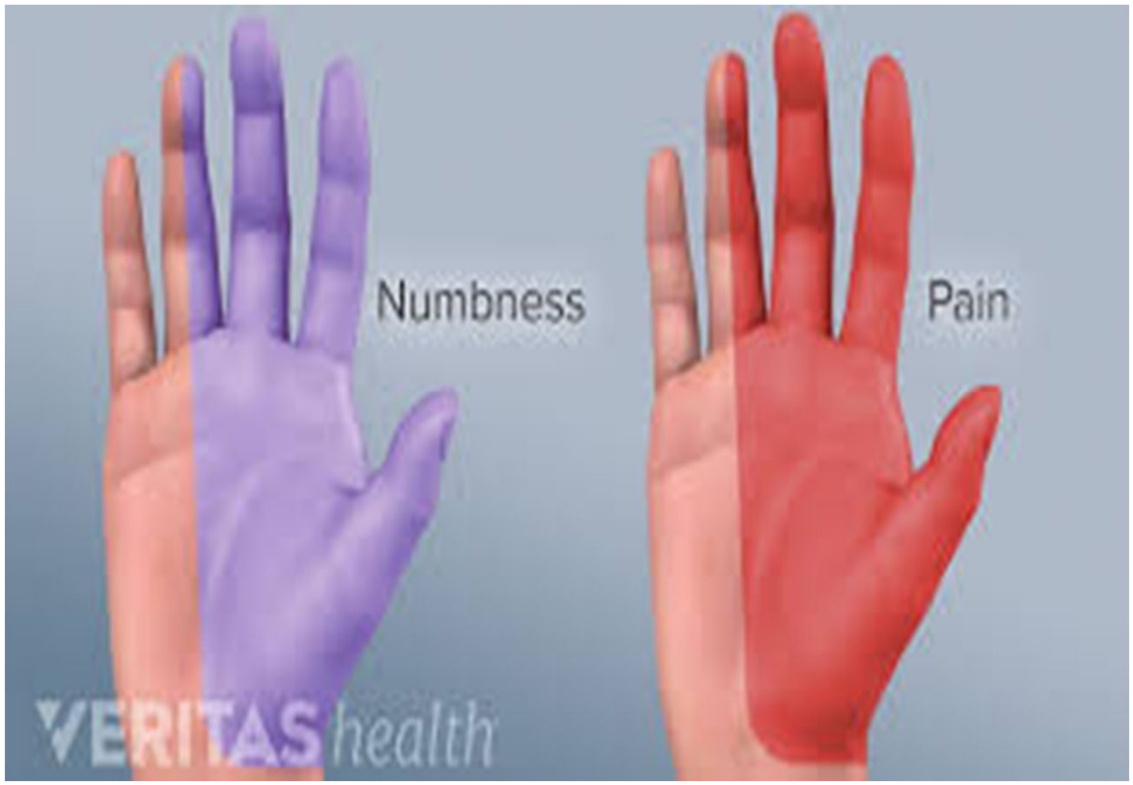
This reduction in lubrication results in inflammation and swelling of the tendon area

Abnormally high carpal tunnel pressures exist in patients with CTS.

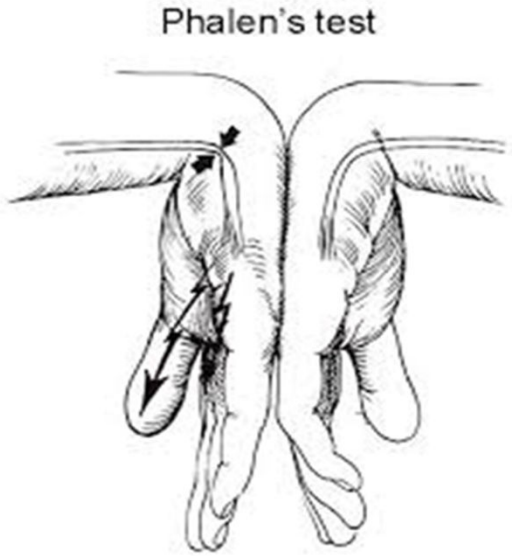
This pressure causes obstruction to venous outflow, back pressure, edema formation, and ultimately, ischemia in the nerve.

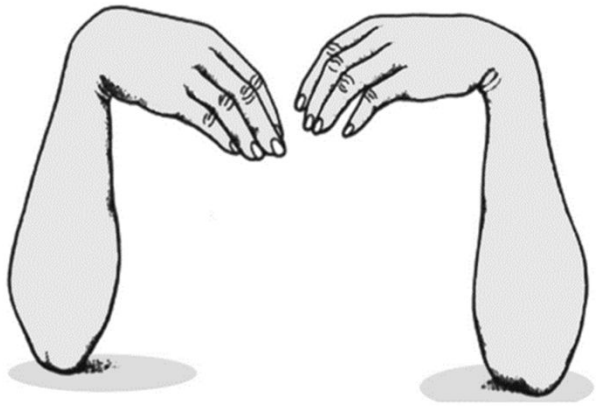
Signs and symptoms





Diagnosis of Carpal Tunnel Syndrome





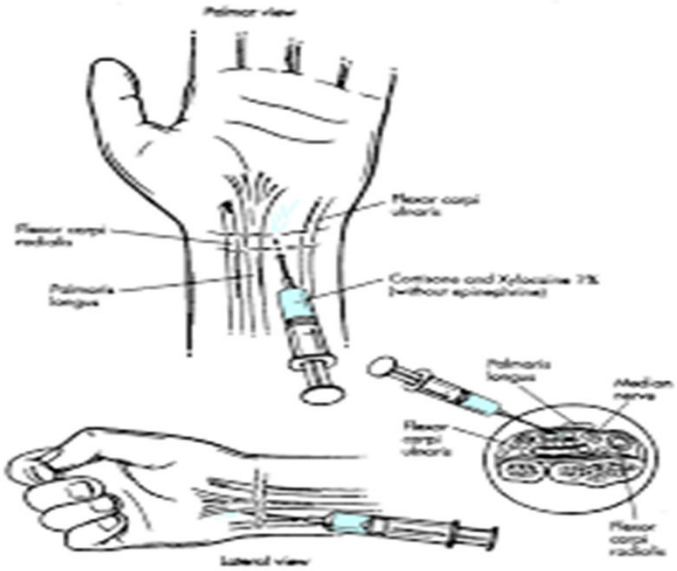
Management of Carpal Tunnel Syndrome

1. non-operative therapy

Wrist splint in neutral position

2. steroid Injection - Triamcinolone acetonide 10 mg/ml 1 ml with 1% lidoocaine 1 ml injec carpal tunnel

