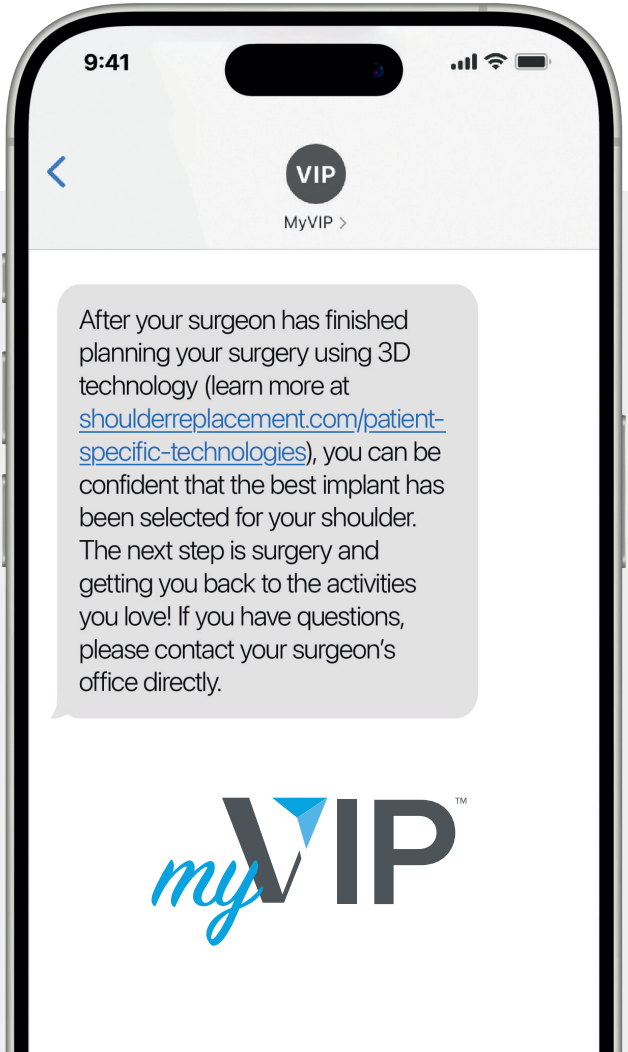
# A Patient's Guide to Shoulder Replacement Surgery

Arthrex®

Welcome to A Patient's Guide to Shoulder Replacement Surgery.

**Our goal is to provide you with educational materials to make your surgery a positive experience.**

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Scan the QR code below with your smartphone or text "SHOULDER" to 762-795-0885.

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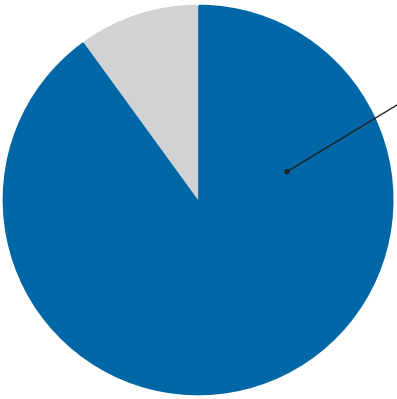
# Overview

Total shoulder replacement is regarded as a highly successful procedure that aims to reduce pain and restore mobility in patients with end-stage shoulder arthritis, and, in some cases, after a severe shoulder fracture.

The purpose of the procedure is to eliminate the source of pain and dysfunction by replacing the damaged parts of the shoulder joint with artificial components called prostheses.

