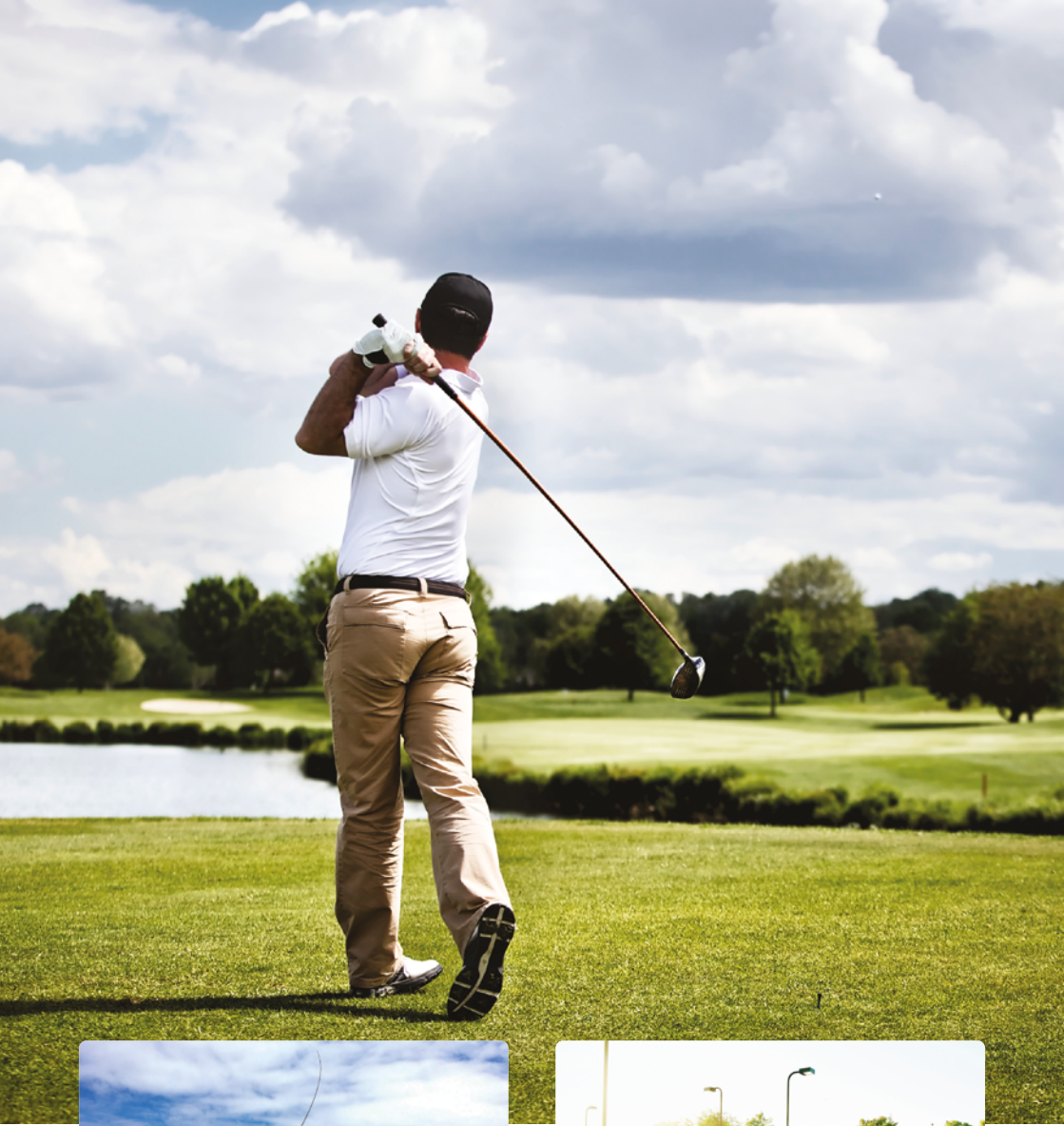


A Patient's Guide to Shoulder Replacement Surgery





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Understanding Your Surgery

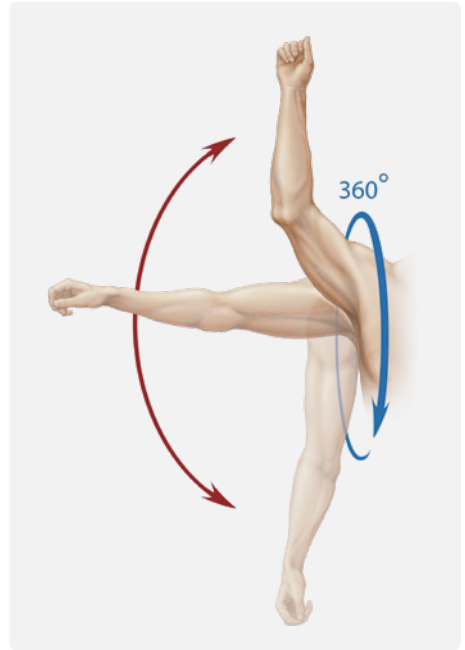
In preparation for shoulder replacement surgery, also known as total shoulder arthroplasty, it is important to understand the normal and healthy anatomy of the shoulder.

The shoulder is composed of 3 bones and a combination of tendons and muscles. The bones of the shoulder are the humerus (upper arm bone), scapula (shoulder blade), and clavicle (collarbone). The main shoulder joint is referred to as a ball-and-socket joint. The head of the upper arm bone forms into a round ball called the humeral head. The humeral head fits into the socket of the shoulder blade, also known as the glenoid, to form the glenohumeral joint.

Another shoulder joint is located where the clavicle meets the tip of the shoulder blade (acromion). This is called the acromio-clavicular (AC) joint.

In a healthy, normal joint, a lubricated layer of articular cartilage protects the bone surfaces and allows for smooth, pain-free movement.

The combination of muscles and tendons surrounding these bones is referred to as the rotator cuff, which provides stability and support. Together, the shoulder joint and rotator cuff allow the shoulder the greatest range of motion of any joint in the body!

