



UNIVERSITY  
of MARYLAND

ORTHOPAEDICS



## Shoulder Replacement

## Treatment Guide

### Overview

The shoulder is the body's most mobile joint, able — when healthy — to rotate a full 360 degrees. It moves your arm both up and down and back and forth, helping accomplish everyday tasks ranging from reaching into cabinets to combing your hair to lifting groceries.

This ball-and-socket joint is normally stable. But sometimes, it can become damaged or diseased by osteoarthritis, or damaged by rotator cuff tears or other injuries. These conditions can cause significant pain and stiffness, disturbing sleep and severely limiting range of motion.

Total shoulder replacement surgery, also known as total shoulder arthroplasty, removes the damaged or diseased parts of the shoulder joint, replacing them with new, prosthetic parts. In reverse total shoulder arthroplasty — typically performed for large rotator cuff tears — the ball and socket prosthetic is reversed.

Board-certified faculty physicians from University of Maryland School of Medicine and University of Maryland Orthopaedics, use state-of-the-art diagnostics and advanced surgical techniques to perform approximately 400 total shoulder replacements each year, among the highest volumes of this type of surgery in Maryland. They also participate in, and have access to, the latest research and treatment options for shoulder care.

This guide will help you understand more about the causes of shoulder damage, treatment options (including reverse total shoulder replacement), recovery after shoulder surgery, current University of Maryland research guiding the future of shoulder care, and the specialized, multidisciplinary team who will help restore comfort and function to your shoulder.

To learn more or to contact one of our qualified surgeons, visit

**[umortho.org](http://umortho.org)**

or call

**410-448-6400.**

## Shoulder Anatomy

The shoulder is a ball-and-socket joint. The bones of the shoulder consist of the upper arm bone (humerus), shoulder blade (scapula), and collarbone (clavicle). The head of the humerus fits into the shoulder socket, or glenoid, and is held there by the rotator cuff, a group of four muscles coming together as tendons to form a covering around the head of the humerus.



## What Causes Shoulder Damage and Disease?

Some of the most common causes of shoulder damage and disease are:

**Osteoarthritis:** Also known as degenerative joint disease, degenerative arthritis or “wear and tear” arthritis, osteoarthritis is the most common form of arthritis, especially in those over age 65. In healthy joints, a firm, rubbery material called cartilage covers the end of each bone, cushioning and providing a smooth surface for the joints to move on. But in osteoarthritis, cartilage gradually wears away, resulting in pain, swelling and stiffness. Bits of bone and cartilage may eventually break off, or tiny new pieces of bone — called bone spurs — may develop. In worst cases, the cartilage wears away completely, causing bones to rub on other bones and triggering joint damage and severe pain. Osteoarthritis can occur in any joint in the body, and the shoulder is one of the most common joints to be affected.

**Rotator Cuff Tears:** Rotator cuff tears involve a tear in the tissue connecting muscle to the head of the humerus bone in the shoulder joint. They can become

very large and no longer repairable. The injury can develop into rotator cuff arthropathy, which is arthritis of the shoulder joint. Rotator cuff tears are very common, especially among people over 65. They may result from an acute injury, such as a fall, or happen gradually because of age-related degeneration of the tendons or ligaments, with the tears growing larger as time passes. Patients with rotator cuff arthropathy have significant loss of function of the affected shoulder and often are unable to lift their arm even to shoulder height. This inability to lift the arm to even shoulder height is called pseudo-paralysis of the shoulder.

**Fractures:** Shoulder fractures commonly involve the collarbone (clavicle), top of the arm bone (proximal humerus) and shoulder blade (scapula). The most common causes of shoulder fractures are falls or trauma, such as car accidents.

## Non-Surgical Treatment Options

In some cases, non-surgical treatments such as activity changes, medication, cortisone injections or physical therapy can provide relief from shoulder pain.

**Activity Changes:** Minimizing activities that aggravate the condition, such as excessive lifting or reaching, avoiding certain exercises and making ergonomic changes in the workplace.

