1 **Musculoskeletal System**
   Chronic problems
   Nursing
   Fall 2008
   Nursing 231

2 **Osteoarthritis**
   • Incidence >90% by age 45
   • 50% of those over 65 will have symptomatic arthritis
   • Overall women = men
     ■ Before 45yo men > women
     ■ After 55 yo women > men

3 **Pathophysiology**
   • Loss of cartilage
   • Loses glistening appearance becomes yellow or gray
   • Cartilage thin and absent over some areas leaving underlying bone unprotected
   • Unprotected subchondral bone becomes sclerotic
   • Joint capsule becomes thickened and adheres to the underlying bone which will have limited movement

4 **Symptoms**
   • Cardinal sx joint pain on weight bearing
   • Stiffness < 15 min in the AM
   • Swelling less common
   • Neuro sxs only secondary to vessel or nerve impingement

5 **Etiology**
   • Seems to go along with aging and other secondary factors contribute
     ■ Previous trauma-joint dislocations, FX
     ■ Infection
     ■ Obesity
     ■ Inflammatory arthritis-release enzymes digest cartilage cells
     ■ Mechanical misalignment
     ■ Drugs (indomethacin, steroids) stimulate digesting enzymes

6 **Clinical Manifestations**
   • Articular surface changes common after 40
   • Pain one or more joint, usually weight bearing/Relieved by resting joint
   • Nocturnal pain not relieved by rest may be accompanied by parasthesia (numbness, tingling, prickling)

7 **Xray**
   • Loss of joint space
   • Osteophytes at margin
   • Normal cartilage
PE

- Osteoarthritis typically affects certain joints
  - Base of thumb
  - Spine
  - Hips
  - Knees
  - NOT the mcps, elbow, wrists, shoulders

- Distribution is usually asymmetrical
- Early on may be swollen, red

Treatment

- To lessen discomfort and retard progression
  - NSAIDs/Rest until inflammation subsides
  - Weight reduction
  - Exercise/Prevent joint capsule contraction
  - Possibly steroid injection

Erosive OA

- An OA that resembles RA, usually in elderly white caucasian women
- Characterized by pain, tenderness, and swelling in hands but not mcps
- Labs wnl,xray typical of OA

Rheumatoid Arthritis

- Most common chronic inflammatory polyarthritis (always multiple joints, usually hands and feet)
- Cause unknown
- Synovial thickening and joint damage
- Extra articular manifestations common

Pathophysiology

- Inflammation of joints known as joint synovitis/Immune response
- Pannus: proliferation of newly formed synovial tissue infiltrated with inflammatory cells, due to altered immune function

Labs

- none are specific but reinforce the clinical impression
- Normochromic, normocytic anemia in 40%, no response to iron
- + RF in 50% at 6 months
  - 75% at 10 months
- 20% will have – RF
- Elevated sed rate
- Aspiration of joint fluid will show elevated WBCs
Younger patients
• More gradual onset
• 67% female
• Less systemic features
• Usually begins in hands or feet
• 75% will have +RF
• Average sed 28 mm
• 17% with fever
• 20% with weight loss

Differential diagnosis in young
• SLE
• Mixed connective tissue disease
• Systemic Sjogrens
• Vasculitis
• Fibromyalgia
• Hypothyroidism
• Spondyloarthropathies
• Bacterial endocarditis

Differential diagnosis in elderly
• Previous diseases +
• PMR
• Erosive OA
• Gout, pseudogout
• Seronegative syndromes

2 types of rheumatoid arthritis in elderly
■ Carryover RA
■ Elderly onset
  ● Average of onset 55yo
  ● Disease behaves differently than in younger groups
  ● Those with severe disease tend to die early

Elderly onset RA
More abrupt onset
• More systemic features
• May present with shoulder involvement
• 57% female
• Fever 8%
• 33% with weight loss
• Average ESR 56m
• +RF 89%
• Diagnosis may be confusing, easy to confuse with other illnesses/conditions

Symptoms
• May have prodrome of months of fatigue, stiffness, weight loss, fever, vague arthralgias before developing the multiple inflamed joints
• AM stiffness usually >30 minutes
• Will have joint pain, swelling, erythema, warmth
• Joint pattern
  ■ Never dips, sometimes pips, always mcps
Swelling of mcps may lead to loss of valleys

