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:**
  1. Hematogenous
  2. Dissemination from osteomyelitis
  3. Spread from adjacent soft tissue infection
  4. Diagnostic or therapeutic measures
  5. Penetrating damage by puncture or cutting.

- **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:**

<table>
<thead>
<tr>
<th></th>
<th>Neonates</th>
<th>Children</th>
<th>Patients with Sickle cell disease</th>
<th>Drug addicts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Streptococcus, S.aureus and E.coli</td>
<td>S.aureus, E.coli, Serratia, Pseudomonas and H.influenzae (in those who are &lt; 4 years of age).</td>
<td>Salmonella (most unique) and S.aureus.</td>
<td>Pseudomonas (unique) and S.aureus.</td>
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</tbody>
</table>

- **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.