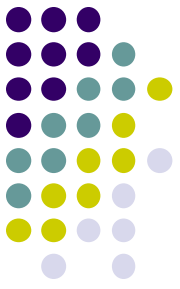


# **LUCENT NCLEX REVIEWS**

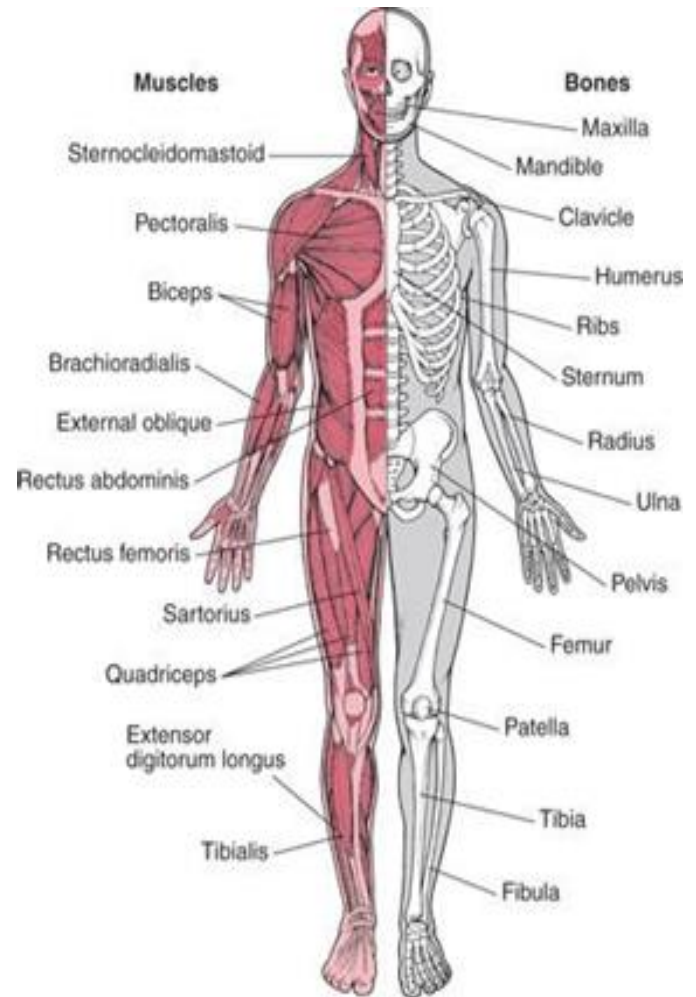
## **MUSCULOSKELETAL DISORDERS**

**DR. AMPOMAH**



# Musculoskeletal System

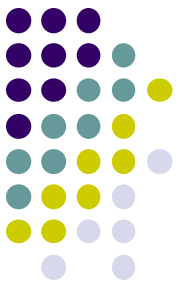
- Protection of vital organs
- Support surrounding tissues
- Movement as muscles contract they pull on the bones
- Mineral storage
- Blood cell formation



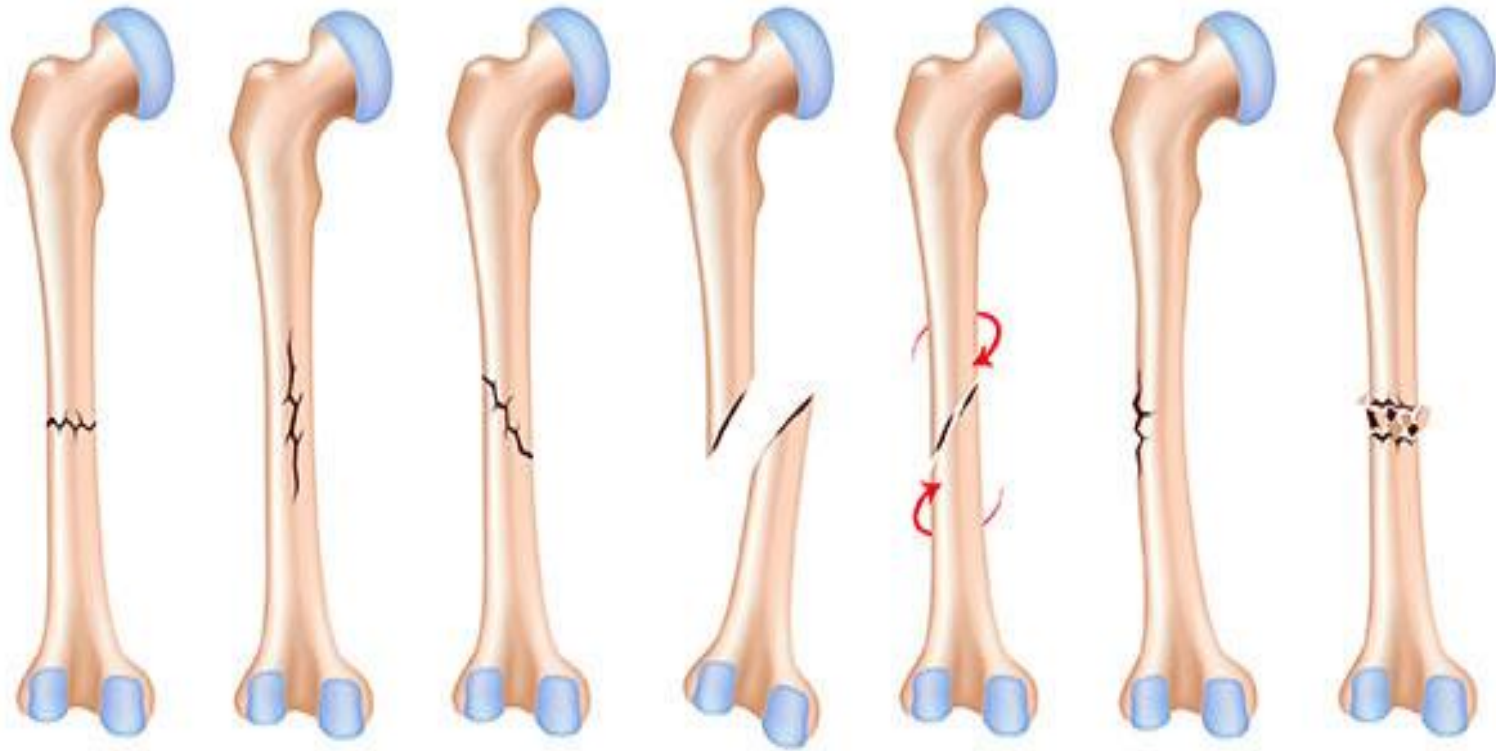
# Fractures (Fx)



- **Complete**- a break across the entire cross- section and is frequently displaced.
- **Incomplete (Greenstick)**-break occurs through only part of the cross-section of the bone.
- **Closed Fracture (simple)**- doesn't break through the skin.
- **Open fracture (compound)** - extends through the skin
- **Comminuted**- splintered into fragments
- **Depressed**- fragment(s) is(are) indriven
- **Pathologic**- through an area of diseased bone



# Types of Bone Fractures



**Transverse**

**Linear**

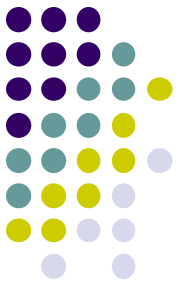
**Oblique,  
nondisplaced**

**Oblique,  
displaced**

**Spiral**

**Greenstick**

**Comminuted**



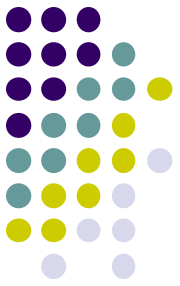
# Fractures

S/Sx:

- continuous pain
- muscle spasm (shortening of extremity)
- unnatural movement
- crepitus
- deformity
- swelling
- shortening of extremity
- Discoloration
- Worry about compartment syndrome

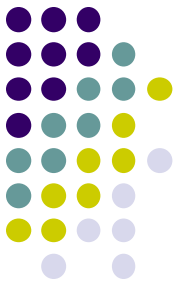


# Treatment/Management



- A-B-C & head to toe
- Immobilize the bone ends plus the adjacent joints
- Support fracture above and below site
- Move extremity as little as possible
- Palpate the area to determine temp, decrease sensation and rotation.
- Splints help prevent fat emboli and muscle spasm.
- Check distal pulses of both affected and unaffected extremities.
- What do you do with open fractures?
- Neurovascular checks: pulses, color, movement, sensation, capillary refill, temp

# Complications



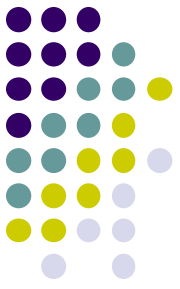
## 1. Shock

## 2. Fat embolism: With what type of fractures

do you see this?

