Musculoskeletal Disorders Part 1

Connective Tissue Disorders
Objectives

- Define connective tissue, list those tissues
- Explain the basic pathophysiology, medical care, and nursing care of the following conditions:
  - Osteoarthritis
  - Rheumatoid arthritis
  - Bechet’s syndrome
  - Gout
  - Osteoporosis
  - Reynaud’s syndrome
  - Progressive systemic sclerosis
  - Polymyositis
  - Carpal tunnel syndrome
Objectives

- State the components of nursing care of the patient who has undergone:
  - Joint replacement
  - Carpal tunnel surgery
- State preventative measures for osteoporosis
- Vocabulary:
  - Shock, fat embolism, DVT, compartment syndrome, osteomyelitis, contracture, post traumatic arthritis, avascular necrosis, malunion/non-union, reflex sympathetic dystrophy
“Tissue that supports and connects other tissues and parts of the body. Connective tissue has comparatively few cells. Its bulk consists of matrix, whose nature gives each type of connective tissue its particular properties.”

Tabers21
Connective Tissue

- Binds structures together
- Provide support for organs and a framework for the whole body
- Store fat
- Transport substances
- Provide protection
- Play a role in the repair of damaged tissues
Bones

- Framework for the body, provide protection, store calcium. Provide movement. Site of manufacture of blood cells. Cells are called osteocytes.

Cartilage

- Fibrous connective tissue. Firm, flexible support. Matrix has the consistency of firm plastic. Cells are called chondrocytes.
- **Ligaments**
  - Strong flexible fibrous bands that connect bones and cartilage and support muscles.

- **Tendons**
  - Strong, dense fibrous connective tissue in the shape of heavy cords that connect muscle to bone.
Age Related Changes

- Loss of bone tissue
- Cartilage becomes more rigid, fragile
- Decrease range of motion
- Intervertebral disc spaces decrease in height
- Tendons shrink and harden
- Muscle bulk and strength decline slowly
Disorders

- Often manifested as joint disorders
- Joint movement is dependant on functional connective tissue.
Diagnostic Procedures

- **Blood studies**
  - CBC, ESR, CRP: determine whether the disorder is an inflammatory process
  - VDRL, RF, creatinine, ANA

- **Urine**
  - Uric acid, creatinine

- **Joint aspirate**
  - Uric acid, WBCs,

- **Radiologic studies**
Osteoarthritis

- AKA: Degenerative joint disease
- Degeneration of articular cartilage, hypertrophy of underlying and adjacent bone
- Affects hands, feet, spine and large weight bearing joints like knees and hips.
Osteoarthritis

- Primary: cause unknown. Arthritis of aging is primarily primary.
- Secondary: related to trauma, infection, congenital deformities, steroid therapy.
- Obesity, poor posture, work related stress increase risk.
Osteoarthritis

- Most common non-inflammatory joint disease
- Chief pathologic feature: loss of articular cartilage in synovial joints
- Men and women over 40
- Women more severely affected
Osteoarthritis: Symptoms

- Many people are asymptomatic
- Severity of pain may not be related to severity of disease
- Pain in the affected joint after repeated use
- Pain and stiffness after prolonged inactivity
- Swelling, deformity, or enlargement of joint
- Generally affects a single joint or few joints
Osteoarthritis: Medical Diagnosis

- Health history
- Radiographic studies
- MRI
Osteoarthritis: Treatment

- No known cure
- Goals of therapy:
  - Reduce pain
  - Maintain mobility
  - Minimize disability
- Drug therapy
  - Aspirin
  - Acetaminophen
  - NSAIDs
  - COX-2 inhibitors
  - Glucosamine and chondroitin
Osteoarthritis: Nursing Care

Assessment
- Pain, disability, joint enlargement, crepitus, gait abnormalities, effect of life, disabilities

Interventions
- Administer prescribed analgesics
- Monitor effectiveness
- Education: drugs, exercise
Total Joint Replacement

**Total Knee Replacement**

- Femur (thigh bone)
- Tibia (shin bone)
- Fibula
- Metal surface
- Plastic bearing
- Screws

**Artificial Hip Joint**

- Metallic replacement for head and neck off femur
- Plastic and metallic replacement for acetabulum (hip socket)
Post-op Care of a Patient after Joint Replacement

- **Routine post op care:**
  - Monitor: VS, I&O, LOC, pain/comfort, respiratory status, urinary and bowel function, wound and dressing condition