- 3. operative treatment→ release transverse carpal ligament



Nursing of Carpal Tunnel Syndrome

1. Wearing a splint and support device
2. Recommend hand physical therapy
3. Take care to take(NSAIDs) drugs according to the doctor's treatment.
4. Postoperative nursing
5. Wear a splint or wrist brace.
6. Change your lifestyle habits, such as avoiding driving. Do not handle heavy objects, etc., to help the treatment be more effective until it is completely healed. This may take approximately 2-3 months or longer than 6-12 months.

Fracture

- Open fracture: more serious and very high possibility of infection and complications.
- Close fracture: when the overlying skin is intact.
- Open fracture: the bone doesn't have to be exposed to call it "open fracture", even
- a small puncture in overlying skin is enough to call it so.

Fractures

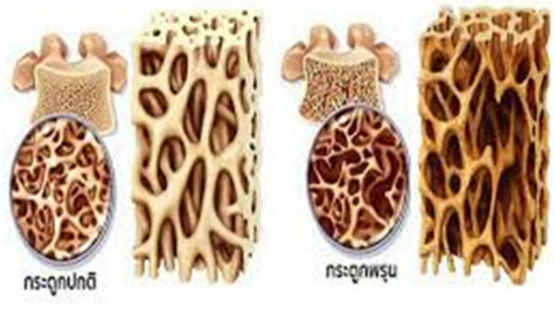
- A complete or incomplete disruption in the continuity of bone structure (structural breech in normal continuity of bone)

CAUSES OF FRACTURES

- direct trauma

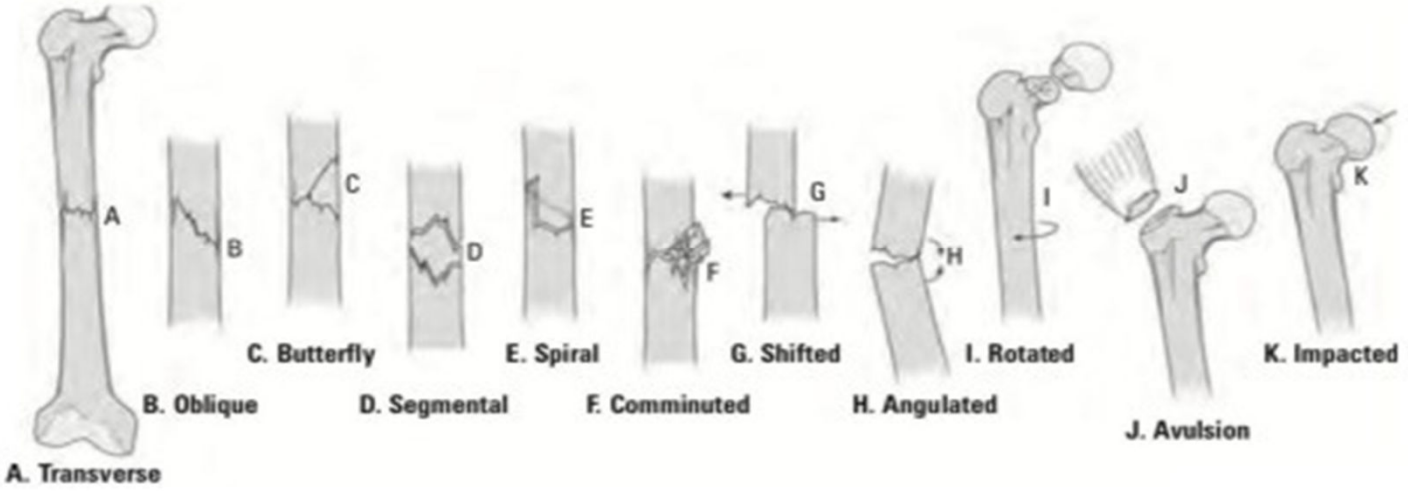
- (indirect trauma

- pathological cause



Traumatic

➢ **Fractures:** Break in the continuity of bone



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PATHOPHYSIOLOGY OF FRACTURE

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PATHOPHYSIOLOGY OF FRACTURE

Stress placed on a bone,
exceeds the bone ability to absorb it

↓

Injury in the bone

↓

Disruption in the continuity of bone

↓

Disruption of muscle and blood vessels attached
to the ends of the bone

↓

Soft tissue damage

↓

Bleeding

↓

Hematoma forms in medullary canal

↓

Bone tissue surround the fractured site dies

↓

Inflammatory response

Clinical manifestations of fractures

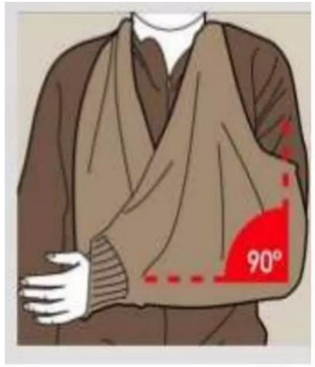
- edema or swelling : Locatized edema &ecchymosis occur after a fracture as aresult of trauma & bleeding into the tissues.
- (Pain) (tenderness)
- Continous and increases in severity until the bone fragments are immobilized.
- muscle spasm
- Deformity : Displaccement, angulation, or rotation of the fragments
- contusion
- disability or loss of function : B/C normal function of the muscles depends on the integrity of the bones to which they are attached.
- Pain contributes to the loss of function.
- Crepitus : Crumbling sensation felt caused by the rubbing of the bone fragments against each other.