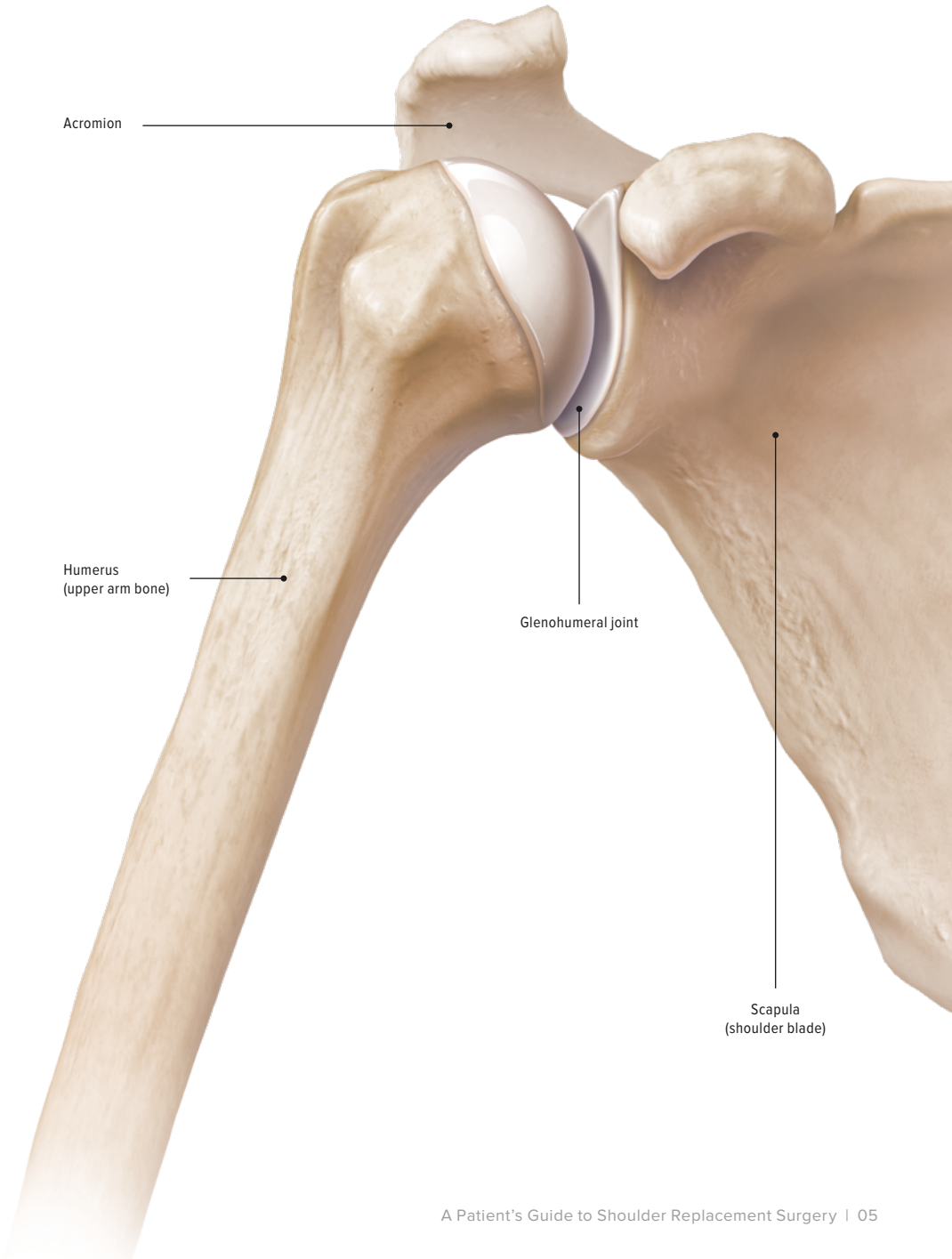


Acromion

Humerus
(upper arm bone)

Glenohumeral joint

Scapula
(shoulder blade)



Who Needs Shoulder Replacement Surgery?

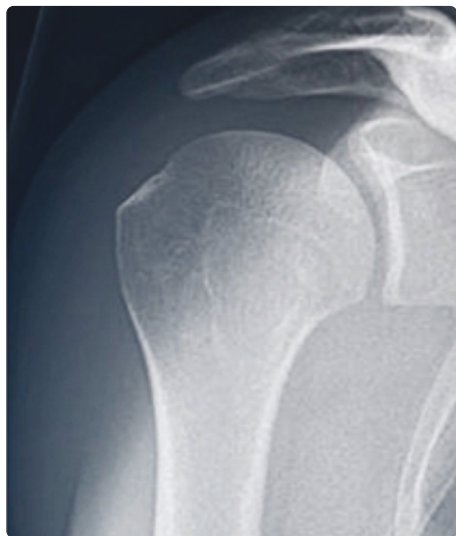
Most patients who undergo shoulder replacement surgery have experienced shoulder pain for a long time, having developed pain that limits daily motion and may even interfere with their sleep. Shoulder stiffness may also have an impact on performing everyday activities. Shoulder replacement aims to alleviate shoulder pain and improve the joint's range of motion.

Total shoulder replacement surgery is often suggested if there is degeneration of the ball-and-socket joint. When the smooth surfaces (cartilage) of the ball and socket become rough, they rub against each other rather than glide.

This rubbing causes pain, stiffness, and swelling. Shoulder replacement surgery may also be appropriate for chronic massive rotator cuff tears or fractures.

Arthritis is inflammation of one or more of your joints and is an informal term referring to joint pain or disease. In a diseased shoulder, inflammation causes pain and stiffness.

Osteoarthritis, rheumatoid arthritis, post-traumatic arthritis, rotator cuff tears (arthropathy), avascular necrosis, and fractures are the most common reasons for shoulder replacement surgery.



