

The Joint Replacement Center at

# BBJI

Boston Bone & Joint Institute

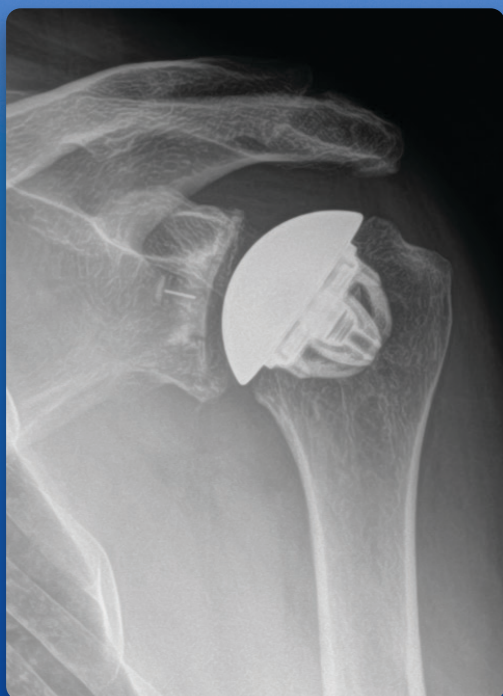
A DIVISION OF  NOA  
NORTHEAST ORTHOPAEDIC ALLIANCE

## A Guide to Your Shoulder Replacement

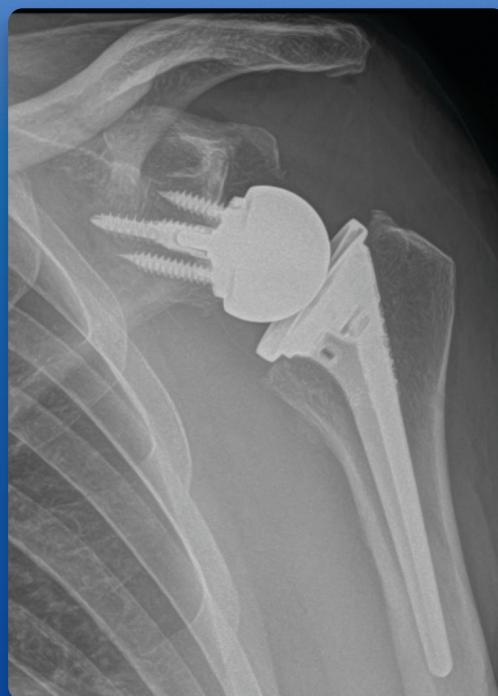
**Andrew Jawa, MD**  
**Kiet Le, PA-C**  
**Marie Peacock**

**Jacob Kirsch, MD**  
**Tessa Lilley, PA-C**  
**Michelle Milks**

Anatomic Replacement



Reverse Replacement





# BBJI

Boston Bone & Joint Institute

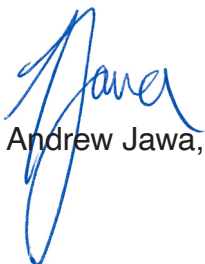
To our patients,

Thank you for the opportunity to take part in your care. Our number one goal, along with that of our team at the Boston Bone & Joint Institute, is to improve your quality of life through our knowledge, skill, experience, and most importantly – compassionate care. Shoulder replacement surgery is a highly effective procedure, but we recognize surgery can be stressful. We hope to make this process as smooth as possible.

This packet is intended to be a resource to help you and your loved ones understand shoulder replacement, the risks and benefits of surgery, and what to expect during your surgical and postoperative experience. Please keep this with you all the way up to your date of surgery and beyond. Additionally, our team is always here to answer your questions – please do not hesitate to contact us about anything. See the backside of this packet for information on how to relay questions to the team.

Our team is highly committed to improving patient outcomes and satisfaction. To this end, we kindly ask that you complete our patient-reported outcome questionnaires before each of your appointments. The questionnaires will ask you about your pain, shoulder function, general health, and satisfaction with your care. We rely on your responses to get a better understanding of how patients are doing and identify ways to improve the experience and outcomes for future patients.

Sincerely,



Andrew Jawa, MD



Jacob Kirsch, MD

# Meet Your Shoulder Replacement Team

## ANDREW JAWA, MD



Dr. Jawa is the open shoulder specialist at Boston Bone & Joint Institute. He is the Chief of Shoulder Arthroplasty at New England Baptist Hospital. He focuses on primary and revision total shoulder replacements (Reverse and Anatomic), Latarjets, tendon transfers and fractures. He performs over 300 shoulder replacements each year. He is a regional and national leader in his field, training other surgeons on the best management and surgical techniques for shoulder surgery. He has served as the head of the shoulder section of the New England Shoulder and Elbow Society, and is a full member of the prestigious American Shoulder and Elbow Society.

Dr. Jawa earned his medical degree from the University of Pennsylvania Medical School, followed by a Harvard combined orthopaedic surgery residency at Massachusetts General Hospital and Brigham and Women's Hospital. He also completed two fellowships at Massachusetts General Hospital; one in hand and upper extremity surgery, and the other in shoulder and elbow surgery. He performs all of his surgeries at the New England Baptist Hospital and the Boston Outpatient Surgical Suites.

## JACOB KIRSCH, MD



Dr. Kirsch is a shoulder and elbow specialist at Boston Bone & Joint Institute. He specializes in arthroscopic and open treatment of shoulder and elbow conditions, including shoulder arthritis, rotator cuff tears, fractures, and instability. He has advanced training in primary and revision shoulder replacement surgery. He has a particular focus in complex problems of the shoulder requiring shoulder replacement, sports related injuries, shoulder instability with bone loss, irreparable tendon tears and failed previous surgery.

Dr. Kirsch graduated *magna cum laude* from Franklin & Marshall College as a member of the Phi Beta Kappa honor society. He earned his Doctor of Medicine with distinction from George Washington University School of Medicine, where he was inducted into the Alpha Omega Alpha (AOA) Honor Society and received the Julius S. Neviasser Award for Excellence in Orthopaedic Surgery. He went on to complete an orthopaedic surgery residency at the University of Michigan, where he also served as a team physician for the University of Michigan Men's Basketball team for several years. Dr. Kirsch also received advanced international training in shoulder surgery from world-renowned experts in Lyon, France. Dr. Kirsch then completed a fellowship in shoulder and elbow reconstruction at the Rothman Institute in Philadelphia, Pennsylvania.

## **KIET LE, PA-C**



Kiet works closely with Dr. Jawa as a physician assistant. He completed his Bachelor of Science in sports medicine at Quinnipiac University and his Master of Physician Assistant Studies at Albany Medical College. He has extensive experience with joint replacements of the knee and shoulder. He should be considered your navigator for the process of shoulder replacement with Dr. Jawa and is available to answer your questions about surgery. He can be reached by calling Marie, by calling our main phone number 781-890-2133, and

asking a member of our staff to send a message through your patient chart, or directly through the patient portal.

## **TESSA LILLEY, PA-C**



Tessa Lilley is a physician assistant who works closely with Dr. Jacob Kirsch. She completed her Bachelor of Science in Biology with a concentration in pre-med from the University of Maine and her Master of Physician Assistant Studies at Northeastern University in Boston. She should be considered your navigator for the process of shoulder replacement with Dr. Kirsch and is available to answer your questions throughout the perioperative course. She can be contacted through the patient portal, by calling Danielle's direct number,

or by calling the main office number: 781-890-2133.

## **MARIE PEACOCK, SURGICAL COORDINATOR**



Marie handles all surgery, imaging and procedure scheduling for Drs. Jawa and Kiet. She is the bridge between patient and provider. She is able to answer common logistical questions before and after surgery, as well as connect patients with the team to answer any clinical questions. Marie can be reached at 617-751-5311.

## **MICHELLE MILKS, SURGICAL COORDINATOR**



Michelle handles all surgery, imaging and procedure scheduling for Dr. Kirsch. She is the bridge between patient and provider. She is able to answer common logistical questions before and after surgery, as well as connect patients with the team to answer any clinical questions. Michelle can be reached at 617-751-5242.

## **DECLAN DIESTEL AND REGAN ARNOLD, RESEARCH ASSISTANTS**



**Declan**



**Regan**

Declan and Regan are medical assistants and research assistants at BBJI who work closely with Dr. Jawa and Dr. Kirsch to monitor surgical outcomes, complications, patient experience and satisfaction. If you have any suggestions to improve patient care, please contact Declan via email at [DDiestel@bbji.com](mailto:DDiestel@bbji.com) or Regan via email at [RArnold@bbji.com](mailto:RArnold@bbji.com).

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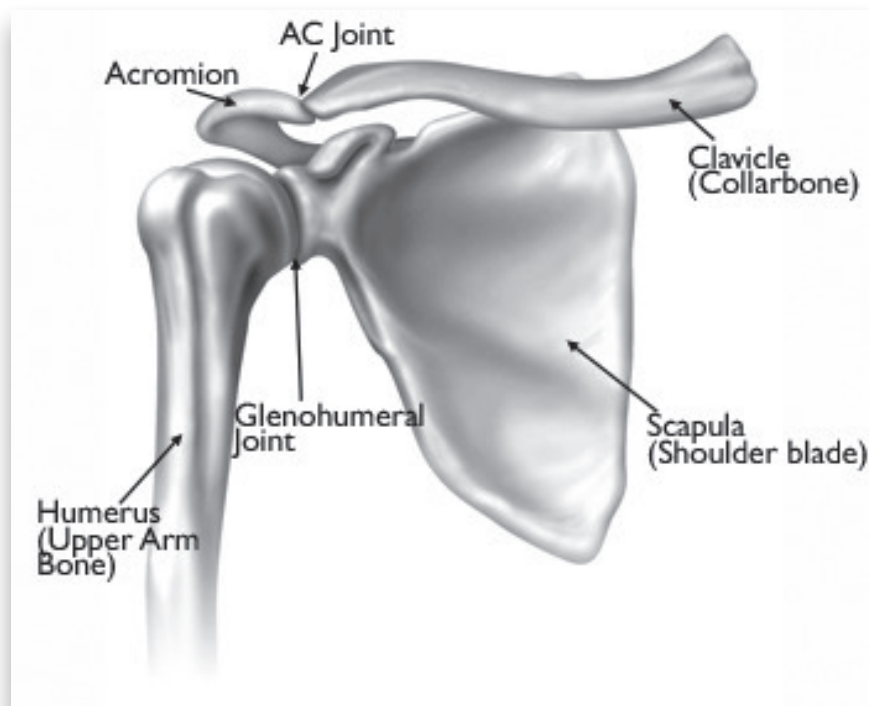
# Understanding Shoulder Replacement Surgery

Shoulder replacement surgery has been recommended for the treatment of your shoulder problem. This operation is usually performed for arthritis or fractures of the shoulder, but other conditions involving the shoulder can also be successfully treated with shoulder replacement surgery.

The purpose of this information packet is to give you information about the surgery, as well as answer the most common questions patients typically ask. This handout provides information on your surgery, your hospital stay, as well as your return home.

## The Normal Shoulder

The normal shoulder is very complex and involves three bones and more than one joint. These bones are the clavicle (collar bone), the scapula (shoulder blade), and the humerus (upper arm bone). The upper end of the arm bone (humerus) and the outside edge of the scapula bone (glenoid) form a “ball-and-socket joint.” There are numerous muscles, ligaments and tendons which help to provide stability and movement. This joint is remarkable because it typically allows greater range of motion than any other joint in your body.



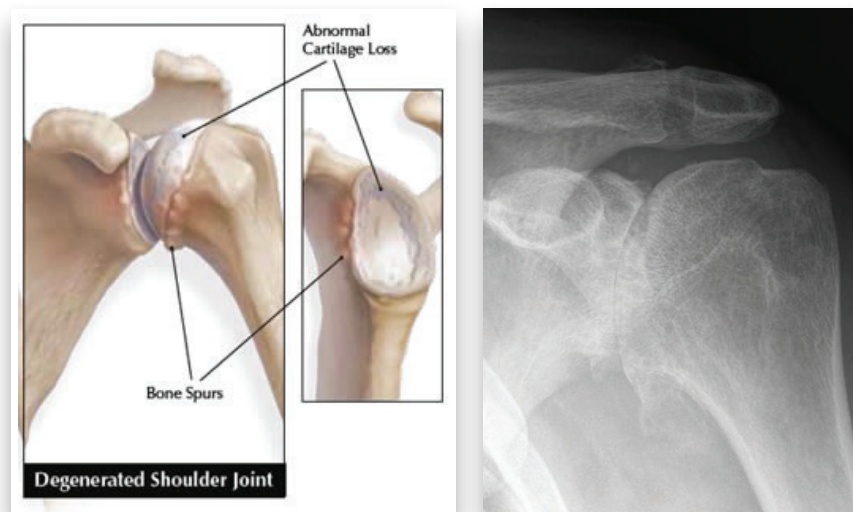
## Who Needs Total Shoulder Replacement Surgery?

Total shoulder replacement surgery is 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. Most patients who decide to have shoulder replacement surgery have experienced shoulder pain for a long time. Many patients have developed pain that limits their daily activities and may interfere with their ability to sleep. Shoulder stiffness may also interfere with the use of their arm for everyday activities. A shoulder replacement is performed to alleviate shoulder pain and improve range of motion of your shoulder joint.

### Types of shoulder replacements:

There are two types of replacements. The anatomic total shoulder maintains the anatomy of your shoulder. A metal ball replaces the end of the upper arm bone (humerus) and a plastic cup replaces the socket (glenoid). A reverse shoulder replacement “reverses” the position of the ball and the socket. A metal ball replaces the glenoid, and a plastic cup replaces the end of the humerus.

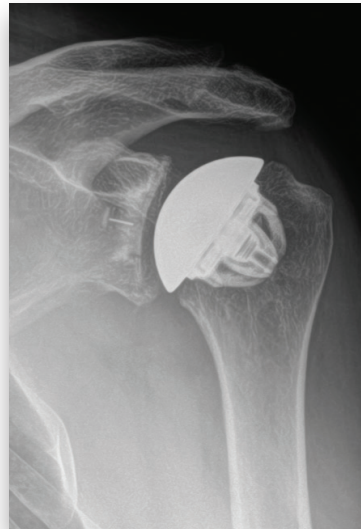
There are multiple factors which determine which implant is best suited for you. The main determining factor is the quality and strength of the bone in the glenoid, and the quality of your soft tissues and your rotator cuff tendons. The risk of rotator cuff injury increases with age, and rotator cuff tears are most common in people older than 60. Other factors include: your age, activity level, and body type.



## Anatomic Total Shoulder Replacement

Shoulder replacement surgery is an option when you have severe degenerative joint disease in your shoulder, and you have tried and failed non-surgical options like medicines, physical therapy, and injections.

In an anatomic total shoulder replacement, the damaged portion of your shoulder joint is removed and replaced with metal and plastic implants. The ball is made of various materials: stainless steel, titanium, and cobalt-chrome. The plastic is made of ultra-high molecular weight polyethylene. Bone cement may also be used in the anatomic total shoulder replacement.



### **The most common reason for a total shoulder replacement:**

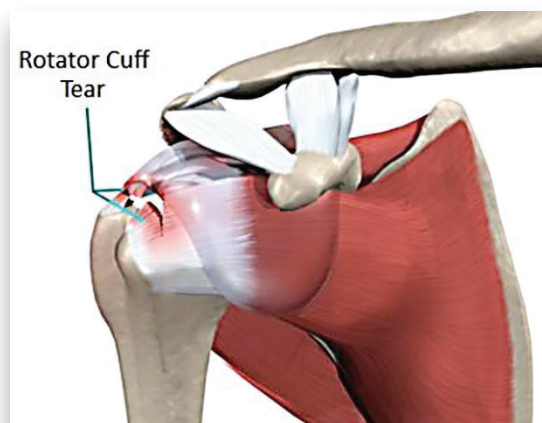
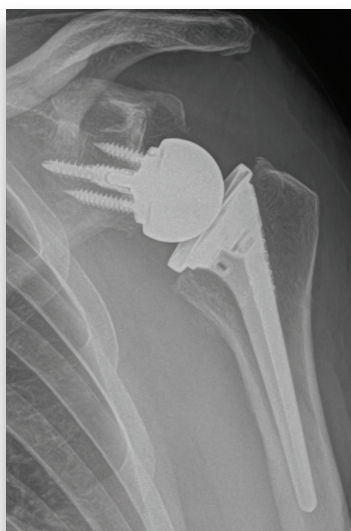
Severe degenerative joint disease (osteoarthritis)

- With: Good bone in your glenoid (socket), and no rotator cuff issues

## Reverse Shoulder Replacement

Reverse shoulder replacement is also an option when you have severe degenerative joint disease in your shoulder. The surgical procedure for a reverse shoulder replacement is very similar to the anatomic total shoulder replacement, only the implants are different. A reverse shoulder replacement “reverses” the position of the ball and the socket. A metal ball replaces the glenoid, and a plastic cup replaces the end of the humerus. Similar to the anatomic total shoulder replacement, the ball is made of stainless steel, titanium, and cobalt-chrome. The plastic is made of ultra-high molecular weight polyethylene.