X ray
- Xray may show joint destruction, erosions and spurring
- Helpful to monitor disease

Extra articular Disease
- Much more problematic
- Weight loss
- Anemia fever
- Rheumatoid nodules/granulomas
- Sjogrens syndrome
- Episcleritis
- RA lungs – pleurisy, pleural effusions
- Splenomegaly
- lymphadenopathy

Treatment
- Important to treat aggressively and in early stages to minimize joint destruction
- Therefore important to diagnose early
- In past used to "step up" only when sx's uncontrolled sometimes missing window of opportunity

Treatment
- NSAIDS still basic therapy for RA
  - All are essentially the same
- Problems with NSAID therapy in the elderly
  - Gastropathy
  - Complicated diverticular disease
  - Renal insufficiency
  - Drug interactions
- Cox-2 inhibitors
- Corticosteroids
- Anti-malarials
- Gold therapy
- Penicillamine
- Sulfasalazine
- Methotrexate
- Arava, Remicade (disease modifying agents)
Rest
PT
Exercise

SLE
Systemic Lupus Erythematosus
- Chronic inflammatory disease of multiple organs
- Primarily a disease of younger people
  - Women age 20-40
- 15% will have onset later in life
- Older persons will have a milder disease

Symptoms
- Range from fulminant febrile illness to asx with only abnormal labs
- Most common presentation is that of multiple constitutional sxs-- fever and malaise, fatigue and weight loss
- Systemic: fever, chills, fatigue, anorexia, weight loss
- Skin: butterfly rash on face but may be anywhere, photosensitivity, frontal alopecia, palmar rash
- MS: polyarthritis
- Eyes: conjunctivitis, retinal lesions
- Lung: pleurisy, rubs, effusions
- CV: pericarditis, endocarditis, cardiomyopathy
- GI: abd. pain secondary to vasculitis, dysphagia, Hepatosplenomegaly

Neuro: anxiety, memory loss, minor psychoses, depression, seizures
- Raynauds: 25%
- Renal: present in most,
  - Protenuria, hematuria
  - Nephritis develops early, may lead to HTN

Lab
- ANA – sensitive and + in most with disease but not diagnostic
- Dec. WBCs, anemia
- Elevated SGOT
Treatment
- Will need chronic care
- NSAIDs, rest
- Antimalarials – plaquenil (need regular ophthalmic exams)
- Immunosuppressives
- Sun avoidance

Ankylosing Spondylitis
- Inflammatory arthritis affecting the axial skeleton (spine, sacroiliac joints)
- Predominantly male 3:1
- Incidence increases after age 40
- Will “burn out” in the elderly but are then left with spine abnormalities

Symptoms
- Posture – flattened lumbar lordosis
- Curving thoracic kyphosis
- Rigid spine, unable to turn neck
- Walk with knees bent to see ahead
- Associated with iritis, aortic enlargement
- Pain lessens with activity
- Sxs persist > 3 months
- Pain worse with rest
- Onset insidious

PE
- Pathophysiology: AS most commonly affects the SI joints and the axial skeleton. Involvement of the SI joints is required to establish the diagnosis. Hip and shoulder joints are affected less frequently. Peripheral joint involvement is least common.
- The initial presentation generally occurs in the SI joints and is followed by involvement of the discovertebral, apophyseal, costovertebral, and costotransverse joints and the paravertebral ligaments
- Chronic involvement of the spine eventually can lead to decreases in ROM and fusion of the vertebral bodies. Involvement of the cervical and upper thoracic spine can lead to fusion of the neck in a stooped forward-flexed position (see Images 1-2). This position can significantly limit the patient’s ability to ambulate and look straight ahead.
- Focus the physical examination on active ROM and passive ROM of the axial and peripheral joints. Tenderness in the SI joints is common.