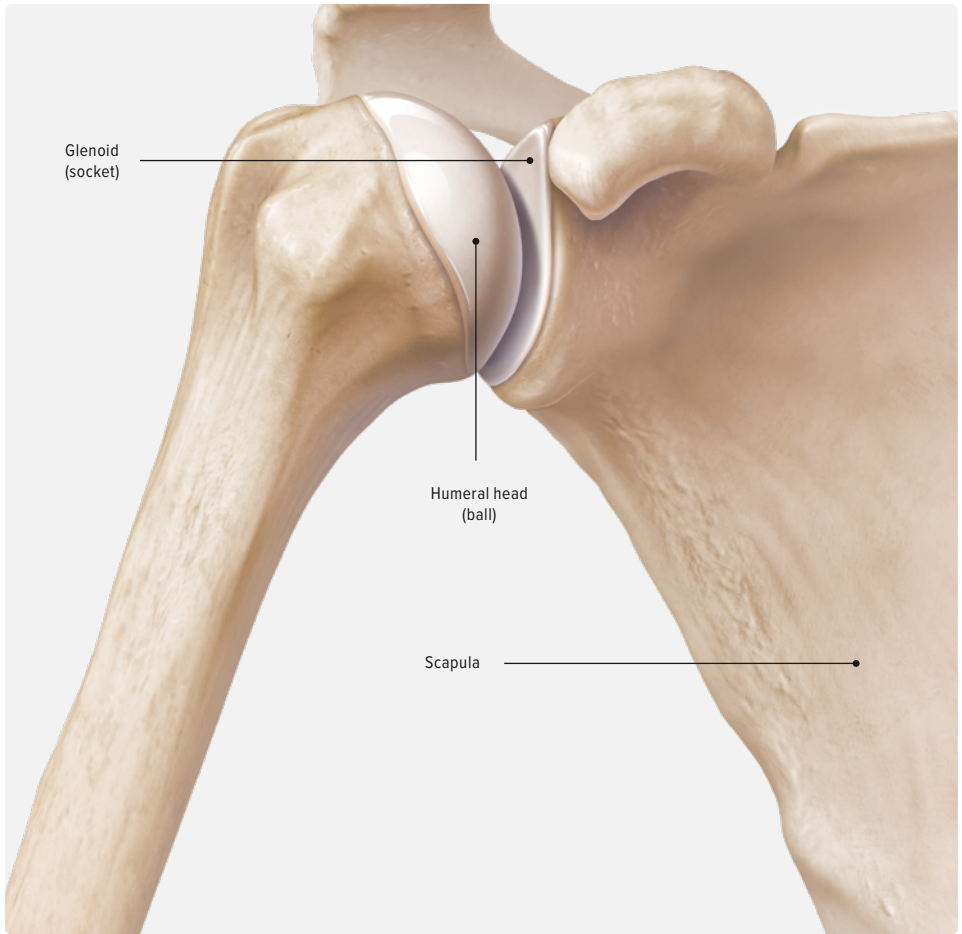
Healthy shoulder



Arthritic shoulder



