

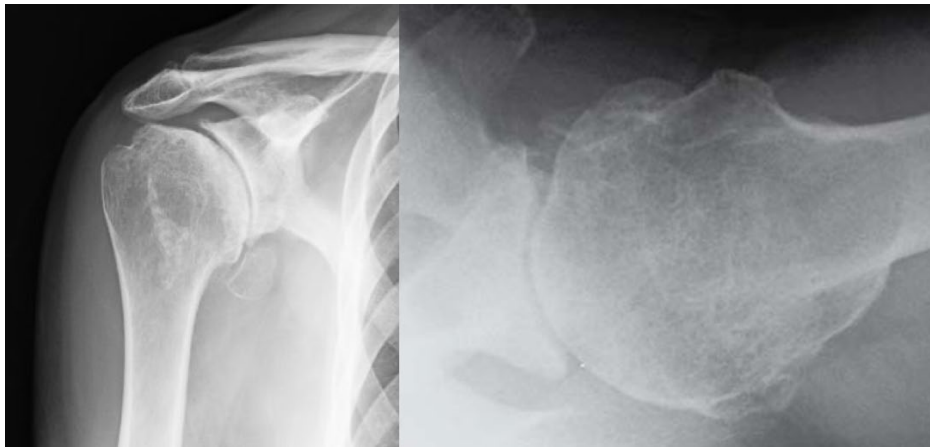
## Shoulder Arthritis

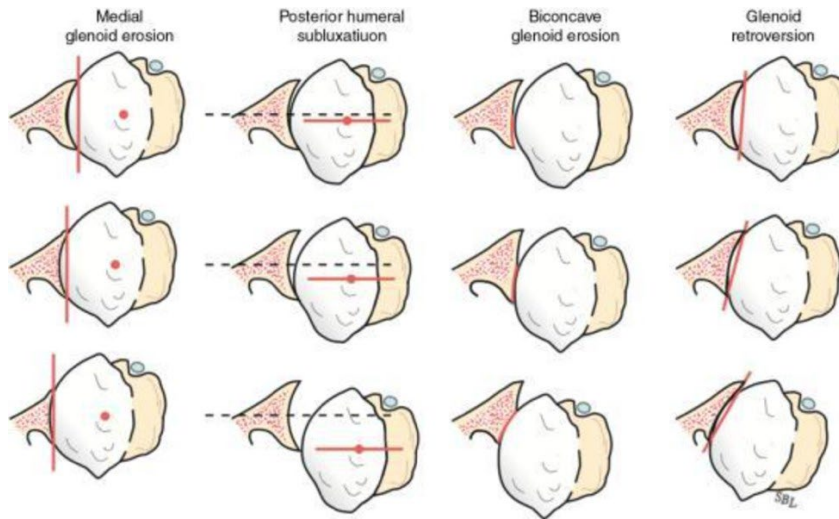
### WHAT IS SHOULDER ARTHRITIS?

There are 2 main types of shoulder arthritis: glenohumeral osteoarthritis and rotator cuff arthropathy. These can be related to wear and tear over time from a patient's occupation, sports/activities, genetics, or prior injuries. Once arthritis has progressed past the mild stage, doing an arthroscopic procedure is unlikely to provide lasting benefit longer than a couple months to years.<sup>5</sup> The level of arthritis will be assessed on physical exam and X-Rays in clinic at every new patient visit.

### WHAT IS GLENOHUMERAL OSTEOARTHRITIS?

Glenohumeral osteoarthritis refers to arthritis of the ball and socket joint in the shoulder. It generally presents with pain, especially at night, limited range of motion of the shoulder, and a cracking/popping sound with movement (called crepitus). X-Rays will show loss of joint space, increased white near the joint space (called subchondral sclerosis), and often a large bone spur underneath the humeral head. When severe, you may also see medial glenoid erosion, posterior humeral subluxation, a biconcave glenoid, or glenoid retroversion (see figure below<sup>7</sup>).