DIAGNOSIS OF FRACTURE

- Clinical: History of trauma
- Plain, swelling,inability to use the injured part
- Tenderness, swelling and bruising
- Deformity, abnormal movement (sure signs of fracture)
- X-ray : A suspected fractured bone should be X-rayed.
- X-ray should be taken in at least two planes (AP and lateral)

Management of fractures

- Management of fractures – Five S's
- Sling for clavicle fractures, shoulder fractures etc.
- Strap for clavicle and rib fractures
- Splint, usually improvised.Eg:Thomas splint, Pneumatic splint
- Shift the patient with utmost care
- Seek professional help at the earliest.



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Emergency Management fracture

- Immobilization
- Adequate splinting
- In open fracture,

  wound is covered with a sterile dressing

  No attempt is made to reduce as little as possible to avoid more damage.

Immobilization (cont'd)

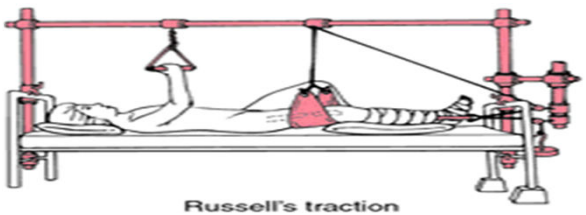
- Methods of immobilization:
- Plaster of Paris (POP) cast--→ Fixation
- Safest and cheapest
- Traction
- I. Using gravity:
- II. Skin traction: using bandage
- III. Skeletal traction: via a pin

Fixation
External fixation
Fixing by metal pins
Mostly in compound fractures

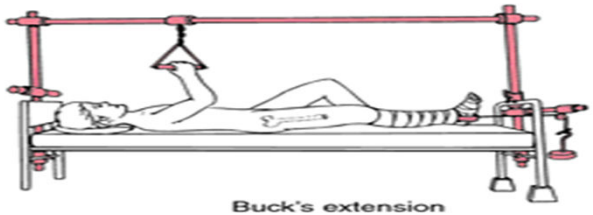
Internal fixation
Operative fixation of fractures by plates, nails, screws, pins and wires
Indicated in poly traumatized patients

conservative method

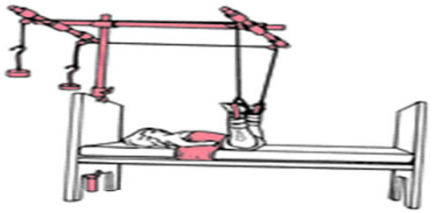
- Skeletal traction



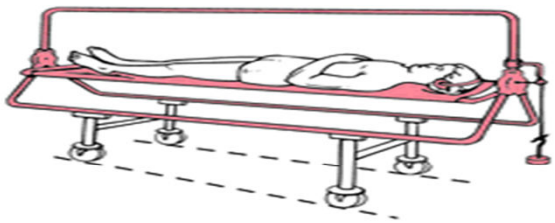
Russell's traction



Buck's extension



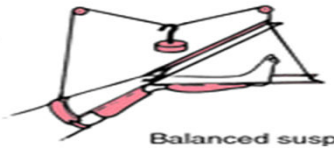
Bryant's traction



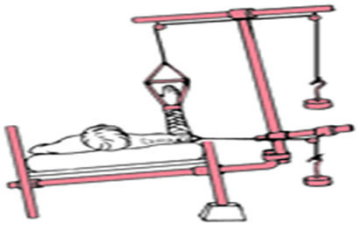
Skull tongs and turning frame

Head halter

Top view

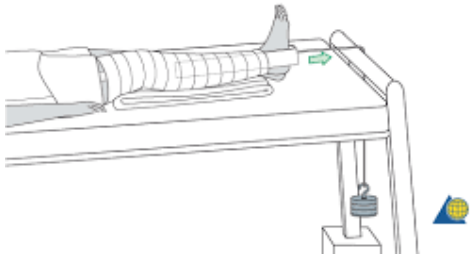


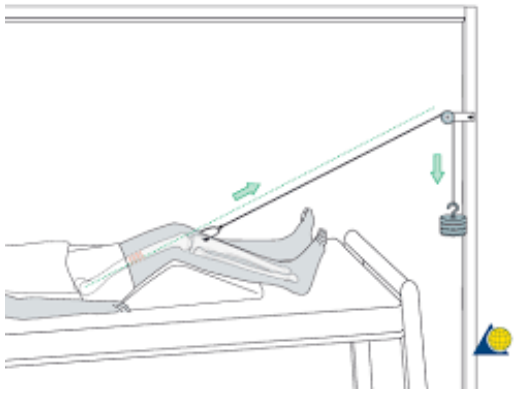
Balanced suspension



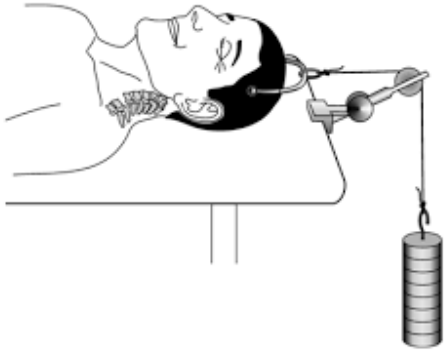
Lateral skeletal traction

traction





1. Skin traction
2. Skeletal traction
3. Cervical traction
4. Skull traction



2. Medical Management of fracture

- A. Reduction
- Restoration of the fracture fragments to anatomic alignment and positioning.
- Canbe closed or open reduction
- The patient is prepared for the procedure
- An analgesic is administered.

Reduction (cont'd….)

- Closed reduction
- Fragments aligned into anatomic alignment through manipulation and manual traction with a cast, splint, or other device.

- Open reduction
- Surgical alining fracture fragments
- Internal fixation devices (metallic pins, wires, screws,plates,nails,or rods) may be used to hold the bone fragments in position until solid bone healing occurs.

