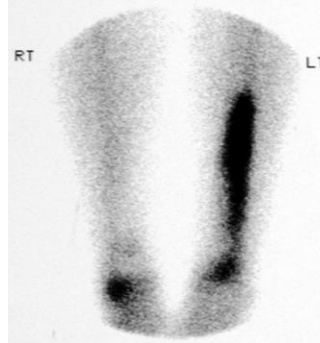




- What is the purpose behind radiological imaging?

- To confirm a specific diagnosis.
- Showing the extent of the disease.
- To assess patient's response to the treatment.

- Below is an image showing Technetium-99m diphosphate bone scan of a patient who has osteomyelitis affecting his left tibia. This was diagnosed by increased uptake of the trace in left tibia.

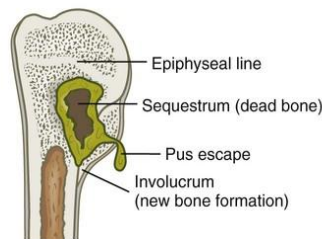
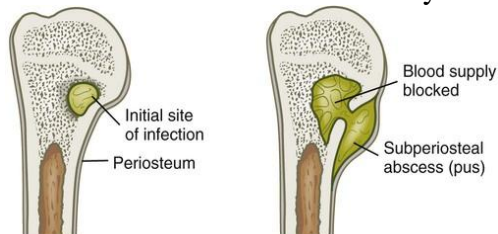
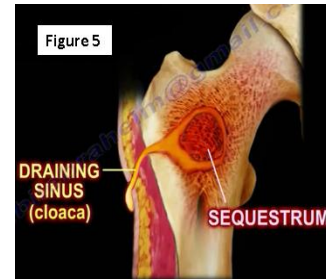


- Plain radiograph in osteomyelitis:

- It has a sensitivity of 45% and specificity of 75%.
- When are you going to detect changes by using plain radiographs?

- ✓ Changes in soft tissues will be visible after 3 days.
- ✓ Bone changes can be detected after 1-2 weeks.
- ✓ Early bone changes are represented by:
 - ❖ Destruction of the cortex.
 - ❖ Bone osteopenia.
- ✓ Late bone changes are represented by the following:

- ❖ *Sequestrum*: necrotic bone which is surrounded by purulent material or granulation tissue. It may harbor bacteria thus serving as a source for chronic osteomyelitis.
- ❖ *Involucrum*: bone shell surrounding purulent material and sequestrum.
- ❖ *Cloaca*: cortical and periosteal defect through which pus drains from infected medullary cavity.





- **Nuclear medicine in osteomyelitis:**

- **Imaging is done by a 3-phase bone scan with radiolabeled marker (which is similar to Technetium-99):**
 - ✓ **Flow phase:** this is immediately after the injection of the marker. It shows areas of increased blood flow (normally occurring when there is inflammation).
 - ✓ **Blood pool phase:** 30 seconds – 15 minutes after the injection of the marker. It shows areas of vascular permeability.
 - ✓ **Delayed phase:** 4 hours after injection of the marker. It shows areas of retained uptake (this is considered most specific for osteomyelitis).
- **Notice that sensitivity decreases when other conditions are present with osteomyelitis such as:**
 - ✓ Surgery.
 - ✓ Trauma.
 - ✓ Diabetes mellitus.

- **MRI in osteomyelitis:**

- **Findings are classified according to being:**

Acute	Chronic
Fat is replaced with edema in medullary space of the bone. Therefore there will be: <ul style="list-style-type: none"> • Low signal on T1. • High signal on T2, STIR or fat-suppressed sequences. 	<ul style="list-style-type: none"> • There is low signal on T1 and T2. • Bone sclerosis with cortical thickening. • Sequestra on gadolinium enhanced T1. • Narrow transition zone.

- ✓ Soft tissue around the infected bone might also show: edema, abscess, sinus tract, ulcer or cellulitis.



- **Location of infection in long bones in hematogenous spread is related to vascular anatomy:**

- **Infants up to 1 months of ageL:**
 - ✓ Bone infection involves: metaphysis, epiphysis and the joint.
 - ✓ When there is epiphyseal infection, infants may develop slipped epiphysis and growth deformities.
- **Toddlers and older children:**
 - ✓ Bone infection involves: metaphysis.
- **Adults (after fusion of epiphysis):**
 - ✓ infection involves joints more frequently than in children.