- Patients with fractured hips/pelvis
- Symptoms depend on what?
- Petechiae or rash over chest
- conjunctival hemorrhages
- snow storm on CXR
- \*young males \*first 36 hours

# Complication



## 3. Compartment syndrome:

*This is when a fracture has not been elevated and has not had ice packs. Fluid accumulates in the tissue and impairs tissue perfusion. The muscle becomes swollen and hard and the patient complains of severe pain that is not relieved with pain meds.*

- Unpredictable
- Life threatening
- Pain is disproportionate to the injury
- If undetected may result in nerve damage and possible amputation.



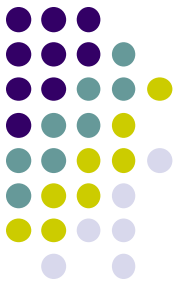
- Common areas are **forearms** and **quadriceps**

- Causes

- **Severe Burns, fluid accumulation, tight cast. trauma**



# Treatment/ Prevention– Compartment Syndrome



- Elevate the extremity
- loosen the cast to restore circulation; bi-valve the cast
- Fasciotomy – cutting into tissues to relieve pressure
- **be careful of the answer “Remove cast.”**
- orthopedic nurses have cast cutters readily available
- instruct the client the cast saw does not touch the skin, but it does vibrate

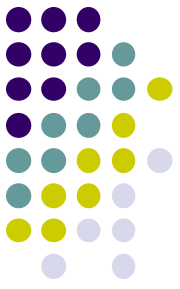


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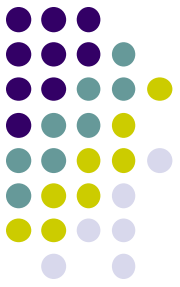
id 39386759  
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# Cast Care – Plaster & Fiberglass



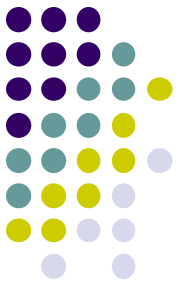
- Ice packs on sides
- No indentations
- Use palms for 1st 24 hours - casting material is wet
- Keep uncovered and dry
- Do not rest cast on hard surface or sharp edge
- Cover cast close to groin with plastic
- Elevate
- Neurovascular checks with the **5 Ps**
- What do you do if your patient complains of pain?
  - **Do neurovascular checks**

# 5P's Assessment for Orthopedic Patients



Symmetric comparison:

- **Pain-** location, severity
- **Pulse-** distal to injury, check bilaterally.
- **Parasthesias-** numbness, tingling, compare bilaterally. Sensation check
- **Pallor-** check skin color and temp.
- **Paralysis-** Assess mobility, watch for foot drop, compartment syndrome.



# CRUTCH WALKING

- **To ensure safety, patient must be:**
  - Measured for accurate fit
  - Assessed for balance
  - Assessed for upper body strength



Axillary crutch



Lofstrand crutch



Elbow extension (Canadian) crutch

# CRUTCH WALKING

- **Weight Bearing**

- 2 point gait
- 4 point gait

2-POINT  
GAIT  
CRUTCHES



4-POINT  
GAIT  
CRUTCHES



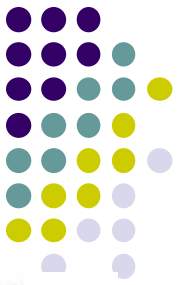
- **Non-Weight Bearing**

- 3 point gait

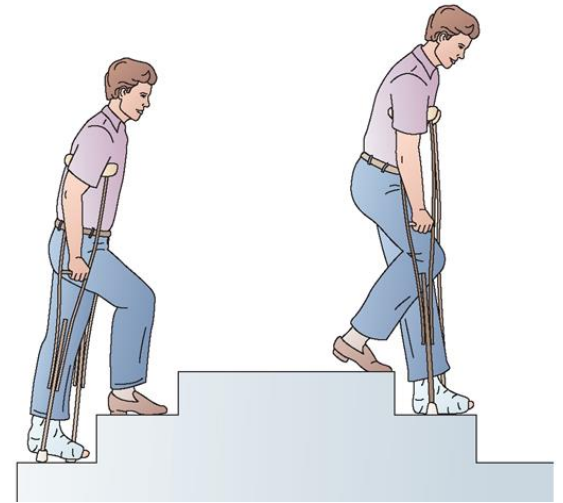
3-POINT  
GAIT  
CRUTCHES



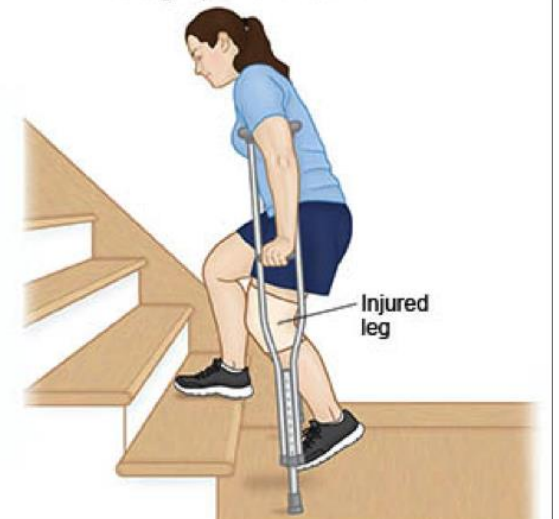
# KEY POINTS WITH CRUTCHES



- Crutch Pad 2" from armpit
- Handpiece at level of wrist
- Tripod position
- Use your seat to move up and down stairs



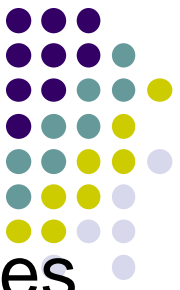
Going Upstairs with Crutches



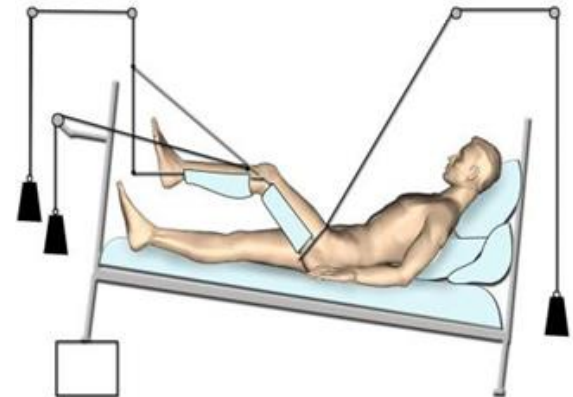
## HOW TO USE CRUTCHES ON THE STAIRS



# Traction

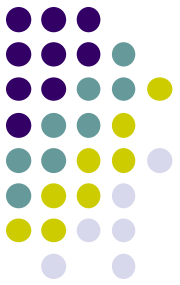


- Decreases muscle spasm, reduces, immobilizes
- Should it be intermittent or continuous?
- Weights should hang freely.
- Keep pt pulled up in bed and centered with good alignment.
- Exercise non-immobilized joints
- Ropes should move freely and knots should be secure
- Egg crate
- Foot board





# Types of traction



## 1. Skin traction (straight) –

- This is when tape or some type of material is stuck to the skin and the weights pull against it.
- Buck's, Bryant's, Pelvic girdle, Russels.
- The pull is transmitted to muscle structure, indirect traction. Used for hip fractures.