One year after surgery, 90% of patients have pain-free function, enabling them to exercise the shoulder to restore strength and motion.[1]

**Over 200,000 shoulder replacement surgeries are performed annually**,[2] helping patients attain improved strength, increased range of motion, and the ability to use their shoulders and arms again. With modern advancements in surgical implants, less invasive techniques, and innovative preoperative planning capabilities, surgeons worldwide are helping people return to their everyday activities and live the active, healthy lifestyles they love. Most patients are able to return to playing golf, tennis, swimming, yoga, and other activities they previously avoided because of shoulder pain.[3]



More than **90%**

of patients who undergo total shoulder replacement return to athletics[3]

- Swimming
- Tennis
- Golf
- Fitness Training
- Recreational Activities

## Understanding Your Surgery

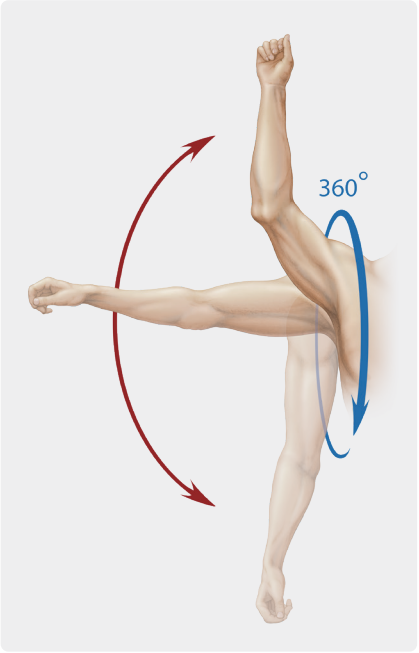
In preparation for shoulder replacement surgery, also known as total shoulder arthroplasty, it is important to understand the normal and healthy anatomy of the shoulder.

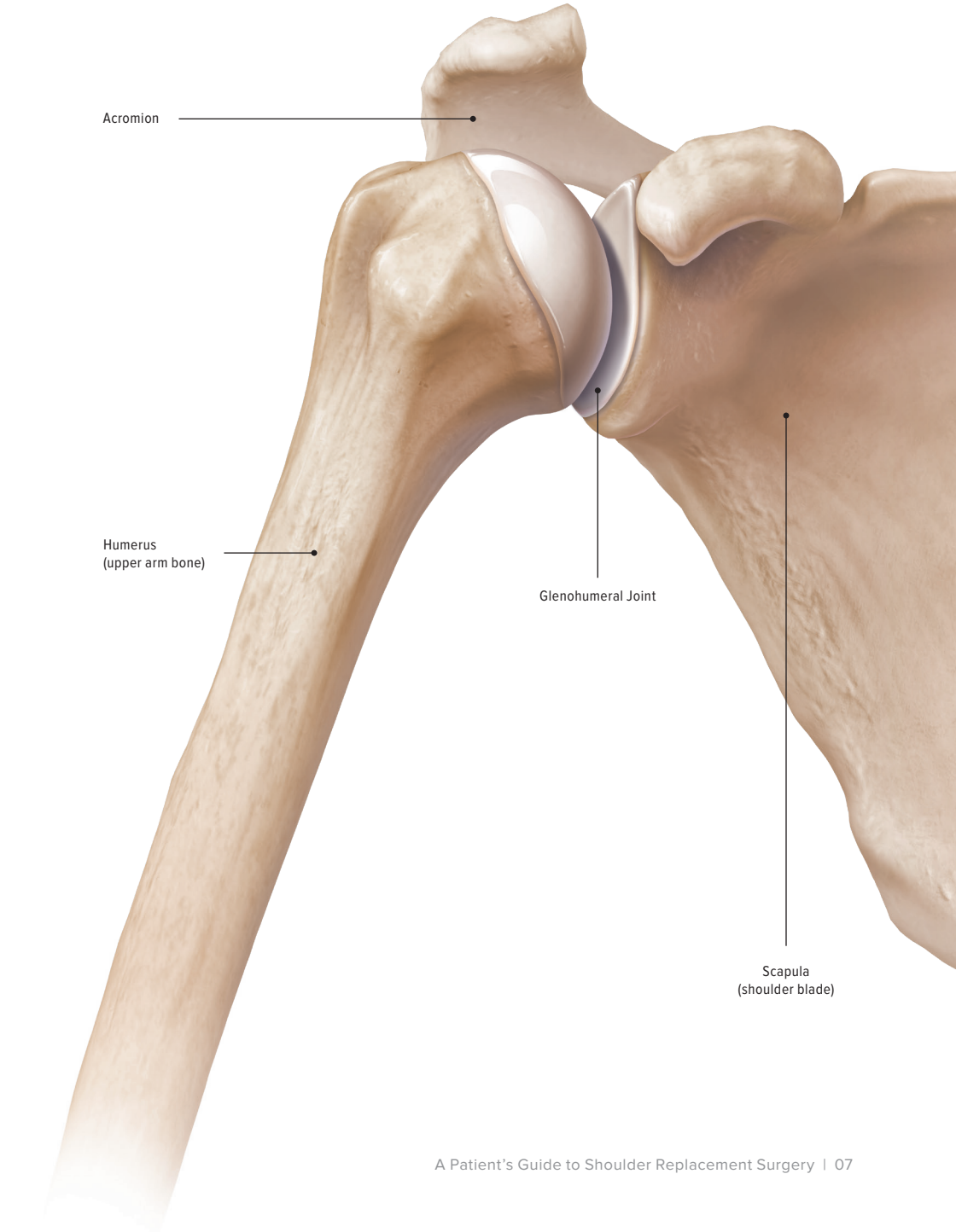
The shoulder is composed of three bones and a combination of tendons and muscles. The bones of the shoulder are the humerus (upper arm bone), scapula (shoulder blade), and clavicle (collarbone). The main shoulder joint is referred to as a ball-and-socket joint. The head of the upper arm bone forms into 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 acromioclavicular (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.