Open reduction

External fixation

Internal fixation

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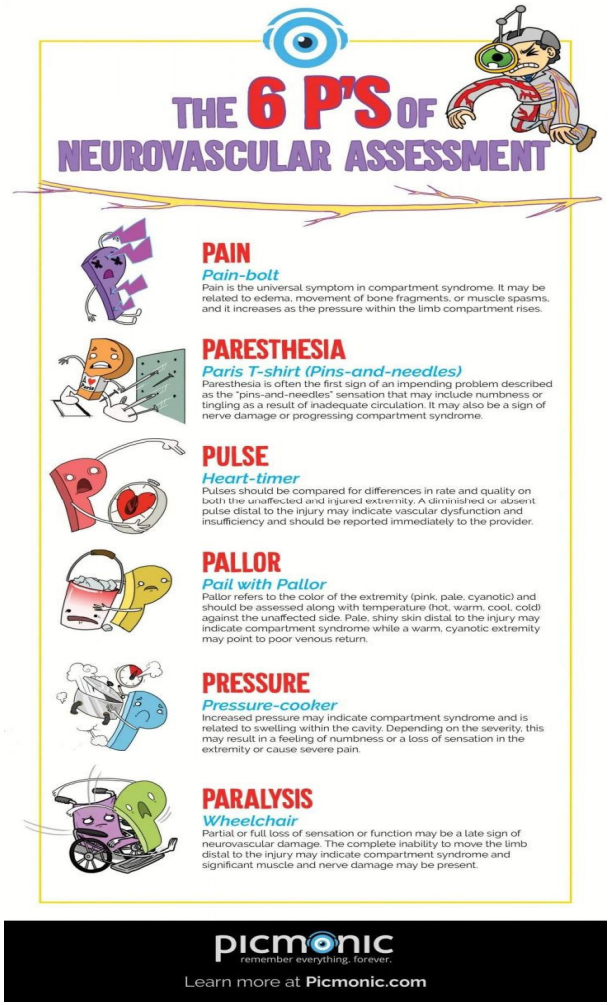
Medical Management of fracture

- b Immobilization
- After fracture reduction, the bone fragments must be immobilized and maintained in proper position and alignment until union occure.

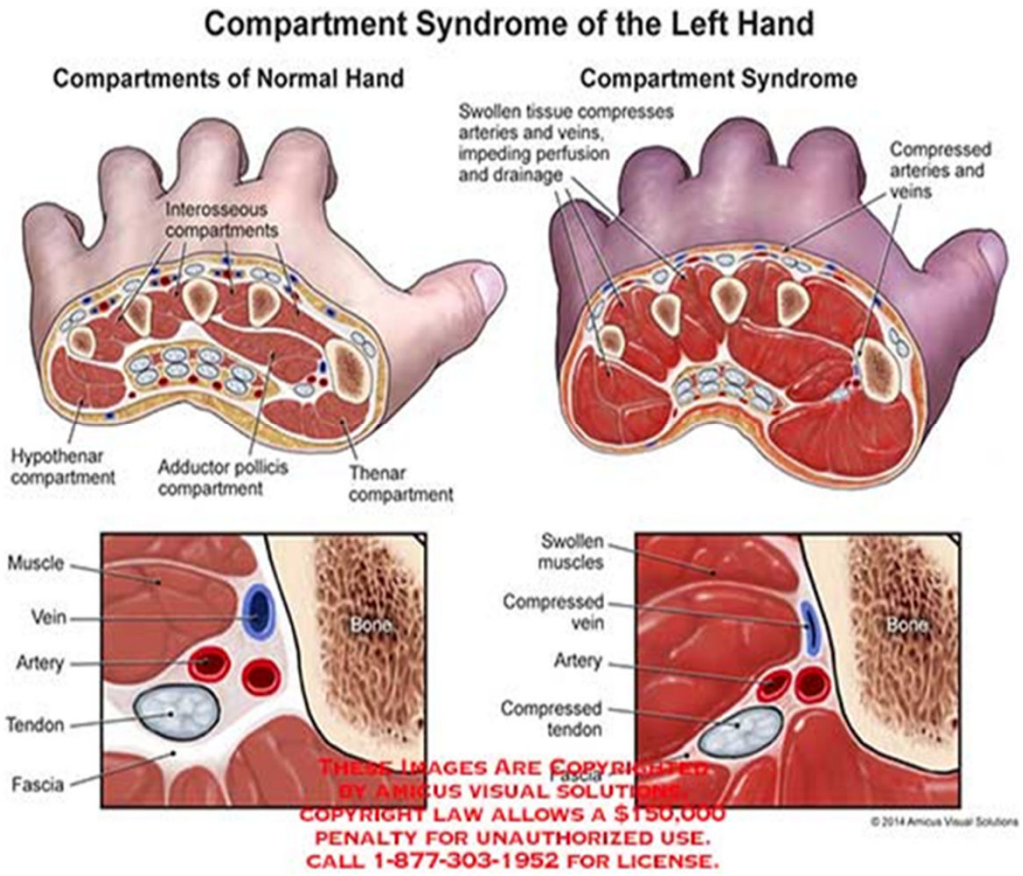
Medical Management of fracture

- C. Maintaining & restoring function
- -Reduction and immobilization
- Controlled edema
- Routine neurovascular status monitoring
- Contro; restlessness, anxiety,and discomfort
- Encouraged (ADLS) is to promote independent functioning&self-esteem.