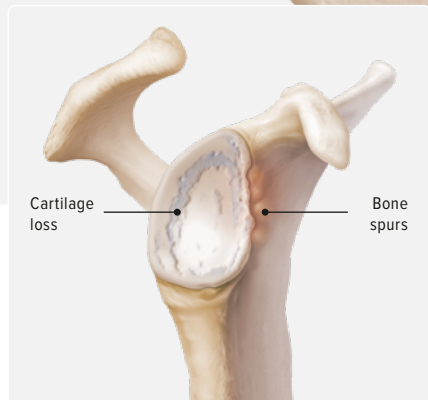
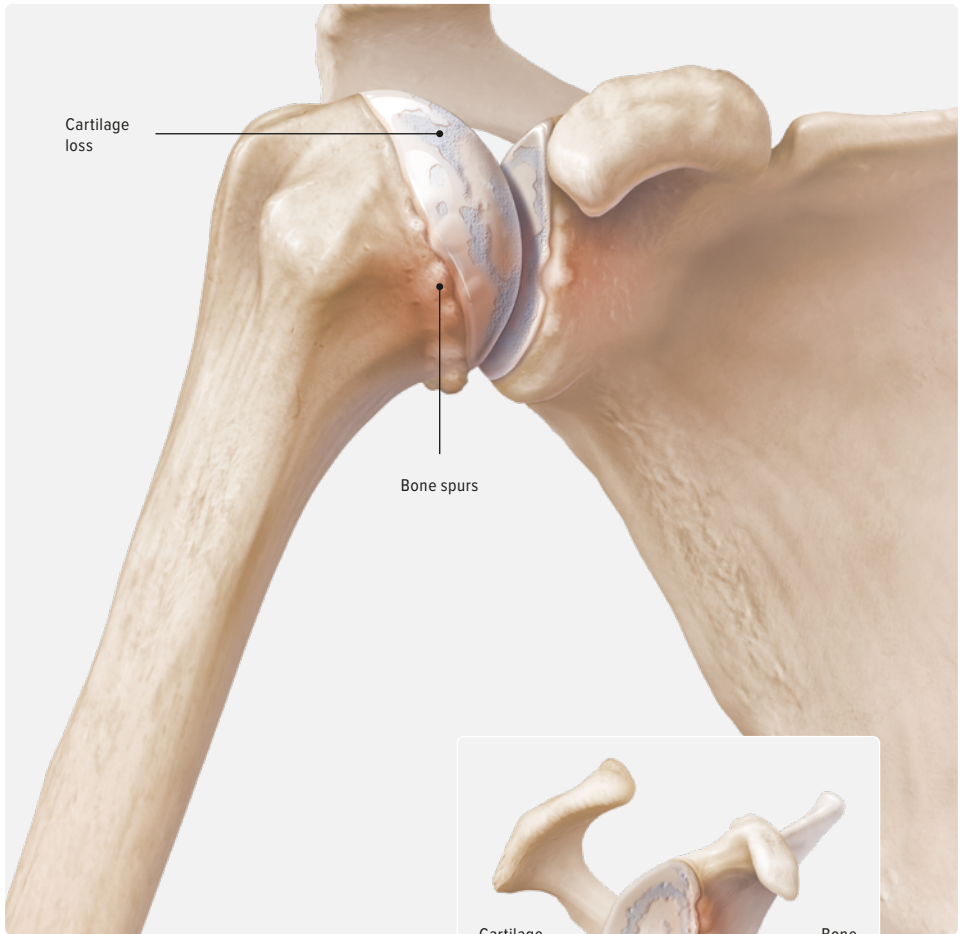
Normal Shoulder Joint