Since 2012, there has been an increase in reverse shoulder replacements being performed in patients aged 50-64. From 2012 to 2017, the incidence of primary RTSA increased from 7.3 cases per 100,000 persons (22,835 procedures) to 19.3 cases per 100,000 (62,705 procedures); anatomic TSA increased from 9.5 cases per 100,000 (29,685 procedures) to 12.5 cases per 100,000 (40,665 procedures).<sup>1</sup>



### Common reasons for reverse shoulder replacement surgery are:

- Severe degenerative joint disease (osteoarthritis)
- Osteoarthritis with any rotator cuff tearing

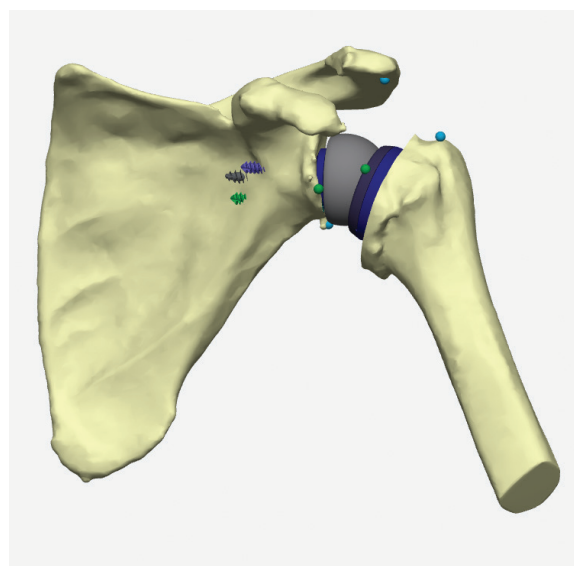
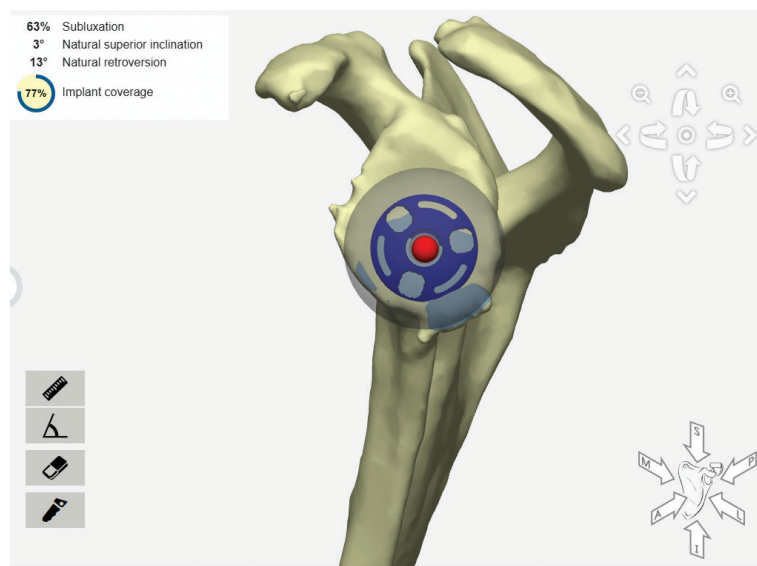
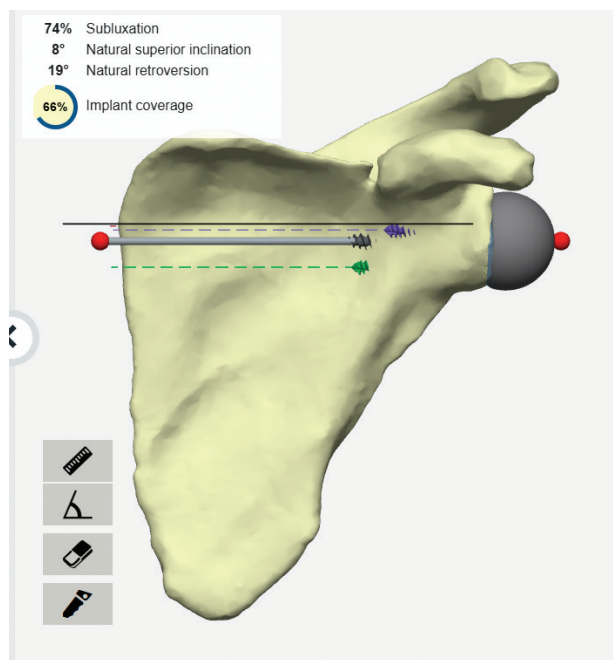
### Other reasons for reverse shoulder replacement surgery:

- Chronic or irreparable rotator cuff tears
- Rotator cuff arthropathy (chronic rotator cuff tear which leads to arthritis)
- Severe glenoid (socket) wear or deformity
- Complicated proximal humerus fractures (including prior surgery to repair the fracture, or fractures, that have not healed (non-union) or healed in poor alignment (malunion))
- Avascular necrosis

1. Best MJ, Aziz KT, Wilkens JH, McFarland EG, Srikumaran U. Increasing incidence of primary reverse and anatomic total shoulder arthroplasty in the United States. *J Shoulder Elbow Surg.* 2021 May;30(5):1159-1166. doi: 10.1016/j.jse.2020.08.010. Epub 2020 Aug 26. PMID: 32858194.

Before surgery, you will get a computerized tomography, or “CT scan” of your shoulder. A CT scan uses low-dose X-ray to create cross-sectional images of your shoulder. That CT scan is then uploaded into a computer program so that Dr. Jawa and Dr. Kirsch can create a preoperative plan for your shoulder replacement. Pre-operative planning allows surgeons to know the anatomy beyond what they can see, optimize implant placement, and have a plan for what size implants will be used.

In some difficult cases, a custom guide, or “patient-specific instrumentation” guide can be 3D-printed so that they can accurately perform the surgery according to the pre-operative planning.



# Longevity of Shoulder Replacement

Shoulder replacement surgery is one of the most reliable and predictable operations for improving pain, function, and overall quality of life. Patients considering shoulder replacement commonly ask about how long their replacement will last. There are several factors that influence the longevity of a shoulder replacement, some of which are patient specific (preoperative diagnosis, ie., osteoarthritis vs. cuff tear arthropathy vs. failed prior surgery) while others pertain to the type of shoulder replacement (anatomic total shoulder vs. reverse shoulder replacement). We will have a personalized discussion with you regarding your individual risk and anticipated likelihood of long-term success with a shoulder replacement. It is important to understand that any long-term information pertaining to the longevity of shoulder replacement surgery is based on surgical techniques and implants that are over 10-20 years old. While we believe that current technology and surgical techniques will improve the survivorship of modern shoulder replacements, long-term follow-up will be needed to know for sure.

Current evidence suggests that reverse shoulder replacement, when performed for osteoarthritis, is associated with lower rates of revision surgery when compared to anatomic shoulder replacement. Recent data from the Australian Orthopaedic National Joint Registry with over 40,000 shoulder replacements demonstrated that at 10 years after surgery, 12.4% of patients required a revision surgery after an anatomic total shoulder replacement compared to 6.6% of patients after a reverse shoulder replacement.<sup>5</sup> With an anatomic replacement, there is the potential for the rotator cuff to tear and for the socket component to loosen, both of which can impact the longevity of your shoulder replacement. While this is possible with a reverse shoulder replacement, this occurs at a lower frequency and is less likely to lead to needing a revision surgery. In general, data from the Mayo Clinic indicates that the likelihood of not requiring a revision surgery after an anatomic total shoulder replacement is approximately 90% at 10 years and 80% at 20 years.<sup>3,4</sup> Patients who receive a reverse shoulder replacement appear to have slightly better implant longevity, with several studies reporting >90% survivorship at a minimum of 10 years.<sup>1,2</sup>

1. Bacle G, Nove-Josserand L, Garaud P, Walch G. Long-Term Outcomes of Reverse Total Shoulder Arthroplasty: A Follow-up of a Previous Study. *J Bone Joint Surg Am* 2017;99:454-461. 10.2106/JBJS.16.00223
2. Cuff DJ, Pupello DR, Santoni BG, Clark RE, Frankle MA. Reverse Shoulder Arthroplasty for the Treatment of Rotator Cuff Deficiency: A Concise Follow-up, at a Minimum of 10 Years, of Previous Reports. *J Bone Joint Surg Am* 2017;99:1895-1899. 10.2106/JBJS.17.00175
3. Schoch B, Schleck C, Cofield RH, Sperling JW. Shoulder arthroplasty in patients younger than 50 years: minimum 20-year follow-up. *J Shoulder Elbow Surg* 2015;24:705-710. 10.1016/j.jse.2014.07.016
4. Singh JA, Sperling JW, Cofield RH. Revision surgery following total shoulder arthroplasty: analysis of 2588 shoulders over three decades (1976 to 2008). *J Bone Joint Surg Br* 2011;93:1513-1517. 10.1302/0301-620X.93B11.26938
5. <https://aoanjrr.sahmri.com/annual-reports-2019>

# Preparing For Your Total Shoulder Replacement

The following information is addressed in this packet. Any questions or concerns should be discussed between you and the team in preparation for your surgery. Much of this information can also be found in the video mentioned on the back page and watched in the office.

- Preoperative education about the surgical procedure
- Surgical risks
- Preparation for surgery
- What to bring to the hospital
- Discharge planning
- Home preparation for after surgery

## Pre-Operative Testing Appointment

Your Pre-operative testing appointment at New England Baptist Hospital will be made roughly 2 months ahead of your surgical date. This appointment should be within 30 days of your scheduled surgery date.

If you have not received your pre-admission testing schedule within 3 weeks before your surgery, or if you have question regarding the dates or times, please contact Marie Peacock or Danielle Michitson at Boston Bone & Joint Institute.

New England Baptist Hospital will provide you with the information and perform any tests that may be required to have prior to surgery. The following are discussed with you at your pre-screening appointment:

- Medications
  - Please bring a list of your medications to your pre-operative visit.
- Blood/Urine tests
- Medical clearance from your doctors
  - You may have additional appointments with a specialist (cardiologist, hematologist) depending on your medical history.
- Pre-operative infection prevention

It is important to continue taking all your other prescribed medication until your pre-admission testing office visit. During this visit, you will be given specific instructions about all of your prescription medication(s).

### Important Phone Numbers:

Pre-Screening: 617-754-5498

Pre-Operative RN: 617-754-5491

Case Management: 617-754-5050

## Preparing Your Home for After Surgery

- Move frequently used items, especially in the kitchen, bathroom, and bedroom, to easy-to-reach drawers and/or shelves.
- Make sure all your medications are within easy reach.
- Have a cell phone or cordless phone close to you.
- Place a list of emergency phone numbers by the phone.
- Shampoo and soap containers with pump tops are much easier to use than pop open tops.
- Stock your freezer with easy to reheat meals and stock up on non-perishables which are pre-cut as using a knife is not easy immediately after surgery. You will need to drink a lot of water and eat plenty of healthy foods and snacks.
- If possible, arrange assistance with laundry and cleaning.
- Clear pathways between your most commonly used areas — such as from your bedroom to your bathroom and kitchen, and between the living room, bedroom, and bathroom.
- Remove all clutter and keep stairs free of objects.
- Install night lights between bedroom and bathroom
- Make arrangements to keep pets in another area of the house when you first get home. They can be an unintentional hazard.

## Recliner Rental

Letourneau Pharmacy  
349 N. Main St.  
Andover, MA 01810  
Telephone: 978-475-7779



## Clothing for After Surgery

- Loose fitting clothing is recommended after surgery or Shoulder Shirts. You can purchase Shoulder Shirts at [www.ShoulderShirts.com](http://www.ShoulderShirts.com) or [www.ShoulderShirts.etsy.com](http://www.ShoulderShirts.etsy.com).
- You may want to get a couple pairs of pants that have elastic waists.
- Many patients prefer bras that fasten in the front.
- You will want to be sure to have a pair of slip on shoes. Do not wear flip flops as it is too easy to trip.

## Cold Therapy Machine

A Cold Therapy Machine to use following your surgery is highly recommended, as it seems to make recovery less painful and reduces swelling. Unfortunately, insurance does not cover these machines. You can search online using “Cold Therapy Unit” and will find some options. BBJI sells a “DonJoy Iceman Classic 3” for \$179.99, which can be purchased ahead of surgery. Please see the inside back cover of this booklet for ordering information.

## Diet

Healthy eating **before** surgery helps you heal and recover **after** surgery. Good nutrition is necessary for healing. During the healing process, the body needs increased amounts of calories, protein, vitamins A and C, and sometimes the mineral zinc. The following guidelines will help you choose “power” foods to promote healing. Eat a variety of foods to get all the calories, proteins, vitamins, and minerals you need. If you have been given a special diet, follow it as much as possible. It will help promote wound healing and may prevent infection and some complications.

### Iron-rich foods

Eat iron-rich foods prior to surgery. Iron combines with protein to make hemoglobin, the substance that carries oxygen in the blood to all parts of your body. When hemoglobin is low, weakness and fatigue may result causing a slower recovery.

Foods that contain a high amount of iron include:

- Lean red meat/ liver
- Enriched bread, pasta, fortified cereals
- Dried beans and peas
- Dried apricots and raisins
- Green leafy vegetables. NOTE: Patients on Coumadin should talk with their physician.

### Vitamin C

Eating foods high in vitamin C along with iron-rich food will help your body absorb the iron.

Foods that are high in vitamin C include:

- oranges and orange juice
- cantaloupe
- tomatoes
- potatoes

### Eating in the days leading up to surgery

Eat only light meals, especially the day before surgery. The combined effects of anesthesia and your medication may slow down your bowel function. This can cause constipation after surgery. Increase fluids (water) and fiber in your diet as well.

### Practice Using a Sling

We suggest practicing daily activities or household duties using one arm or while wearing a sling for a few weeks prior to surgery. This will help you adapt and prepare for after surgery.

# Preparing For Your Surgery

## The Night Before Surgery

- Remember that you are to have *nothing to eat or drink after midnight* the night before surgery. Do not eat or drink anything including: gum, mints, or candy, and water or black coffee.
  - Some patients may be told by NEBH to take “Ensure” and instructed to consume it the day before surgery and the morning of your surgery. Please follow the instructions given to you by the hospital.
- If you are experiencing any signs of infection such as fever, cold/flu symptoms, diarrhea, skin rash, or open sores, please call the team and your medical doctor as soon as possible.
- Try to get a good night sleep. It is important to be well rested before surgery.
- Bathe or shower the night before or the morning of your surgery. A special wash may have been recommended by pre-screening at New England Baptist Hospital.
- All nail polish should be removed before your arrival for surgery. Your fingers will be used to accurately monitor your oxygen level during surgery.
- Creams and lotions should not be worn on the day of surgery. A light application of deodorant is allowed.

You will be admitted to the hospital on the morning of your surgery. You are typically asked to arrive about three hours prior to your actual surgery time. **New England Baptist Hospital will contact you the day prior to your surgery between 12-4 pm with an exact time to arrive at the hospital registration area on the day of surgery.** Please make every effort to arrive on time.

**Most patients can be discharged the day of surgery (day surgery or outpatient surgery) or the day after surgery. Patients are typically discharged to their home without the need for a rehab facility.** Some patients with complex medical issues or who may need rehab after surgery will stay overnight. It is important to prepare your home for discharge after surgery (see Preparing Your Home for Surgery section). A case manager will be assigned to you the day of surgery, and he or she will determine if you would benefit from going to a rehab facility instead of straight home. This process will also be initiated at your pre-operative appointment.

**If you are having surgery at Boston Outpatient Surgical Suites, you will be contacted the day before surgery, between about 12 pm and 3 pm for your surgery and arrival time.**

## What to Pack for an Overnight Stay

While the vast majority of patients go home the same day of surgery, if you need to stay overnight and go to a rehab facility, pack a bag or small suitcase with only the items you may need during your hospital stay. Please bring your own toiletries and any necessary personal items. While in the hospital you may opt to wear the hospital gown or you may bring your own clothes from home. Please review the following about what to and what not to bring with you.

## What to Bring to the Hospital

- This Total Shoulder Replacement Guide.
- A full set of comfortable clothing. The clothing should be loose-fitting to allow room for any post-operative swelling.
- Shoes with non-skid soles.
- Personal items: contact lenses/denture care materials, glasses, hearing aids.
- CPAP/BIPAP machine (if routinely used).
- A form of photo ID and insurance cards to present to the registration and admitting department.
- Cell phone and charger.

## What Not to Bring to the Hospital

- Money, jewelry, or other valuables.
- Medication - unless instructed by your surgeon/pre-operative nurse.
- Cigarettes, electric cigarettes, or tobacco.

# **Bring this Total Shoulder Replacement Binder with You on the Day of Your Surgery.**

## **Your Surgery Day**

### **When You Arrive at the Hospital or the Outpatient Suite**

The day of surgery you will check in and proceed to the pre-operative area where you will change into a hospital gown. You will be asked to confirm your name, date of birth, your surgeon's name, and the procedure for which you are scheduled. Before your surgery, several different people who are in charge of your care will ask you to repeat this information. Do not be alarmed, this is a routine safety measure. The nurse in the surgery area will take your vital signs, start an IV, and review your medical history.

You will also meet with the anesthesiologist. Anesthesiologists are physicians who administer the medication to make you fall asleep and provide pain management during and following the surgery. During surgery, anesthesiologists choose from a variety of medications for their different functions such as relieving pain, making the patient unconscious, and relaxing the body's muscles. To do this they may administer inhalation (gas) anesthetic agents, sedatives, muscle relaxants, and other medications. The anesthesiologist balances all of these medications in accordance with medical and surgical needs of each patient.

The most common method of providing anesthesia during shoulder replacement is general anesthesia. With this, you are unconscious and have no awareness of the surgical procedure or any sensations. A tube is placed into the airway into your lungs. In addition to this, it is common to have a regional nerve block administered either before surgery or right after surgery. This will be discussed with you further by the anesthesiologist.

It is important to inform your anesthesiologist in the pre-operative area of any allergies or medications that have caused you problems in the past. It is also important to discuss any problems you may have had in the past with anesthesia.