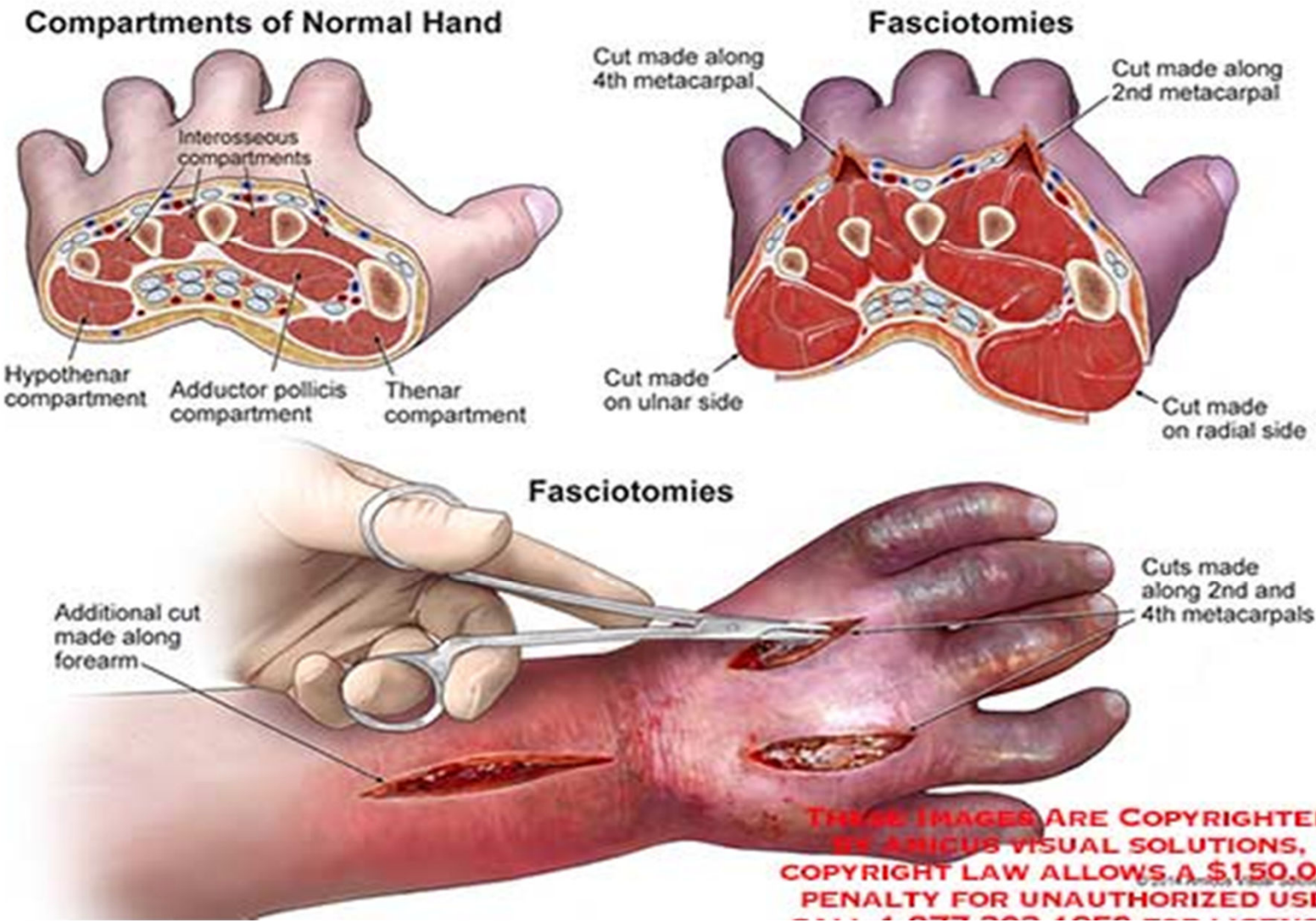


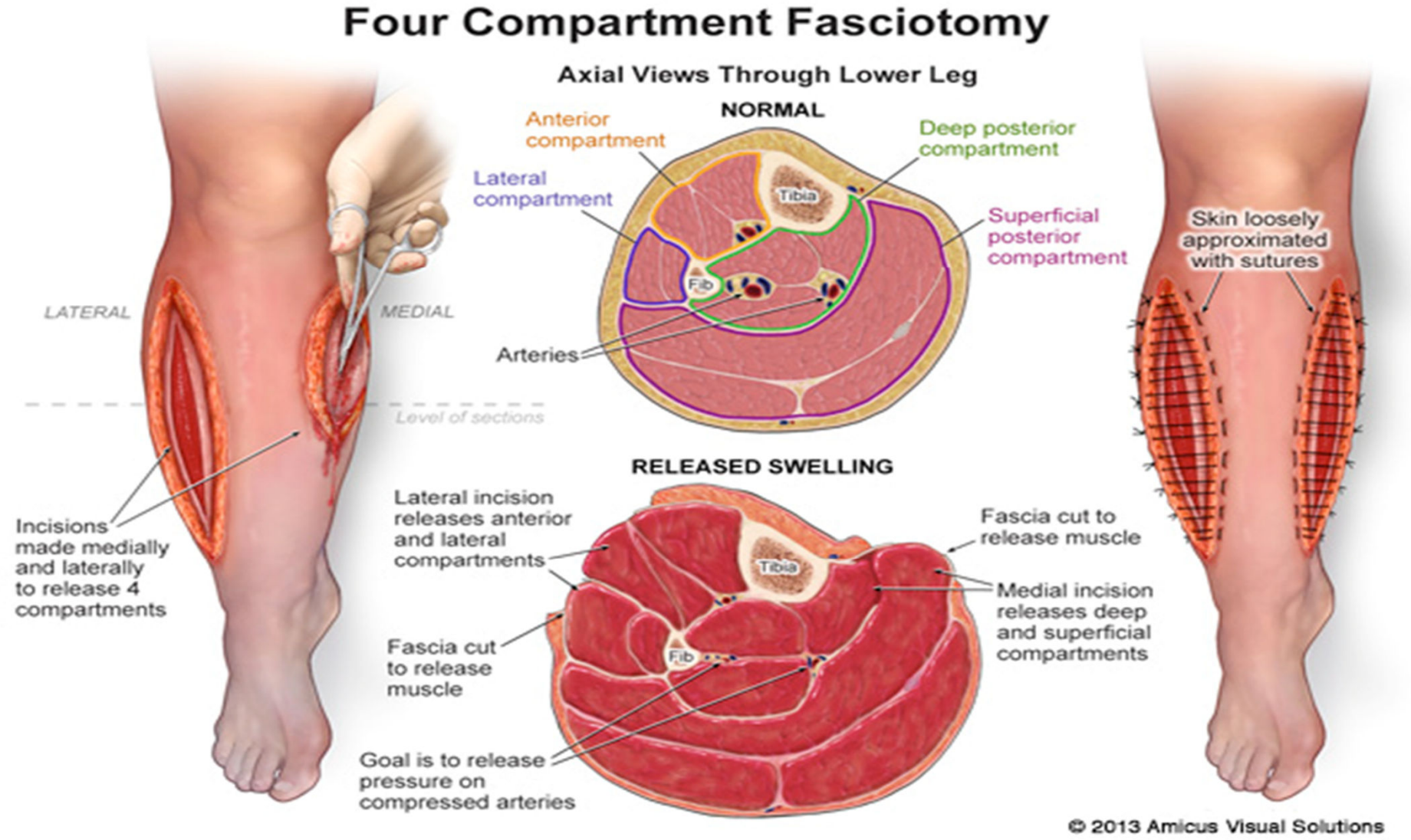
Fracture

- Compartment Syndrome: increase in
- intra-compartment pressure which endangers
- the blood circulation of the limb and may
- affect nerve supply



Fasciotomy to Relieve Compartment Syndrome




Four Compartment Fasciotomy
Axial Views Through Lower Leg
NORMAL
Anterior compartment
Deep posterior compartment
Lateral compartment
Superficial posterior compartment
Tibia
Fib
Arteries
LATERAL
MEDIAL
Level of sections
Incisions made medially and laterally to release 4 compartments
RELEASED SWELLING
Lateral incision releases anterior and lateral compartments
Fascia cut to release muscle
Medial incision releases deep and superficial compartments
Fascia cut to release muscle
Goal is to release pressure on compressed arteries
Skin loosely approximated with sutures
© 2013 Amicus Visual Solutions

Nursing Management

- I. Patients with closed fractures
- Instruct the pt regarding controlling edema & pain.
- Teach:
  - -Exercises
  - - Assistive devices crutches, walkers, and special utensils
  - - Self-care, medication information, potential complications,
  - - Fracture healing and restoration (max.of 6 to 8 wks)

Nursing Management cont'd…

- II. Patients With Open fractures
- Risk for osteomyelitis, tetanus, and gas gangrene.
- Immediately IV antibiotics – give upon arrival