**Medication:** Acetaminophen (Tylenol) or NSAIDs (non-steroidal anti-inflammatory drugs) such as ibuprofen or naproxen are over-the-counter pain relievers that can reduce mild arthritis pain and reduce inflammation in joints. Other NSAIDs are available by prescription. These medications can cause side effects and interact with other medications. Be sure to discuss potential side effects and drug interactions with your doctor.

**Cortisone Injections:** Cortisone, a powerful anti-inflammatory medication, can be injected into diseased or damaged shoulder joints to temporarily reduce pain and inflammation. Injections can be given every few months. You should not have an injection within three months of surgery, and within six months of a joint replacement because it increases the risk of an infection.

**Physical Therapy:** Gentle stretching and strengthening exercises prescribed by a doctor or physical therapist can lessen pain. But exercises must be done with caution, as they can also aggravate shoulder pain and stiffness.

If non-surgical treatments do not provide relief or improve shoulder function, shoulder replacement surgery is a highly effective option for many patients.

### Surgical Treatment Options

With severe osteoarthritis or rotator cuff tears, chronic pain and limited mobility can make it difficult or even impossible to sleep or lift your arms effectively. In these cases, total shoulder replacement or reverse total shoulder replacement can dramatically improve your quality of life. Patients who have experienced shoulder fractures or other traumatic shoulder injuries may also benefit from shoulder joint replacement.

### Physical Examination and Imaging

Before surgery, our orthopaedic surgeons will evaluate the motion, stability and strength of the shoulder through physical examinations and imaging tests. During the physical exam, they look for tenderness around the joint; range of passive (assisted) and active (self-directed) motion; pain when pressure is applied on the joint; and signs of injury to the bones, muscles and tendons around the shoulder. They also ask extensive questions about how the diseased or damaged shoulder impacts your quality of life.

X-rays of the shoulder are used to assess the degree of arthritis, bone loss or destruction of the joint, as well as the formation of bone spurs (osteophytes). MRI and or CT scans are typically used to evaluate the condition of the shoulder joint and surrounding soft tissues.

### Surgery

During total shoulder replacement, University of Maryland surgeons remove the damaged bone and cartilage and replace it with prosthetic components made of metal and plastic.

- Under regional or general anesthesia, the shoulder area is surgically approached through a 4 to 6-inch incision on the front of the shoulder.
- After dividing only one muscle, the diseased joint is entered. The damaged bone is removed from the humerus (upper arm bone).
- The shoulder socket is prepared and a plastic liner is cemented in place in a fashion much like placing a filling in a tooth.
- A metal ball with or without a stem is placed down the arm bone in such a way that cement is usually not required. The surface of the prosthesis has a special coating that allows human bone to grow

into it, thereby providing fixation without the need for cement.

- The rotator cuff muscles are repaired and the wound is closed. The entire procedure takes one to three hours.

During reverse total shoulder replacement, the position of the ball and socket is changed so that the ball is on the socket side of the joint and the socket is on the ball side. In the normal shoulder, the rotator cuff helps the large deltoid muscle to elevate the arm. Reversing the position of the ball and socket compensates for the loss of the healthy rotator cuff, enabling the deltoid muscle to once again raise the arm.



CONVENTIONAL  
ARTHROPLASTY

REVERSE  
ARTHROPLASTY

### Advanced, Expert Care

University of Maryland orthopaedic surgeons are fellowship-trained in shoulder surgery and are at the forefront of research and advances in leading-edge surgical techniques. Additionally, two of our shoulder surgeons have specialized training in highly complex reverse shoulder replacement.

We're also unique in that our shoulder surgeons can offer state-of-the-art "stemless" shoulder replacement to eligible patients. Stemless shoulder replacement, uses a prosthetic joint with a much shorter metal rod to be inserted into the patient's humerus, or upper arm bone. The stemless implant also offers decreased incidence of fracture, and easier revision, if ever necessary.

University of Maryland orthopaedic surgeons are spearheading innovative research into surgical techniques to enhance outcomes for patients undergoing total shoulder replacement. This includes using virtual or computer-guided analysis to "model" nearly all surgical cases pre-operatively, which allows for more accurate placement of implants and a shorter surgery.