## **Nerve Block**

You may have a nerve block to control your pain before surgery. A nerve block is used when pain from surgery affects a smaller area of your body, such as an arm. There are several potential advantages of a nerve block. One advantage is that nerve blocks may allow for a significant decrease in the amount of opioid (narcotic) medication needed, which may result in fewer side effects such as nausea, vomiting, itching, drowsiness, constipation, and light-headedness. Nerve blocks generally last for 18-24 hours after surgery. We recommend taking pain medication prior to when your block wears off even though you are not experiencing pain; therefore, you do not fall behind in pain management when the block wears off.

## **Hearing aids**

If you use hearing aids, wear them to the hospital on the day of your surgery. Wearing them will help you hear everything we need to tell you.

## **Dentures**

You will be asked to remove all nonpermanent dental work before your surgery.

## **Contact lenses**

Wear glasses if possible. If contact lenses must be worn, bring your lens case and solution. If glasses are worn, bring a case for them.

## **Hair**

Wear your hair loose. Do NOT use clips, pins or bands in your hair. Do not use hair spray. A head cover will be provided on the way to the operating room. Before going to surgery, patients are asked to remove wigs and hairpieces.

## **Family Waiting Area**

When you are taken to the operating room, your family will be directed to the family waiting area, where they will wait during your surgery. Once the surgery is completed, your surgeon will call or visit your family to update them on your condition.

## During Surgery

Once in the surgery suite, you will be assisted onto the surgical table. The surgery room itself is kept cool and the nurses will give you warm blankets if needed.

The anesthesiologist will attach monitoring equipment and check your IV. They will constantly monitor your vital signs, including your heart rate and rhythm, blood pressure, and amount of oxygen in your blood throughout your procedure.

An additional aspect of our culture of safety is called the “time out.” In this safety measure, we confirm that we have the following before surgery begins:

- the correct patient
- the correct side and site marking
- the correct procedure
- the correct position on the operating table
- the correct implants, special equipment, and X-rays (when applicable)

Your surgery will last approximately 2 to 3 hours, possibly longer.

## Post Anesthesia Care Unit (PACU)

After surgery, you will be taken to the Recovery Room/Post-Anesthesia Care Unit (PACU) where a nurse will care for you for at least the next 2-3 hours. The total time spent in recovery varies for each patient. The nurse will take your temperature, pulse, and blood pressure and assess your pain level. Pain medication will be started. You may feel very cold after surgery and may be warmed with blankets. Your arm will be in a sling. Dr. Jawa or Dr. Kirsch will assess your ability to move your fingers, wrist, and elbow and the sensation in your hand.

To assist your breathing, you may receive oxygen through a small nasal tube or mask. Circulation aids will be applied to your lower legs to prevent blood clots. A cold pack system may be wrapped around your surgical site to reduce swelling and pain. An X-ray will be done on your operative shoulder.

At **New England Baptist Hospital**, friends and family cannot visit with you in the PACU but can meet you in your hospital room. Dr. Jawa, Dr. Kirsch, or the hospital staff will inform your family members that once they leave you in the pre-operative waiting area it may be a number of hours before they see you again.

At **Boston Outpatient Surgical Suites**, your accompaniment will be brought into the recovery room when you are ready to see them. You will then come down to the Waltham BBJI office for an X-ray of your shoulder, and to discuss post-operative instructions as well as any questions you may have.

## Circulation Aids

**Compression stockings:** You will not be as active as you usually are; therefore, you have a greater chance of developing blood clots. To help prevent them from forming, you will need to wear TED stockings. They are to be used at all times, except when bathing. **Once you are home and ambulatory and if your lower extremities are not swollen, then these can be discontinued.**

**Sequential Compression Calf Sleeves:** You can move while using the pump. The sleeves inflate every 20 to 60 seconds and make it feel as though your calves are being massaged. These sleeves are a very important part of your care. Please help by making sure you wear them at all times while in bed. Tell your nurse if you do not feel the sleeves inflating.



## Cough and Deep Breathing

Coughing and deep breathing are extremely important to your recovery after surgery.

**Incentive Spirometer:** When in the hospital, you will be using a small device called an incentive spirometer. A nurse will show you how to use it and help you with deep breathing exercises. It is important that you use the incentive spirometer 10 times every hour while you are awake. Use this for 3-4 days after returning home from the hospital. Using it helps reduce the chance of developing pneumonia after your surgery and helps to keep your lungs clear and active during your recovery. Having good lung function will help you perform activities of everyday living once you return home.



## Pain Management

Effective pain management following surgery is a major priority for both you and your healthcare providers. Every effort is made to safely minimize your pain; however, it is normal to experience some discomfort following surgery.

You will be asked about your level of pain upon admission, and this will continue throughout your stay. You will be asked to “rate” your level of pain on a scale from 0 to 10. A rating of ‘0’ means that you are not in any pain at all, a 5 means that you are experiencing a moderate amount of pain, and a 10 means you are experiencing the worst possible pain. This score will be used to select the best pain medicine to manage your level of pain. The doctors and nurses will ask you how the pain medicine is working and adjust the dose as needed. Again, remember to take pain medication before your block wears off to stay ahead of your pain.

Most commonly, post-operative pain is best managed with oral pain medications.

The following information will help you understand your options for pain treatment, describe how you can help your doctors and nurses control your pain, and empower you to take an active role in making choices about pain treatment.

- You may receive more than one type of pain treatment, depending on your needs and the type of surgery you are having. All of these treatments are relatively safe, but like any therapy, they are not completely free of risk. Dangerous side effects are rare. More common side effects, such as nausea, vomiting, itching, drowsiness, constipation, and light-headedness can occur. These side effects are usually easily treated in most cases.
- Be sure to tell your doctor and nursing staff if you are taking pain medication at home on a regular basis and if you are allergic to or cannot tolerate certain pain medications.
- It is important that you DO NOT DRIVE while on pain medications

### Why is pain control so important?

In addition to keeping you comfortable, pain control can help you recover faster and may reduce your risk of developing certain complications after surgery, such as pneumonia or blood clots. If your pain is well controlled, you will be better able to complete important tasks such as walking and deep breathing exercises.

**IMPORTANT! Do not wait until your pain is severe before you ask for pain medications.**

**Please give our office 24-48 hours notice for all narcotic refills.**

## Bowel Management

Some patients become constipated because of the pain medication and inactivity. We recommend staying on a stool softener or laxative while you are taking pain medication.

## Physical Therapy

The goal of therapy on the day of surgery is to begin doing activities that will help you move about while still abiding by your restrictions. Doing these activities will help you gain confidence. These activities may be performed at bedside by your nurse or a physical therapist.

## Occupational Therapy

Occupational therapy is the part of your care plan that centers on teaching you how to take care of yourself once you return home.

Occupational therapy focuses on such things as:

- Activities of Daily Living (ADLs), which includes bathing and bathroom safety, dressing, toileting, and homemaking tasks
- Advice on possible equipment needed
- Education about restrictions

## Care Coordination

During your surgical stay at the hospital, a care coordinator will visit with you to assist in making your discharge plans. You have already discussed your options in the pre-operative stage, but the care coordinator is there to help make the final arrangements. Most patients plan to be discharged home after surgery. Generally, outcomes after surgery are much better when patients go home. However, if there is concern about your ability to manage at home, the care coordinator will help discuss post-operative rehabilitation in the facility of your choice. The referral process will be started and you will be informed of the status and anticipated day of your discharge.

If you are going to a community skilled nursing or rehab facility, you may want to consider having a family member/friend drive you to the facility on the day of discharge from the hospital. Transportation can also be arranged through an ambulance service; however, there may be a cost for this service.

# After Discharge

You will be discharged from the hospital or the outpatient surgical suites when it is felt that you are safe to be discharged and your pain is under control. This is a collaborative decision made by you, your nurse, and the physical therapist. It varies for each individual patient.

Your nurse will review your discharge instructions, medications, and address any questions you may have.

If you are having surgery at the hospital and you have not met the criteria to be discharged home, you will be discharged to a skilled nursing facility of your choice. The facility will be informed of your hospital stay and a time of anticipated arrival will be arranged.

Please have your ride available on this day. Your team will let you know the approximate time. When notifying the person coming to pick you up, ask them to bring a pillow for your comfort. If you chill easily, it would be a good idea to have them bring a blanket.

# Narcotic Fact Sheet for Patients

Please read the information below regarding what to expect following your surgery, the goal of post-operative pain management and the side effects of the medications prescribed.

## What to expect after surgery

- Almost all surgical procedures result in some level of pain and discomfort. Pain and discomfort are generally greatest immediately after surgery and subside as time goes on.
- Reducing your pain is a priority for caregivers
- Over time, your pain will reduce and may be eliminated completely
- Oral narcotic medication is frequently administered to patients after surgery to help control post-operative pain. It is important to note that although these medications are effective for the treatment of acute pain, use beyond that can be detrimental to your health.
- It is vital that you discontinue the use of these medications as soon as your pain allows. Specifically, the medication should only be taken as needed as prescribed (usually every 4 hours). The medication is not required for the prescribed time interval.

## Narcotic medication: Facts you need to know

- Physical dependence on opioids (which means the absence of opioids can produce withdraw symptoms) can occur at prescribed doses.
- Opiate abuse is on the rise in recent years and has tripled in the US since 1990.
- 5 million people in the United States are addicted to opiates.
- There are 17,000 opiate overdoses per year in the US.
- There were nearly 5 million drug related ER visits in 2010; 425,000 from narcotic pain relievers.
- Every day in the US, 46 people die of prescription drug overdoses.
- Unintentional deaths from prescription narcotics outnumber those of heroin or cocaine.

## Adverse reactions to opioids include:

- Sleepiness
- Difficulty controlling arms/legs
- Constipation
- Limit ability to fight infection
- Itching
- Hormonal imbalance
- Decreased breathing
- Drug interactions
- Death
- Decreased coordination
- Slower reaction times

## Potential risk factors for opiate abuse:

- Age 18-34
- Male
- 4 or more opioid prescriptions
- Refilling prescriptions early
- Opioid prescriptions from 2 or more pharmacies or physicians

## Early symptoms of withdrawal:

- Agitation
- Anxiety
- Muscle aches
- Insomnia
- Sweating

## Late symptoms of withdrawal:

- Abdominal cramping
- Diarrhea
- Nausea
- Vomiting

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Hall AJ, Logan JE, Toblin RL, et al. Patterns of abuse among unintentional pharmaceutical overdose fatalities. *JAMA*. 2008;300:2613–2620

Substance Abuse and Mental Health Services Administration, Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-44, HHS Publication No. (SMA) 12-4713.

Rockville, MD: Substance Abuse and Mental Health Services Administration, 2012.

Gregory TB. How to safely prescribe long-acting opioids. *J Fam Pract*. 2013 Dec;62(12 Suppl 1):S12-8. Opioid Painkiller Prescribing (Centers for Disease Control and Prevention) <http://www.cdc.gov/vitalsigns/opioid-prescribing/>

Hill KP, Rice LS, Connery HS and Weiss RD. Diagnosing and treating opioid dependence. *J Fam Pract*. 2012 October;61(10):588-597.

Painkiller Addiction Impacts Your Children <http://www.percocetabusehelp.com/painkiller-addiction-impacts-your-children>

White AG, Birnbaum HG, Schiller M, Tang J, Katz NP. Analytic models to identify patients at risk for prescription opioid abuse. *Am J Manag Care*. 2009 Dec;15(12):897-906.

Emergency Medicine: A Comprehensive Study Guide (6th edition 2004)

# Other Concerns/Considerations

## Infection

What is a surgical site infection (SSI)?

A surgical site infection (SSI) is an infection that occurs after surgery in the part of the body where the surgery took place. Most patients who have surgery do not develop an infection.

Some common symptoms of surgical site infection are:

- Increased redness and pain around the area where you had surgery
- Drainage of cloudy fluid from your surgical wound
- Foul odor from the incision site
- Fever

## DVT/Blood Clot

Deep Vein Thrombosis (DVT) is a formation of a blood clot. This is a potential complication following a total shoulder replacement. A blood clot from your leg can travel to your lungs and cause a serious complication called a pulmonary embolism.

**Sudden onset of shortness of breath and chest pain are warning signs of this condition. If you develop any of these signs, call 9-1-1.**

Symptoms of a DVT may include:

- Pain in your calf and leg
- Increased swelling of your thigh, calf, ankle, or foot
- Redness
- Increased skin temperature at the site

Prevention of blood clots is the best treatment:

- Exercise, increased mobility
- Blood thinners, including aspirin
- Support stockings

## Future Procedures – Dental work

The following recommendation is taken from the ADA Chairside Guide (© ADA 2015)

- **In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.**
- For patients with a history of complications associated with their joint replacement surgery who are undergoing dental procedures that include gingival manipulation or mucosal incision, prophylactic antibiotics should only be considered after consultation with the patient and orthopedic surgeon.

## Smoking

If you smoke, you are required to stop prior to surgery. Stopping smoking will reduce the risk of breathing (respiratory) problems and complications from anesthesia that is used for surgery. Smoking also affects wound healing after surgery and puts you at an increased risk of infection.

There are many other health benefits from stopping smoking. Stopping smoking helps to:

- prolong your life
- decrease your risk of disease, including heart disease, heart attack, high blood pressure, lung cancer, throat cancer, emphysema (a type of lung disease), ulcers, gum disease and other conditions
- help you to feel better (if you stop smoking, you won't cough as much, have as many sore throats, and your stamina will improve)

We know it is an extremely difficult process to stop smoking, but we will be flexible and will work with you in scheduling surgery. Speak with your primary care physician for information on how to stop smoking. For more information about other smoking cessation programs in your community, please contact your local American Heart Association at 1-800-242-8721 or American Cancer Society at 1-800-227-2345.

## Alcohol Use

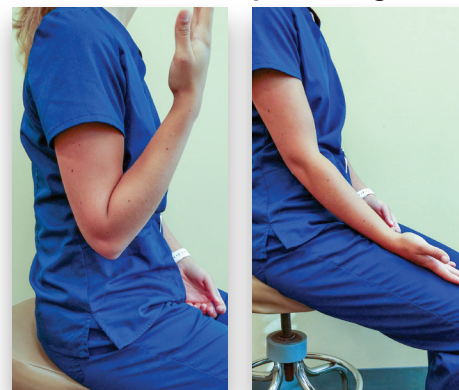
Drinking alcohol can greatly affect the outcome of your surgery. Your recovery from surgery may not proceed as planned if your health care providers are not aware of your history of alcohol use. Tell your health care provider how many drinks you have per day (or per week). Although it may be difficult to discuss alcohol use with your healthcare team, it is done for your safety and to improve the outcome of your surgery.

During your pre-surgical visit, you will be asked a series of questions. Your answers will help determine your risk of alcohol withdrawal and other alcohol related problems that could occur after surgery. Alcohol withdrawal is a serious condition that occurs when someone stops using alcohol after prolonged periods of heavy drinking. Symptoms include headaches, nausea, tremors, anxiety, hallucinations, and seizures. Alcohol withdrawal can be life-threatening. To appropriately gauge your risk for alcohol withdrawal while in the hospital, please respond to the questions as honestly as possible. Remember, any information provided is held in strict confidence. We are here to help you prepare and recover from your surgery as quickly and safely as possible.

# General Discharge Information After: Shoulder Replacement

## Sling/Activity:

- Sling should be worn at bedtime and outside of the home for the first 6 weeks after surgery. It does not need to be worn while you are at home or you are eating/drinking; however, it is very important to avoid rotating your hand away from your body. Please see the picture to the right as a reference of maintaining neutral shoulder rotation. The **hand of your operative arm** should remain in the box, and in front of you at all times.
- If you are wearing your sling at all times for comfort, it is important to come out of your sling 3-4 times a day to straighten your elbow and move your wrist and fingers to avoid stiffness.
- Until you are more comfortable you will need some help to remove your sling. You will need to unclip the shoulder strap and the Velcro strap across your forearm. Be sure to support your arm while the sling is being removed and put back on. Do not actively move your shoulder to remove your sling.
- You are unable to drive a car as long as you need to utilize a sling.



## Ice:

- An ice device or ice bag (not directly touching the skin) should be utilized to reduce swelling and pain. Please ice every 3-4 hours for about 15-20 minutes each time until swelling subsides.

## Wound Care:

- A waterproof dressing will be applied to your incision after surgery. **Please leave this dressing in place until your follow up appointment with Dr. Jawa or Dr. Kirsch.** You may shower with this dressing, but no soaking in baths, pools or hot tubs. If you notice staining (darkening) of the dressing, please contact the office.



**Bruising in your surgical arm and swelling of your hand and forearm may occur in the days following surgery and is very common. It will improve with time and the exercises described later in the handout.** Icing and anti-inflammatories may help as well.

## Pain Medication:

- You will be given a prescription for narcotic **pain medication**. Take this as needed until the pain is minimal. You should also continue to take over the counter Tylenol or anti-inflammatories (NSAIDs) as directed for pain control. These medications have different mechanisms and can be taken together.
- Tylenol (acetaminophen) 2 tabs (Extra Strength Tylenol, 500mg each) every 8 hours as needed. **DO NOT exceed 3000mg (6 tablets) in a 24-hour period.**

## Anti-inflammatories (NSAIDs):

- Mobic (Meloxicam) – **1 tablet (7.5 mg) twice per day** (do not take with any additional NSAIDs if you take the Mobic).