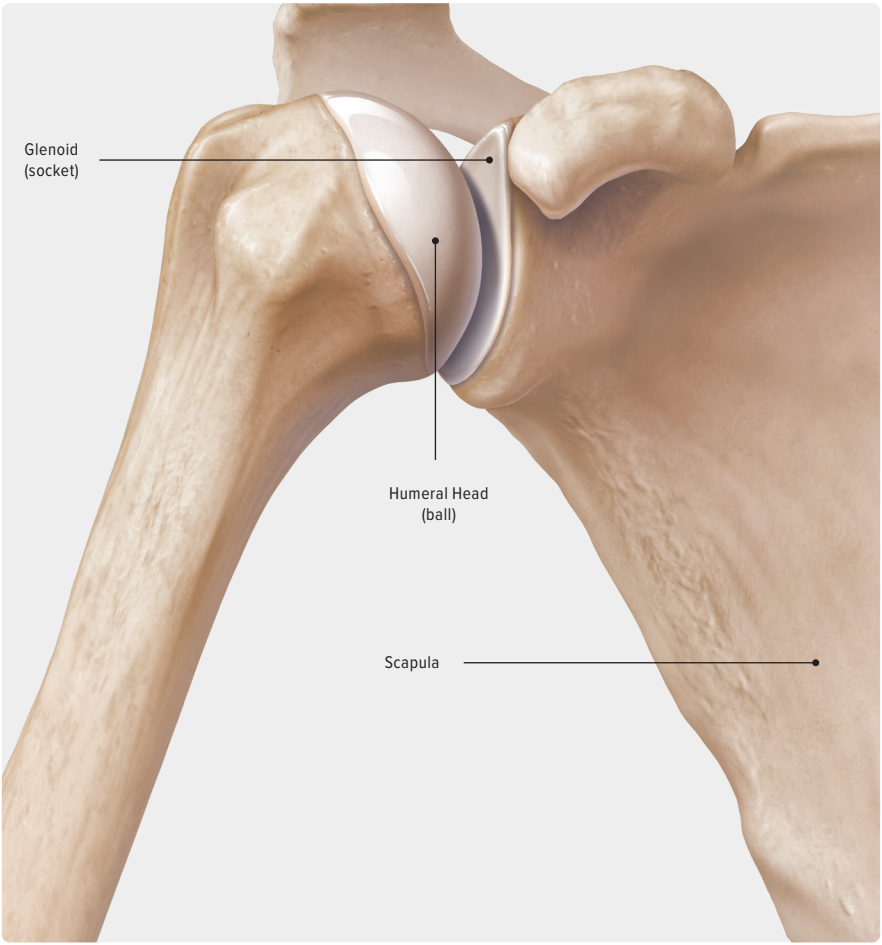
Arthritis is inflammation of one or more of your joints and is an informal term referring to joint pain or disease. In a diseased shoulder, inflammation causes pain and stiffness.