- For short term treatment

Mostly 5-10 lbs

- Is the skin penetrated? No

## 2. Skeletal traction – (invasive)

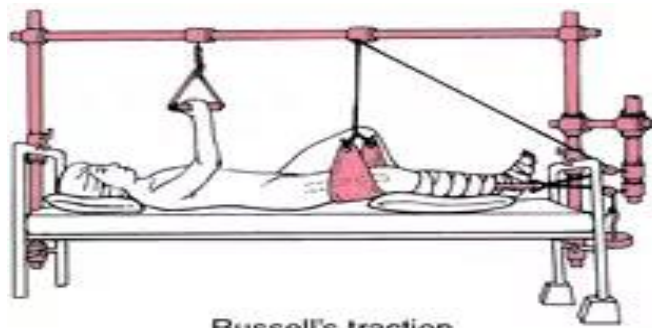
- pins or wires and screws inserted in bone and attached to traction, may be used to treat fractures of humerus, tibia, fibula (e.g. Crutchfield)

- For longer term treatment

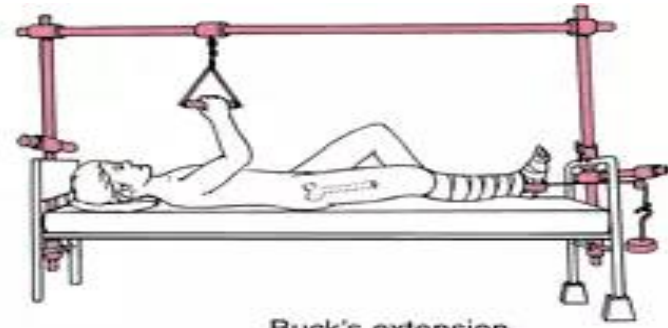
Heavier weights  
15-30 lbs)

## 3. Continuous - for fractures

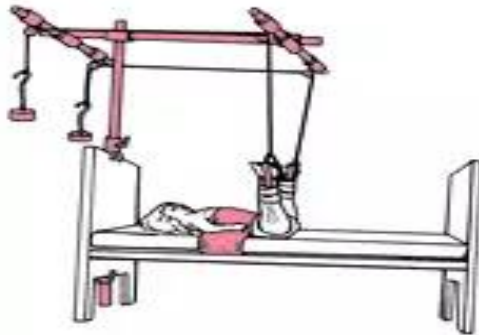
## 4. Intermittent - for back muscle sprains



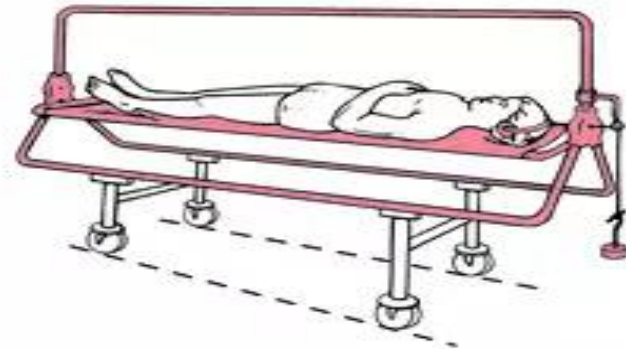
Russell's traction



Buck's extension



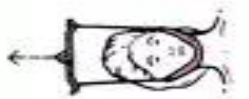
Bryant's traction



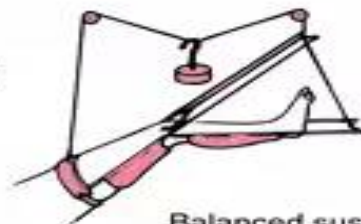
Skull tongs and turning frame



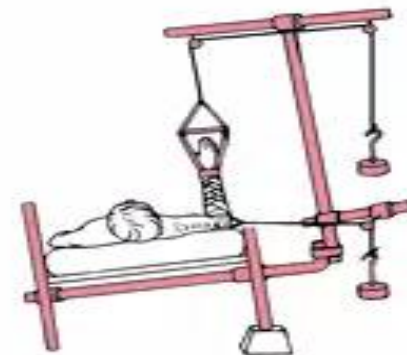
Head halter



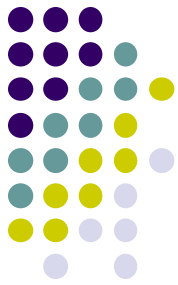
Top view



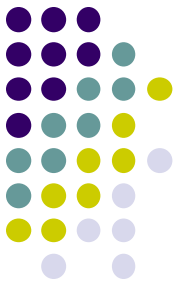
Balanced suspension



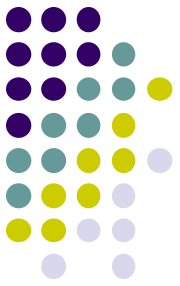
Lateral skeletal traction



# Bucks Traction

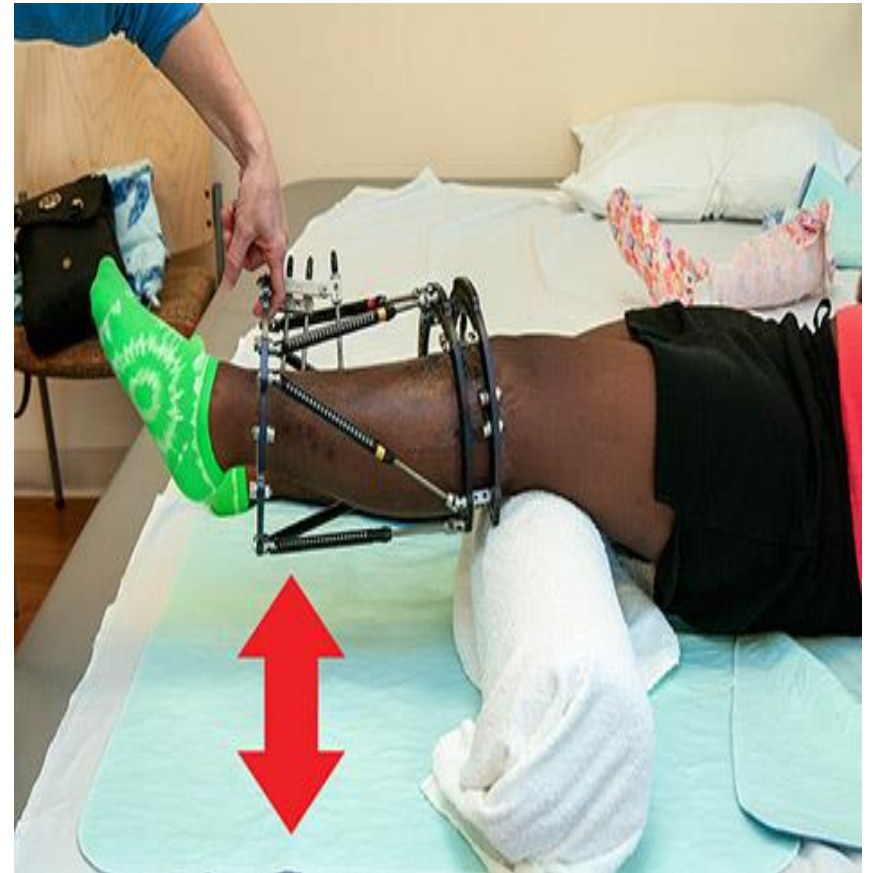


# Skeletal Traction

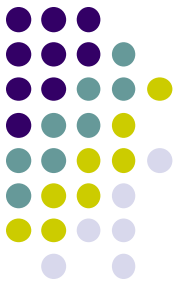


## SKELETAL TRACTION

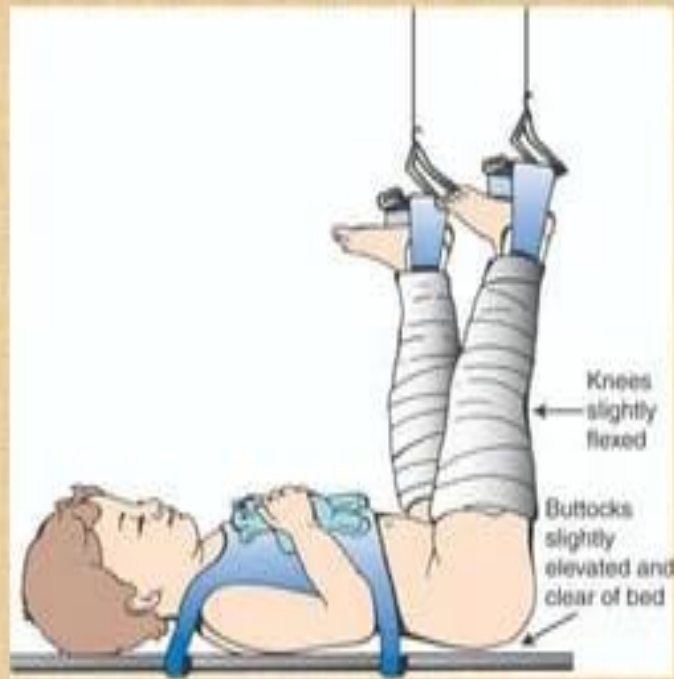
•Applied **directly to the bone** either by a pin or wire through the bone. (eg- **Steinmann pin**, **denham pin**, **kirschner wire**)



