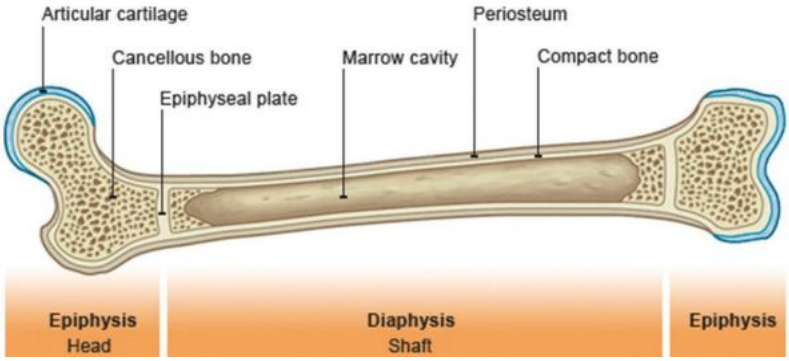
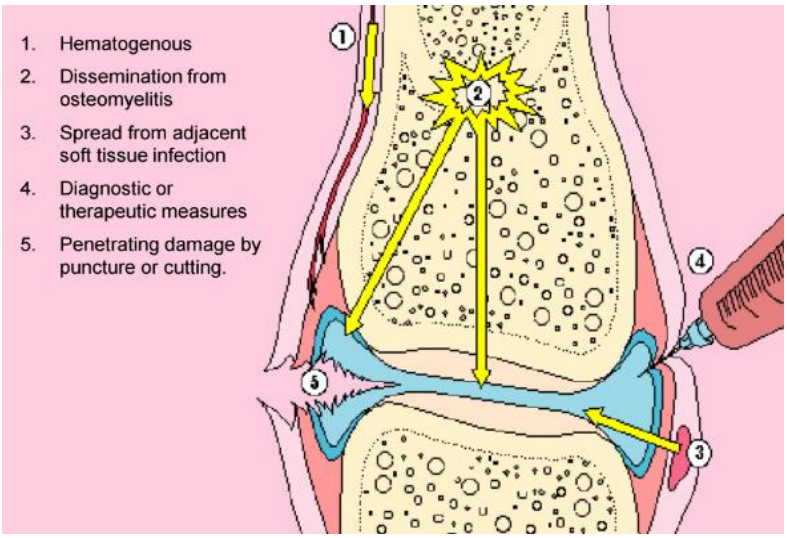
Unit VII – Problem 1 – Clinical: Bone and Joint Infections

- **The image below shows the anatomical structure of the bone:**



- **Acute osteomyelitis:**
  - **Definition**: inflammation of a bone caused by and infecting organism.
  - **Spread**: infection may remain localized or spread to bone marrow, cortex, periosteum and soft tissues.
  - **Source of infection:**

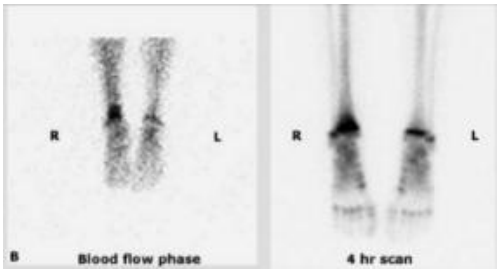


  - **Epidemiology**: osteomyelitis is more common among male children.
  - **Site of infection**: metaphysis of long bones (commonly tibia and femur).
  - **Organisms causing the infection are classified according to the age:**

Neonates	Streptococcus, S.aureus and E.coli
Children	S.aureus, E.coli, Serratia, Pseudomonas and H.influenzae (in those who are < 4 years of age).
Patients with Sickle cell disease	Salmonella (most unique) and S.aureus.
Drug addicts	Pseudomonas (unique) and S.aureus.

  - **Risk factors include the following**: diabetes mellitus, sickle cell disease, AIDS, alcoholism, IV drug abuse, chronic use of corticosteroids, pre-existing joint disease and post-surgical patients (especially those with prosthetic valves).
  - **Clinical features:**
    - ✓ Fever.
    - ✓ Pain (most important).
    - ✓ Limb is held still.
    - ✓ Physical examination of the limb (look, feel, move) shows signs of inflammation.
  - **Laboratory findings:**
    - ✓ Elevated inflammation markers: WBCs, ESR and CRP.
    - ✓ Blood culture (taking up to 48 hours): it is positive in 30-50% of patients and bacterial growth decreases with antibiotic use.

- **Radiology:**
  - ✓ Plain X-ray has 45% sensitivity and 75% specificity.
  - ✓ It will show:
    - ❖ Soft tissue swelling within 48 hours.
    - ❖ Periosteal reaction within 1 week.
    - ❖ Osteolysis within 1-2 weeks from the infection.
  - ✓ Other imaging modalities which can be used are: MRI, CT-scan and nuclear bone scan (using Technetium-99).



- **Treatment:**
  - ✓ General: admission, hydration, analgesia and immobilization.
  - ✓ Specific: antibiotics and surgical drainage.

- **Chronic osteomyelitis:**

- It results when inflammation of the bone continues for a long time resulting in bone sclerosis and deformity.
- **Site of infection**: ends of long bones.
- **Organism**: S.aureus.
- **Causes:**
  - ✓ Acute osteomyelitis which is not treated adequately.
  - ✓ Trauma.
  - ✓ Iatrogenic (joint replacements and internal fixation of fractures).
  - ✓ Compound fractures.
  - ✓ TB, syphilis.
  - ✓ Chronic ulcers (such as diabetic foot).
- **Clinical presentation:**
  - ✓ Pain, bone destruction and formation of sequestrum.
  - ✓ Discharging sinuses and formation of new bone (involucrum).
  - ✓ Brodie's abscess.
  - ✓ Involvement of adjacent joints.
  - ✓ Distant spread (which might result for example in endocarditis).
- **Treatment:**
  - ✓ Medical: administrating appropriate antibiotics to the patient.
  - ✓ Surgical:
    - ❖ Adequate drainage and debridement.
    - ❖ Obliteration of dead space.
    - ❖ Soft tissue cover.
    - ❖ Restoring effective blood supply to the affected area.
- **Complications:**
  - ✓ Arthritis (inflammation of the joint).
  - ✓ Skeletal deformities and pathologic fractures.
  - ✓ Malignant transformation.

- **Septic arthritis:**

- **Definition**: inflammation of a joint caused by an infecting organism.
- **Spread**: infection may remain localized or spread to the bone and soft tissues.