

Nursing Implications for Diagnostic Tests

**Bone Scan and Gallium Scan**

**Bone Scan**

Client Preparation
- Assess the client’s understanding of the procedure, providing explanation, clarification, and emotional support as needed.
- Radioactive material (technetium-99m phosphate) is injected intravenously for 2 to 3 hours so that it concentrates in the bone.
- Observe the injection site for redness or swelling. If a hematoma forms, apply warm soaks to the area.
- Have the client drink four to six glasses of water in the 2- to 3-hour waiting period before the procedure to facilitate renal clearance of any circulating radioactive material.
- The client is not restricted to foods or fluids prior to the exam.
- Have the client empty the bladder prior to testing; a full bladder will mask the pelvic bones and make the client uncomfortable.
- The scan takes about 30 to 60 minutes to complete. The client must remain still during the scanning.
- The client may be active during the waiting period.
- A sedative should be ordered and administered to any client who may have difficulty lying quietly.

Postprocedure Care
- No specific care is needed after the procedure.

Client and Family Teaching
- Remove jewelry or any metal objects that may hide X-ray visualization of the bones.
- The scanner machine moves over the body and detects radiation emitted by the skeleton. X-ray films are prepared, showing a two-dimensional view of the skeleton. You may have to be repositioned several times.
- The scanning machine makes a clicking sound.
- Drinking liquids and frequent activity in the first 6 hours after the procedure help reduce excess radiation to the bladder and gonads.
- Family members will not be affected by the radionuclide, nor will urine or feces need special handling before, during, or after the procedure.

**Gallium Scan**

Client Preparation
- Prepare as for a bone scan.
- Radioactive material, gallium-67, is injected intravenously 24 to 72 hours prior to the examination.
- Gallium is used because of its high affinity for soft-tissue abscesses.

Postprocedure Care
- Additional imaging may be performed at 24-hour intervals to differentiate normal activity from pathologic concentrations.
- No specific care is needed after the procedure.

Client and Family Teaching
- Refer to bone scan discussion.
- After a gallium scan, X-ray films may be obtained in 24-hour intervals for comparative results.

- **Radionuclide bone scans** help determine if infection is active and differentiate between infectious and noninflammatory bone changes. Nursing care for clients having these procedures is described in the box above.
- **Ultrasound** can detect subperiosteal fluid collections, abscesses, and periosteal thickening and elevation associated with osteomyelitis.
- **Erythrocyte sedimentation rate (ESR)** and **WBC** are elevated in an acute infection.
- **Blood and tissue cultures** (from affected bone or soft tissue) are obtained to identify the infecting organism and direct antibiotic therapy.

**Medications**

Antibiotic therapy is mandatory to prevent acute osteomyelitis from progressing to the chronic phase. Parenteral antibiotic therapy begins as soon as cultures (blood and/or wound) are obtained. A penicillinase-resistant semisynthetic penicillin (e.g., methacillin, oxacillin) may be given until the culture and sensitivity results are known. These antibiotics are used initially because many cases of osteomyelitis are caused by *Staphylococcus aureus*. When the detailed sensitivity report is obtained from the cultures, more definitive antibiotics are prescribed.

For the client with acute or chronic osteomyelitis, antibiotics are continued for 4 to 6 weeks. Intravenous antibiotic administration or oral therapy is common. Oral therapy with twice-daily ciprofloxacin has been shown to be as effective as parenteral therapy for treating adult clients with chronic osteomyelitis caused by susceptible organisms (Tierney et al., 2001).

**Surgery**

Needle aspiration or percutaneous needle biopsy may be performed to obtain a specimen in acute osteomyelitis. Surgery may be performed to obtain a specimen of the infectious agent, to debride the area, or both.

Surgical debridement is the primary treatment for the client with chronic osteomyelitis. The periostium is excised and the cortex is drilled to release the pressure from accumulated pus. During this procedure, cultures may be obtained and sent to the laboratory for analysis. The wound holes are irrigated, and the wound is then closed. The cavity may be kept clean by inserting drainage tubes that are connected to an irrigation system.

Postoperatively, the nurse is responsible for instilling and removing dilute antibiotic solutions through the drainage tubes. See the Nursing Care box on page 1270 for related nursing care.

A musculocutaneous (myocutaneous) flap is another approach used for the treatment of the dead space caused by extensive debridement of the infected site. The procedure involves moving or rotating a muscle and the section of skin fed