### OR, YOU CAN CHOOSE TO TAKE ONE OF THE FOLLOWING:

- Advil or Motrin (ibuprofen, available over the counter) - **2 tabs (200 mg each) every 4 hours as needed. DO NOT exceed 2,400mg of ibuprofen in a 24-hour period.**
  - You may take Aleve or Naprosyn (naproxen) instead of ibuprofen, but Aleve dosage differs, and is **1-2 tablets (225 mg each) every 12 hours as needed. DO NOT exceed 1,000mg of Naprosyn (naproxen) in a 24-hour period.**
- You can alternate these medications, e.g., Tylenol at 8 am, Advil at 12 pm, Tylenol at 4 pm, etc.
- If you take any oral anticoagulation, you may not be able to take any NSAIDs.
- If you need a refill of your pain medication, please call the office at least 2 business days in advance.
- You may have been given a prescription for **Colace, a stool softener**, while on pain medication, as these may cause constipation. **Colace** should be taken twice daily, and can also be purchased over the counter.
- You may also have been given a prescription for **Zofran**, which you can take as needed for nausea.

## Follow Up:

You have been scheduled for a post-operative visit, which should be listed in your surgical packet. Your first visit should be approximately 2 weeks after surgery. If you are unsure of when your follow up visit is scheduled, please contact the office.

# Medication Schedule

## 3 days prior to surgery

- Begin using Hibiclens soap from neck to waist
- Colace 100 mg daily (available over-the-counter)

## 2 days prior to surgery

- As above
- Take Tylenol 1000 mg (available over-the-counter) every 8 hours

## Days 1-3 after surgery

- Take Mobic (Meloxicam) 7.5 mg daily
- Take Tylenol 1000 mg every 8 hours
- Use Oxycodone 5 mg 1-2 pills every 4 hours ONLY if needed for pain
  - Can take 1-2 tablets at night if needed
- Take Zofran 4 mg every 4-6 hours as needed for nausea
- Take Colace 100 mg daily
- Take Aspirin 81 mg daily (for 4 weeks)

## Notes:

- \*\*\*remember to ice ~20m every few hours as needed for pain/swelling\*\*\*
- Some patients who experience nausea may have been discharged with a prescription for Zofran, which is a medication that can help with nausea
- Some patients may need pain medications during the night due to pain/discomfort while sleeping
- Ok to restart other medications, vitamins, etc. at this point

## Day 4-14 after surgery

- Take Mobic (Meloxicam) 7.5 mg daily
- Take Tylenol 1000 mg every 8 hours until off of oxycodone and pain is controlled
- Use oxycodone 5 mg, 1 tablet every 4-6 hours ONLY if needed for pain
  - \*\*\*aim to wean off oxycodone within a few days after surgery as your pain improves\*\*\*
    - Can take 1-2 tablets at night if needed
- Take Zofran 4 mg every 4-6 hours as needed for nausea
- Take Colace 100 mg daily
- Take Aspirin 81 mg daily (for 4 weeks)

## Day 14+ after surgery

- Discontinue Mobic (Meloxicam). You may restart/take other anti-inflammatories (NSAIDs) as needed
  - Motrin/Advil 200 mg - 3 tablets (600 mg) every 8 hours as needed
- OR you can take:**
  - Aleve 220 mg - 2 tablets (440 mg) every 12 hours as needed
- Continue Tylenol if needed, 1000 mg every 8 hours as needed
- Take Aspirin 81 mg daily (for 4 weeks)

# Post-operative Pain Management Update: Medrol Dose Pack (methylprednisolone)

## Why We Added a Medrol Dose Pack to Your Post-Operative Care:

As part of your recovery following surgery, we aim to control pain while minimizing the need for stronger medications like opioids. A recent randomized controlled study demonstrated that patients who received a low-dose steroid required fewer opioid medications compared to patients who did not. Furthermore, there were no adverse effects associated with the low-dose steroid. Therefore, we've updated our protocol to include a Medrol Dose Pack (methylprednisolone) to help you recover more comfortably and quickly.

**\*\*PATIENTS WITH DIABETES WILL NOT RECEIVE THE MEDROL DOSE PACK\*\***

## What Is a Medrol Dose Pack?

- A 6-day tapering dose of methylprednisolone, a corticosteroid that reduces inflammation.
- It is taken orally daily according to a scheduled dose. This begins on the day after surgery (post-operative day #1).
- For Example: Take 6 pills on day #1, 5 pills on day #2, etc. as directed on the packaging.

## Is It Safe?

Yes—when taken as directed. The Medrol Dose Pack is short-term and low-dose and generally well tolerated. **PATIENTS WITH DIABETES WILL NOT RECEIVE THE MEDROL DOSE PACK.**

## Questions or Concerns?

Please reach out to us if you have any additional questions or concerns.

*Sample post-operative schedule:*

**Days 1-3 after surgery**

7-8 am

- Mobic (Meloxicam) 7.5 mg
- Tylenol 1000 mg
- Oxycodone 5 mg, 1-2 tablets (if needed)
- Colace 100 mg
- Zofran 4 mg (if needed for nausea)
- Aspirin 81 mg

12 pm

- Oxycodone 5 mg, 1-2 tablets (if needed)
- Zofran 4 mg (if needed for nausea)

4 pm

- Tylenol 1000 mg
- Oxycodone 5 mg, 1-2 tablets (if needed)
- Zofran 4 mg (if needed for nausea)

8-10 pm (before bed)

- Tylenol 1000 mg
- Oxycodone 5 mg, 1-2 tablets (if needed)

2-4 am (if needed)

- Oxycodone 5 mg, 1-2 tablets (if needed)

**Days 4-14+ after surgery**

7-8 am

- Mobic (Meloxicam) 7.5 mg
- Tylenol 1000 mg
- Colace 100 mg (if still taking oxycodone)
- Aspirin 81 mg

4 pm

- Tylenol 1000 mg

8-10 pm (before bed)

- Tylenol 1000 mg
- Oxycodone 5 mg, 1-2 tablets (if needed)

# WHEN TO CONTACT YOUR DOCTOR AFTER SURGERY

- You have a fever over 101.4 degrees Fahrenheit
- You have drainage from incision
- The area around your incision becomes hot to touch, red, or swollen
- You have increased pain that is not relieved with pain medication
- You develop sudden or severe calf pain, or swelling in the calf that does not decrease after elevation of leg
- You have questions regarding activity or your medications
- Chest pain or shortness of breath

## Physical Therapy/Home Exercise Program

- Please perform elbow, wrist, and finger range of motion on a regular basis after surgery.
- Dr. Jawa and Dr. Kirsch prefer that their patients do not do formal physical therapy after Shoulder Replacement. They have found that most patients do well with progressing their motion and strength through normal daily activities. They have also found that sometimes physical therapy pushes patients too much causing increased pain and discomfort. At each post-operative appointment, Dr. Jawa, Dr. Kirsch, Kiet, or Tessa will teach you exercises to do on your own to work on range of motion. Although you should progress with some gentle range of motion, as demonstrated by the team, and do not force any shoulder motions. Most importantly, do not let anyone (family members, physical therapists, etc.) force your arm into uncomfortable positions.

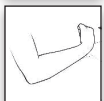
## Discharge - Until Follow-Up Appointment

### Instructions

- Perform these exercises 2-3 times per day with 10 repetitions per session.
- Encourage early range of motion of your elbow, wrist, and hand. Please begin this immediately.



1. Open and close your hand.



2. Bend your wrist up and down.



3. Turn your palm up and down in a motion similar to turning the pages of a book.



4. Bend and straighten your elbow as much as possible

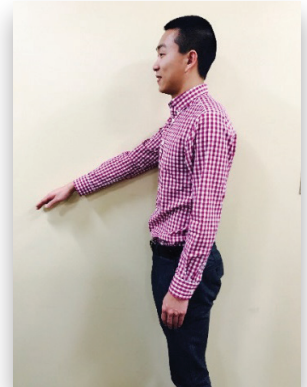
# First Post-Operative Visit Instructions

At your first post-operative visit (two weeks from your surgical date), we will show you exercises to begin gentle range of motion of your shoulder. These exercises should be done in sets of 10, 3-5 sets daily. We may also recommend that you remove your sling as much as possible to do activities in front of you. It is important to remember not to rotate your arm to the side any further than seen to the right. You should also be sure to continue to wear your sling while sleeping and when in public.



## Exercises

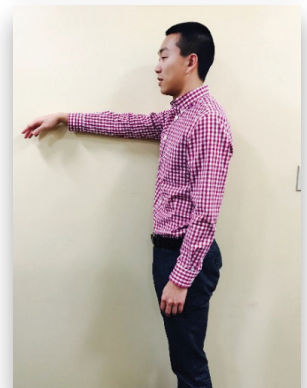
Begin with your operative shoulder against a wall. Slowly lift your arm in front of you as high as possible. Your shoulder should remain against the wall to prevent you from rotating your shoulder outwards while doing this exercise.



Next, use your other arm to help lift your operative arm gently until you reach resistance. Stay in this position for 10 seconds and slowly release. Your non-operative arm should only be doing approximately 10% of the work.



Your goal by your next post-operative visit should be at least 90° as seen to the right.

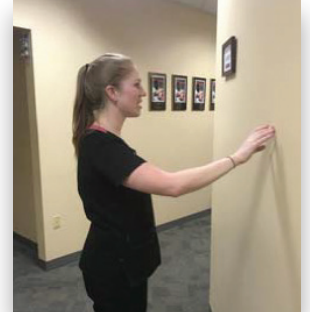


# Second Post-Operative Visit Instructions

At your second post-operative visit (6 weeks from your surgical date), we will show you exercises to begin gentle range of motion of your shoulder. These exercises should be done in sets of 10, 3-5 sets daily. We may also recommend that you remove your sling as much as possible to do activities in front of you.

## Exercises

**Forward Elevation:** Continue to work on lifting your arm in front of you. You may use a wall and “walk up” the wall with your fingertips as displayed to the right.



**External Rotation:** You can gently begin to rotate your arm outwards after your **second post-operative appointment**. You can use your non-operative arm to help apply light pressure to help you.



**Internal Rotation:** You may also now start to reach behind your back. This is generally the most difficult motion for patients after shoulder replacement.

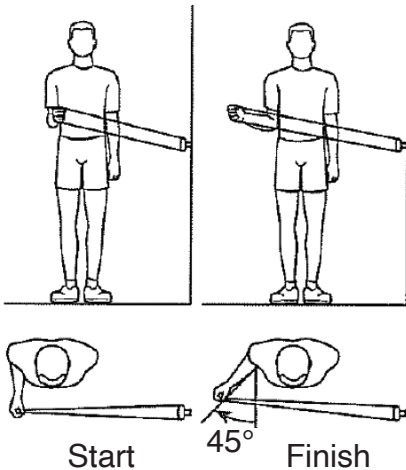


# Optional Rehabilitation Exercises: 3rd Post-Operative Visit

\*\*If using TheraBands: use light/medium resistance bands, which are yellow, red, green, blue. Other resistance bands can be used, as long as their overall resistance is < 15 lbs (usually called #0, #1, extra-light, or light).

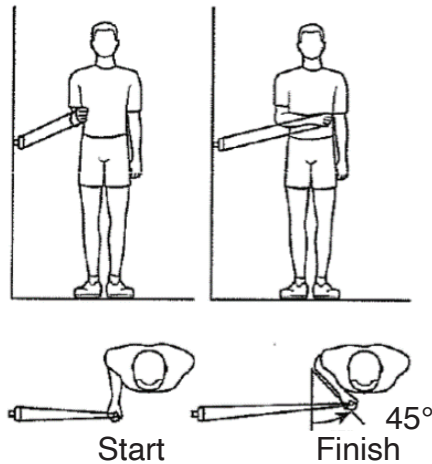
## 1) External Rotation:

Keeping your elbow at your side, turn your hand OUTWARD against resistance. Perform 3 sets of 10 repetitions, 2-3 times per day.



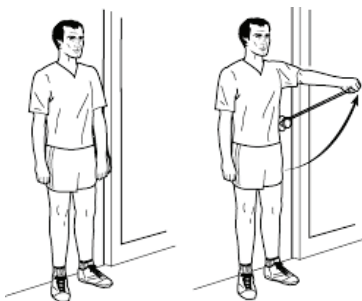
## 2) Internal Rotation:

Keeping your elbow at your side, turn your hand INWARD against resistance. Perform 3 sets of 10 repetitions, 2-3 times per day.



## 3) Forward Raise:

With light resistance, lift your arm in front of you to approximately shoulder height. Lift higher as you can tolerate. Perform 3 sets of 10 repetitions, 2-3 times per day.





# Checklist for your upcoming surgery at New England Baptist Hospital

## After booking Surgery:

- Contact any specialists (i.e. Cardiology, Hematology/Oncology, Rheumatology) for documentation and clearance that they are comfortable with you proceeding with shoulder replacement surgery.
- If you take any medications such as immunosuppressants, hormone replacement, rheumatoid arthritis or osteoporosis medications, contact the prescribing physician as there may need to be changes to these before surgery.
- Register for BBJI patient portal. This can be an effective way to relay any pre- and post-operative concerns.
- Make sure that no dental appointments are booked for 3 months after your surgical date.
- You cannot have a cortisone injection into the operative shoulder within 3.5 months of surgery.
- If you have ever had reactions to anesthesia or pre-surgical prep, be sure that Dr. Jawa/ Dr. Kirsch's staff are aware so these issues can be addressed early, preventing delays to your surgery.
- Visit and view the NEBH patient education video series for shoulder arthroplasty at:  
<https://www.nebh.org/patients-care-partners/patient-education/shoulder-replacement/>
- Consider purchasing a cold therapy unit for your shoulder. These are available online, as well as through the BBJI. Contact the office at BBJI to purchase (refer to your pre-operative booklet).

## Within two months of Surgery:

- Make sure to check the mail; a letter will be coming with your pre-screening appointment.
- Notify Dr. Jawa/Dr. Kirsch's staff of any change in medical conditions such as open wounds, rashes and any infections as they could impact your surgery.
- If you are on a blood thinner, consult with the provider who prescribes for a plan to stop safely before surgery. Be sure to know the details of this plan and when exactly to stop.
- If considering staying at a hotel near the hospital the night before surgery, contact New England Baptist Hospital at 617-754-5800 for further information.
- Begin to make arrangements to have someone (spouse, children, friend etc.) at home with you for a few days after surgery, to help you with day-to-day tasks.

## Within one month of Surgery:

- If you have not received the date for your pre-screening appointment, contact Dr. Jawa/ Dr. Kirsch's office.
- If you are prescribed prednisone for a medical condition, contact Dr. Jawa/Dr. Kirsch's office.
- Be proactive in keeping healthy. Even simple illnesses such as a common cold could cancel surgery.
- If any dental work is taking place within the last month, contact your dentist immediately for any signs of infection. You need to be clear of any infections prior to surgery.
- Your pre-screening at New England Baptist Hospital will last between 3-6 hours. There can be delays, but this day is vital to ensuring you have a safe and comfortable experience for surgery. At this appointment you will be able to discuss any concerns you have with regards to medications, including anesthesia. You will also be able to inquire about VNA or rehab at this appointment and coordinate that care for after surgery. If you require an MRI or CT for surgery, it will be scheduled for this day as well.
- If you are a smoker, remember that you need to be completely off of cigarettes by the time of your surgery, or it may be canceled.

## Within one week of Surgery:

- Stop all anti-inflammatories, unless otherwise directed by a physician, 7 days prior to surgery, Tylenol is okay to continue.
- If you ordered a cold therapy unit through BBJI, arrange to pick it up at the office (Waltham office).
- Make any necessary arrangements at home to ensure safety after surgery.
- Be sure to know the date, time, and location of your post-operative appointments.
- Make sure to use the Hibiclens soap as recommended, 3 days prior to surgery.
- Expect a call from New England Baptist Hospital between 12-4pm the day prior to surgery, informing you of your arrival time.

# Checklist for your upcoming surgery at Boston Outpatient Surgical Suites

## After booking Surgery:

- Register for BBJI's patient portal. This can be an effective way to relay any pre- and post-operative concerns.
- Make sure that no dental appointments are booked for 3 months after your surgical date.
- You cannot have a cortisone injection into the operative shoulder within 3.5 months of surgery.
- If you have ever had reactions to anesthesia or pre-surgical prep, be sure that Dr. Jawa/ Dr. Kirsch's staff are aware so these issues can be addressed early, preventing delays to your surgery.
- Inform Dr. Jawa/Dr. Kirsch's staff immediately if you have ever tested positive for MRSA.
- Register with the surgical center at [bostonoutpatient.com](http://bostonoutpatient.com).
- Book a pre-surgical clearance with your primary care physician within 30 days of surgery. They will need to complete a History & Physical. If you are over the age of 65, they will also need to complete an EKG.

## Within two months of Surgery:

- Make sure to check the mail; a letter will be coming with instructions on pre-surgical medications.
- Notify Dr. Jawa/Dr. Kirsch's staff of any change in medical conditions such as open wounds, rashes, and any infections as they could impact your surgery.
- Begin to make arrangements to have someone (spouse, children, family member, friend, etc.) at home with you for a few days after surgery, to help you with day-to-day tasks such as preparing meals, medications, dressing yourself, etc.