1. Osteoarthritis

Also known as “wear-and-tear” arthritis, osteoarthritis is a condition that destroys the smooth outer covering (articular cartilage) of bone. As the cartilage wears away, it becomes frayed and rough, and the protective space between the bones decreases. During movement, the bones of the joint rub against each other, causing pain.

Degenerated Shoulder Joint



Degenerated shoulder socket

2. Rheumatoid Arthritis

Rheumatoid arthritis (RA) is a chronic disease that attacks multiple joints throughout the body. It is symmetrical, meaning that it usually affects the same joint on both sides of the body.

Rheumatoid arthritis is an autoimmune disease. This means that the immune system attacks its own tissues. In RA, the defenses that protect the body from infection instead damage normal tissue, such as cartilage and ligaments, and soften bone.

3. Post-Traumatic Arthritis

Post-traumatic arthritis is a form of osteoarthritis that can develop after a prior injury, such as a fracture or dislocation of the shoulder.

4. Rotator Cuff Tear Arthropathy

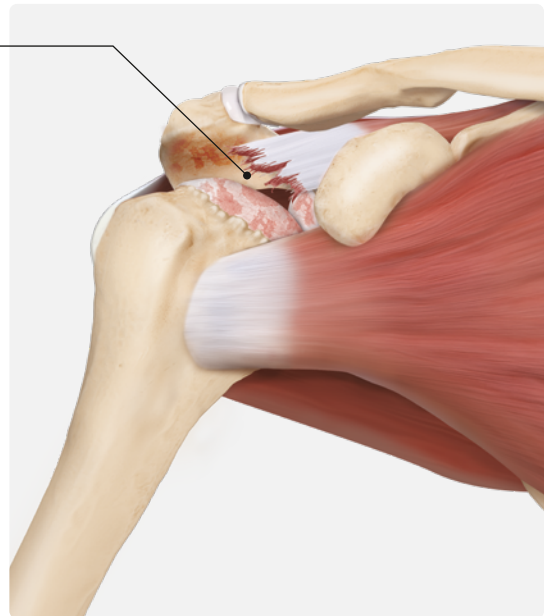
Arthritis can also develop after a large, long-standing rotator cuff tendon tear. The torn rotator cuff can no longer hold the head of the humerus in the glenoid socket, and the humerus can now move upward and rub against the acromion. These abnormal movements can damage the surfaces of the bones, causing arthritis to develop.

The combination of a large rotator cuff tear and advanced arthritis can cause severe pain and weakness, which can lead to not being able to lift the arm from the side. This is known as pseudoparalysis.