- **Joint Replacement**
  - Shock
  - CS&M
  - Positioning
  - 5 P’s
  - DVT prophylaxis
  - Monitor for DVT, PE
  - Infection
Rheumatoid Arthritis

- Chronic, progressive inflammatory disease
- Systemic autoimmune disease whose most notable effects are on synovial joints
- Affects more women than men, peak onset 30 to 60 years of age.
- No known cause
Rheumatoid arthritis usually affects joints symmetrically (on both sides equally), may initially begin in a couple of joints only, and most frequently attacks the wrists, hands, elbows, shoulders, knees and ankles.
In rheumatoid arthritis the synovium becomes inflamed and produces excess fluid, and later the cartilage becomes rough and pitted.
Rheumatoid Arthritis: Symptoms

- The disease usually begins gradually with:
  - Fatigue
- Loss of appetite
- Morning stiffness (lasting more than 1 hour)
- Widespread muscle aches
- Weakness
- Eventually, joint pain appears
Rheumatoid arthritis (late stage)

- Boutonniere deformity of thumb
- Ulnar deviation of metacarpophalangeal joints
- Swan-neck deformity of fingers

Common sites for rheumatoid nodules

Source: ACP Medicine © 2004 WebMD Inc.
A specific blood test is available for diagnosing RA and distinguishing it from other types of arthritis. It is called the anti-CCP antibody test. Other tests that may be done include:

- Complete blood count
- C-reactive protein
- Erythrocyte sedimentation rate
- Joint ultrasound or MRI
- Joint x-rays
- Rheumatoid factor test (positive in about 75% of people with symptoms)
- Synovial fluid analysis
Rheumatoid Arthritis: Treatment

- **Medical**
  - Symptom relief: ASA, NSAIDs, COX-2 inhibitors, gold salts
  - Slow progression of disease: DMARDs
  - Control local inflammation: Steroid injections

- **Nursing Care**

- **Physical and occupational therapy**
Osteoporosis

- Bone resorption outpaces bone formation
- Begins earlier, progresses faster in women
- Primary: age related
- Secondary: due to factors other than age (steroids)
- Risk factors: older, small-framed women post-menopause; estrogen deficiency; inadequate calcium, vitamin D, protein intake; steroid therapy; smoking; low BMI; caffeine; alcohol
Osteoporosis is a condition characterized by progressive loss of bone density, thinning of bone tissue and increased vulnerability to fractures. Osteoporosis may result from disease, dietary or hormonal deficiency or advanced age. Regular exercise and vitamin and mineral supplements can reduce and even reverse loss of bone density.
Osteoporosis
Osteoporosis: Symptoms

- First sign usually a broken bone
- Back pain
- Vertebral compression and loss of height
Diagnostics

- Bone mineral density testing (specifically a densitometry or DEXA scan) measures how much bone you have. This test has become the gold standard for osteoporosis evaluation. For specific information on such testing, see bone density test.

- A spine CT can show loss of bone mineral density. Quantitative computed tomography (QCT) can evaluate bone density. However, it is not as available and is more expensive than a DEXA scan.

- In severe cases, a spine or hip x-ray may show fracture or collapse of the spinal bones. However, simple x-rays of bones are not very accurate in predicting whether someone is likely to have osteoporosis.

- Urine NTX
Treatment

- The goals of osteoporosis treatment are to:
  - Control pain from the disease
  - Slow down or stop bone loss
  - Prevent bone fractures with medicines that strengthen bone
  - Minimize the risk of falls that might cause fractures
Treatment

- Primary prevention
- Calcium supplementation: 1000mg/day premenopausal and postmenopausal if on estrogen supplementation; 1500mg/day postmenopausal without HRT
- Vitamin D3
- Exercise
- Bisphosphonates
- Selective estrogen receptor modulators
Osteoporosis: Nursing care

- Data collection: Diet, exercise, calcium intake, menopausal status, posture, pain.
- Prevention of injury
- Education
Osteomalacia
Gout

- Uric acid crystal deposits in joints and body tissues

- **Primary:** Uric acid is high because of a metabolic disorder
  - More prevalent in men
  - Peak onset 40’s and 50’s

- **Secondary:** due to another disease process
Gout: Pathophysiology

- Hyperuricemia due to excess uric acid production or decrease renal excretion
- Increased serum urate
- Recurring acute attacks of arthritis
- Clumping of urate crystals around joints
- Renal damage
- Uric acid kidney stones
Gouty arthritis is characterized by a rapid onset of pain in the affected joint followed by warmth, swelling, reddish discoloration, and marked tenderness.
The joint at the base of the big toe is the most common site of an acute gout attack.
Severe gout in the fingers resulting in large, hard deposits of crystals of uric acid. These deposits are called tophi.
Gout: Prevention