## Within one month of Surgery:

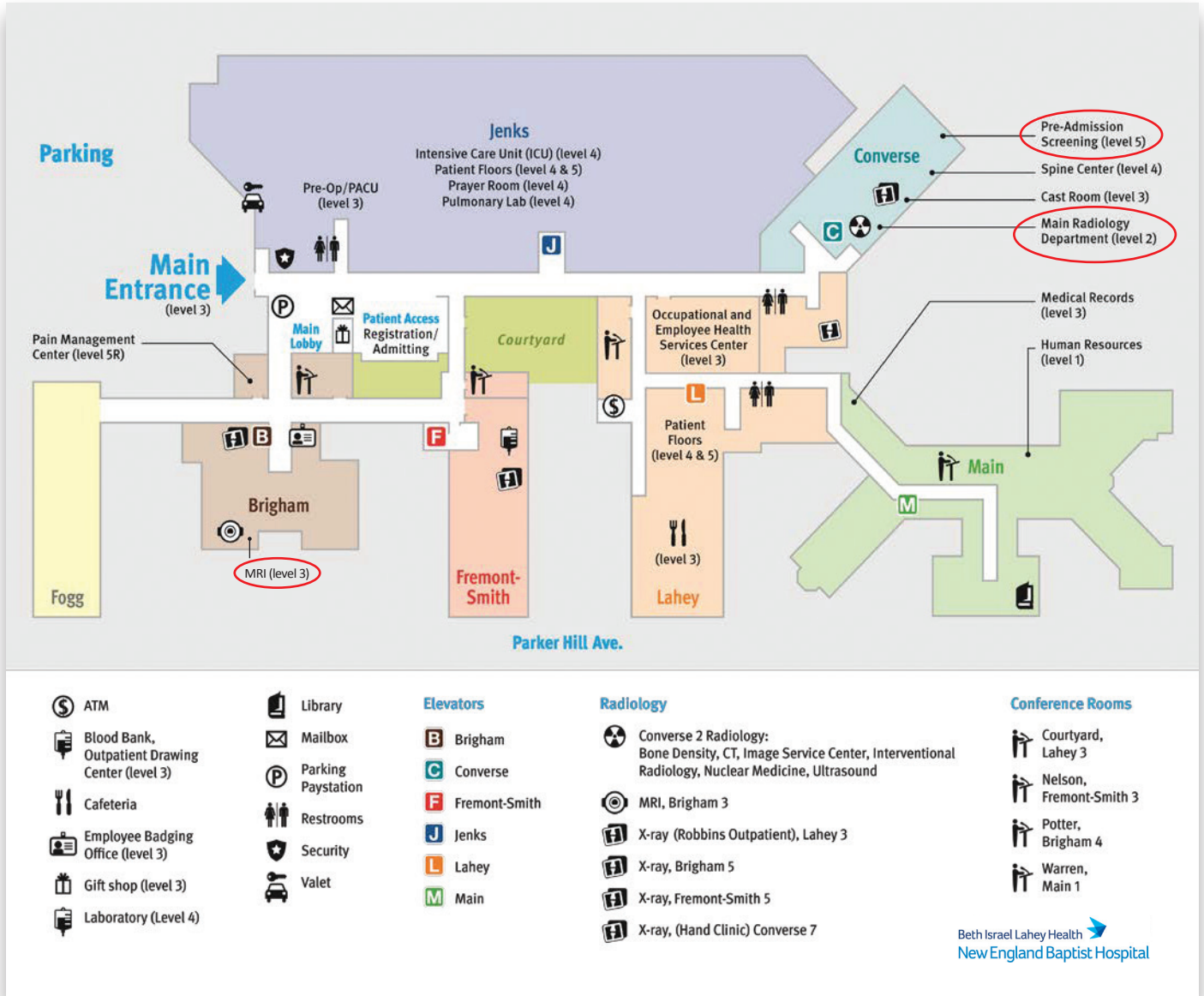
- If you are prescribed prednisone for a medical condition, contact Dr. Jawa/Dr. Kirsch's office.
- If a CT or MRI is needed before surgery, be sure you have that appointment by now.
- Be proactive in keeping healthy. Even simple illnesses such as a common cold could cancel surgery.
- If any dental work is taking place within the last month, contact your dentist immediately for any signs of infection. You need to be clear of any infections prior to surgery.
- Make sure you have registered with the surgical center, and that your surgical clearance is sent to them.

- If you are a smoker, remember that you need to be completely off of cigarettes by the time of your surgery, or it may be canceled.
- Consider purchasing a cold therapy unit for your shoulder. These are available online, as well as through the BBJI. Contact the office at BBJI to purchase, and please reference your pre-surgical binder for more information.

## **Within one week of Surgery:**

- Stop all anti-inflammatories, unless directed by a physician, 7 days prior to surgery. Tylenol is okay to continue.
- Make any necessary arrangements at home to ensure safety after surgery.
- If you ordered a cold therapy unit through BBJI, arrange to pick it up at the office (Waltham office).
- Be sure to know the date, time, and location of your post-operative appointments.
- Expect a call from Boston Outpatient Surgical Suites between 11am-2pm the Friday prior to surgery, informing you of your arrival time.

# Map of New England Baptist Hospital



# Supporting Our Research

Boston Bone & Joint Institute has a continuous goal of raising the bar of high-quality patient care. In years past, research has primarily been independent and performed through individual surgeon efforts using patient-outcomes databases. In 2021, we established the BBJI Research Foundation, a 501(c)(3) not-for-profit organization, to centralize and elevate our research and educational capacities. Our core values of providing evidence-based patient care, performing cutting-edge research, and offering interdisciplinary education to the next generation of physicians remain the pillars of BBJI; however, with your support, we can set an entirely new standard of what high quality-patient care means in orthopedics, and specifically for shoulder replacements. We strive for the ideals of earlier recovery, zero pain, and most importantly, restoration of quality of life. Your charitable donation would ensure continued research to improve patient outcomes and the training of tomorrow's leaders in shoulder surgery through the gift of fellowship. All donations are tax-deductible and can be made through our Research Foundation website directly ([www.bsscresearchfoundation.org](http://www.bsscresearchfoundation.org)) or written out as a check!

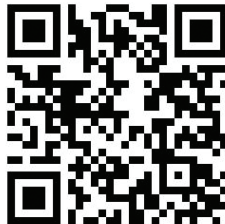
## How are donations used?

1. Essential support for peer-reviewed research studies, including a research assistant
2. Supports fellowship education and training

## Contact Us

For additional information, or if you would like to make a gift, please contact:

**Kiet Le** (Foundation Manager): [researchfoundation@bbji.com](mailto:researchfoundation@bbji.com)

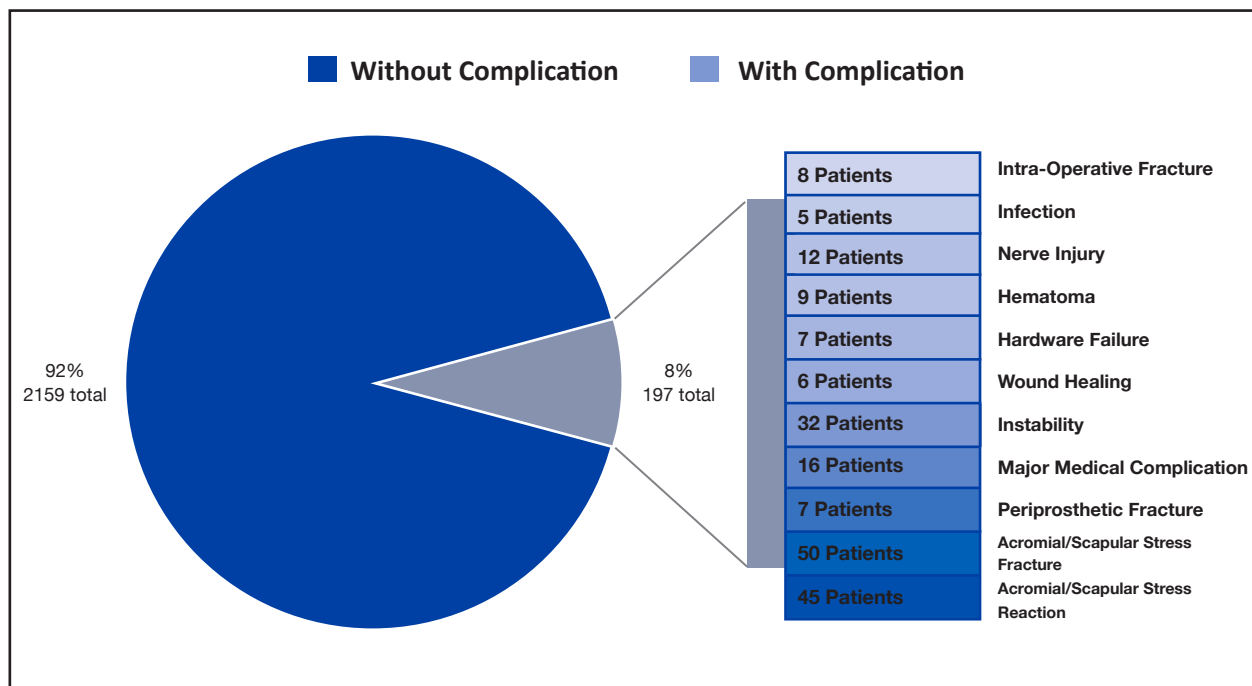


# Surgical Overview and Outcomes, 2016 – 2024

## All Shoulder Procedures between 2016–2024

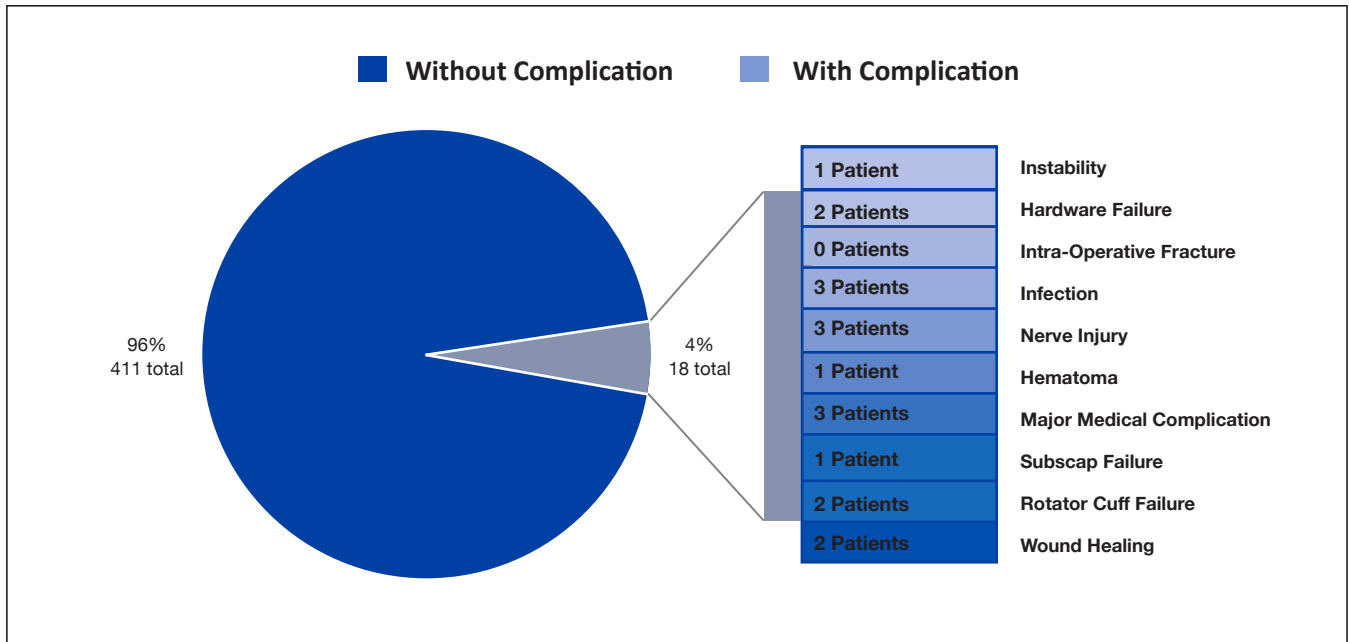
Procedure Type	Number of procedures performed
Primary Anatomic Shoulder Replacement	429
Primary Reverse Shoulder Replacement	2356
Revision Total Shoulder Replacement	190
Latarjet	67
Open Reduction Internal Fixation	23
<b>TOTAL</b>	<b>3065</b>