## Shoulder Revisions

Shoulder replacement revision surgeries account for roughly 25% of all total shoulder replacements done each year at University of Maryland — often for patients whose initial shoulder replacement surgery was performed elsewhere. Revision surgery is sometimes necessary because of complications after the initial procedure, including infection around the artificial joint. Occasionally, components of the artificial shoulder joint become loosened over time or a fracture develops around the prosthetic joint, also requiring revision.

## Medical Complications

University of Maryland's complication rates after shoulder replacement surgery are lower than the national average of 10 - 16%. While rare, complications can occur after surgery, including joint infection, blood clots or shoulder dislocation and loosening. Surgeons minimize risk by working with patients' primary care doctors to ensure optimal health before surgery. Patients who are smokers are encouraged to quit and referred to smoking cessation programs; those with BMIs (body mass indexes) over 40, which categorize them as obese, are referred to a nutritionist for weight-loss guidance. Avoiding tobacco and controlling weight are two key ways of preventing post-surgical complications.

## Infection Prevention

Infection after surgery poses a threat to the success of shoulder replacement surgery, but University of Maryland's infection rate is just 1%, better than the national average of up to 4%. Our surgeons go to great lengths to prevent infection. Some of the tactics they use include:

- Requesting patients clean the surgical area before the procedure with an antibacterial skin soap specifically targeting the type of bacteria residing on the shoulder area. UM physicians are also leading a clinical trial comparing various antibacterial products to optimize effectiveness.
- Applying antibiotic ointment around the patients' nostrils before surgery.
- Limiting traffic in and out of the operating room during surgery.
- Prescribing antibiotics for use before and after surgery.
- Requesting patients undergo a dental exam before surgery to ensure no abscesses in the mouth.



- Using laminar air flow operating suites, which significantly reduce airborne bacteria.

## Recovery

At University of Maryland, the length of stay is dependent on age and overall health, and more than 50% of patients can go home the same day. This short hospitalization minimizes the chance of infection and helps patients return more quickly to the comfort of their own homes.

After surgery, the arm is placed in a sling. The morning following the procedure, patients are encouraged to use their arm immediately for simple tasks such as eating, brushing teeth, etc. Physical therapy need is dependent on the individual patient and surgery performed.

Pain is managed seamlessly during surgery and in the recovery period. Many of our patients receive a long acting nerve block, which eliminates pain throughout the surgery and for several days afterward helping to minimize narcotics. After the immediate post-surgical period, patients are prescribed pain medications or may take over-the-counter pain relievers. Most patients are pain-free within eight weeks after surgery.

Our surgeons close the incision with a suture that runs under the skin which eliminates the need for suture removal. A waterproof aquacel bandage is used so patients can shower right away. The aquacel dressing also acts as a bacterial barrier protecting against infection.

Patients typically resume normal, light activities within days after surgery and enjoy an increasing range of motion in their shoulder as weeks pass. Activities such as golf may resume in three to four months.

## Durability

Chances are high that your shoulder replacement will last up to 20 years. But over time, the artificial joint may loosen or wear out — most often due to everyday activity. Patients with artificial shoulder joints are





advised to avoid lifting heavy weights, but are otherwise able to enjoy recreational sports such as tennis, golf, bowling or baseball.

### Patient Experience

University of Maryland Orthopaedics scores high in patient satisfaction, with more than 95% of patients telling physicians they are satisfied with their shoulder replacement surgery. In addition, patients state having a very positive experience visiting University of Maryland Rehabilitation & Orthopaedic Institute (UMROI), one of our surgical locations for UM Orthopaedics and a partner hospital. UMROI has been serving the Baltimore community for over 120 years as a provider of orthopedic surgery and the largest inpatient rehabilitation hospital and provider of rehabilitation services in the state of Maryland.

According to patient satisfaction surveys from January 2021 to December 2021, a majority of patients also said:

- Doctors and nurses always treated them with courtesy and respect.
- Doctors and nurses always listened carefully to them.
- Pain during the hospital stay was always well controlled.
- Hospital staff always did everything they could to help with pain.
- Hospital staff always explained the reasons for new medicines.
- Upon discharge, hospital staff took family preferences into account when deciding health care needs.

**Remember:** If you are contemplating a shoulder replacement, **the decision should be a cooperative one.** Talk with family members, your primary care physician and a qualified orthopaedic surgeon to determine the best treatment for you.