- Increase fluid intake
- Decrease alcohol intake
- Lose weight
- Avoid purine rich foods: shellfish, organ meats
- Meat and seafood increase risk of acute attack
- Dairy foods reduce the risk of acute attacks
Gout: Treatment

- Symptom relief: ASA, NSAIDs, colchicine, steroids reduce inflammation
- Uric acid reducing medications: allopurinol, probenecid
Progressive Systemic Sclerosis

- Scleroderma
- Chronic, multi-system autoimmune disease
- Hardens the skin
- Affects blood vessels, GI tract, heart, lungs, kidneys
- Severity depends on organ involvement
- Onset: 30 to 50 years of age, more women than men
Symptoms

- Skin symptoms may include:
  - Blanching, blueness, or redness of fingers and toes in response to heat and cold (Reynaud’s syndrome)
- Hair loss
- Skin hardness
- Skin is abnormally dark or light
- Skin thickening and shiny hands and forearm
- Small white lumps beneath the skin
- Tight and mask-like facial skin
- Ulcerations on fingertips or toes
Symptoms

- Bone and muscle symptoms may include:
  - Joint pain
  - Numbness and pain in the feet
  - Pain, stiffness, and swelling of fingers and joints
  - Wrist pain

- Breathing problems may include:
  - Dry Cough
  - Shortness of breath
  - Wheezing

- Digestive tract problems may include:
  - Bloating after meals
  - Constipation
  - Diarrhea
  - Difficulty swallowing
  - GERD or heartburn
  - Weight loss

- Additional symptoms associated with this disease include:
  - Eye burning, itching, and discharge
CREST Syndrome

- Calcinosis
- Reynaud’s Phenomenon
- Esophageal dysfunction
- Sclerodactyly
- Telagiectasis
Raynaud's phenomenon is characterized by fingers becoming white due to lack of blood flow, then blue due to oxygen consumption, and finally red as blood flow returns.
Treatment

- Drugs used to treat scleroderma include:
  - Corticosteroids
  - Immunosuppressants (Methotrexate, Cytoxan)
  - Nonsteroidal anti-inflammatory drugs (NSAIDs)

- Other treatments for specific symptoms may include:
  - Antacids for heartburn
  - Blood pressure medications (particularly ACE inhibitors) for high blood pressure or kidney problems
  - Medicines to improve breathing
  - Medications to treat Raynaud's phenomenon
Nursing Interventions

- **Skin Integrity**
  - Keep skin clean and dry
  - Maintain warmth,
  - Meticulous mouth care
  - Administer anti-inflammatory drugs as ordered

- **Chronic Pain**
  - Treat pain
  - Protect extremities

- **Nutritional deficits**
  - Small frequent meals
  - Discourage foods which exacerbate gastric reflux: spicy, alcohol, caffeine
  - Keep head elevated after meals for at least 30 minutes
  - Monitor for weight loss
Dermatomyositis/Polymyositis

- Rare acute or chronic inflammatory diseases
- Involve primarily skeletal muscles
- Polymyositis: no skin involvement
- Dermatomyositis: characteristic skin rash
Signs and Symptoms

- Muscle weakness
- Raynaud’s phenomenon
- Joint pain and inflammation
- Dermatomyositis:
  - Periorbital edema
Diagnosis

- Progressive proximal symmetrical weakness
- Elevated muscle enzyme levels
- Abnormal findings on muscle biopsy
- Abnormal findings on electomyograms
- Rash is patchy, bluish-purple to dusky discoloration on upper chests, knees, knuckles, face, neck, shoulders
Treatment

- High dose glucocorticoids and chemotherapeutic drugs
- Supportive treatment based on balancing rest and exercise
Bursitis

- Acute or chronic inflammation of bursae caused by strain, trauma or infection.

- Overuse: tennis elbow

- Symptoms: pain and limited movement in affected joint, usually hip or shoulder

- Treatment: Rest, splinting, NSAIDs. Progressive ROM
Carpal Tunnel Syndrome

- Common over use syndrome
- Median nerve compression in wrist cause pain and numbness
- Signs and symptoms: pain and numbness in palmar side of fingers, weakness of thumb
- Treatment: splinting to prevent flexion and hyperextension, steroid injections, surgery
- After surgery assess color, temperature of hand. Notify surgeon of pallor, cyanosis, numbness