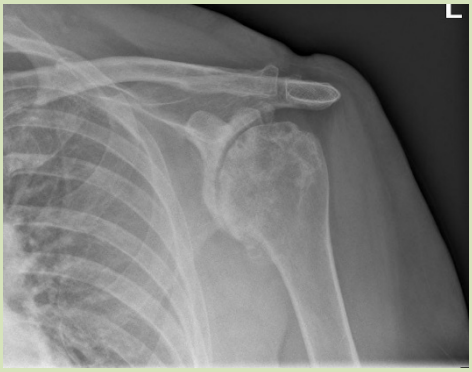
The Shoulder Replacement

A total shoulder arthroplasty (TSA) is a surgery to replace the damaged parts of the "ball and socket" shoulder joint with an artificial prosthesis. The damage to the shoulder can be the result of a number of causes including degenerative joint diseases like arthritis or a traumatic fall:

Causes

ARTHRITIS



- **Osteoarthritis**: this is an age-related form of arthritis, typically occurring in those over 50 years of age. The cartilage between the bones of the shoulder wears away, causing the bones to rub against one another resulting in shoulder pain and stiffness.

- **Rheumatoid Arthritis**: Inflammatory arthritis where the membrane surrounding the shoulder joint is chronically inflamed, causing damage to the cartilage.

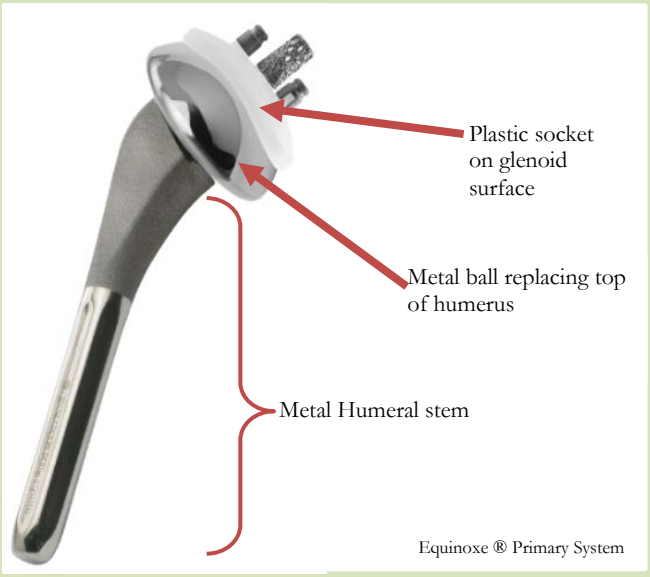
- **Post-traumatic Arthritis**: Can occur after a serious injury to the shoulder joint. A traumatic event may cause a tear or damage to the cartilage that worsens over time to result in limited shoulder function and joint pain.

ANATOMIC TOTAL SHOULDER REPLACEMENT:

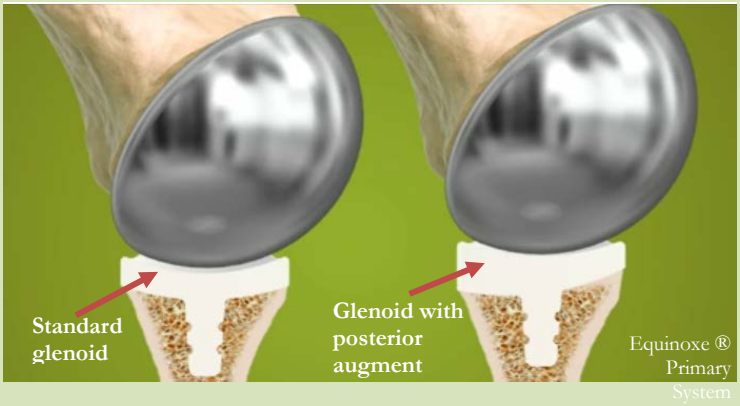
Also known as an Anatomic **Total Shoulder Arthroplasty (TSA)**, this shoulder replacement mirrors the anatomy of the shoulder joint, replacing the top of the humerus bone with a metal ball and stem and the glenoid surface with a plastic socket. Patients with osteoarthritis and those with intact rotator cuff tendons are typically recommended an anatomic TSA.

TSA Components

The orientation of the humeral head can be adjusted by the surgeon with a plate positioned underneath the metal ball implant.



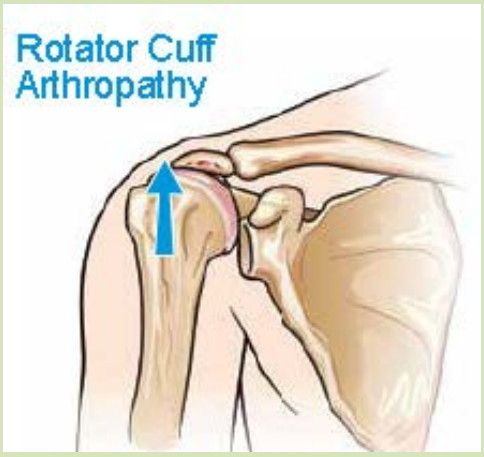
The augment, or angle and shape, of the plastic socket can also vary to correct for different types of wear on the glenoid surface.

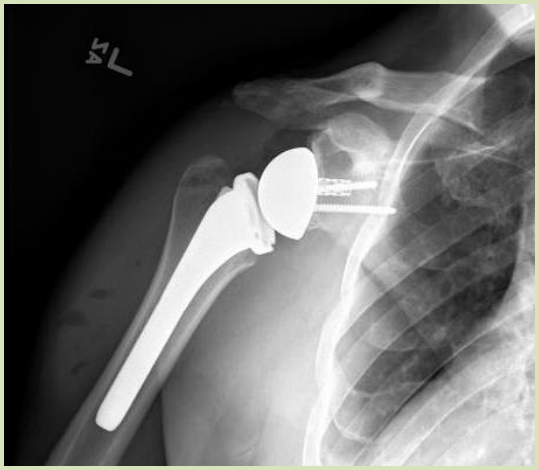


Patients with osteoarthritis and those with intact rotator cuff tendons are typically recommended an anatomic TSA.