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

Healthy shoulder

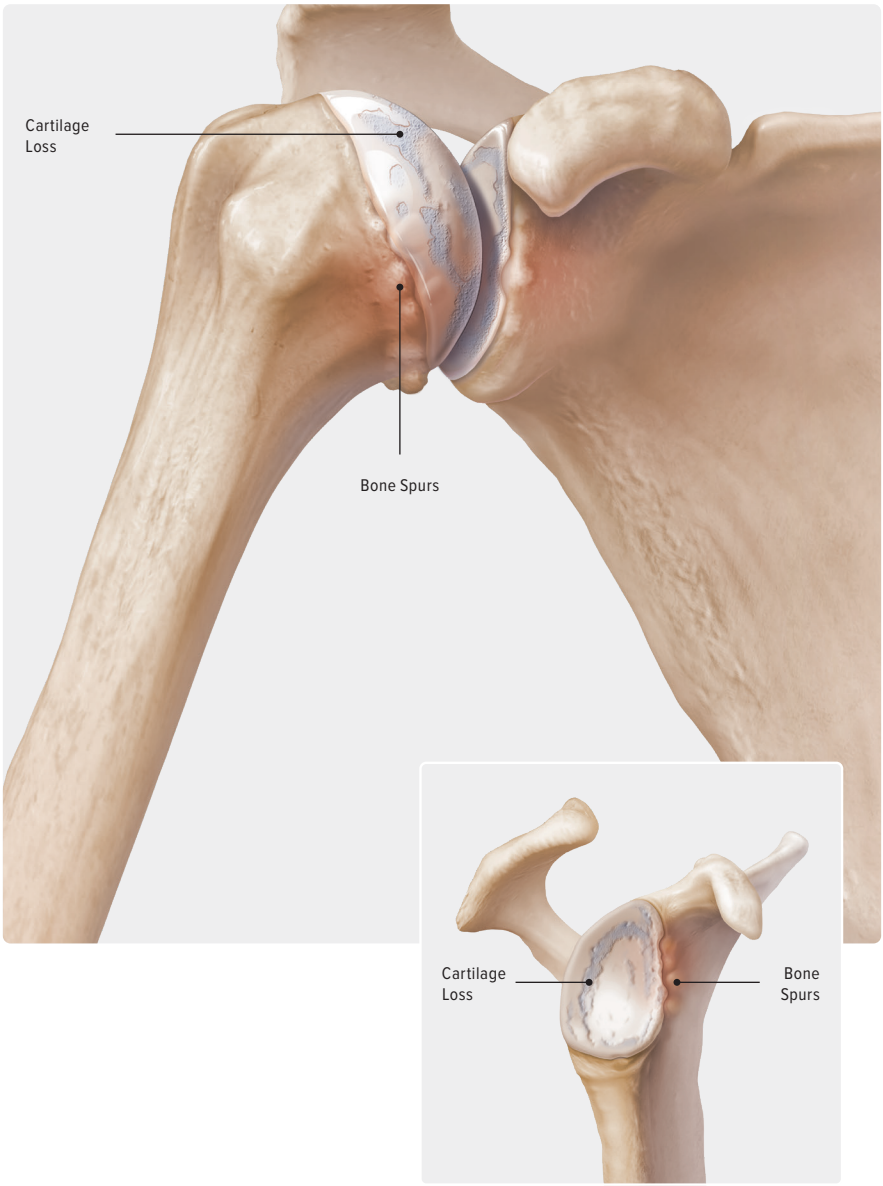
Arthritic shoulder

## 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.

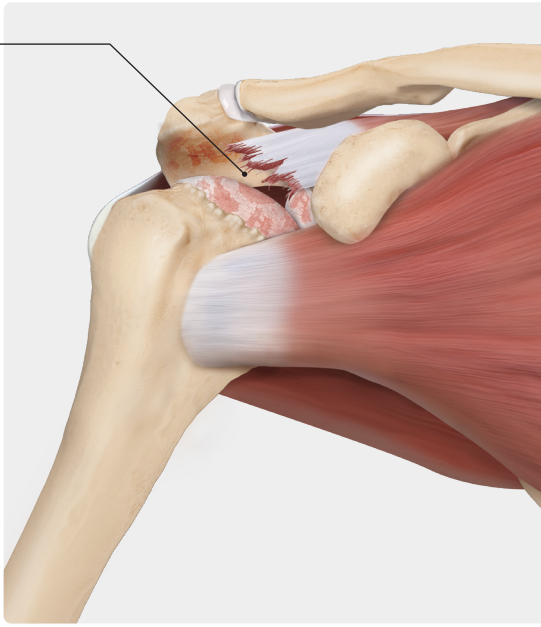
3. **Post-traumatic Arthritis**
   Post-traumatic arthritis is a form of osteoarthritis that can develop after a prior injury, such as a fracture or dislocation of the shoulder.

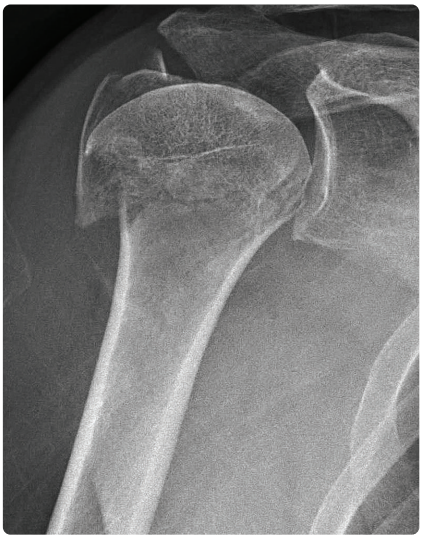
4. **Rotator Cuff Tear Arthropathy**
   Arthritis can also develop after a large, long-standing rotator cuff tendon tear. The torn rotator cuff can no longer hold the head of the humerus in the glenoid socket, and the humerus can now move upward and rub against the acromion. These abnormal movements 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 at 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 the bone and leads to arthritis. At first, AVN affects only the head of the humerus, but as it progresses, 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. Non-operative management used to be the preferred treatment; however, with the advent of newer, safer technology, surgical interventions to help restore function and provide pain relief now exist.

   Reverse total shoulder replacement for fracture has improved the treatment of complex proximal humerus fractures, especially in older patients with osteoporotic bone.[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

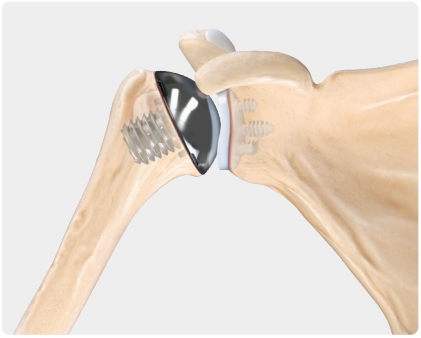
With anatomic total shoulder replacement, the damaged ends of the humerus (ball) and glenoid (socket) bones are removed. The bone is then prepared to accept the artificial joint components, which are made of metal (usually a cobalt-chrome or titanium alloy). A stem or cage-screw is placed inside the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