Labs
- Genetic component
  + HLA B27 in 90%
  - rheumatoid factor

Xrays
- Classic “bamboo spine” secondary to fusion

Treatment
- PT exercise
• In advanced disease no NSAIDs
• Treat early pain symptomatically

Gout
• Most common form of acute arthritis in elderly
• Occurs secondary to crystal deposition in the joint
• May be acute or chronic and may have extra articular manifestations

Signs and symptoms
• Acute – warm, red, very painful swollen joint usually in lower extremities
• Chronic – aching in various joints and AM stiffness
• Extra articular manifestations
  ■ Tophi
  ■ Renal calculi

Labs
• Serum uric acid >9 does not diagnose but correlates with high risk
• Poss elevated ESR
• Definitive dx only with joint aspiration

• Acute Gout
  The four treatment options available for the acute gouty attack are NSAIDs, colchicine, corticosteroids and analgesics

Meds
• Indocin 50 mg tid X 1 week doc
• Colchicine >5 mg q 2 hrs until effective may lead to severe diarrhea
• If attacks recur, tophi are present, or serum UA >9 use allopurinol 100-200 mg qd to prophylax

Osteoporosis
Definition: systemic skeletal disease characterized by decreased bone mass and deterioration of bone tissue leading to increased bone fragility and susceptibility to fracture

Osteoporosis lead to...
• 250,000 hip fractures per year
• 240,000 wrist fractures per year
• 500,000 vertebral fractures per year
• Government expense of 10 billion dollars per year
• Decreased mobility, decreased independence, pain syndromes and disfigurement

Risk Factors for Osteoporosis
20% of Caucasian women >70 have it
40% of Caucasian women >80 have it
Thin
Positive family History
Increased ETOH and caffeine
Smoking
Steroids, thyroid replacement, anticonvulsants
Positive family history of kidney stones (Ca++ wasting)

**Indications for Bone Densitometry**
- Women at menopause
- Persons with major risk factors
- Osteopenia by plain X-ray
- Persons with fractures
- Major risk factors
- Secondary causes

**WHO Criteria**
- Osteopenia – 1-2.5 SD below mean
- Osteoporosis - >2.3 SD below mean
- Severe osteoporosis – non violent fracture

**Treatment**
- Calcium – need lifelong supplementation
  - 1000mg qd if post menopausal on ERT
  - 1500 mg qd if has osteoporosis or not on ERT
- Need dietary Ca++ too
- Vit D Adults 400u qd/ Seniors 800u qd
- Exercise!!!
- ERT – reduces the increased osteoblastic and osteoclastic activity present in older women
- Decreases risk of fracture by 25%
- The dose may have an effect on therapeutic response
- Duration required to show benefit is 7 or more years
- Timing of therapy has only a moderate influence on outcome
- Tamoxifen and Raloxifen also improve bone density

**Osteoclastic Inhibition**
- Alendronate (Fosomax)10 mg qd or 70mg/week
- Calcitonin (Miacalcin) nasal spray use 200 IU qd or subq 50IU qd
  - Some pain relief with calcitonin

**Low Back Pain**
- Incidence
  - Lifetime probability of 70-80%
  - Most people will improve without treatment
  - Most people will have multiple recurrences
  - Referral is not usually warranted
- Etiology??????
  - Soft tissue injury, overuse, deconditioning
  - Herniated intervertebral disc
  - Impingement of nerve
Other causes of back pain

- Spinal stenosis – typically in the elderly
- Ureteral colic
- Pyelonephritis
- Pancreatitis
- Peptic ulcer
- Differential Diagnoses
  - Acute MS pain
  - Recurrent chronic MS pain
  - Pain from other organ systems
- 3 main questions to address...
  - Is there a serious systemic illness causing the back pain?
  - Is there any neurologic compromise?
  - Are there any psychosocial issues complicating the pain?
- And how will you know if these problems exist?