## Total Primary Reverse Shoulder Arthroplasties from 2016–2024

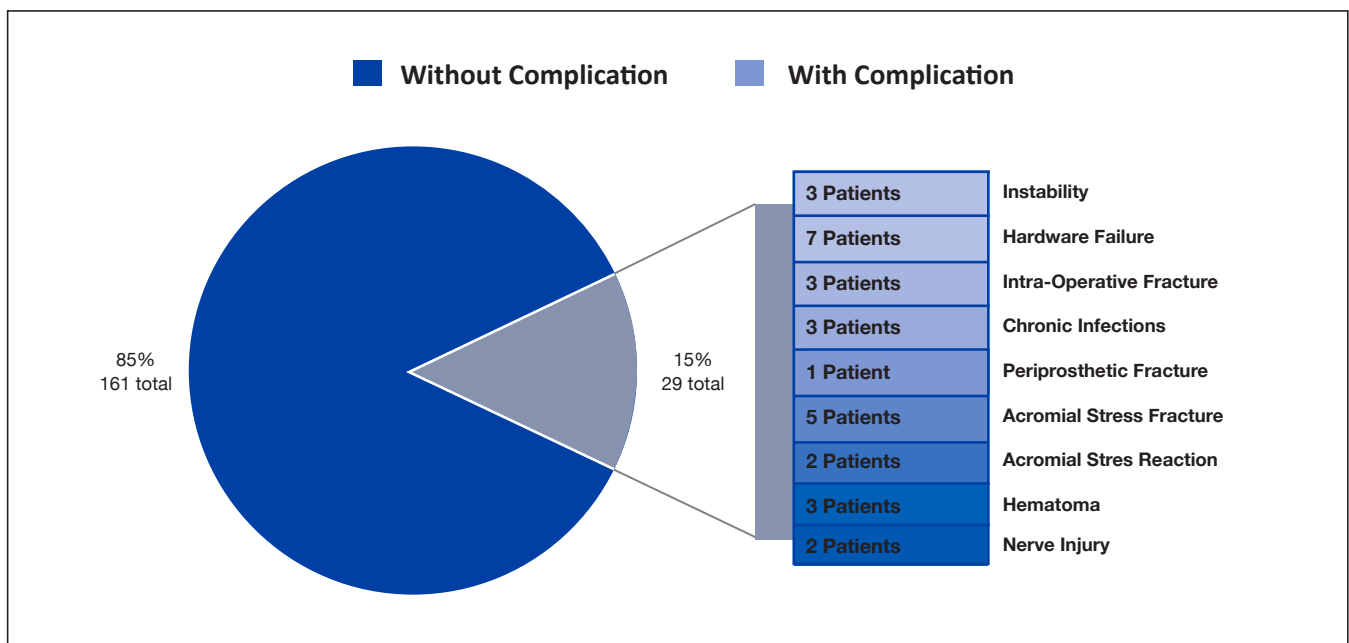


# Surgical Overview and Outcomes, 2016 – 2024

## Total Primary Anatomic Shoulder Arthroplasties from 2016 – 2024

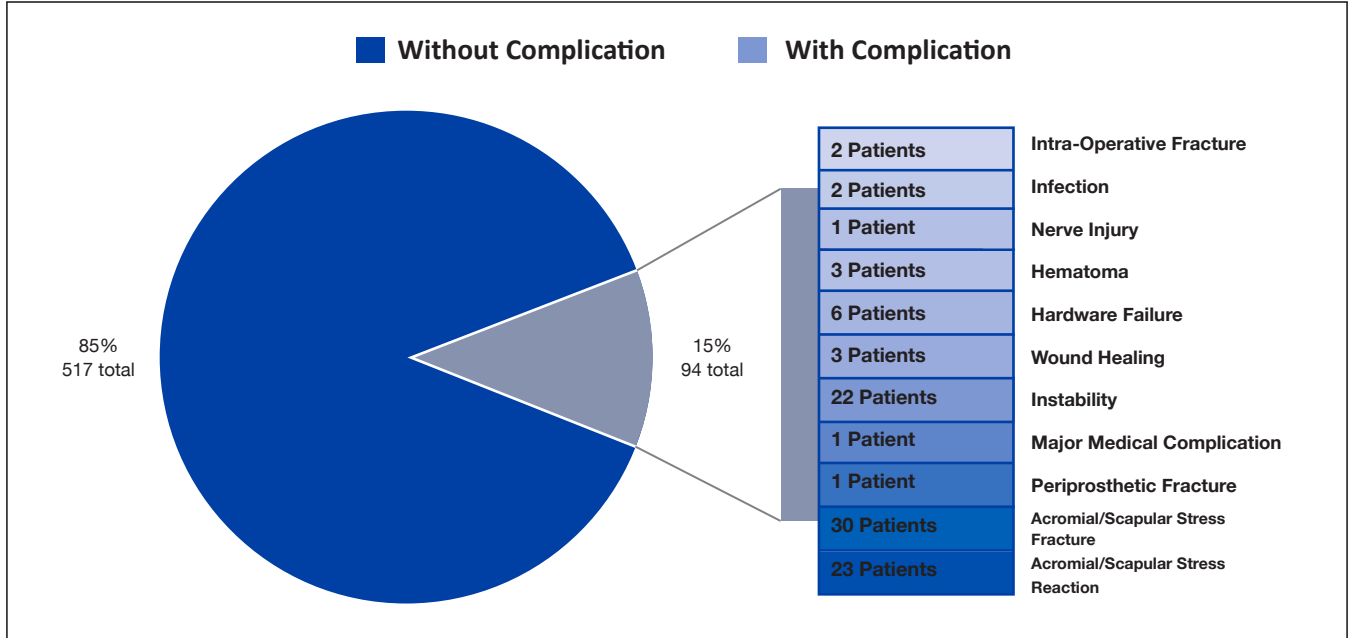


## Total Revision Shoulder Arthroplasties from 2016 – 2024

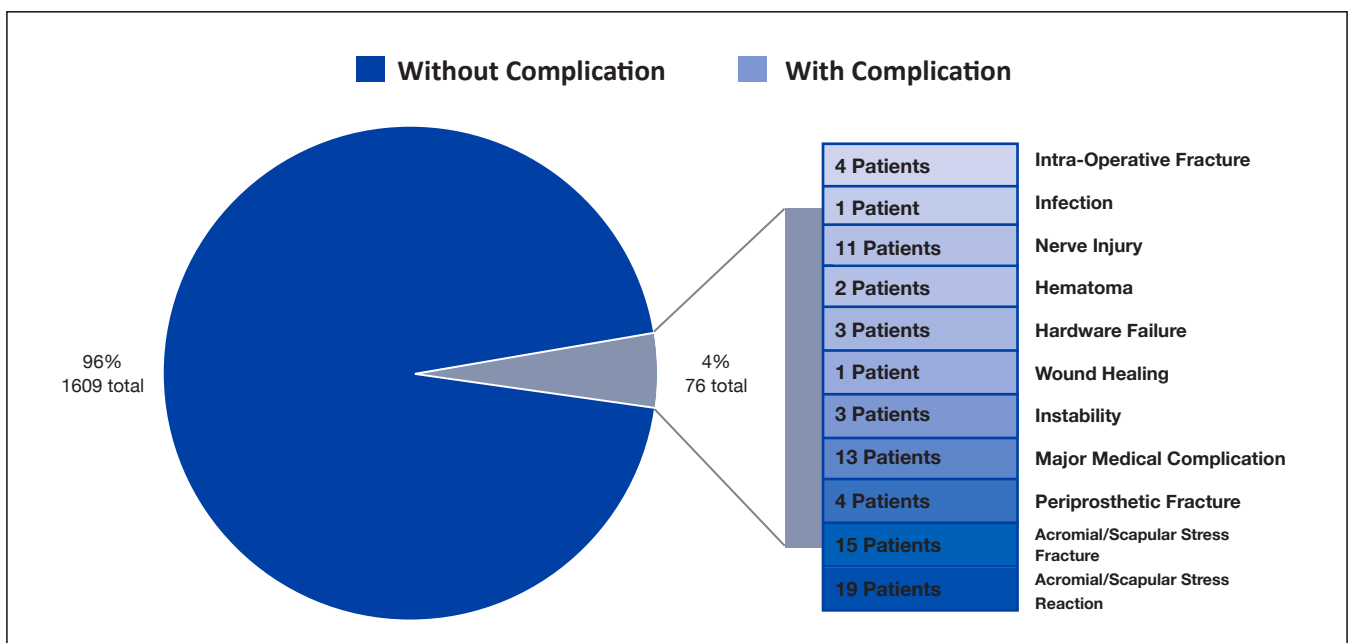


# Surgical Overview and Outcomes, 2016–2024

## Total Primary Reverse Shoulder Arthroplasties for Rotator Cuff Arthropathy or Massive Rotator Cuff Tear from 2016 – 2024

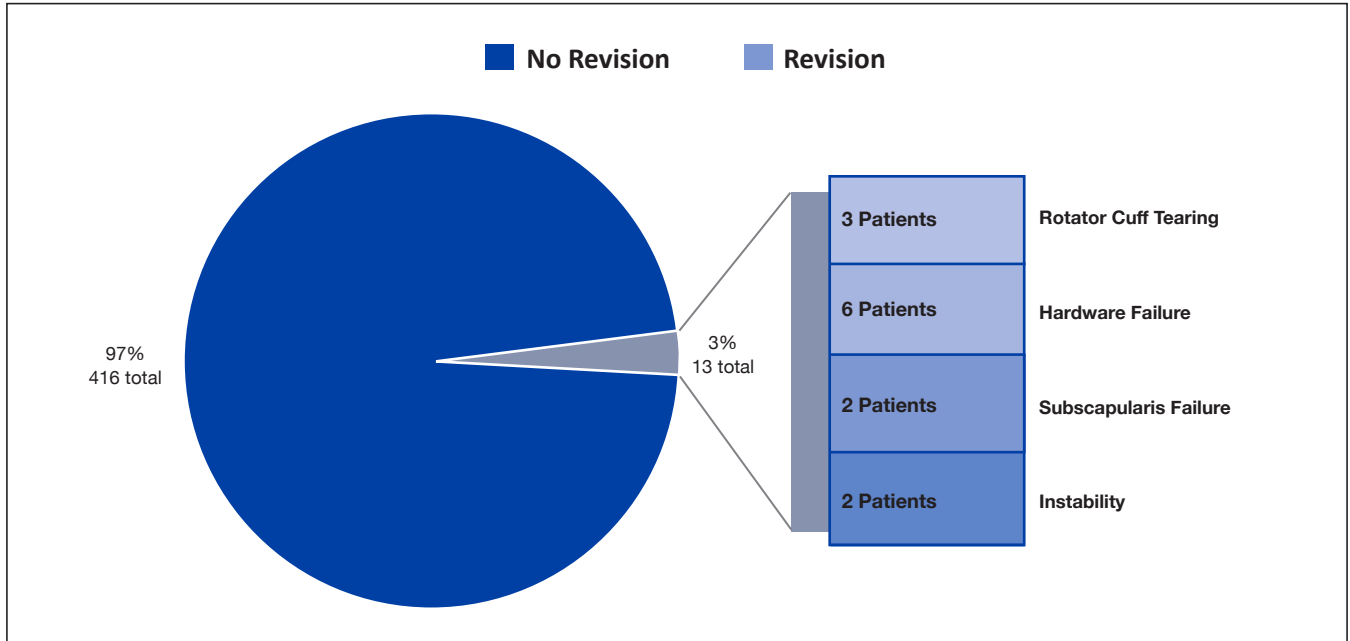


## Total Primary Reverse Shoulder Arthroplasties for Glenohumeral Osteoarthritis from 2016 – 2024

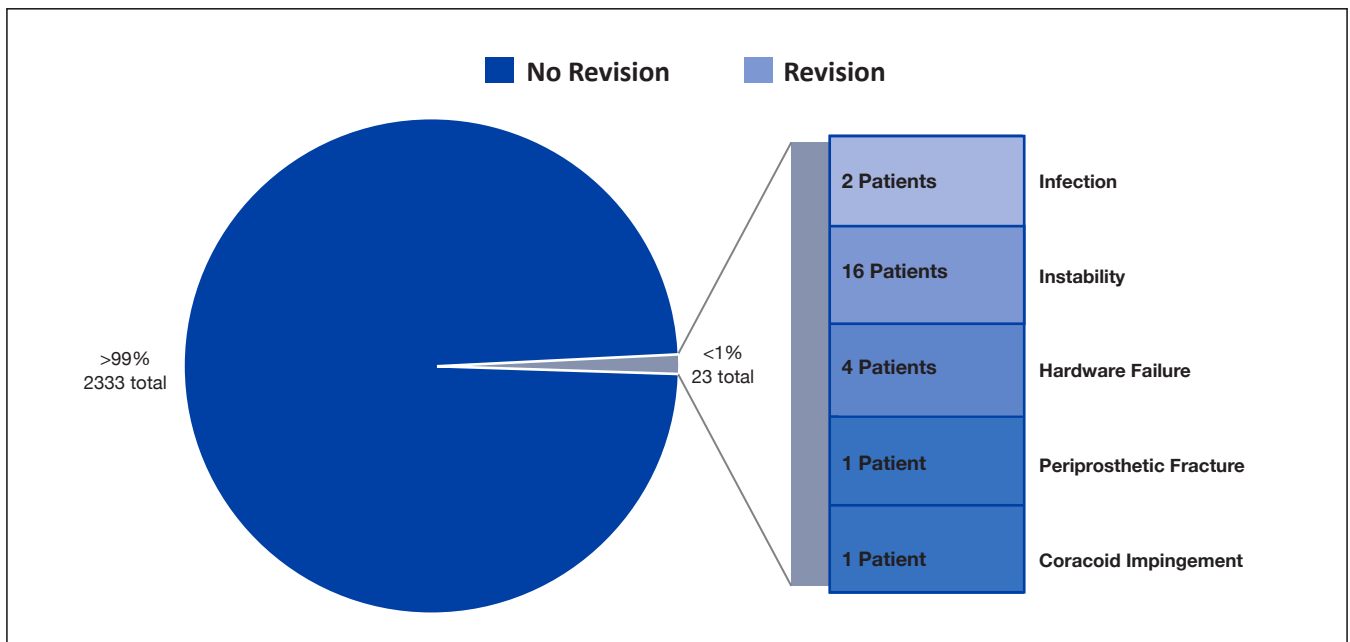


# Surgical Overview and Outcomes, 2016–2024

## Revisions of Dr. Jawa's and Dr. Kirsch's Primary Anatomic Total Shoulder Arthroplasties from 2016–2024

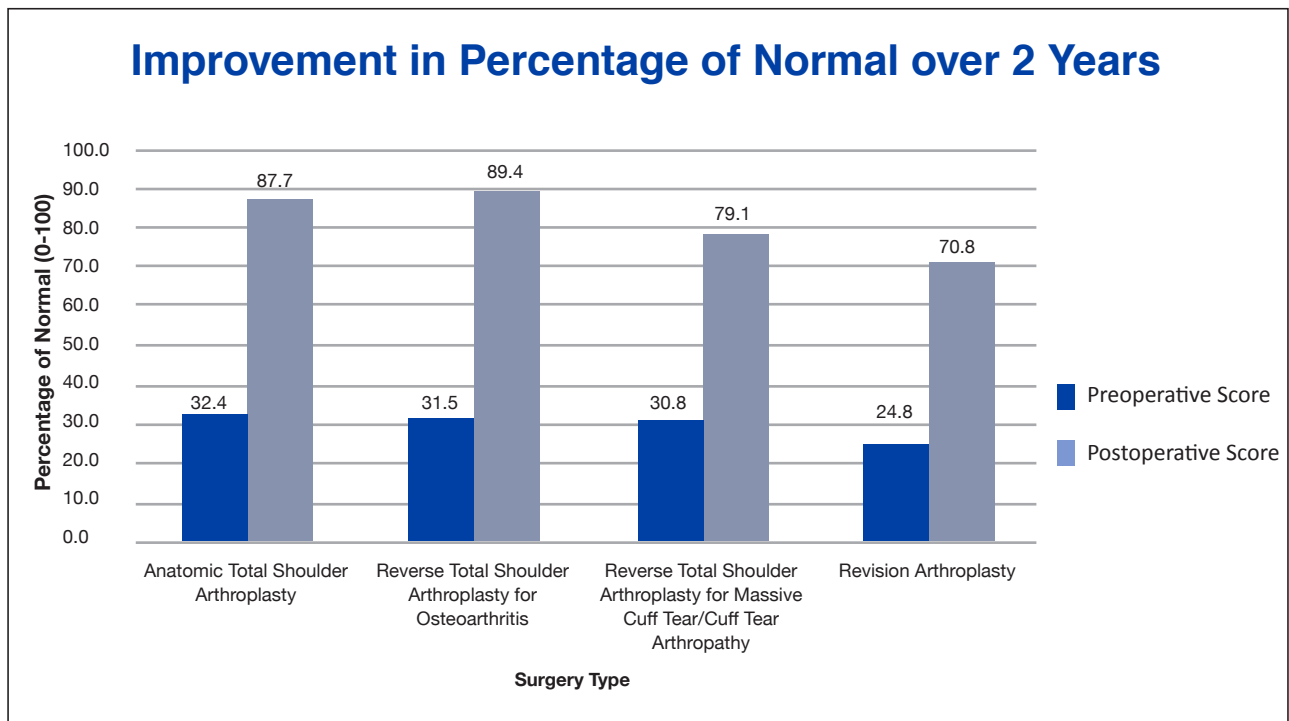
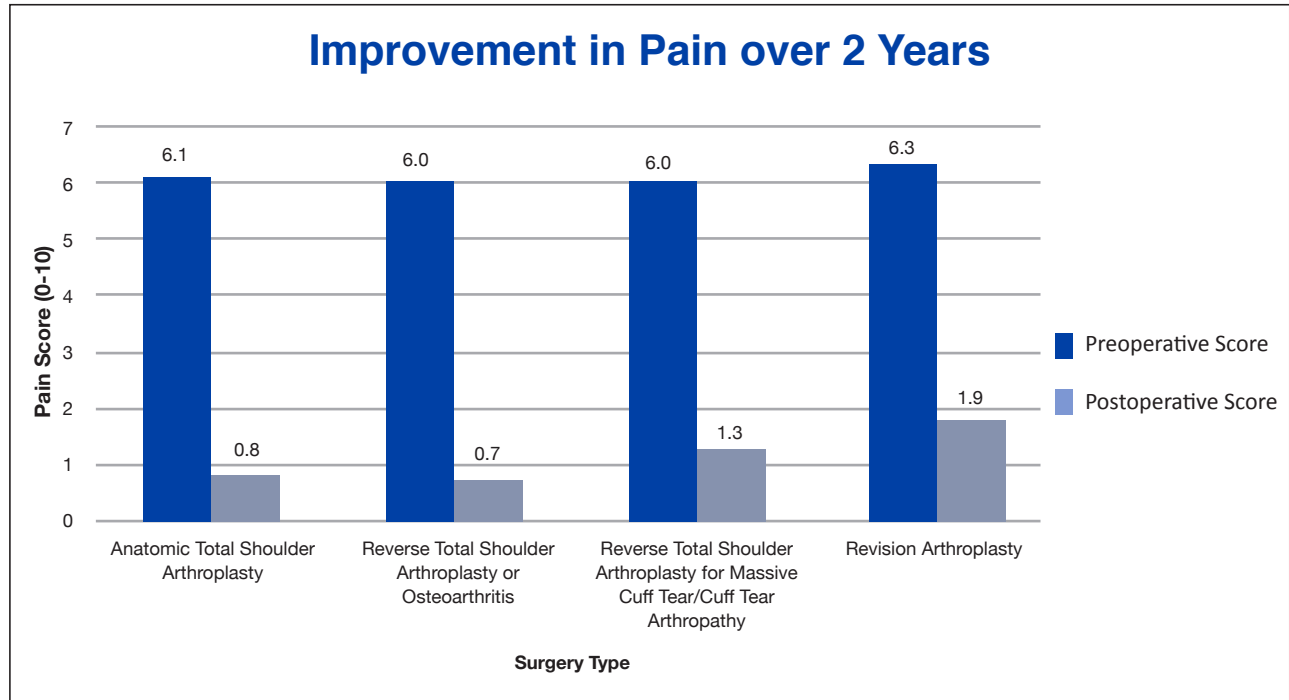