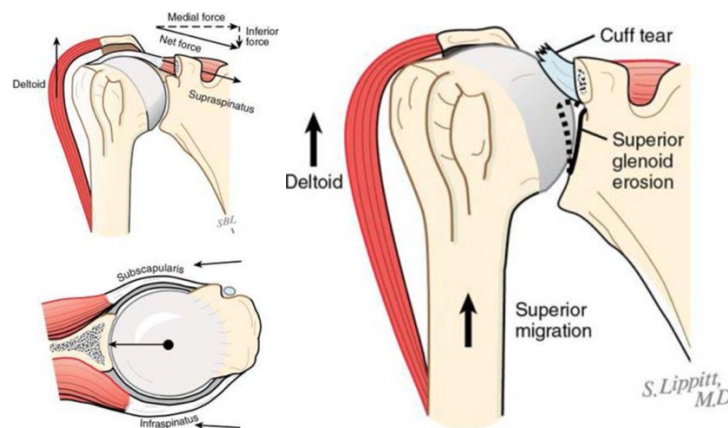




## WHAT IS ROTATOR CUFF ARTHROPATHY?

Rotator cuff arthropathy is a type of shoulder arthritis resulting from a prior, usually chronic, rotator cuff injury. It results in the humerus riding high in the shoulder joint. It presents usually with pain, especially at night, and an inability to lift the arm over a patient's head. Some patients are barely able to move their arm actively at all, called pseudoparalysis.

When the rotator cuff is intact, it functions to compress the humeral head into the glenoid concavity (called concavity compression, figure on left<sup>7</sup>). This is important because the shoulder is inherently an unstable joint. When the rotator cuff has been torn, this concavity compression mechanism is lost and the humerus will move superiorly in the joint (figure on right<sup>7</sup>).



## WHAT ARE THE NON-SURGICAL OPTIONS FOR SHOULDER ARTHRITIS?

The first option for shoulder arthritis is to manage the symptoms with a home exercise program or physical therapy, anti-inflammatory medications, or injections. This home exercise program from the American Academy of Orthopaedic Surgeons is a great home exercise program and highly recommended by Dr. LaPrade for all patients: <https://orthoinfo.aaos.org/en/recovery/rotator-cuff-and-shoulder-conditioning-program/>.

While the arthritis may worsen, for the most part, it does not change the later surgical options if a patient chooses to live with or manage the pain for as long as he/she can tolerate.

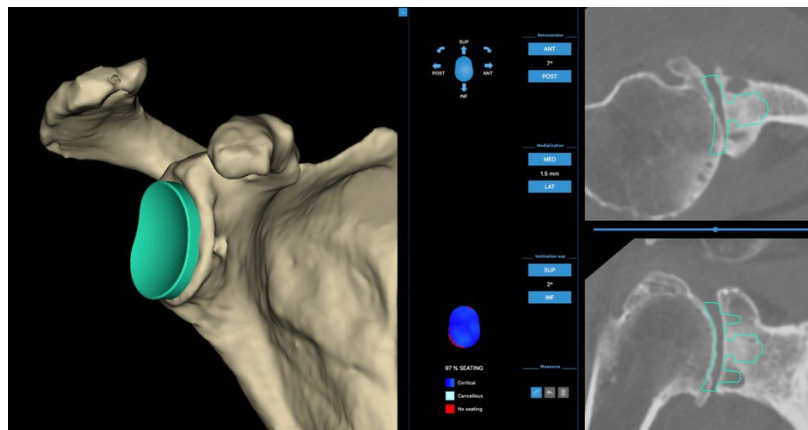
Corticosteroid injections can be effective for a short period of time, but there is evidence that they can increase the risk of infection after an arthroplasty<sup>10</sup> or lead to more opiate use after surgery.<sup>6</sup>

Dr. LaPrade will discuss the risks and benefits of an injection for arthritis and generally will not recommend more than 1 injection, with at least 3 months delay after an injection before proceeding with a shoulder replacement.

## WHAT ARE THE SURGICAL OPTIONS FOR GLENOHUMERAL OSTEOARTHRITIS?

The first option is an anatomic total shoulder arthroplasty. For this, the rotator cuff has to be intact. Also, as noted above, there cannot be too much medial bony erosion or glenoid retroversion or the risk of failure is increased. In order to assess these fully, all patients who are planning to undergo a shoulder replacement will get a preoperative CT scan that allows Dr.

LaPrade to completely plan the surgery before getting into the operating room. This then allows Dr. LaPrade to then recreate this plan in the operating room to give patients the best chance for success.



## WHAT DOES AN ANATOMIC TOTAL SHOULDER SURGERY ENTAIL?

The incision is typically around 10 cm long on the anterior (front) shoulder, and the anterior aspect of the rotator cuff (subscapularis) is released at the beginning of the case, before later reattaching the subscapularis after the replacement has been placed. The worn away cartilage surfaces will be removed and replaced with a plastic piece on the glenoid, with or without a metal central peg, and a metal humeral head, either stemless or with a stem, to recreate the normal ball and socket joint of the shoulder.