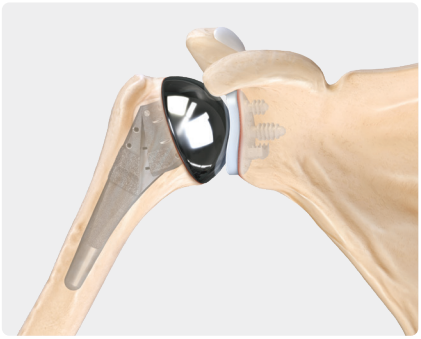
Once the components are in place, your surgeon confirms the joint is stable and has the potential for good motion after rehabilitation.

Universal Glenoid™ convertible baseplate

Univers VaultLock® glenoid system



Eclipse™ total shoulder system



Univers Apex OptiFit™ total shoulder system



Anatomic Shoulder Replacement

## Reverse Total Shoulder Replacement

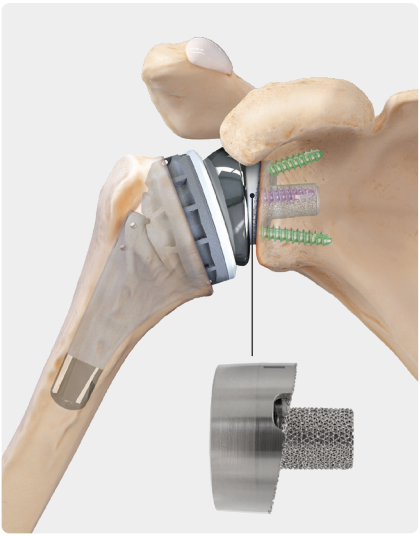
A reverse total shoulder replacement may work better for people with arthritis and an irrepairable or deficient rotator cuff, because it relies on different muscles other than the rotator cuff to move the arm.

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]

Reverse Shoulder Replacement

# Preparing for Your Shoulder Replacement Surgery

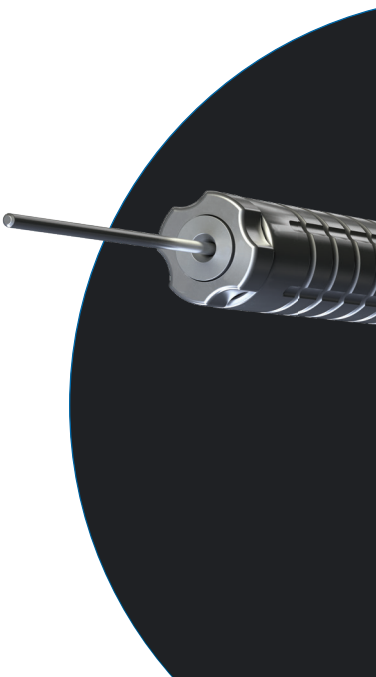
Your surgeon recently recommended shoulder replacement surgery and will help you prepare for optimal outcome and recovery. The resources below provide information about the innovative technology that may be used to carefully plan your individualized procedure. Precision surgical planning with the Virtual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


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

**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.

3D Preoperative Planning




2

Your surgeon's expertise combined with the VIP™ system may reduce complications like unusual postoperative 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.

## Preparation: Preoperative Questions and Education

Taking the appropriate time to research and learn about other patients' experiences may help you better prepare for surgery and alleviate stress. Remember, you are not alone. Many people are apprehensive and delay shoulder replacement surgery. Often, these are the patients who gain the most relief following their procedures.

Visit ShoulderReplacement.com, where you'll find testimonials from patients who took similar action to regain their quality of life!

