Infracapsular neck of femur fractures the blood supply to femoral head is compromised. For these displaced fractures, patients will do better if any of the hip components are replaced. In some cases, this can mean a replacement of the head of the femur (hemiarthroplasty) or both the head of the femur and acetabulum (total hip replacement).

**Shoulder Resurfacing Arthroplasty:**
Resurfacing hemiarthroplasty may be an option if the glenoid has an intact cartilage surface, there has been no fresh fracture of the humeral neck/head or there is a desire to preserve humeral bone. Resurfacing hemiarthroplasty avoids the risk of component wear and loosening that may occur with conventional total shoulder replacements.

The image on the left shows a Left shoulder Resurfacing hemiarthroplasty - replacing just the joint surfaces of the humeral head with a cap-like prosthesis without a stem.

**Total Knee Replacement:**
These are used for internal fixation of fractures of the femoral neck and intertrochanteric region. The screw is a large cancellous lag screw that glides freely in a metal sleeve. The sleeve is attached to a side plate that is fixed to the lateral femoral cortex with screws. Shaft of the lag screw slides down the sleeve maintaining reduction of the fracture as compression occurs.

**Dynamic Hip screw:**
These are used for internal fixation of fractures of the femoral neck and intertrochanteric region. The screw is a large cancellous lag screw that glides freely in a metal sleeve. The sleeve is attached to a side plate that is fixed to the lateral femoral cortex with screws. Shaft of the lag screw slides down the sleeve maintaining reduction of the fracture as compression occurs.

**Constrained screw:**
These are used for internal fixation of fractures of the femoral neck and intertrochanteric region. The screw is a large cancellous lag screw that glides freely in a metal sleeve. The sleeve is attached to a side plate that is fixed to the lateral femoral cortex with screws. Shaft of the lag screw slides down the sleeve maintaining reduction of the fracture as compression occurs. It can be used in elderly patients undergoing revision arthroplasty.

**Neuralization plates:**
Are designed for protecting surface fractures from axial loading, bending and rotation. They allow the primary fracture fixation to be accomplished with other devices such as lag screws.

**Total Hip Replacement:**
The damaged femoral head is removed and replaced with a metal stem that is placed into the hollow femur centre. The femoral stem may be either cemented or press fit into the bone. A metal or ceramic ball is placed on the upper part of the stem replacing the removed femoral head. The damaged acetabulum is replaced with a metal socket. Screws or cement are sometimes used to hold the socket in place. A plastic, ceramic, or metal spacer is inserted between the new ball and the socket to allow for a smooth gliding surface.

The image on the left shows a Left shoulder Resurfacing hemiarthroplasty - replacing just the joint surfaces of the humeral head with a cap-like prosthesis without a stem.

**Hip Prosthesis**
A hip hemiarthroplasty involves replacement of the articular surface of the femoral head without surgical alteration to the acetabular articular surface. This may involve replacement of the femoral head and neck (spinal hemiarthroplasty), replacement of the femoral head and neck with an additional acetabular cup that is not attached to the pelvis (polybetal hemiarthroplasty), or replacement of the entire surface of the femoral head (resurfacing hemiarthroplasty).

The image on the left shows a semi constrained knee replacement - including placement of a large central anterior tibial spine that articulates with a rectangular box-like opening between the femoral condyle component. The posterior portion of the box is formed by a transverse metal cam that prevents posterior tibial separation when the knee is in extension.

The image above shows a typical right total knee replacement which involves replacing the articular joint surfaces with highly polished metal ball attached to a stem, and a plastic socket.

The image on the right shows a total knee replacement. The socket and metal ball are attached - a metal tibia is attached to the humerus. This allows the patient to use the deltoid muscle in lieu of the torn rotator cuff to lift the arm.

**Total Knee Replacements**
Total knee replacements (TKR) can be categorized by mechanical stability into:
- Non-constrained
- Semi-constrained
- Constrained or hinged

**Wires**
Wires are used primarily as adjunctive fixation devices for fractures of the long bones. They are used for internal fixation of fractures of the femoral neck and intertrochanteric region. The screw is a large cancellous lag screw that glides freely in a metal sleeve. The sleeve is attached to a side plate that is fixed to the lateral femoral cortex with screws. Shaft of the lag screw slides down the sleeve maintaining reduction of the fracture as compression occurs.

**Kirschner wires:**
Are threaded segments drilled into bone like a drill bit. K wires can be used for either temporary or final stabilization, be placed between bones, or they can be used as an intramedullary device to bridge a fracture of a small tubular bone.

**Radiolucent bone:**
Completely bony fractures of the patella and proximal humerus can occur in a variety of types of prostheses. These prostheses have more inherent stability by virtue of a variety of design techniques.

**Non-constrained or cruciate retaining prostheses:**
These are designed at the PCL and referred to as PCL sparing prostheses. The components are not linked and rely on the patient’s own ligaments and muscles for stability.

**Constrained/hinged prostheses:**
These are used when the knee is highly unstable and the ligaments cannot support the forces of prosthesis, as seen with severely damaged knees. Typically they are used in elderly patients undergoing revision arthroplasty.

**Cortical screws:**
Cortical screws have fine threads along their shanks and are inserted into the cortical bone on both ends. These screws are used in the shaft of the screws inserted into the cortical bone in an attempt to increase compression and to control rotation of the femoral head.