5. Avascular Necrosis

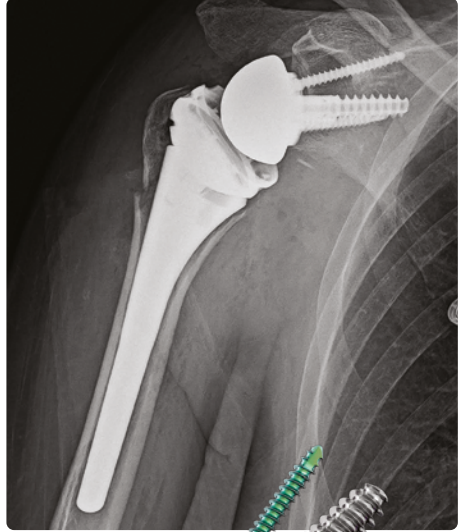
Avascular necrosis (AVN) of the shoulder is a painful condition that occurs when the blood supply to the head of the humerus is disrupted. Bone cells die without blood supply, so AVN can ultimately lead to the destruction of the shoulder joint and arthritis.

Avascular necrosis develops in stages. As it progresses, the dead bone gradually collapses, which damages the cartilage covering bone and leads to arthritis. At first, AVN affects only the head of the humerus, but over time, the collapsed head of the humerus can damage the glenoid socket.





Before



After

6. Fracture

Complex proximal humeral fractures are becoming more common in the older population as we are living longer. In the past, treatment without surgery was usually preferred; however, with newer, safer technology, there are now surgical options that can help restore function and relieve pain.

Reverse total shoulder replacement for fracture has improved the treatment of complex proximal humerus fractures, especially in older patients with bone weakened by osteoporosis.⁴



Anatomic or Reverse?

The purpose of shoulder replacement surgery is to remove the damaged bone and replace it with a shoulder prosthesis (artificial joint). Depending on the condition of your shoulder, your surgeon may decide to perform an anatomic or reverse shoulder replacement surgery to provide better function and relief.

Anatomic Total Shoulder Replacement

With anatomic total shoulder replacement, the damaged ends of the humerus (ball) and glenoid (socket) bones are removed. The bone is then prepared to accept the artificial joint components, which are made of metal (usually a cobalt-chrome or titanium alloy). A stem or cage-screw is placed inside the humerus and a rounded metal component is attached to replace the humeral head.

The new glenoid (socket) component, which is made of special plastic (polyethylene), is cemented into place.

Once the components are positioned, your surgeon confirms the joint is stable and has the potential for good motion after rehabilitation.



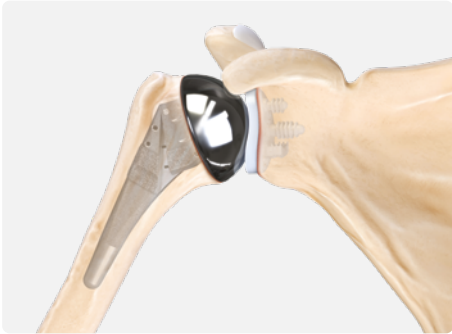
Universal Glenoid convertible baseplate



Univers VaultLock glenoid system



Arthrex Eclipse total shoulder system



Univers Apex OptiFit total shoulder system



Anatomic Shoulder Replacement

Reverse Total Shoulder Replacement

A reverse total shoulder replacement may work better for people with arthritis and an irreparable or deficient rotator cuff, because it relies on different muscles other than the rotator cuff to move the arm.

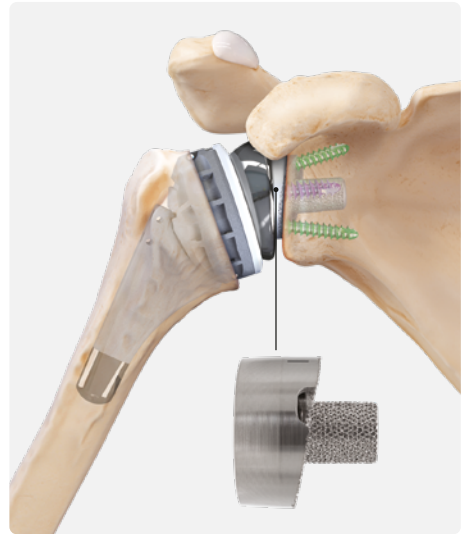
With reverse total shoulder replacement, the ball and socket are switched, meaning that a metal ball is attached to the glenoid and a plastic socket is attached to the upper arm bone (humerus). This is done to maximize shoulder function when shoulder mechanics are compromised.