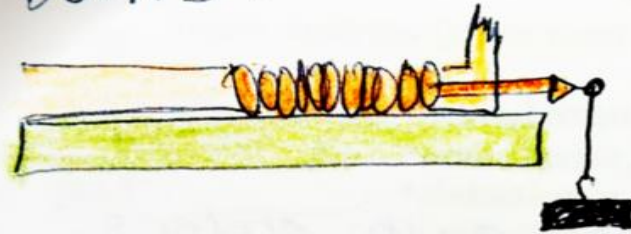
# Bryant & Russels Traction



**BRYANT'S TRACTION (GALLOWES)**



**BUCK'S :**



**Russell's :**



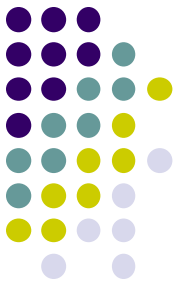
# TYPES



## Skeletal traction-

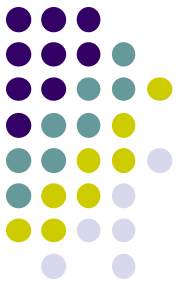
- This traction is applied directly to the bone with pins/wires.
- Used when prolonged traction is needed.
- Types: Steinman pin, Crutchfield, or Gardner-Wells tongs, Halo vest
- Must monitor the pin sites and do pin care.
  - Sterile technique? **yes**
  - Remove crusts? **yes**
  - Is serous (clear) drainage okay? **Yes**
- **Monitor for DVT, PE & fat embolism**

# Traction – Nursing management



- Ropes unobstructed and in straight alignment.
- Skin care- check skin traction for intact skin, pin care for skeletal traction.
- Circulation- fat emboli, thromboembolism.
- Respiratory- pneumonia, exercise, ROM.
- GI- high fiber diet, increased fluids.
- Renal- to prevent stones- increase fluids.
- MS- isometric exercises
- Pain management
- Diversion activities

# TOTAL HIP REPLACEMENTS

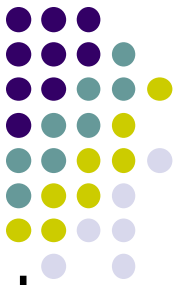


- Pre-op Care
  - Buck's traction is used frequently pre-op
- Post-op Care
  - Neurovascular checks
  - Monitor drains (Don't want fluid to accumulate in tissue)
  - Firm mattress (joints need support)
  - Over-bed trapeze
  - Positioning:
    - neutral rotation - toes to the ceiling
    - limit flexion; want extension of hip
    - abduction or adduction (**abduction means legs apart**)





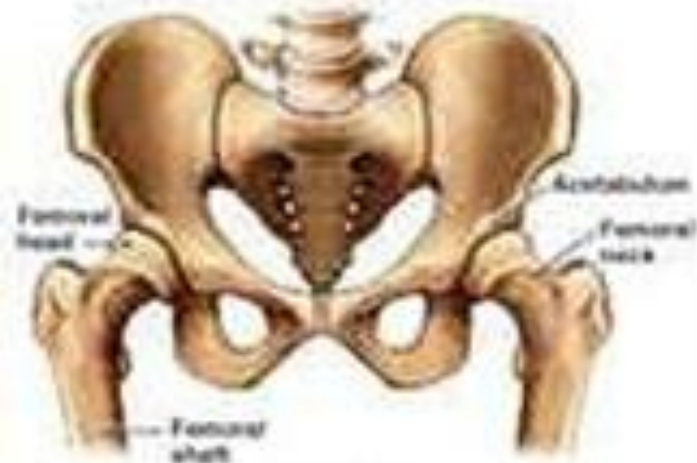
# TOTAL HIP REPLACEMENTS



- What exercise can the pt do while still confined to bed? **Isometric**
- What is the purpose of the trochanter roll? *Is to prevent external rotation. Document in nurses notes*
- No weight-bearing until ordered by MD
- Avoid crossing legs, bending over
- Hydration is very important with this patient
- Stresses to new hip joint should be minimal in the first 3-6 months.
- Do not give pain meds in the operative hip

# TOTAL HIP REPLACEMENT

## Normal Anatomy of Pelvis



Anterior view of pelvis

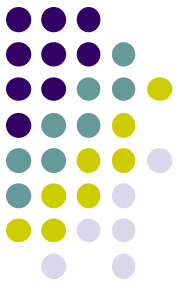
## Condition with Arthritic Changes



Anterior sub-sexy view of pelvis



# TOTAL HIP REPLACEMENTS



## Complications:

- Dislocation → circulatory and nerve damage
  - S/Sx: shortening of leg, abnormal rotation
  - can't move extremity
  - pain
- Infection
  - prophylactic antibiotics (just like with heart valve replacement)
  - remove foley and suction ASAP
- Avascular Necrosis (death of tissue due to poor circulation)
- Immobility problems

# TOTAL KNEE REPLACEMENTS -Arthroplasty



- CPM: continuous passive motion
- Keep knees in motion and prevent formation of scar tissues
- Patient will set machine gradually and increase flexion and extension of knee
- Never hyperextend or hyperflex knee
- Neurovascular checks
- Pain relief (PCA)
- Ambulation
- store CPM machine in clean room when not in use. Goal is to prevent contamination.



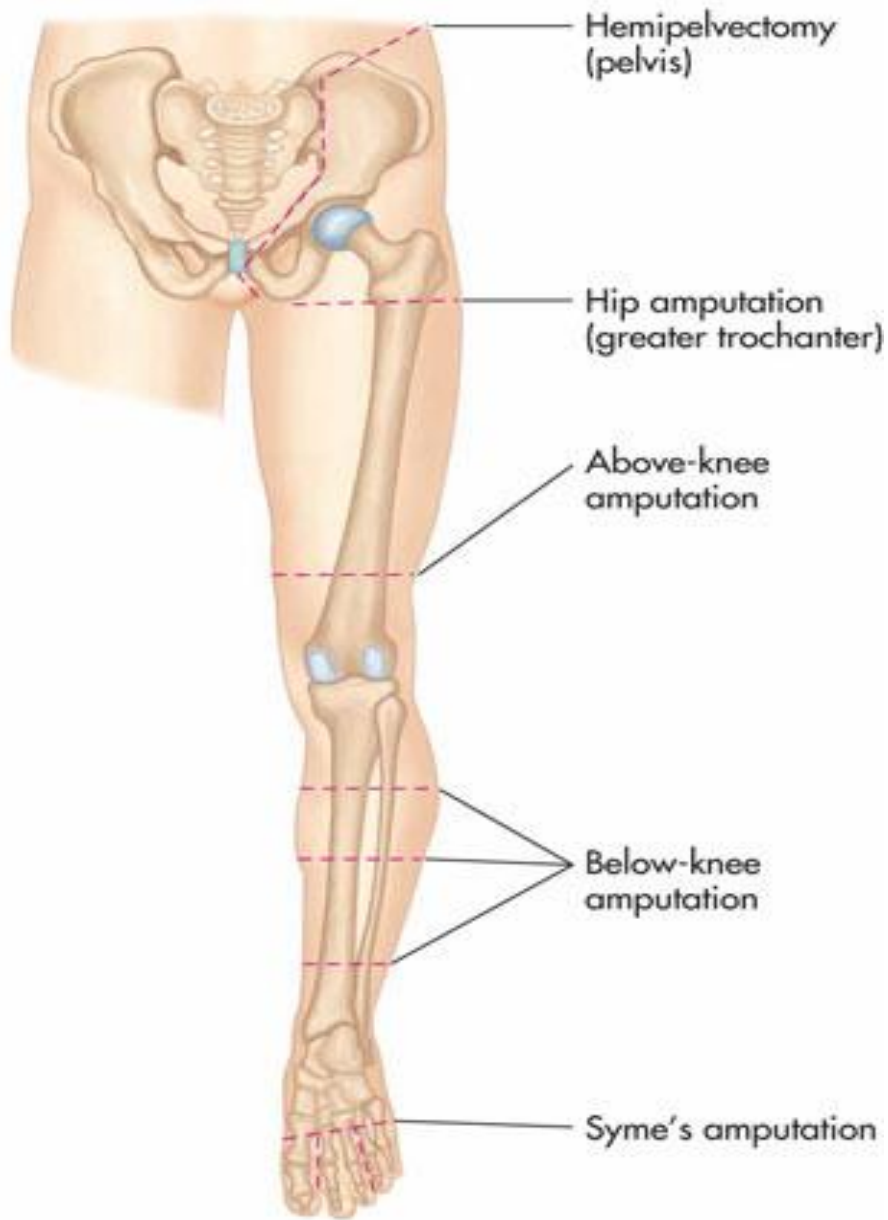
# AMPUTATION

Performed at the most distal point that will heal. The doctor tries to preserve the knee and elbow