- Wound irrigation and debridement are initiated
- Wound is cultured and bone grafting
- Carefully reduced and stabilized by external fixation & wound is usually left open for 5 to 7 day for intermittent irrigation and cleansing.

Nursing Management cont'd…

- Primary wound closure is usually delayed.
- Heavily contaminated wounds are left unsutured and dressed with sterile gauze
- Assess neurovascular status frequently.
- Monitored temperature & signs of infection at regular intervals
- In 4 to 8 weeks, bone grafting

Fracture Healing

- Takes longer than soft tissue healing (wks-months)
- Long bone 6- 12 weeks to heal in an adult
- Flat bones (pelvis, sternum, and scapula) heal rapidly.
- Comminuted fracture may heal slower.
- More vascular and cancellous, heal more quickly than fractures in dense and less vascular

Amputation

Amputation

- Amputation is the removal or excision of part
- or whole of a body part, often an extremity/limb.
- Frequency: upper extremity < a lower
- extremity(often necessary because of progressive
- peripheral vascular disease

Causes of amputations

- Diabetes mellitus
- Fulminating gas gangrene
- Trauma (crushing injuries, burns, frostbite,etc
- Congenital deformities,
- Chronic osteomyelitis,
- Malignant tumor.
- Peripheral vascular disease accounts for most
- amputations of lower extremities

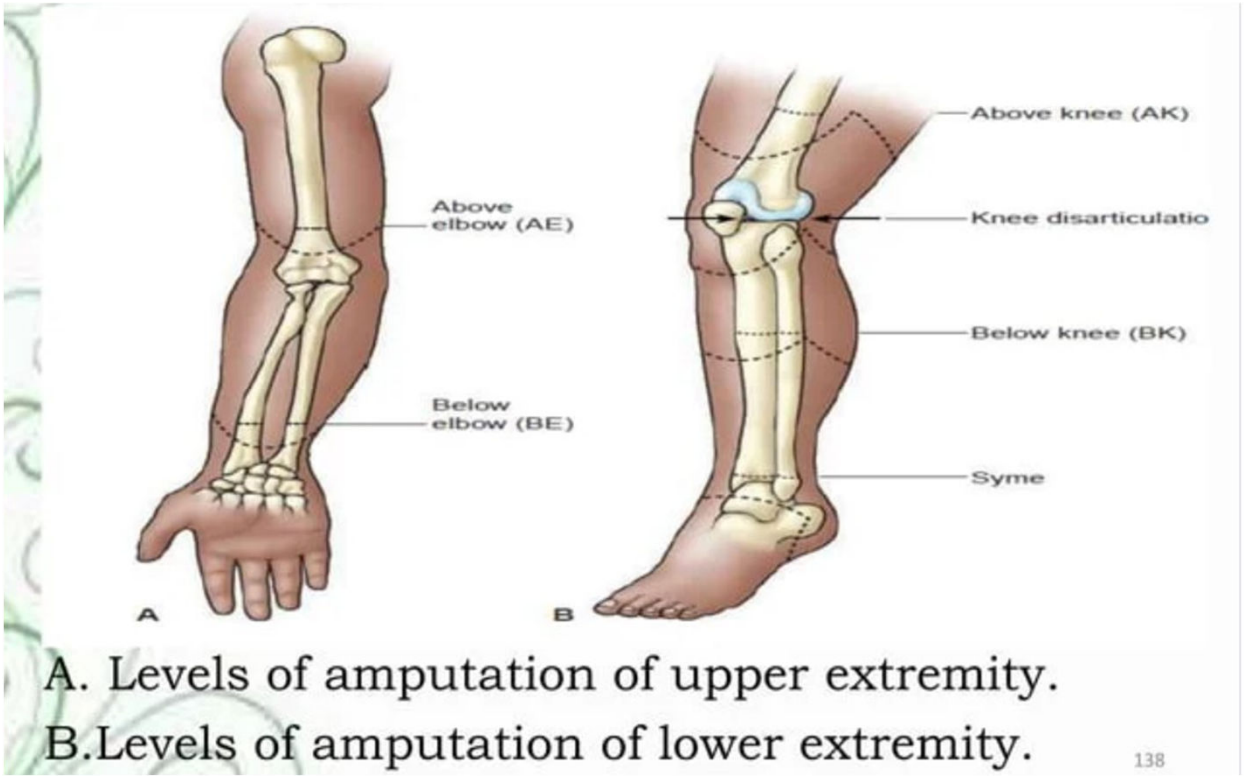
Levels of amputation(cont'd...)