## Revisions of Dr. Jawa's and Dr. Kirsch's Primary Reverse Total Shoulder Arthroplasties from 2016–2024



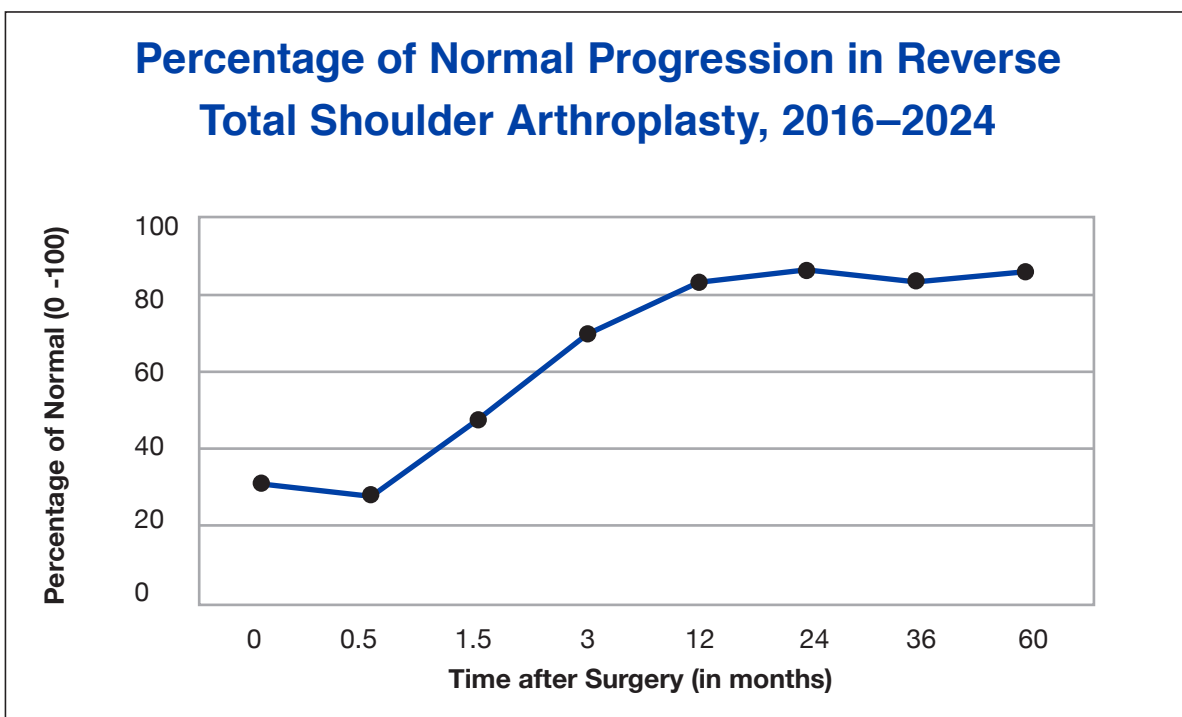
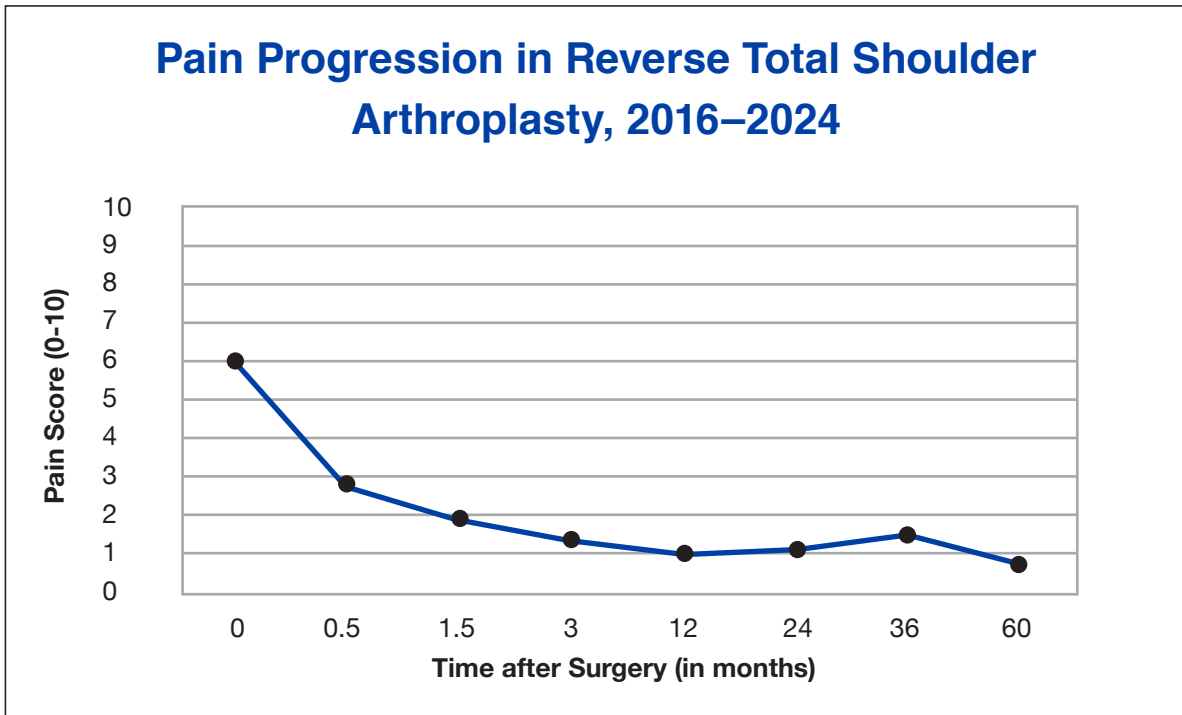
# Surgical Overview and Outcomes, 2016–2024

## Preoperative vs. Postoperative Pain and Percentage of Normal Scores, 2016–2024



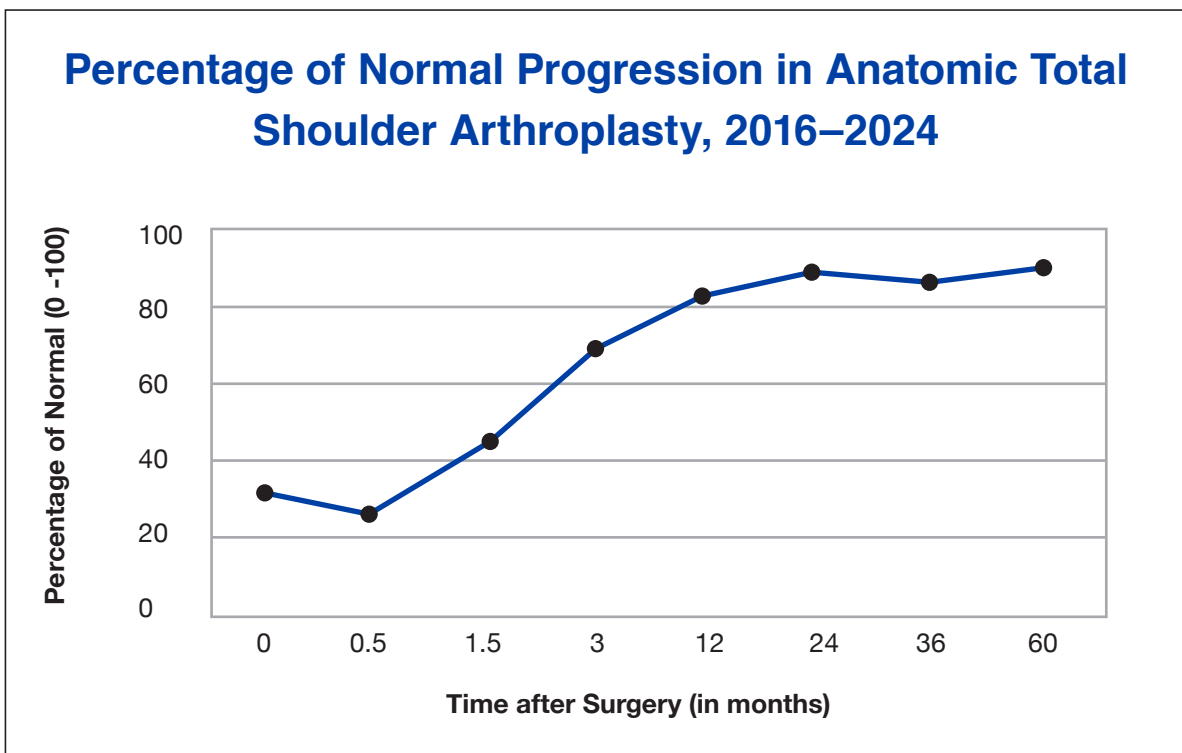
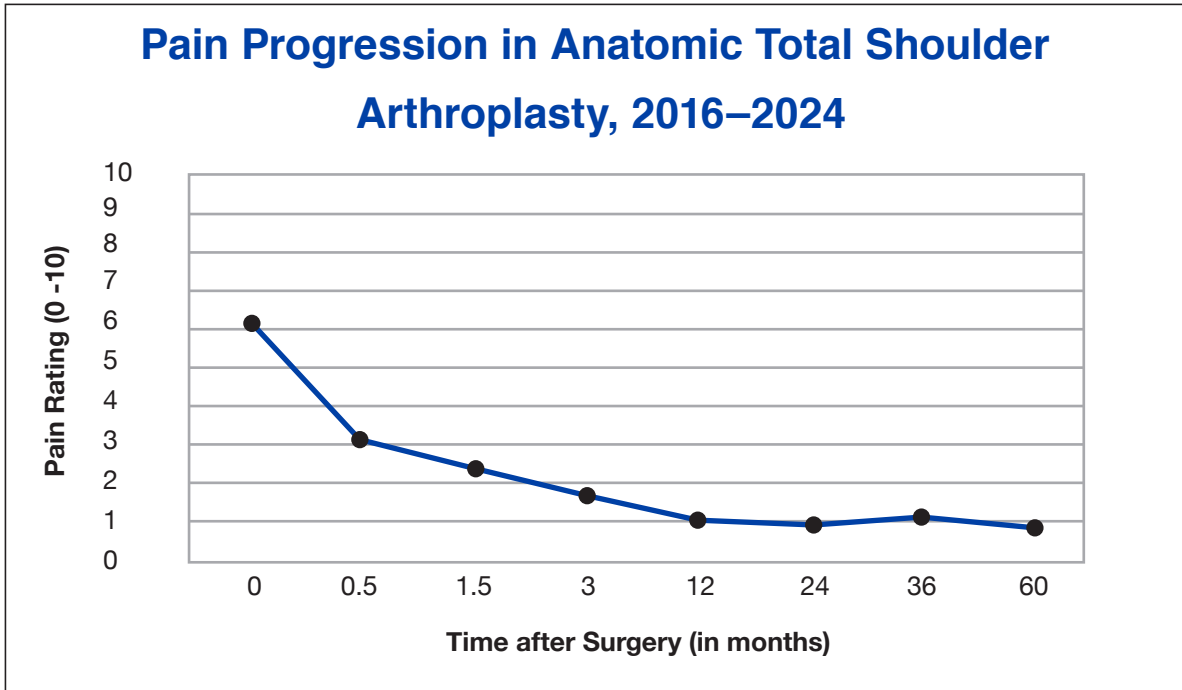
# Surgical Overview and Outcomes, 2016–2024

## Progression of Pain and Percentage of Normal Scores in the Postoperative Period after Reverse Total Shoulder Arthroplasty, 2016–2024



# Surgical Overview and Outcomes, 2016–2024

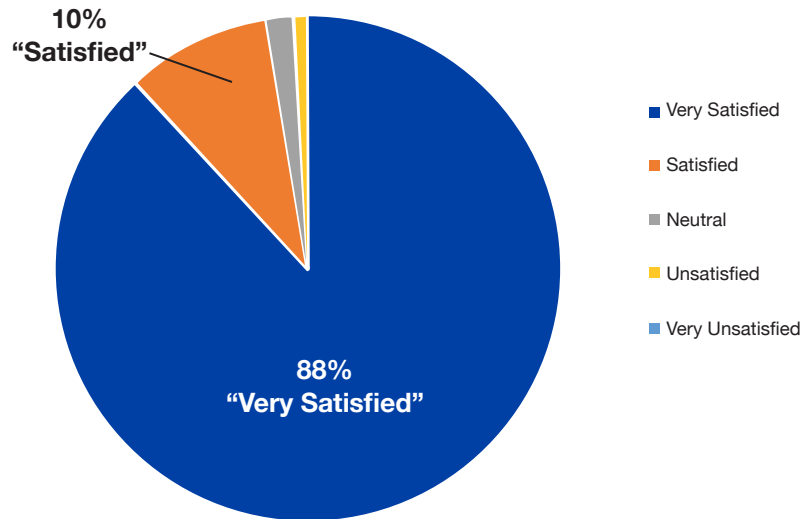
## Progression of Pain and Percentage of Normal Scores in the Postoperative Period after Anatomic Total Shoulder Arthroplasty, 2016-2024



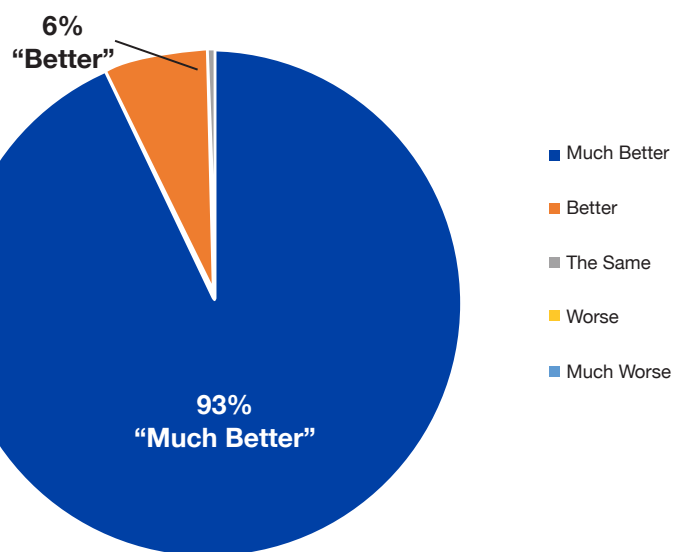
# Surgical Overview and Outcomes, 2016–2024

## Patient Assessment of Surgical Outcome at 2 Years after Reverse Total Shoulder Arthroplasty for Glenohumeral Osteoarthritis, 2016–2024

### How satisfied are you with your surgical outcome?



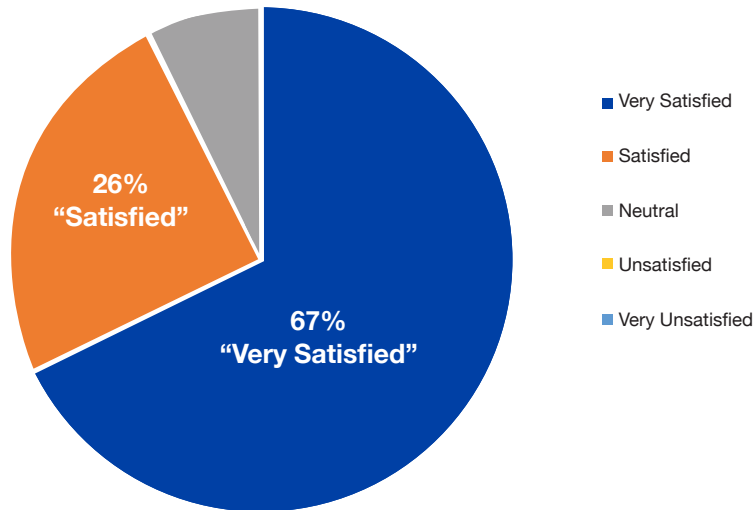
### How is your shoulder compared to before surgery?



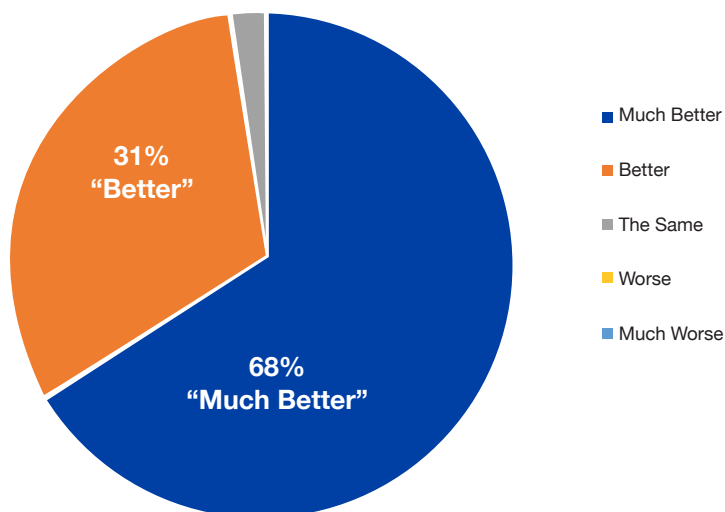
# Surgical Overview and Outcomes, 2016–2024

## Patient Assessment of Surgical Outcome at 2 Years after Reverse Total Shoulder Arthroplasty for Rotator Cuff Arthropathy, 2016–2024

How satisfied are you with your surgical outcome?



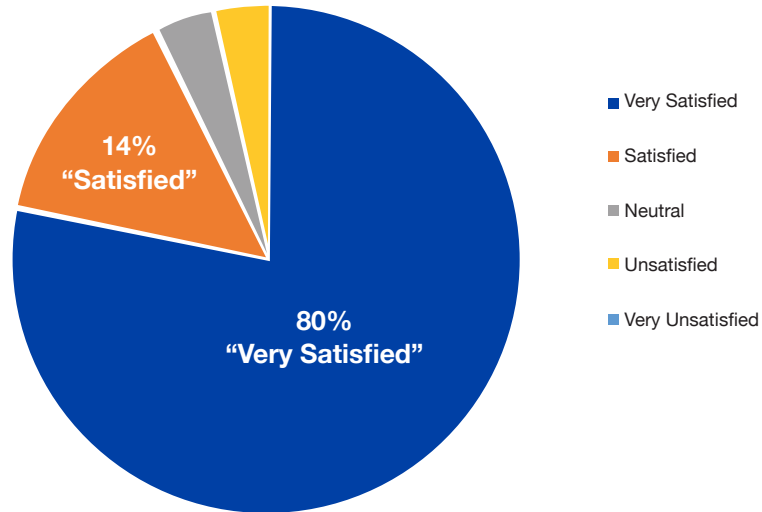
How is your shoulder compared to before surgery?