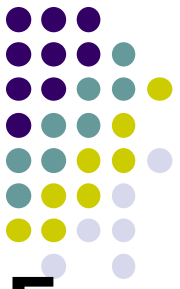
## Immediate Post-op Care:

- Keep what at the bedside? Tourniquet in case of massive hemorrhage
- Elevate on pillow for first 24 hours. Then how do you elevate? If ordered only elevate for a short time to reduce swelling
- Do not elevate on pillow, elevate foot of bed
- Prevent hip/knee contractures. How? Extension
- Phantom pain
  - What is the first intervention to decrease phantom pain? Diversional Activity, Seen more with AKA's
  - Usually subsides in 3 months.





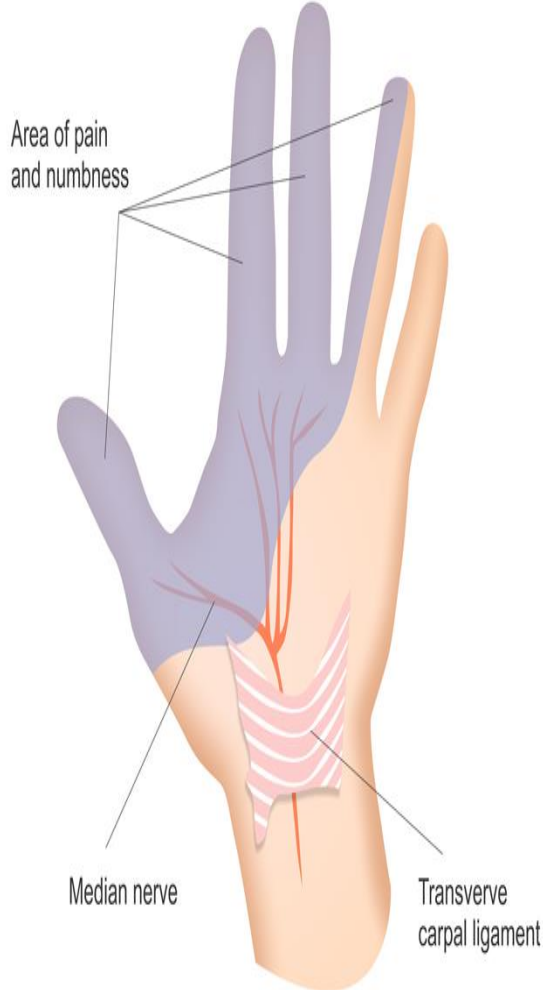
# CARPAL TUNNEL SYNDROME

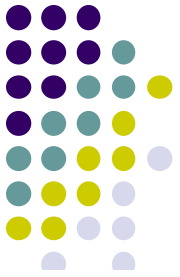


- **PAIN/NUMBNESS OF MEDIAN NERVE OF HAND**
  - PALMAR SIDE OF THUMB / INDEX FINGER
  - RADIAL SIDE OF RING FINGER / MAY RADIATE UP ARM
  - Due to cumulative trauma
- **RISK FACTORS:**
  - REPETITIVE WRIST MOVEMENT
  - POSITIVE PHALEN'S
  - POSITIVE TINELL'S test is performed by tapping the median nerve along its course in the wrist.

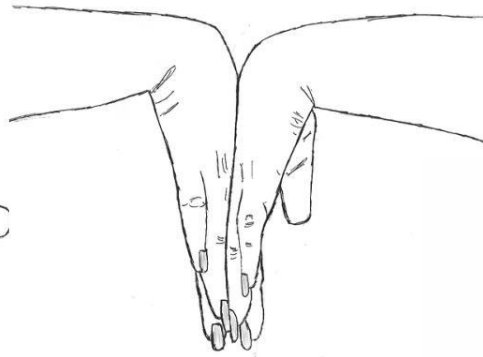


# CARPAL TUNNEL SYNDROME





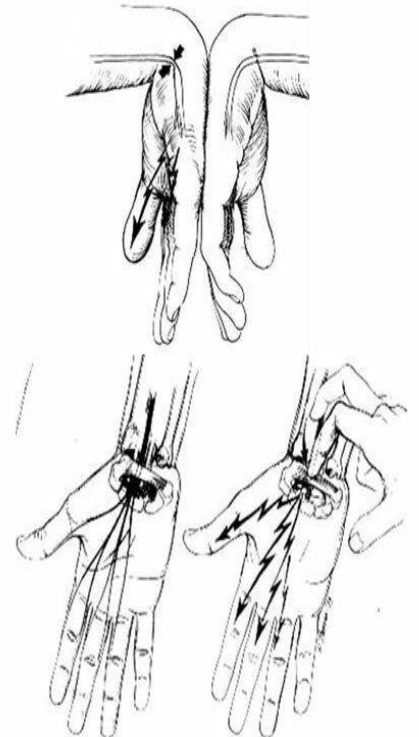
**tinel's sign**

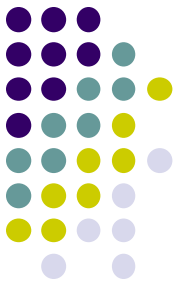


**phalen's sign**

## Special Tests Phalen's & Tinel's Tests

- Phalen's
  - Wrist flexion to maximum for 60 sec
- Tinel's
  - Tapping over transverse carpal ligament
- Symptoms
  - Pain
  - Anesthesia
  - Paresthesia

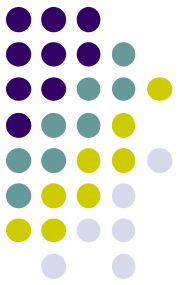




# Arthritis

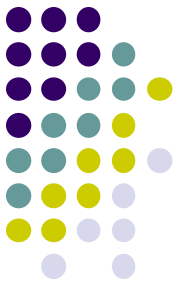
- Degenerative Joint Disease
- Arthritis= joint inflammation.
- Arthralgia= joint pain
- Different types of arthritis:
  - Osteoarthritis
  - Rheumatoid arthritis
  - Gouty arthritis

# Osteoarthritis

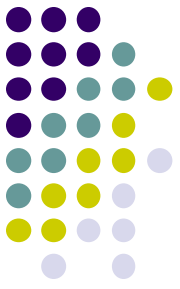


- Most common form of arthritis, noninflammatory, **nonsystemic** disease
- One or many joints undergo degenerative and progressive changes, mainly wt. bearing joints.
- Stiffness, tenderness, crepitus and enlargement develop.
- Deformity, incomplete dislocation and synovial effusion may eventually occur.
- Treatment: rest, heat, ice, anti inflammatory drugs, decrease wt. if indicated, injectable corticosteroids, surgery.