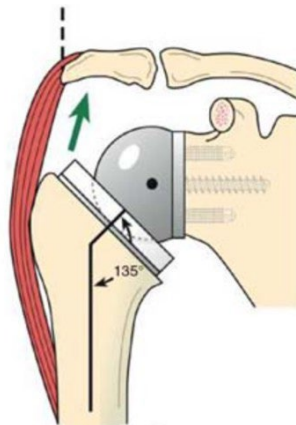
The other option for glenohumeral osteoarthritis is a reverse total shoulder arthroplasty (described more in next section). The advantage of an anatomic replacement versus a reverse is the common belief that for glenohumeral arthritis with an intact rotator cuff, “the best anatomic is better than the best reverse.” This is often thought to be due to a shoulder that feels more normal with an anatomic replacement, as well as reports of improved ROM with an anatomic.<sup>3,9</sup> However, other studies challenge this notion and have reported that top-performing reverses do similarly to anatomics. There is disagreement in the literature regarding the reoperation rate between the 2 types of replacements.<sup>3,8-9,11</sup> Studies have reported that anatomics have high levels of survivorship of 94-97% at 5 years, 85-94% at 10 years, and 73- 83% at 15 years.<sup>1,4</sup>

The most common complication for an anatomic replacement used to be loosening of the glenoid over time, but with improved technology this has now changed to a future rotator cuff tear.<sup>2,8</sup> The other more common complications are stiffness, infection, or subscapularis tendon failure, with nerve or blood vessel injury, later periprosthetic fracture or instability much less common.<sup>7</sup> The importance of supervised physical therapy is essential to prevent stiffness and minimizing the risk of instability or a subscapularis tear.

Given the fact that there is a lack of consensus in the orthopaedic community at this time, Dr. LaPrade will discuss both as options with patients and will involve the patient in decision- making. In his experience, those patients who are highly active (such as golfers) do prefer an anatomic and would likely benefit from this surgery, with the understanding that at some point another procedure could be required in the future.

## WHAT ARE THE SURGICAL OPTIONS FOR ROTATOR CUFF ARTHROPATHY?

Unlike for glenohumeral arthritis, if there is a rotator cuff tear present, an anatomic replacement is not an option. A reverse total shoulder is the only replacement option, and it works because it changes the center of rotation of the shoulder to leverage the deltoid muscle to power the arm in the absence of the rotator cuff. It requires the same incision, release of the subscapularis, and removal of the damaged cartilage surfaces as an anatomic. However, differently than the anatomic, the implants are “reversed” with the ball going on the glenoid side and the socket on the humeral side.



Studies have reported that at 15 years, approximately 70-85% of reverse total shoulders have not required another operation or revision.<sup>7</sup> The main complications are stiffness, dislocation/instability or infection, with nerve or blood vessel injury, later periprosthetic fracture, or acromial stress fractures being much less common. The importance of supervised physical therapy is essential to prevent stiffness and minimizing the risk of instability.

There are many proponents of not repairing the subscapularis after a reverse total shoulder, which allows the rehab to be faster than an anatomic. However, there likely is a role of the subscapularis in preventing dislocation. In Dr. LaPrade’s practice, he will repair the subscapularis if possible and safe, but at times will not repair the subscapularis based on the tissue quality. Also, if a patient actively smokes, he will not repair the subscapularis as well as it is at higher risk of failure.

## WHAT HAPPENS IF I NEED A REVISION TOTAL SHOULDER?

As more and more shoulder replacements are happening worldwide, there are more revisions, or “redo surgeries,” as well. In all cases, whether the original procedure was an anatomic or a revision, the revision procedure almost always involves doing a reverse total shoulder. Each revision is unique and may require a workup to rule out infection or a CT or MRI to plan the operation. Dr. LaPrade will explain the reason and plan for all revision total shoulders in the clinic.

The biggest concern for the need for a revision is for an infection of the original replacement. In this case, the only way to safely defeat the infection is to remove all of the original plastic and metal and treat with a cement spacer and intravenous antibiotics. A second procedure at a later date can be performed with a revision reverse total shoulder once the infection has been safely defeated.

## WHAT IS THE PT PROTOCOL FOR AN ANATOMIC OR REVERSE TOTAL SHOULDER ARTHROPLASTY?

Please see the PT protocols on Dr. LaPrade’s website for each: <https://tcomn.com/physicians/christopher-laprade/>

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