- History
  - Oldcart
  - Pertinent ROS
  - Onset, hx of pain
  - Occupation, activity
  - Treatment to date
  - Previous workup, dx
  - Other health problems

- PE
  - Affect, Gait, general appearance
  - Palpate back
  - Observe back flexion
  - Knee, ankle reflexes
  - Strength: HT walking, big toe dorsiflexion
  - Straight leg raising (SLR)
  - Abd, chest, possibly pelvic and rectal

- Labs
  - Chem panel
    - ESR
    - Rheumatologic testing
Osteomyelitis

Causes

- Incisional infection
- Direct contamination open fracture, surgery
- Bloodborne, spread by other sites of infection (Pulmonary)

Those at risk include

- Elderly
- Malnourished
- Immpaired immune system
- Chronic illness
- Long term use of corticosteroids

Pathophysiology

- Staph Aureus 70-80% infections
- Increased vascularity and edema
- Thrombosis of blood vessels occurs in the area causing result ischemia and bone necrosis
- Infection extends to medullary cavity, soft tissue and joints

Clinical Manifestations

- Septicemia
- Pain, Swelling, Tenderness
- Constant pain intensifies with movement due to pressure of collecting pus

Diagnostic Findings

- Xrays
- Bone Scan
- MRI
- Elevated Leukocytes
- Sed Rate
- Wound and blood culture

Medical Management

- Control infection
- Hydration
- Diet high in vitamins and protein
- Correction of anemia
- Area immobilized to decrease discomfort
- Prevent pathologic fx.
- IV antibiotics 3 to 6 weeks

Osteomalacia

- Metabolic bone disease due to inadequate mineralization of bone, calcium deficiency. Softening and weakening of the skeleton, causing pain, tenderness to touch, pathologic fx.

Pathophysiology

- Deficiency of activated vitamin D
- Low calcium and phosphate in the extracellular fluid
- Malabsorption Syndrome
- Excess loss of calcium
- GI disorders/Chronic Pancreatitis, Celiac Disease
- Renal insufficiency/Acidosis

### Diagnostic Findings
- X-ray/Demineralization is evident
- Low serum calcium
- Urine excretion of calcium and creatinine are low
- Bone Biopsy

### Medical Management
- Increase Vit D along with calcium
- Diet/Fortified milk, eggs
- Exposure to sunlight
- Deformities treated with braces or surgery

### Osteosarcoma
- Most common malignant bone forming tumor
- Accounts for 38% of bone tumors
- Male/Female 3:2
- Adolescents, young adults
- Occurs at ages 50-60
- History of radiation

- Located in the metaphyses of long bones
- Distal femoral metaphysis, 50% around the knee
- Tumor breaks through cortex, lifts periosteum and stimulates bizarre patterns of new bone formation

### Symptoms
- Pain
- Swelling
- Pathologic Fx

### Treatment
- Surgery is the major treatment of choice
- Location of tumor, size, malignancy grade, evidence of metastasis
- Preoperative chemotherapy has greatly increased the number of individuals qualifying for limb salvage surgery

### Amputations
- Removal of body part, usually extremity
- Progressive peripheral vascular disease
- Trauma/Crushing injuries
- Congenital Deformities
- Malignant Tumor/Osteomyelitis

### Levels of Amputation
- Performed at the most distal point
- Circulation in the part/functional usefulness
- Angiography
- Prosthesis
- Surgery/conservation of extremity

### Complications
- Hemorrhage
• Infection
• Skin breakdown
• Phantom Limb pain/Caused by the severing of peripheral nerves
• Joint contracture

Medical Management
• Healing amputation
• Nontender residual limb for prosthesis
• Control of limb edema with soft compression dressing
• Dressings/ care not to constrict circulation
• Removable rigid dressing

Rehabilitation/Nursing Interventions
• Psychological support/Sudden change in body image
• Relieving Pain
• Minimize Altered Sensory Perceptions
• Promote wound healing
• Enhancing body image
• Promote independent self care
• Help patient achieve physical mobility

Reynaud’s Phenomenon
• Localized, intermittent episodes of vasoconstriction of small arteries of the feet and hands that cause color and temp changes
• Generally unilateral, affecting only one or two digits. Usually underlying systemic disease present.

Clinical Manifestations
• Pallor brought on by sudden vasoconstriction
• Fingers, toes, and ears may turn white due decreased blood flow, then turn blue due to little oxygen.
• Once spasm occurs, the patient may have tingling and swelling of the extremities.
• After the attack is over, area turns red and pink, indicating blood flow now back to normal

Treatment
• Meds to dilate blood vessels
  ■ Calcium channel blockers/Adalat, Procardia
  ■ Alpha blockers
  ■ Avoid stimuli/smoking, cold