# Osteoarthritis- Risk Factors

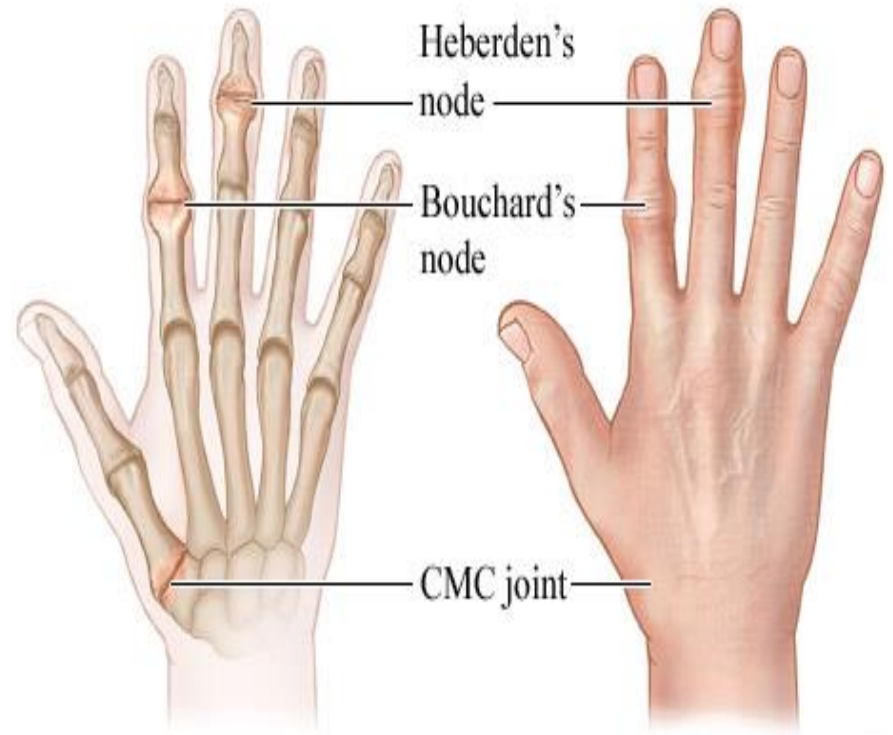
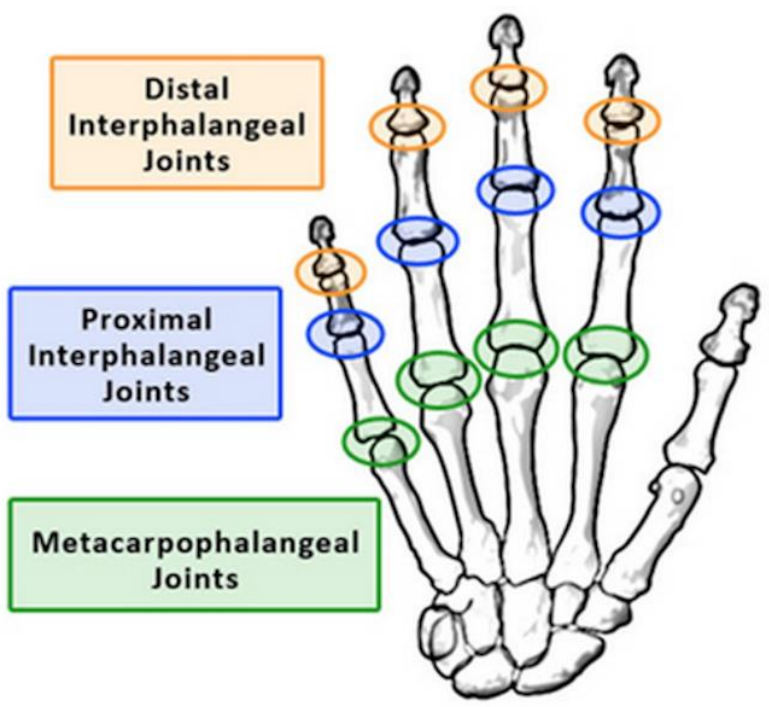


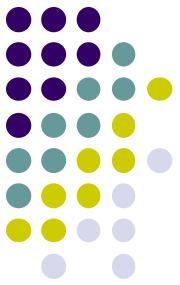
- Age
- Decreased muscle strength
- Obesity
- Possible genetic risk
- Early in disease process, OA is difficult to dx from RA
- Hx of Trauma to joint



# OA- Signs and Symptoms

- Joint pain and stiffness that resolves with rest or inactivity
- Pain with joint palpation or ROJM
- Crepitus in one or more joints
- Enlarged joints
- Heberden's nodes enlarged at distal IP joints
- Bouchard's nodes located at proximal IP joints

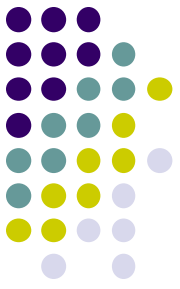




# What to assess for:

- ESR, Xrays, CT scans
- Pain
- Degree of functional limitation
- Levels of pain/fatigue after activity
- Range of motion
- Proper function/joint alignment
- Home barriers and ability to perform ADLs

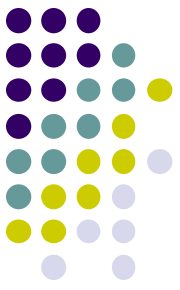




# Osteoarthritis- Tx

- Pharmacotherapy- tylenol, NSAIDS, ASA, Cox-2 inhibitors
- Intra-articular injections of corticosteroids
- Glucosamine- acts as a lubricant and shock absorbing fluid in joint, helps rebuild cartilage
- Balance rest with activity
- Use bracing or splints
- Apply thermal therapies
- Arthroplasty- joint replacement can relieve pain and restore loss of function for patients with advanced disease.

# Rheumatoid Arthritis



- Chronic, systemic, progressive inflammatory disease of the synovial tissue, bilateral, involving numerous joints.
- Synovitis-warm, red, swollen joints resulting from accumulation of fluid and inflammatory cells.
- Classified as autoimmune process
- Exacerbations and remissions
- Can cause severe deformities that restrict function

## Labs:

- ANA
- C - Reactive protein
- Rheumatoid Factor
- ESR

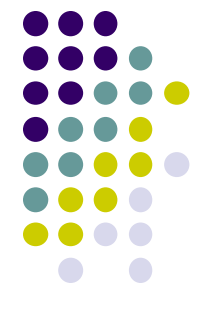


# RA- Risk Factors

- Female gender
- Age 20-50 years
- Genetic predisposition
- Epstein Barr virus
- Stress

## Typical deformities

- Ulnar drift.
- Boutonnière deformity.
- Hallux valgus.
- Swan neck deformity



NORMAL

AND  
Bunion (Hallux Valgus)



Rheumatoid arthritis  
(late stage)

Boutonniere  
deformity  
of thumb

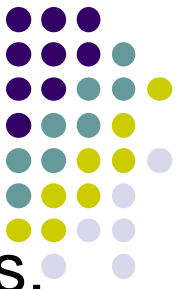
Ulnar deviation of  
metacarpophalangeal  
joints

Swan-neck deformity  
of fingers



ADAM.

# RA – Signs and Symptoms



- Joints- bilateral and symmetric stiffness, tenderness, swelling and temp. changes in joint. Painful joints
- Morning stiffness lasting longer than 30 minutes after rising, subsides with activity.
- Pain at rest and with movement , Fever
- Pulses- check peripheral pulses, use doppler if necessary, check capillary refill.
- Edema- observe, report and record amt. and location of edema.

# Rheumatoid Arthritis- Tx



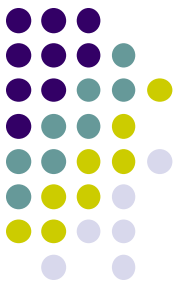
- Rest, during day- decrease wt. bearing stress.
- ROM- maintain joint function, exercise –water.
- Medication- analgesic and anti-inflammatory (**NSAIDS**), steroids,
- Gold therapy, topical meds. Immunosuppressive drugs- Imuran, Cytoxan, **methotrexate**. Monitor for toxic effects
- Biological response modifiers (BRM): Inhibit action of tumor necrosis factor (**Humira, Enbrel, Remicade**)
- Ultrasound, diathermy, hot and cold applications
- Surgical- Synovectomy, Arthroplasty, Total hip replacement.

