

Musculoskeletal System

Tumors

Bone Cancer

- **Statistics**
- Estimated new cases each year 3,500
- Estimated deaths per year 1,660

Bone Cancer

- Usually ↑ in men; peaks in teens
- More children than adults
- MS tumors have a higher incidence due to metastasis, rather than as a primary tumor

- Primary tumor = arises in a particular tissue
- Secondary tumor = spreads to another tissue from the original site
- Etiology
 - Unknown
 - Radiation
 - Increased incidence with Chronic osteomyelitis & Paget's Disease

- **Primary Tumors:**

- **Osteosarcoma**

- most common malignant primary bone tumor in adults
- Rapid growth & metastasis
- Peak incidence = 10-30 years and more in males
 - 2nd peak later in life secondary to Paget's disease
- Usually seen in the distal femur, proximal tibia, & proximal humerus
- S/Sx: pain, local tenderness, enlargement, limited joint movement
- Dx: x-rays, CT, MRI
 - MRI – shows a “sunburst” appearance
 - Bone scan: tumor size & possible metastasis
 - ↑ Calcium, ↑ alkaline phosphatase
 - Biopsy
- Treatment:
 - Amputation - radiation & chemotherapy
- Also doing limb salvage methods with radiation & chemotherapy (pre/post)
- Limb salvage = wide excision of tumor & surrounding tissues- remove as much as possible while ‘salvaging’ the limb
- Metastasis to lungs → poor prognosis

- **Chondrosarcoma**

- Second most common primary bone tumor in adults
- Incidence: ↑ with advancing age : 20-75 yrs
- cartilage – pelvis, proximal femur, proximal humerus
- Dx: x-ray or CT will show thinned bone cortex, bone destruction, & soft tissue mass

- S/SX: dull pain, edema
- Slower to metastasize

- Treatment: surgery, occasional radiation; limited blood supply

- **Ewing's Sarcoma**

- Most malignant
- More in men < 30 yrs
- Rapid growth within the medullary cavity of long bones
- Especially the femur & tibia, with early metastasis to lungs
- wide surgical resection, radiation, & chemo have improved the 5 year survival rate

- S/SX: progressive local pain, swelling, palpable soft tissue mass, noticeable ↑ in size of the affected part, fever, leukocytosis, anemia

- Dx:
 - x-ray, CT, or MRI
 - periosteal elevation

- Treatment: standard treatment = radiation
- May do surgical resection or amputation, & chemotherapy

- **Limb Salvage:**

- Alternative to amputation
- Procedure: tumor bearing bone is resected & replaced with a cadaver allograft or a custom-made prosthesis
- Very wide resection; may need tendon or muscle transfer; artificial ligaments, or leg-lengthening procedures

- Leg-Lengthening Procedure
- Expandable prosthesis –allows growth
- Device is surgically adjusted 1-2x/year
- Causes ↓ need for amputation

- **Complications**

- Infection, Hemorrhage, Nerve injury, DVT
- Mechanical failure
- ↓ Function
- Tumor recurrence
- Amputation

■ **Metastatic Tumors**

- Most common type of malignant bone tumor occurs from primary tumor metastasis
- Common sites = breast, GI, lungs, prostate
- Metastatic lesions: pelvis, spine, or ribs
- pathologic fractures - weakened bones
- S/SX: pain, ↓ ROM, ↓ motion/use, pathologic fractures
- Dx:
 - bone scans - metastatic lesions before x-ray
- ↑ alkaline phosphatase
- High calcium
- X-ray
- Biopsy
- Treatment: Radiation
- Treatment for primary tumors → chemotherapy
- Palliative treatment to ↓ pain

■ **Multiple Myeloma**

- Plasma cell myeloma; white blood cell (WBC) cancer
- Incidence: males > 50 yrs
- Most common in African American males
- Insidious onset
- Plasma cells (mature lymphocytes) causing infiltration & destruction of bone marrow & cortex
- Produces osteolytic lesions
- Most common involved bones :: active marrow
- Sternum, ribs, spine, clavicles, skull, pelvis, long bones

- S/SX:
 - Back pain → most common symptom
 - Frequent & multiple pathologic fxs
 - Progressive weakness, malaise, vague bone pains, weight loss
 - Chemo – thrombocytopenia
 - ↑ RBC destruction – anemia
 - ↑ gamma globulin → potential for renal failure
 - ↑ Calcium

- Dx:
 - Bone biopsy or bone marrow aspiration
 - Proteinuria (Bence-Jones)
 - Poor prognosis due to late diagnosis
 - Common causes of death → SC compression, CKD, progressive anemia, 2nd infection

- Treatment:
 - Chemotherapy to suppress plasma cell growth
 - Palliative treatment to ↓ pain
 - Radiation to local areas

Bone Cancer

■ Nursing Care

- Acute pain
- Comfort measures
- Meds
- Emotional support
- Risk for injury
- Gentle position changes
- Safety measures
- Risk for infection
- High risk if receiving chemotherapy
- Deficient Knowledge
- Teach treatments, discharge care, tumor progress
- Risk for ineffective coping
- Grieving, poor prognosis
- Disturbed body image
- Impaired physical mobility
- Impaired home management
- Complications of immobility
- Activity intolerance
- Anxiety
- Grieving
- Impaired skin integrity
- Respiratory – lung mets
- Powerlessness
- Interrupted family processes

■ Hypercalcemia

- Most common in metastatic CA to bone
- Excessive calcium release as tumor destroys bone
- S/SX: fatigue, anorexia, nausea, vomiting, constipation, abdominal distension, vague muscle weakness, lethargy → altered mental status → coma → death

- Dx: >11 high Ca⁺
 > 15 serious
 cardiac dysrhythmias

■ Treatment

- NS 1 liter - diuresis
- lasix
- Monitor cardiac