Scan to visit
**ShoulderReplacement.com**

1. Open camera phone
2. Center QR code in viewfinder
3. Click the link

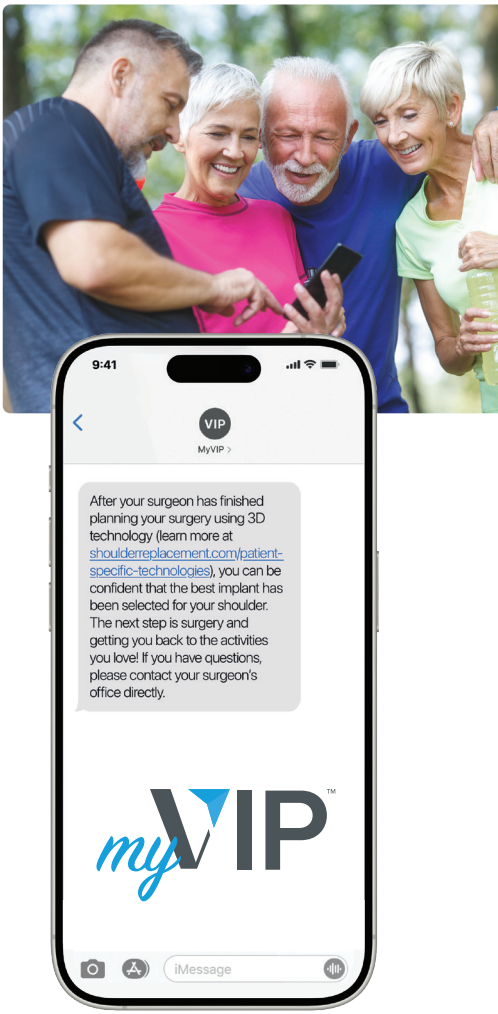
If your surgeon is using preoperative planning for your procedure, many tools and services are available to enhance your surgical experience. The MyVIP™ platform is a preoperative texting experience that sends you meaningful information about the prostheses being used and how your surgeon is using the VIP™ system to 3D plan your surgery. You'll also receive helpful tips on how to best prepare for your surgery. If your surgeon is using the VIP platform to plan your case, you can ask to be enrolled in the MyVIP program to receive texts leading up to your surgery. Or, if you already know your surgery date, follow the instructions on page 2 to enroll today!

The following information should also be discussed between you and your surgeon in preparation for your surgery. You may want to talk about the following topics:

- Preoperative education about the surgical procedure
- Surgical risks
- Allergies to medications or device materials, including certain metals
- Preparation for surgery
- What to bring to the hospital
- Discharge planning
- Home preparation for after surgery

Your doctor's office will provide you with the information to schedule any required tests, which may include:

- Blood tests
- Urinalysis
- EKG and chest x-ray or CT scan
- Medical clearance from an internist/family or specialty physician




*Please be aware that surgery and recovery protocol may vary and any questions pertaining to the surgical procedure or postoperative protocol should be discussed with your surgeon.

Patient-Specific Guide

## Leading Up to Your Surgery

If there is any change in your physical condition, such as a fever, flu, diarrhea, rash, or cold, please call your primary care physician and your surgeon's staff as soon as possible.

**In Preparation for Your Surgical Day**

- Bathe or shower the night before or the morning of your surgery. Your surgeon may require you to use a special wash that is available without a prescription to help prevent infection.
- In most cases, fast after midnight the night before and arrive at the hospital/surgery center 2 hours before your surgery.
- Please bring a form of photo identification (eg, driver's license) and insurance cards to present to registration and the patient admission department.
- Speak to the hospital, nursing, and preoperative staff about any concerns.
- Discuss anesthesia options, previous surgeries, and adverse/allergic reactions to anesthesia and pain control with your surgeon and anesthesiologist.

**Immediately After Surgery**

- You will be woken up and brought to the recovery room/post-anesthesia care unit (PACU).
- Your arm will be immobilized in a sling.
- You may experience some temporary pain from surgery, which is typical.
- You will remain in the recovery room for 1-2 hours. Then, depending on the plan that was discussed preoperatively with your surgeon, you may be discharged home or brought to your hospital room.