# Nursing Interventions

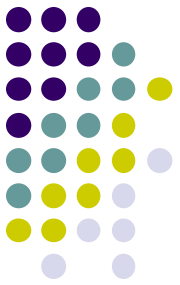
- Assist with/encourage physical activity
- Provide a safe environment
- Utilize progressive muscle relaxation
- Refer to support groups
- Emotional support
- Joint deformity
- Vasculitis
- Cervical subluxation

## Complications

- Sjorgren's syndrome
- Joint deformity



# Gouty Arthritis

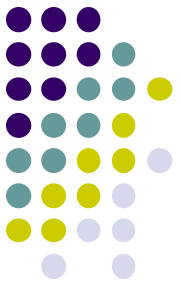


- DEFECT PURINE METABOLISM (over secretion or decreased excretion)
- Excess uric acid crystallizes and infiltrate joints
- GENETIC
- “RICH MAN’S DISEASE”
- Men 40-50
- Increased Uric Acid level  $>7$
- Swelling/redness/severe pain over joint





# GOUT - Treatment



## CHRONIC

- HEAT
- ALLOPURINOL
- NSAIDS
  - COLCHICINE
  - MONITOR
  - CREATININE

## ACUTE

- ICE
- COLCHICINE
- NARCOTIC ANALGESICS
- ◆ NSAIDS

# Generalized Treatment



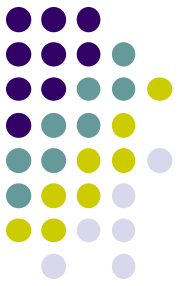
# Foods Good For Gout

## Fiber

Food sources of fiber include whole wheat, bran, fresh or dried fruits, and vegetables



# Gouty Arthritis



## Treatment:

- Meds- colchicine, NSAIDS, Indocin (indomethacin), glucocorticoid drugs,
- Allopurinol, Probenecid-reduce uric acid levels
- Diet- excludes purine rich foods, such as organ meats, sardines, lentils, sweetbreads, red wine , liver, lentil, kidneys
- Avoid ASA, alcohol, and diuretics- may precipitate attacks

# Systemic Lupus Erythematosus

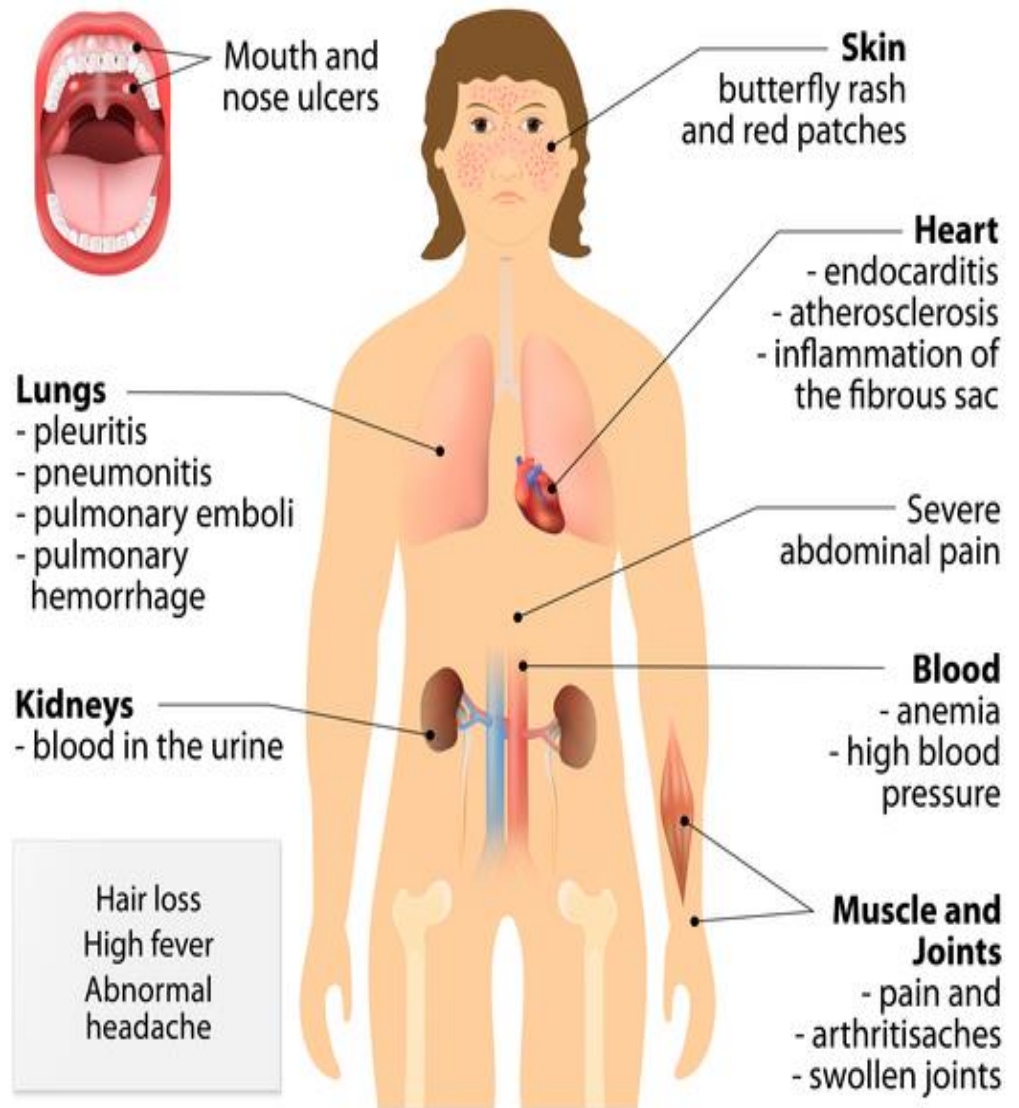


- SLE- Chronic Inflammatory disease affecting many systems.
- Women between 18-40, black>white, child bearing years
- Autoimmune process- antibodies react with DNA, immune complexes form- damage organs and blood vessels.
- Includes: vasculitis; renal involvement; lesions of skin and nervous system.
- Initial manifestation- arthritis, **butterfly rash**, weakness, fatigue, wt. loss
- Symptoms and tx. depend on systems involved.

# Systemic lupus erythematosus

## PRECIPITATORS

- Sunlight
- Stress
- Infection
- Injuries



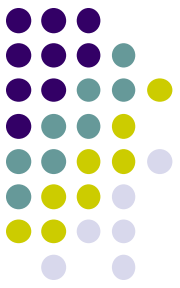
# Systemic Lupus-Erythematosus



Pathologic changes-Autoimmune process

1. Vasculitis in arterioles and small arteries
2. Granulomatous growths on heart valves- non bacterial endocarditis.
3. Fibrosis of the spleen, lymph node adenopathy
4. Thickening of the basement membrane of glomerular capillaries.
5. 90% swelling and inflammatory infiltrates of synovial membrane.
6. Renal- Lupus nephritis
7. Pleural effusion or PN
8. Raynaud's phenomenon- about 15% cases
9. Neuro- psychosis, paresis, migraines, and seizures

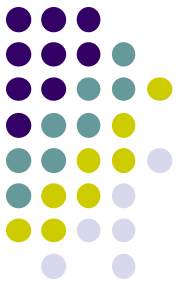
# SLE: Dx & Meds/Education



- ANA- hallmark test, + in 98% pts.
- Medications-
  - NSAIDS
  - HYDROXYCHLOROQUINE (antimalarial)
  - STEROIDS
  - AZATHIOPRINE
  - METHOTREXATE
  - REST/ STRESS REDUCTION
- Education
  - Avoid sunlight, use sunscreen
  - Alternate exercise + planned rest periods.
  - Teach how to recognize the symptoms of a flare
  - Teach how to prevent and recognize infection

**Meds avoid- Pronestyl,  
Hydralazine.**

# LYME DISEASE



## What is It??

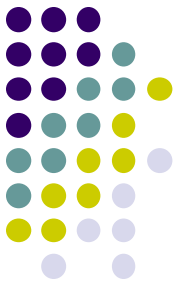
- Most common tick borne disease
- Tick needs to stay attached
- Bulls Eye Rash
- Flu like symptoms



## CLINICAL STAGES

- Stage 1: Early Localized
  - erythema migrans rash at tick bite
- Stage 2: Early disseminated (weeks)
  - flu-like illness
  - cardiac neurologic
- Stage 3: Late months—years
  - LYME arthritis
  - Encephalopathy / Neuropathy