- Upper limb:
- "Attempt should be made to conserve every possible
- inch.
- Lower limb:
- "Most important factor is to try & conserve the knee
- joint whenever possible.
- "Amputation of toes & foot can cause changes in
- gait & balance
- "A Syme amputation (ankle disarticulation) .
- extensive foot trauma

Levels of amputation(cont'd...)

- Below-knee amputation (BKA) is preferred to
- above-knee amputation (AKA) because of :
- "Importance of the knee joint
- ·Energy requirements for walking.
- Knee disarticulations - successful with:Young
- Active patients who can develop precise control of the prosthesis.

Levels of amputation



A. Levels of amputation of upper extremity.
B.Levels of amputation of lower extremity.

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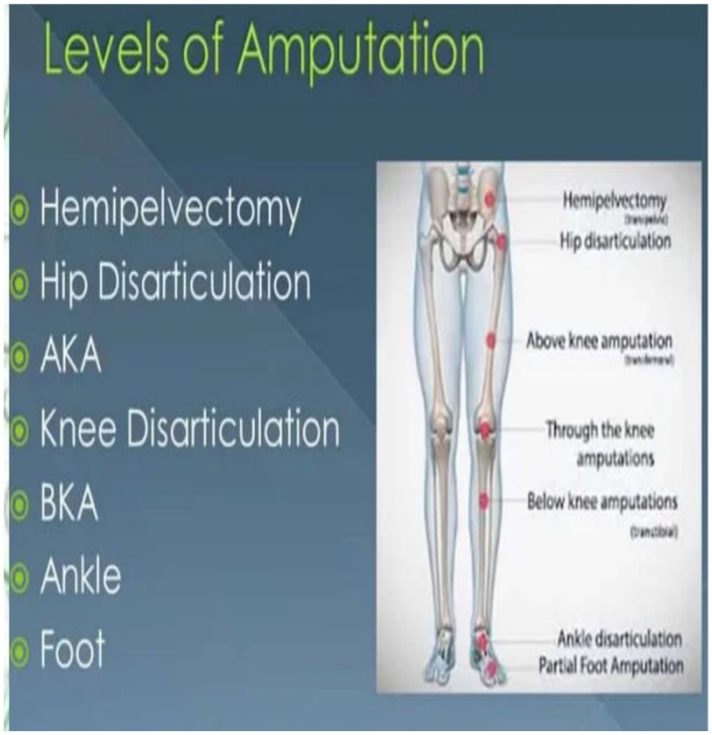
Lower limb



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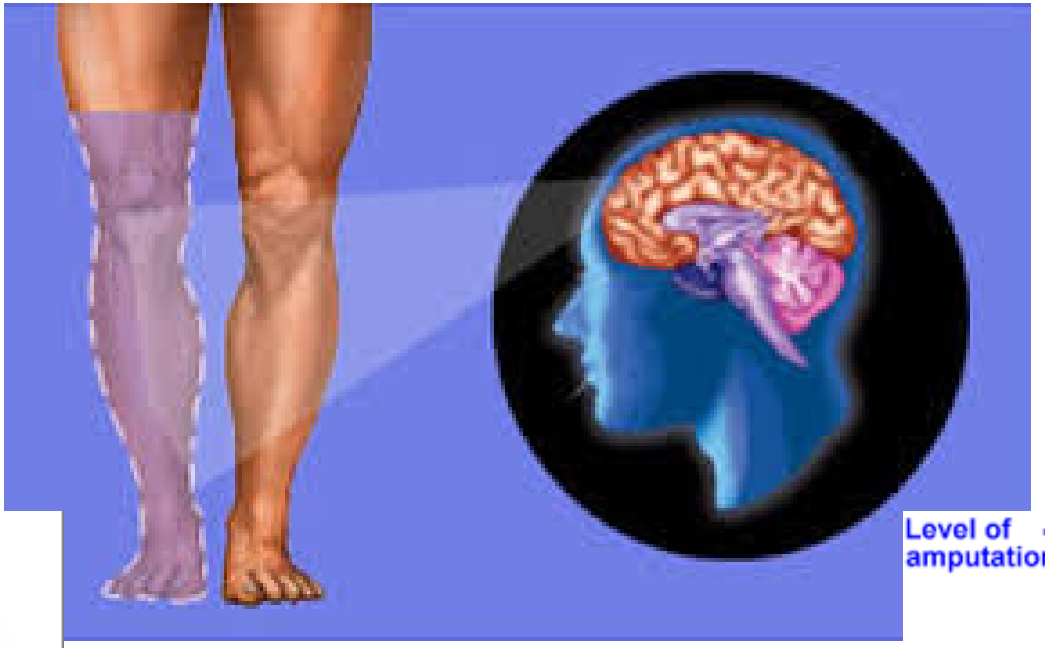
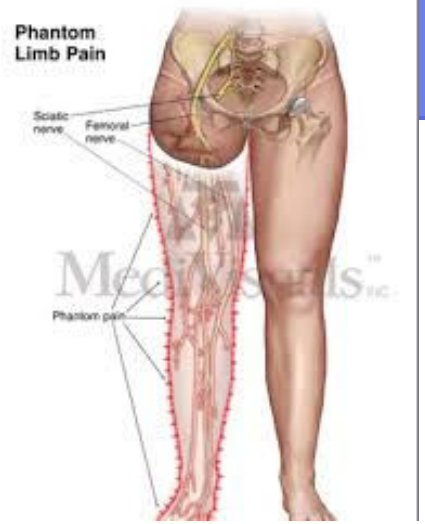
Complications of amputation

- Hemorrhage (secondary & reactionary)
- Edema & hematoma
- Ischemic necrosis
- Infection
- Skin breakdown
- Phantom limb
- Flexion contracture

Phantom Syndrome





Medical Management

- Objective - to achieve healing
- Immediately after surgery, a sterilized residual
- limb sock is applied to the residual limb.
- ・Padding is placed over pressure-sensitive areas.
- ・Healing is enhanced by gentle handling of the
- residual limb, control edema, use of aseptic
- technique

Medical Management(cont'd...)