### Why Should You Choose University of Maryland Orthopaedics?

University of Maryland is a tertiary referral center for complex shoulder problems. As such, physicians here are specifically equipped to handle total shoulder replacement surgery. All UM surgeons who specialize in shoulders are board-certified, fellowship-trained and have extensive experience performing everything from first-time shoulder replacements to complex shoulder replacement revision surgery. They are supported by one of the top academic medical centers in the country and have access to advanced techniques, as well as the latest research for shoulder patients.

UM orthopaedic surgeons also take a multidisciplinary approach to care, incorporating general surgeons, primary care physicians, certified physical and occupational therapists and support staff into patients' individualized treatment plans. In addition, our affiliated occupational and physical therapists are specially trained in rehabilitation of the shoulder and elbow before and after surgical reconstruction.

Additionally, our orthopaedic surgeons are the referral surgeons for the entire state of Maryland. That means when patients need challenging shoulder replacement surgery or have a failed shoulder replacement, they come to us.

You can find our surgeons at:

- University of Maryland Orthopaedics in Columbia
- University of Maryland Orthopaedics at the Camden Yards Warehouse
- University of Maryland Orthopaedics in Hunt Valley
- University of Maryland R Adams Cowley Shock Trauma Center
- University of Maryland Medical Center Midtown Campus
- University of Maryland Rehabilitation & Orthopaedic Institute
- University of Maryland Laurel Medical Center

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#### MEET THE TEAM

##### S. ASHFAQ HASAN, MD

*Associate Professor of Orthopaedics,  
University of Maryland School of Medicine  
Chief, Shoulder and Elbow Program,  
University of Maryland Orthopaedics*



**Special Interests:** Reverse Shoulder Replacement;  
Total Shoulder Replacement; Arthroscopic Rotator  
Cuff and Labral Repair; Arthroscopic Shoulder  
Instability; Shoulder Fractures; Humeral Nonunions;  
Post-traumatic Reconstruction; Elbow Fractures;  
Elbow Arthroscopy; Tommy John; Elbow Contractures

**MD:** Georgetown University

**Residency:** Barnes Jewish Hospital, Orthopaedics

**Fellowships:** University of Pennsylvania, Shoulder & Elbow Surgery  
Anthroscopy and Reconstruction Fellowship of Northern Virginia,  
Sports Medicine

**Board Certification:** Orthopaedic Surgery & Orthopaedic Sports Medicine

##### MOHIT N. GILOTRA, MD

*Associate Professor of Orthopaedics,  
University of Maryland School of Medicine  
Shoulder and Elbow Surgeon, University of  
Maryland Orthopaedics*



**Special Interests:** Acromioclavicular Joint Injuries;  
Bicep Tears; Clavicle Injuries; Elbow Arthroscopy;  
Elbow Replacement; Shoulder and Elbow Frac-  
tures; Labral Repair; Post-Traumatic Reconstruction;  
Reverse Shoulder Replacement; Rotator Cuff Repair;  
Shoulder Arthritis; Shoulder Arthroscopy; Shoulder  
Dislocation; Throwing Injuries; Tommy John Reconstruction

**MD:** Jefferson Medical College

**Residency:** University of Maryland Medical System, Orthopaedic Surgery

**Fellowships:** University of Pennsylvania Medical Center, Ortho, Shoulder  
& Elbow Surgery

**Board Certification:** Orthopaedic Surgery

##### GERARD SLOBOGAN, MD, MPH

*Assistant Professor of Orthopaedics  
University of Maryland School of Medicine  
Shoulder Surgeon, University of Maryland  
Orthopaedics*



**Special Interests:** Malunion, Nonunion; Orthopaedic  
Traumatology; Pelvis and Acetabulum Surgery;  
Post-Traumatic Shoulder and Elbow Reconstruction

**MD:** University of British Columbia

**Residency:** University of British Columbia -  
Orthopaedic Surgery

**Fellowships:** St. Michael's Hospital Toronto - Upper Limb Reconstruction  
& Orthopaedic Trauma

University of Maryland R. Adams Cowley Shock Trauma Center -  
Orthopaedic Trauma

**Board Certification:** Orthopaedic Surgery