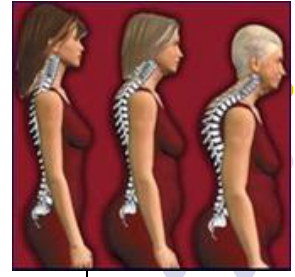




# Diagnosis & Treatment

- Enzyme Linked Immuno- Sorbent Assay (ELISA)
- Western Blot
- Indirect fluorescent antibody (IFA)
- DOXYCYCLINE
- IF UNTREATED
  - MYALGIA
  - CARDIOMYOPATHY
  - NEUROLOGIC PROBLEMS
  - PSYCHIATRIC PROBLEMS

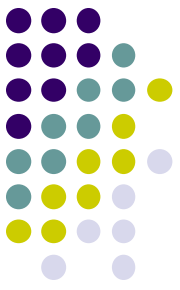
# Osteoporosis



- AGE
- FEMALE
- SEDENTARY
- CHRONIC ILLNESS
- DECREASED CALCIUM AND VIT D
- FAMILY HISTORY
- TOBACCO
- ALCOHOL
- CAUCASIAN/ASIAN
- SMALL FRAME

## Treatment

- HRT (raloxifene (Evista))
- PTH – Forteo giving SQ
- CALCIUM
- VIT D
- WEIGHT BEARING ACTIVITIES
- PREVENT FALLS
- BISPHOSPHONATES (DRONATES)
  - FOSAMAX
  - ACTONEL
  - BONIVA



# Pt. teaching- osteoporosis

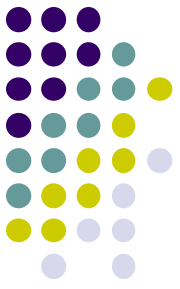
- Adequate dietary calcium- 1200mg/day with fluids
- Exercise, wt. bearing beneficial.
- Walking outdoors- vitamin D absorption.
- Good body mechanics
- Safe home environment, fall prevention
- Balanced diet- protein, Mg, Vit K & D, Ca
- Modify lifestyle choices- smoking, alcohol and caffeine intake and sedentary lifestyle.

# Paget's Disease (Osteitis Deformans)



- 2nd most common bone disease after osteoporosis
- Chronic metabolic disorder in which bone is excessively broken down and reformed → newly formed bones are weak and deformed
- Up to 40% of all patients with Paget's disease have a
- relative with the disorder
- Risk Factors: increases with age

# Signs and Symptoms



- 80% of patients are asymptomatic
- Hip and pelvic pain, aggravated by walking
- Fatigue
- Bowing of long bones
- Waddling gait
- Low back and sciatic nerve pain

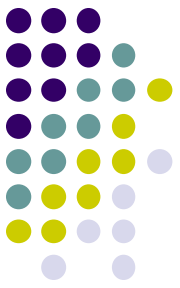


# Diagnostic Assessment

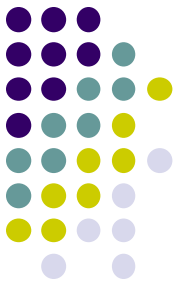
- ↑ serum alkaline phosphatase (ALP) and urinary hydroxyproline levels
- Calcium levels in blood and urine may be low, normal or elevated
- ↑ uric acid
- X-rays
- Bone scan
  - Best test in detecting Paget's

# Treatment & Management

- NSAIDS
- Biphosphonate drugs
- Alendronate (Fosamax)
- Risedronate (Actenel)
- Calcium and vitamin D
- Orthopedic surgery may be necessary
- Firm mattress
- Wear corset or light brace
- Exercise –



# Osteomyelitis



- Infection of the bone

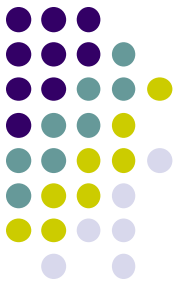
## Endogenous:

- Extension of soft tissue infection- infected pressure ulcers or incision.
- Blood borne (spread from other body sites)
- At risk- poorly nourished, elderly, obese, impaired immune systems, corticosteroid therapy, chronic illnesses.
- Prevention- proper tx. of infections, aseptic post op wound care

## Exogenous:

- Organism enters from outside the body. Eg. Open fx

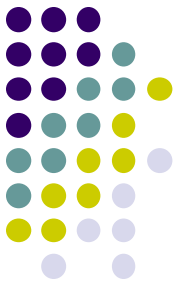
# Osteomyelitis



## Signs and symptoms-

- High fever, chills, increased HR, general malaise, swelling, tenderness, heat and erythema, painful movement.
- Draining ulcers, bone pain
- Dx- increased WBCs, elevated ESR, positive blood cultures, X-rays, bone scan, MRI.

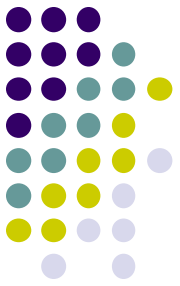




# Osteomyelitis Tx

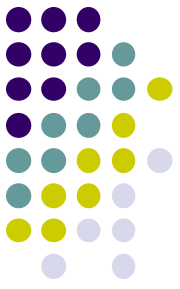
- Long term IV antibiotics
- Hickman or other CVAD catheter
- Strict sterile technique for treatment
- Hyperbaric oxygen treatment
- Surgery- bone exposed and necrotic tissue removed, debridement, bone grafts, amputation

# Rhabdomyolysis

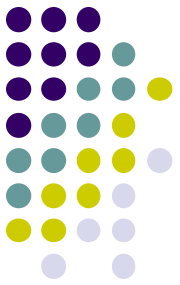


- Rhabdomyolysis is the breakdown of muscle fibers that results in the release of muscle fiber content into the circulation. Myoglobin is released into the bloodstream, and then is filtered by the kidneys.
- Myoglobin may occlude the structure of the kidney, causing damage, such as acute tubular necrosis or kidney failure. Necrotic skeletal muscle may cause massive fluid shifts from the blood- stream into the muscle, reducing the relative fluid volume of the body and leading to shock and reduced blood flow to the kidneys.

# Causes

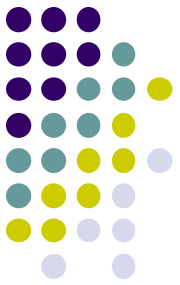


- Any condition that causes damage to skeletal muscle, such as:
- blunt trauma
- burns
- excessive exercise
- falls
- heatstroke
- infections
- near electrocution
- Prolonged immobilization
- snakebite



# Assessment findings

- Dark urine
- Fatigue
- Fever
- Joint pain
- Muscle pain (especially in the thighs, calves, or lower back)
- Myalgia
- Nausea
- Vomiting
- Weakness
- Weight gain

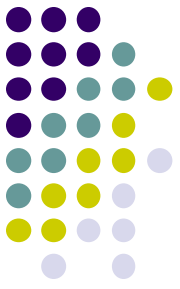


# Diagnostic Test

- A positive serum or urine myoglobin test indicates rhabdomyolysis.
- Creatine kinase levels 100 times normal or greater suggest rhabdomyolysis.

## **NURSING DIAGNOSES**

- Risk for injury
- Fatigue
- Excess fluid volume
- Impaired urinary elimination

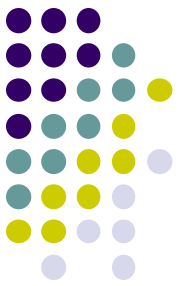


# Treatment

- Dialysis, if kidney failure is present
- Early aggressive hydration
- Kidney transplant (severe cases)

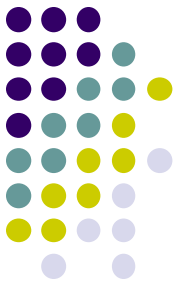
## *Drug therapy*

- Bicarbonate with sufficient urinary output to help prevent dissociation of myoglobin
- Diuretics: furosemide (Lasix), ethacrynic acid, bumetanide, mannitol



# Intervention

- Administer aggressive I.V. fluids *to help minimize damage to the kidneys.*
- Monitor the client's intake and output *to monitor changes in urine output that could indicate kidney failure.*
- Carefully monitor the client's kidney function tests, electrolyte levels, and daily weight *to monitor for renal failure.*
- Notify the physician immediately if the client has dark or decreased urine *because this is a sign of worsening rhabdomyolysis.*



**END**