- A closed rigid cast dressing/elastic residual limb
- shrinker that covers the residual limb may be used:
- "To provide uniform compression,
- "To support soft tissues,
- "To control pain, and
- "To prevent joint contractures.

Medical Management(cont'd...)

- ・The cast is changed in about 10 to 14 days.
- ・Rigid dressing is removed several days after
- surgery
- ・An immobilizing splint may be incorporated in
- the dressing.
- Wound drainage devices to minimize infection

Nursing process for amputating patient

- Assessment
  - ❖Evaluate the neurovascular and functional
  - ❖status of the extremity
  - ❖Evaluates the nutritional status

Assessment

- Pre-Operative
- Psychological preparation
  - Age
  - Emotionnal stability
  - Prognosis
  - Circumstances
  - Meaningof loss
  - Body image

Teaching

- Marking
- Standard pre-op teaching
- Physical preparation
- "Phantom limb' pain
- Prosthesis

Assessment cont'd..

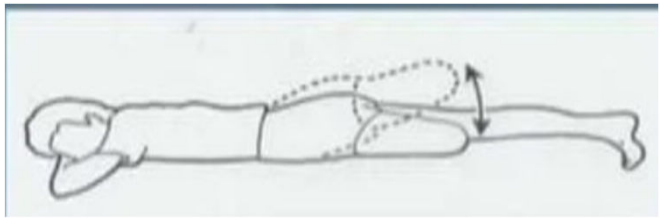
- -Concurrent health problems
- * Use of corticosteroids, anticoagulants,
- vasoconstrictors, or vasodilators (influence mg't
- and delay wound healing.
- "Evaluation emotional reaction to amputation and
- grief responses

Post-Operative

- Dressings
- Drains
- Suture line
- Edema
- Infection

Position/Exercise

Prevent hip contractures
No pillows
Prone-10-30 minutes
No prolonged sitting
Ambulation



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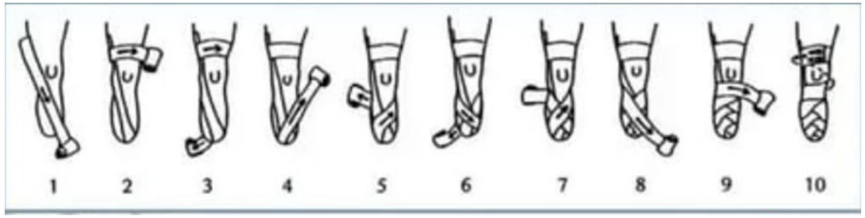
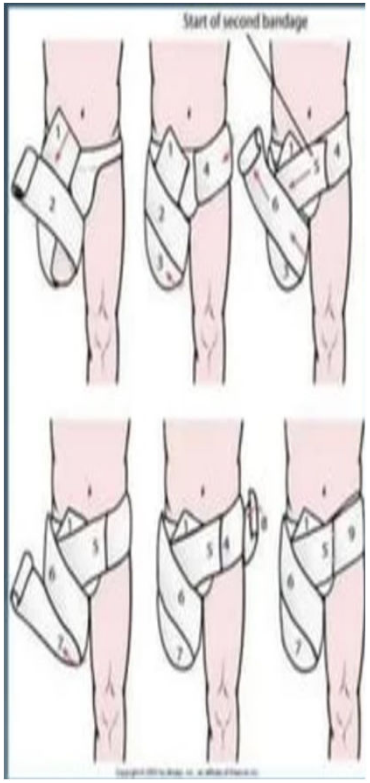
Stump Care/Conditioning

Figure '8'
Compression
Cone shape
4'-6' ace wrap ONLY





- Evaluate the neurovascular and
- functional status of the extremity(
- residual limb & unaffected
- extremity).
- Infection or gangrene status

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Nursing diagnoses

- Psychological/Physiological adjustment
- Pain
- Prevention of complications
- Mobility/functional status
- Prognosis / treatment needs

Nursing diagnoses

- Acute pain related to amputation
- Disturbed sensory perception: phantom limb pain related to amputation
- Impaired skin integrity related to surgical amputation
- Disturbed body image related to amputation of body part
- Grieving and/or risk for complicated grieving related to loss of body part and resulting disability

Nursing diagnoses

- Self-care deficit: feeding, bathing/hygiene, dressing/ grooming, or toileting, related to loss of extremity
- Impaired physical mobility related to loss of extremity
- Collaborative problems/potential complications
  Postoperative hemorrhage
- Infection
- Skin breakdown

Planning and goals (major)

- Relief of pain
- Absence of altered sensory perceptions,
- Wound healing,
- Acceptance of altered body image,
- >Resolution of the grieving process,
- Independence in self-care,
- Restoration of physical mobility, and
- Absence of complications.

Nursing intervention

- Relieving pain
- Minimizing altered sensory perceptions-
- (phantom limb pain)
- Promoting wound healing
- Enhancing body image- communicate to accept
- & to care the residual

Nursing intervention cont'd

- Helping the patient to resolve grieving
- Promoting independent self-care
- Helping the patient to achieve physical mobility
- Monitoring & managing potential complications
- Promoting home & community-based care


Thank You

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