The ball-shaped glenoid, called the glenosphere, is attached to a metal baseplate that is anchored to the scapula with screws, while the socket becomes the component that is attached to the upper end of the humerus.

In shoulders with severe arthritis, there may be significant bony changes to the glenoid that require an augmented implant, which has a specific angle and thickness to correct the bony deformity to better restore the anatomy, range of motion, and function of the shoulder.



Univers Revers total shoulder system with standard MGS baseplate



Univers Revers Apex total shoulder system with augmented MGS baseplate

There has been a significant **increase in the amount** of reverse procedures over the last few years.⁵



Preparing for Your Shoulder Replacement Surgery

Your surgeon recently recommended shoulder replacement surgery and will help you prepare for optimal outcome and recovery. The resources below provide information about the innovative technology that may be used to carefully plan your individualized procedure. Precision surgical planning with the Virtual Implant Positioning (VIP) system can help you get back to performing everyday activities and living the active, healthy lifestyle you love.

Why do I need a CT scan?

Before surgery, your surgeon may request a computerized tomography (CT) scan to get detailed pictures of your shoulder. CT scans merge detailed x-ray images taken from multiple angles to create unique, cross-sectional images of bones and soft tissues within the body. With the help of an advanced software, the VIP system, these images are “stacked” together to create a three-dimensional image of your shoulder, allowing your surgeon to virtually perform your surgery before you enter the operating room. This process helps ensure that the best implant for your shoulder is selected and placed properly in the optimal orientation and position.

Your virtual surgical plan is then transferred to your procedure with instrumentation settings specific to your shoulder, which helps your surgeon place the implant as accurately as possible to minimize the potential for complications.



A CT scan is taken to get detailed pictures of your shoulder



3D Preoperative Planning



2

Your surgeon's expertise combined with the VIP system may reduce complications like unusual post-operative pain, decreased range of motion, and the potential for long-term implant failure.⁶⁻¹²



3

In the OR, your surgeon uses VIP instrumentation with settings specific to your shoulder to place your preselected implant.

VIP[™]
Virtual Implant Positioning

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ShoulderReplacement.com



Anatomic Shoulder
Replacement



Reverse Shoulder
Replacement



3D Preoperative Planning

Important Patient Information: Arthrex total shoulder replacement (TSA) implants are designed for patients with severe shoulder pain or disability due to joint arthropathy (eg, arthritis). Arthrex anatomic TSA implants are designed for patients with an intact or repairable rotator cuff. Arthrex reverse TSA implants are designed for patients with a damaged, nonfunctioning, and/or irreparable rotator cuff. These implants are intended to help relieve pain and improve shoulder function. You should not receive these implants if: you have an active infection or poor blood supply; have known allergies to implant materials; are unable or unwilling to follow postsurgery care instructions. Possible risks and complications include: infection; allergic reaction to implant materials; nerve, blood vessel, or muscle injury; implant shift or wear over time; joint dislocation or bone fracture; chronic pain or limited shoulder movement; cardiovascular issues; need for additional surgery if complications occur. Implants contain titanium, cobalt-chromium, and nickel. Consult with your doctor if you have known metal allergies and for postsurgery care instructions. The Arthrex VIP[®] System is a set of tools used by your surgeon to plan and guide shoulder replacement surgery. The system includes: an instrument to guide implant placement and a software component to create a presurgical plan based on a 3-dimensional virtual model of your shoulder made using your CT scan. Possible risks and limitations: the system is a planning tool and not a guarantee of surgical success; the system is not compatible with MRI scans; if the planned implant position is not suitable during surgery, your surgeon may adjust using standard tools.

The information contained in this brochure is not medical advice and is not meant to be a substitute for the advice provided by a surgeon or other qualified medical professional on the use of these products. You should talk with your physician or health care provider for more information about your health condition and whether Arthrex products might be appropriate for you. The surgeon who performs any surgical procedure is responsible for determining and using the appropriate techniques for surgical procedures on each individual patient. Arthrex recommends that surgeons be trained on the use of any particular product before using it in surgery. A surgeon must always rely on their own professional medical judgment when deciding whether to use a particular product when treating a particular patient. A surgeon must always refer to the package insert, product label, and/or directions for use before using any Arthrex product. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes. Products may not be available in all markets because product availability is subject to the regulatory approvals and medical practices in individual markets. Please contact Arthrex if you have questions about the availability of products in your area.