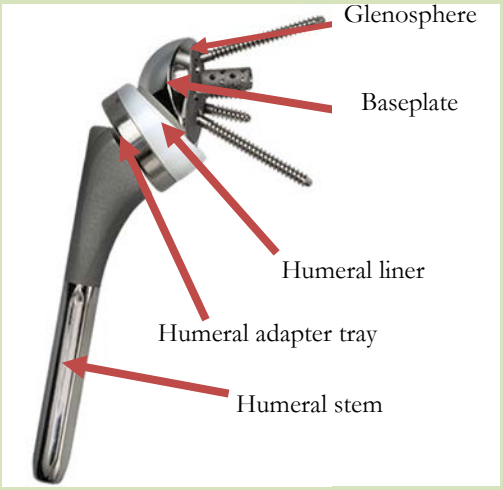
Reverse Total Shoulder Arthroplasty

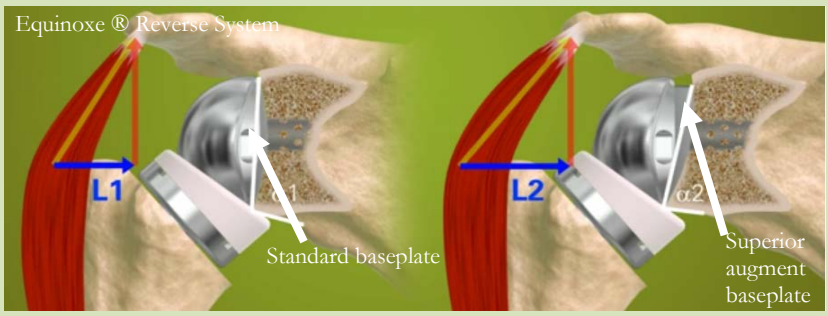
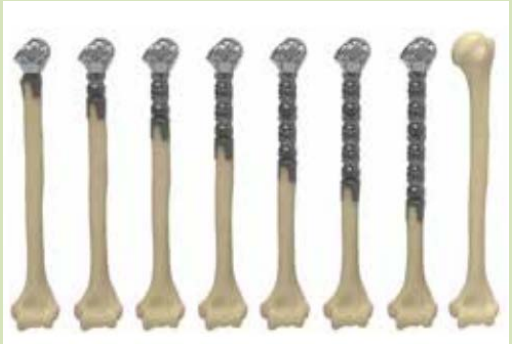
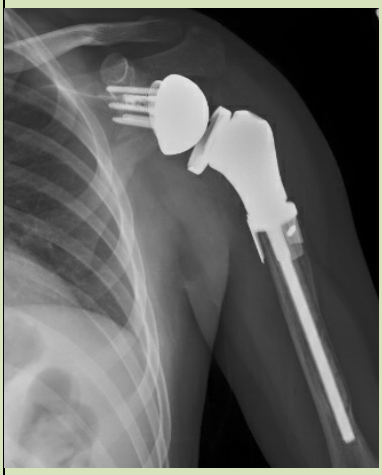
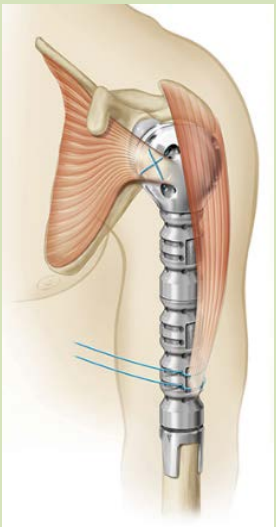
ROTATOR CUFF ARTHROPATHY: May occur following a chronic rotator cuff tear. The changes to the joint from the rotator cuff tear can build up and result in arthritis and destruction of the joint cartilage.





REVERSE TOTAL SHOULDER ARTHROPLASTY A reverse prosthesis is a newer technology that utilizes a "non-anatomic" shoulder replacement in patients who have shoulder arthritis and are without normal rotator cuff muscles and tendons. This means the "ball and socket" are reversed. This prosthesis can also be used as a salvage procedure for failed surgery or in older patients with severe fractures of the proximal humerus (shoulder) that may be beyond surgical repair (due to loss of bone or a large number of fracture pieces).



rTSA components	Different augments of baseplates which sit under the glenosphere, the ball, are also available to correct for bony defects on the glenoid. 
HEMI-ARTHROPLASTY	 Depending on the damage to the shoulder joint, only the humerus may need to be replaced. A hemi-arthroplasty uses similar components to the anatomic TSA, but replaces only the ball of the joint with a metal ball and stem. If the humerus is severely damaged, but the socket is normal this may be the suggested treatment.
Humeral Reconstruction Prosthesis	The humeral reconstruction prosthesis (HRP) can be used for cases with significant humeral bone loss and following removal of bone tumors in humerus. This prosthesis allows for the implementation of a hemiarthroplasty, reverse TSA, or anatomic TSA with a range of heights (as seen to the right) depending on how much of the humeral shaft is replaced.    The segments which comprise the reconstruction prosthesis include numerus suture holes and plasma-coated sites for reattachment of soft tissues such as muscles (as seen to the right).  Post-operative X-ray of an HRP for rTSA and HRP components

FRACTURES	A fracture of the humerus bone may be so severe that it cannot be pieced back together. Additionally, the blood supply to the bone pieces may be compromised. A shoulder replacement surgery may be the only option for fractures of this severity.