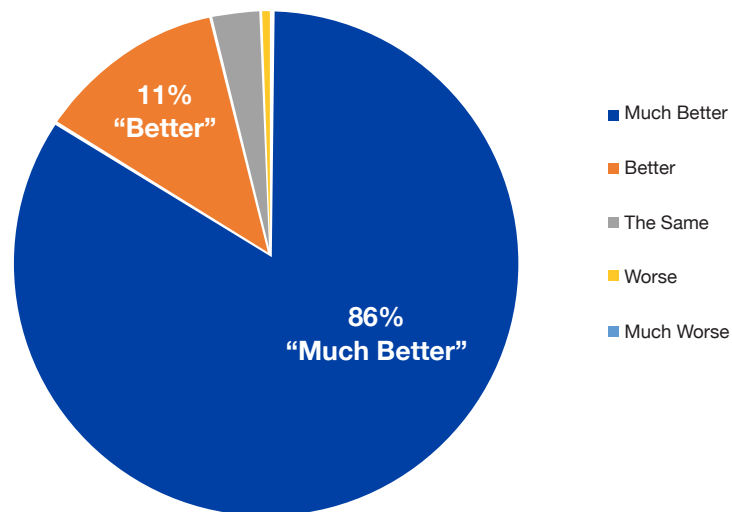
# Surgical Overview and Outcomes, 2016–2024

## Patient Assessment of Surgical Outcome at 2 Years after Anatomic Total Shoulder Arthroplasty, 2016–2024

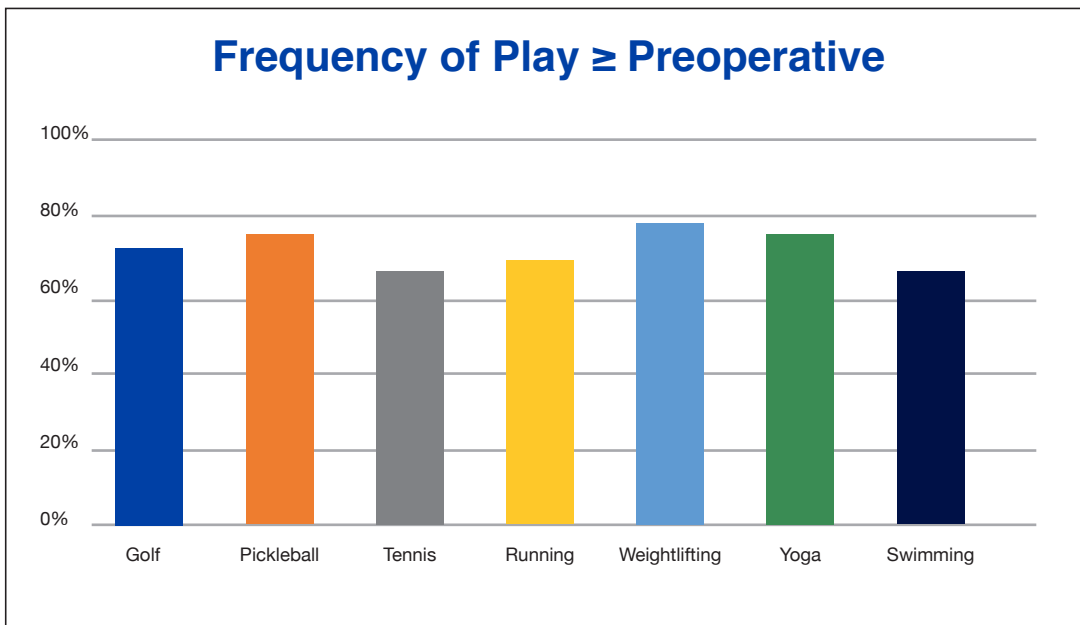
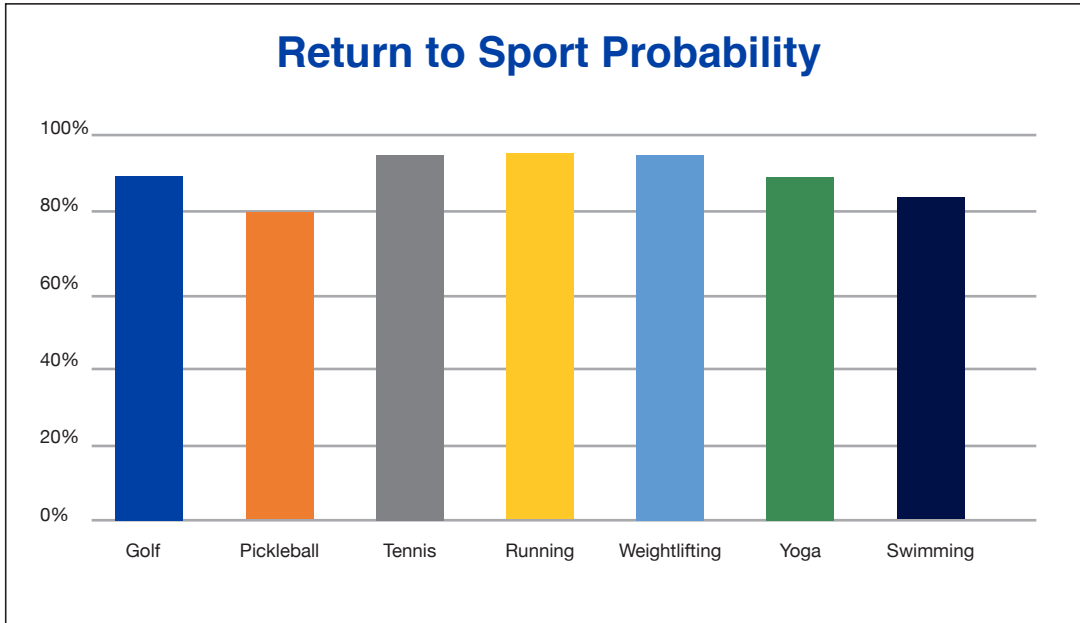
How satisfied are you with your surgical outcome?



How is your shoulder compared to before surgery?



# Surgical Overview and Outcomes, 2016–2024



# Andrew Jawa, MD

## Curriculum Vitae

### Office

Boston Bone & Joint Institute  
71 Border Road, Waltham, MA 02451  
Phone: (781) 890-2133  
Fax: (781) 890-2177

### Citizenship

United States

### Education

- 1994 - 1998 Williams College  
Williamstown, MA  
Degree: BA, *summa cum laude*, 1998  
Major: Economics and Biology  
Awards: Phi Beta Kappa, 1997, 1998
- 1998 - 2002 University of Pennsylvania, School of Medicine  
Philadelphia, PA  
Degree: MD, 2002  
Award: Alpha Omega Alpha
- 2002 - 2003 Brigham and Women's Hospital  
Boston, MA  
Intern – Surgery
- 2003 - 2007 Harvard Combined Orthopaedics Residency Program  
Boston, MA  
Resident – Orthopaedic Surgery
- 2007 - 2008 Massachusetts General Hospital  
Jesse Jupiter, MD  
Boston, MA  
Fellow – Hand and Microvascular Surgery
- 2008 - 2009 Massachusetts General Hospital  
Jon J.P. Warner, MD  
Boston, MA  
Fellow – Shoulder and Elbow Surgery

### Licensures

Medical, Massachusetts, 2007 #231192

## Certifications

Diplomate of the American Board of Orthopaedic Surgery, 2011  
Subspecialty Certificate in Surgery of the Hand  
American Board of Orthopaedic Surgery, 2012

## Employment

03/2009 - 05/2014 Boston University Medical Center

03/2011 - present Boston Bone & Joint Institute,  
New England Baptist Hospital

## Academic

Boston University

03/2009 - 05/2014 Assistant Professor

02/2009 - 05/2014 Boston University Residency Training Program

Tufts University

03/2011 - present New England Baptist Sports Fellowship Training Program

06/2014 - present Assistant Professor

05/2015 - present Tufts Residency Training Program

Harvard University

2018 - present New England Baptist Shoulder Fellowship Training Program

## Patents

### Ignite Orthopaedics

1. U.S. Patent Application Number 20190254829: "Radial Head Orthopaedic Implant Apparatus and Method of Using Same" Filed July 2, 2018.
2. U.S. Patent Application Number 20190269516: "Trial Radial Head Implant" Filed July 2, 2018.
3. U.S. Patent Application Number 20190298322: "Surgical Instrument Handle with Implant Sizing Feature and Method of Using" Filed January 10, 2019.

## Awards and Honors

2017 - Present Boston Magazine, Top Doctor in Boston

2017 Teacher of the year award, New England Baptist Hospital, Sports Fellowship

2018 Teacher of the year award, Tufts Orthopaedics Residents

2016 - 2017 Best Podium Presentation, New England Shoulder and Elbow Society Meeting

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## Top 18 Most Recent Peer Reviewed Publications

1. Saini SS, Pettit RJ, Puzzitiello RN, Hart PA, Shah SS, **Jawa A**, Kirsch JM. Clinical outcomes after reverse total shoulder arthroplasty in patients with primary glenohumeral osteoarthritis compared with rotator cuff tear arthropathy: Does preoperative diagnosis make a difference? *J Am Acad Orthop*: 2021 Dec. doi: 10.5435/JAAOS-D-21-00797.
2. Mahendraraj KA, Carducci MP, Galvin JW, Golenbock SW, Grubhofer F, **Jawa A**. Reassessing the minimum two-year follow-up standard after total shoulder arthroplasty-Is one year sufficient? *Shoulder Elbow*. 2021 Oct;13(5):527-533. doi: 10.1177/1758573220922845.
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6. Avant-Garde Health and Codman Shoulder Society Value Based Care Group; Khan AZ, Best MJ, Fedorka CJ, Belniak RM, Haas DA, Zhang X, Armstrong AD, **Jawa A**, O'Donnell EA, Simon JE, Wagner ER, Malik M, Gottschalk MB, Updegrove GF, Makhni EC, Warner JJP, Srikumaran U, Abboud JA. Impact of the COVID-19 pandemic on shoulder arthroplasty: surgical trends and postoperative care pathway analysis. *J Shoulder Elbow Surg*. 2022 Dec; 31(12):2457-2464. doi: 10.1016/j.jse.2022.07.020.
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8. Moverman MA, Sudah SY, Puzzitiello RN, Pagani NR, Hart PA, Swanson D, Kirsch JM, **Jawa A**, Menendez ME. Neighborhood socioeconomic disadvantage does not predict outcomes or cost after elective shoulder arthroplasty. *J Shoulder Elbow Surg*. 2022 Dec; 31(12):2465-2472. doi: 10.1016/j.jse.2022.04.023.
9. Menendez ME, Pagani NR, Puzzitiello RN, Moverman MA, Sudah SY, Namdari S, **Jawa A**. Strong Public Desire for Quality and Price Transparency in Shoulder Arthroplasty. *Cureus*. 2022 Oct 17;14(10):e30396. doi: 10.7759/cureus.30396.

10. Elmallah R, Swanson D, Le K, Kirsch J, **Jawa A**. Baseplate retroversion does not affect postoperative outcomes after reverse shoulder arthroplasty. *J Shoulder Elbow Surg*. 2022 Oct;31(10):2082-2088. doi: 10.1016/j.jse.2022.02.043.
11. Kolin DA, Moverman MA, Pagani NR, Puzzitiello RN, Dubin J, Menendez ME, **Jawa A**, Kirsch JM. Substantial Inconsistency and Variability Exists Among Minimum Clinically Important Differences for Shoulder Arthroplasty Outcomes: A Systematic Review. *Clin Orthop Relat Res*. 2022 Jul 1; 480(7):1371-1383. doi: 10.1097/CORR.0000000000002164.
12. Le Breton S, Sylvia S, Saini S, Mousad A, Chilton M, Lee S, Li L, MacAskill M, Ross G, Gentile J, Otto RJ, Kaar SG, Pinnamaneni S, **Jawa A**, Kirsch J, Ode G, Aibinder W, Greiwe RM, DeAngelis J, King JJ, Shah SS. A validated algorithm using current literature to judge the appropriateness of anatomic total shoulder arthroplasty utilizing the RAND/UCLA appropriateness method. *J Shoulder Elbow Surg*. 2022 Jul; 31(7):e332-e345. doi: 10.1016/j.jse.2021.12.025.
13. Fang CJ, Shaker JM, Hart PA, Cassidy C, Mattingly DA, **Jawa A**, Smith EL. Variation in the Profit Margin for Different Types of Total Joint Arthroplasty. *J Bone Joint Surg Am*. 2022 Mar 2;104(5):459-464. doi: 10.2106/JBJS.21.00223.
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18. Sudah S, Menendez M, **Jawa A**, Levy J, Denard P. Wide Geographic Variation in Resource Utilization after Shoulder Arthroplasty. *Orthop Rev (Pavia)*. 2023 Feb 21; 15:38653. doi: 10.52965/001c.38653.

# Jacob M. Kirsch, MD

## Curriculum Vitae

### Office

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Waltham, MA 02451  
Phone: (781) 890-2133  
Fax: (781) 890-2177

### Citizenship

United States

### Education

- 2006 - 2010 Franklin & Marshall College  
Lancaster, PA  
Degree: BA, *magna cum laude*, 2010  
Major: Religious Studies  
Awards: Phi Beta Kappa, Benjamin Rush Honor Society, Black Pyramid Honor Society
- 2010 - 2014 George Washington School of Medicine  
Washington, DC  
Degree: MD, 2014  
Awards: Alpha Omega Alpha, Julius S. Neviasser Award for Excellence in Orthopaedic Surgery
- 2014 - 2019 University of Michigan  
Ann Arbor, MI  
Resident - Orthopaedic Surgery
- 2019 - 2020 The Rothman Institute at Thomas Jefferson University  
Philadelphia, PA  
Clinical Fellow – Shoulder and Elbow Reconstruction

### Licensures

Medical, Massachusetts, 2020

### Certifications

ACLS 2014-2020

### Employment

- 9/2020 - present Boston Bone & Joint Institute  
New England Baptist Hospital

## Academic

Tufts University

03/2011 - Present New England Baptist Sports Fellowship Training Program

06/2014 - Present Assistant Professor

05/2015 - Present Tufts Residency Training Program

## Bibliography

### Top 17 Most Recent Peer Reviewed Publications

1. Hill BW, Churchill R, Carducci M, Joyce CD, **Kirsch JM** et al. Accuracy of Magnetic Resonance Imaging Compared with Computed Tomography for Glenoid Version when the medial border of the Scapula is not visualized. In Press, JSES International
2. Gutman MJ, Kohan EM, Hendy BA, Joyce CD, **Kirsch JM**, Singh A, Sherman M, Austin LA, Namdari S, Williams GR. Factors associated with functional improvement after augmented total shoulder arthroplasty. In Press, JSES
3. Puzzitiello RN, Colliton E, Swanson D, Hart PA, Menendez ME, Moverman MA, Allen AE, **Kirsch JM**, Jawa A. Patients with Limited Health Literacy Have Worse Preoperative Function, Pain Control and Experience Prolonged Hospitalizations Following Shoulder Arthroplasty. *J Shoulder Elbow Surg.* 2022 Dec;31(12):2473-2480. doi: 10.1016/j.jse.2022.05.001.
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5. Fang C, **Kirsch JM**, Hart PA, Swanson D, Shaker J, Smith EL, Levy J, Jawa A. Arthroplasty Costs Excluding Implants: Anatomic Total Shoulder vs Reverse Shoulder Arthroplasty. *JSES: Seminars in Arthroplasty.* 2022 Sept;32(3): 633-637.
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8. **Kirsch JM**, Puzzitiello RN, Swanson D, Le K, Hart PA, Churchill R, Elhassan B, Warner JP, Jawa A. Outcomes after Anatomic and Reverse Shoulder Arthroplasty for the Treatment of Glenohumeral Osteoarthritis: A Propensity Score Matched Analysis. *J Bone Joint Surg Am.* 2022 Aug 3;104(15):1362-1369. doi: 10.2106/JBJS.21.00982.

9. Menendez ME, Puzzitiello RN, Moverman MA, **Kirsch JM**, Little D, Jawa A, Garriagues GE. The Association Between Anterior Shoulder Joint Capsule Thickening and Glenoid Deformity in Primary Glenohumeral Osteoarthritis. *J Shoulder Elbow Surg.* 2022 Sep;31(9):e413-e417. doi: 10.1016/j.jse.2022.02.011
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# Helpful Administrative Tips

## General appointment scheduling

Our main phone number, 781-890-2133, is the best place to start if you need to schedule a follow up appointment. Select Option 1 after hearing the automated prompt.

## Prescription Requests

Using our main number, select option 2 after hearing the automated prompt. You will be asked to leave a voicemail, which our medical assistants regularly check during business hours. They will then contact Kiet with your request, so please be sure to leave a detailed message, including verifying your pharmacy.

## FMLA/Disability Paperwork

These requests can be faxed to our office at 781-890-2177. Please be sure they include your name, and where they should be faxed after completion. There is roughly a 7 day turnaround for these forms, so please allow enough time before surgery for their completion.

## Patient Portal

If you have not yet registered for our patient portal, please consider doing so. If you need any assistance please contact our office at 781-890-2133. Our portal allows you to send and receive secure messages, which are kept as a part of your medical record. This can be especially helpful after surgery, as questions often come up during non-business hours. Once your message is sent, it is received by your surgical coordinator who can triage it appropriately (please note that urgent matters should not be sent in this manner).







Dear Patient,

Dr. Andrew Jawa, MD, and Dr. Jacob Kirsch, MD, have identified a list of products you will need at your pre-operative visit to assist in your recovery following your surgery. These products can be useful as part of a protocol to help reduce pain and swelling and may improve your recovery post-operatively or when surgery is not necessary.

These products are not covered by health insurance and may be purchased using an HSA account or other payment method.

We do not process these orders through our office. To streamline this process and ensure you are receiving products appropriate for you, we have partnered with The Recovery Shop.

These products have been reviewed by Dr. Jawa and Dr. Kirsch, and are specific to your recovery and wellness needs.

**Cold Therapy is recommended.**

To purchase these products please follow these steps:

1. Please go to <https://shop-recovery.net/jawa>
2. Review Recommended Products
3. Select products
4. Check Out & Pay
5. Receive products in 1-3 Business Days

1. Please go to <https://shop-recovery.net/kirsch>
2. Review Recommended Products
3. Select products
4. Check Out & Pay
5. Receive products in 1-3 Business Days

Or Scan the QR Code Below:



Or Scan the QR Code Below:



**We recommend you purchase these products as soon as possible, so you have them immediately post-op to aid in your recovery.**

If you need assistance with your order, are unable to purchase online, or have product-related questions, please feel free to contact The Recovery Shop directly:

Phone: 860.500.5020  
Email: [info@shop-recovery.com](mailto:info@shop-recovery.com)

Sincerely,

Boston Bone & Joint Institute (BBJI)

**SCAN ME FOR AN INFORMATIONAL VIDEO  
ABOUT SHOULDER REPLACEMENT.**



**BBJI**  
Boston Bone & Joint Institute

A DIVISION OF   
NORTHEAST ORTHOPAEDIC ALLIANCE

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Waltham, MA 02451  
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Fax: 781-890-2177

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