## Postoperative Care

The postoperative regimen prescribed by your surgeon should be strictly followed to avoid adverse stresses applied to the implants. Detailed instructions on the use and limitations of your implanted devices should be discussed with your surgeon.

**Physical Therapy:** Discuss your daily activity and physical therapy with your treating physician.

**Discharge Planning:** Your surgeon should share the plan before you go to the hospital for surgery. Some patients may go home the same day, while others may stay overnight.

**Restrictions/Precautions:** Ask your surgeon what your restrictions are following a shoulder replacement. Your surgeon will provide you with detailed instructions and limitations of the device and will prescribe a postoperative regimen, to which you should strictly adhere. Keep in mind that there may be limitations to daily activities such as exercising, bathing, sexual activity, and driving for a certain period. Most importantly, do not let anyone (family members, etc) force your arm into uncomfortable positions.

**Sling/Immobilizer:** During the initial postoperative period, do not use your arm to pull and/or push yourself out of bed or out of a chair. It is necessary to wear a sling or arm immobilizer to protect your shoulder from any unexpected movements unless indicated otherwise by your surgeon. Wearing the sling also alerts others around you to be cautious and avoid accidentally striking your arm. Your surgeon will notify you when you can discontinue the use of the sling and, until such time, the sling should only be removed for monitored therapeutic exercises and bathing.

**Returning to Work:** Returning to work depends on the demands of your work responsibilities and therefore should be discussed thoroughly with your surgeon.

**Medications:** You will be provided with a prescription for pain medication. If you have problems with your medication or you run out of medication, please call your surgeon's office.

**Infection Prevention and Incision Care:** Follow your physician's instructions regarding dressings or wound care. Please check your wound every day to prevent infection. Signs may include redness, swelling, increased pain, drainage, fever greater than 100.4 °F or warmth, especially outside of the dressing. Contact your surgeon's office immediately if you develop any of these symptoms. Do not scratch, cleanse, or apply any creams, lotions, or other treatments to the incision until you have seen your surgeon in the office. Typically, your sutures will be removed in the office 7-10 days after your surgical procedure.

# Example Follow-up Visits

Your doctor will see you periodically to check x-rays, examine your wound, monitor physical therapy, and discuss your daily activities. While evaluations may vary by doctor, below are some examples of what might occur during each visit.

**1- to 2-week evaluation:**

- X-rays
- Check the site of surgery
- Review exercise program progress
- Evaluate comfort level

**6-week evaluation:**

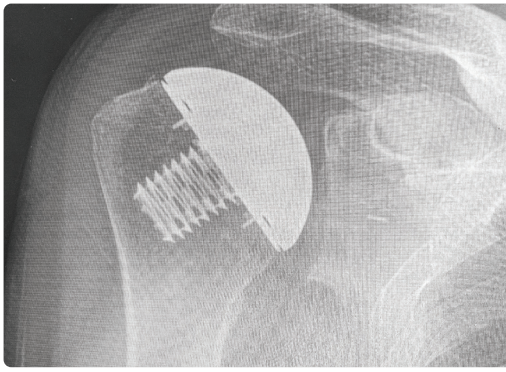
- Check the site of surgery
- Check range of motion
- Review ability to begin a strengthening program
- Evaluate ability to perform activities of daily living and personal care
- Discuss return-to-work responsibilities
- No weightbearing activities unless directed by your surgeon

**12-week (3-month) evaluation:**

- Check range of motion
- Review strengthening program progress
- Evaluate activities of daily living and personal care progress
- Discuss return-to-work responsibilities

**Annual Checkup**

Your surgeon may choose to reevaluate you and your shoulder replacement on an annual basis to reexamine your shoulder, check your range of motion and strength, as well as obtain new radiographs (x-rays) to look at the relationship between the shoulder prosthesis (replacement) and the bones. Follow-up examinations are important to provide you with important information regarding your shoulder replacement and to monitor your recovery.



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# Notes

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.



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