99-m-Technetium Diphosphonate is an indicator of bone blood flow and has been used widely for assessment of the vascular status of femoral heads;[3] however, its uptake is affected by changes in regional blood flow making its use less reliable in the face of an acute fracture.

Technetium-99m-Sulfur Colloid reflects activity in bone marrow. It is currently used most commonly for liver and spleen scanning. It is phagocytized by the Kupffer cells in the liver and spleen and by the reticuloendothelial cells in the bone marrow. Meyers[4] was the first to use this agent to detect early avascular necrosis following femoral neck fracture or hip fracture dislocation using qualitative methods for assessing uptake. He reported 95% accuracy in diagnosing avascular necrosis in femoral neck fractures.

The purpose of our study is to confirm and reproduce Meyer's results and refine this method by using quantitative rather than qualitative method of assessing sulfur colloid uptake.

C. APPROACH:

Seventy five patients over age seven admitted with femoral neck fracture, intertrochanteric fracture or fracture dislocation of the hip will have a sulfur colloid scan. The scan will be performed within 24 hours of the time of injury, if possible. The patient will have a single scan of both hips after injection of a standard dose, 8 millicuries of Technetium Sulfur Colloid, using quantititive methods for comparison of the hips. This information will be stored on a computer disc for accessability at a later date. Preoperative scans are necessary if a femoral head prosthesis is to be implanted; however, postoperative scans will be acceptable in patients undergoing his pinning. Any pregnant patients will be excluded from the study.

Patients who will be undergoing hemi-arthroplasty for treatment of the femoral neck fracture will receive 500 mg of Tetracycline orally every six hours for two to three days preoperatively if feasible.

Femoral head specimens submitted when prosthetic preplacement is performed will be examined microscopically for evidence of avascular necrosis by conventional technique, as well as noting the absence or presence of Tetracycline labeling on trabecular bone. The presence of Tetracycline fluoresence is a laminar pattern on trabecular bone is indicative of viable bone.

X-rays will be obtained pre-scan and 3 months, 6 months, 12 months, and 24 months postinjury on patients with femoral neck fractures treated by pinning and on patients with hip fracture dislocations. Final correlation will be made between radiographic appearance, scans and histopathology when available.