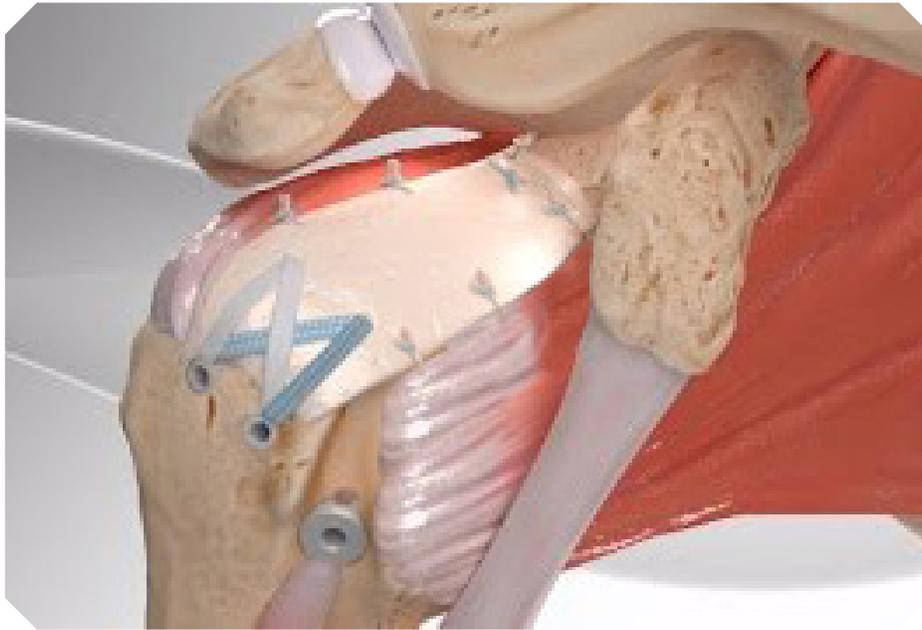




TWIN CITIES ORTHOPEDICS

SUPERIOR CAPSULAR RECONSTRUCTION



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HOW THE SHOULDER WORKS

The shoulder is the most mobile joint in the human body providing extensive range of motion allowing you to place your arm in many different positions. With increased mobility, there is always a decrease in stability making the shoulder susceptible to injury.

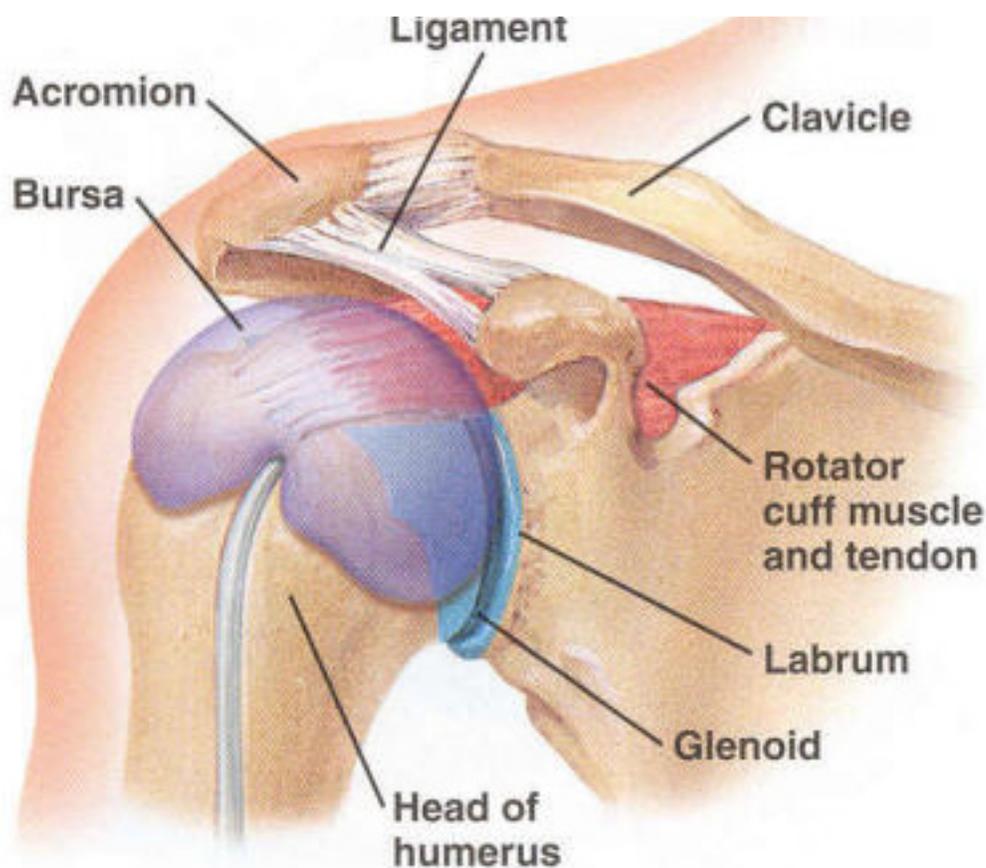
The shoulder is a ball and socket joint and is made up of three bones: the upper arm bone (humerus), shoulder blade (scapula) and collar bone (clavicle).

The ball at the top end of the arm bone fits into the small socket (glenoid) of the shoulder blade to form the shoulder joint (glenohumeral joint). A common comparison is that of a golf ball sitting on a golf tee. The socket of the glenoid is surrounded by a soft-tissue rim (labrum). The labrum increases the stability of the shoulder deepening the socket and creating negative pressure similar to a suction cup. To help with smooth articulation of the shoulder joint, there is a smooth, durable surface (articular cartilage) on the head of the arm bone along with a thin lining of the joint (synovium).

The upper part of the shoulder blade (acromion) projects over the shoulder joint. One end of the collarbone is joined with the shoulder blade by the acromioclavicular (AC) joint; the other end of the collar bone is joined with the breast bone (sternum) by the sternoclavicular joint (SC).

A sac-like membrane (bursa), similar to an empty plastic bag, sits between the rotator cuff muscles and the upper shoulder bone (acromion) cushioning and decreasing friction between muscle and bone.

There are 4 rotator cuff muscles that attach to the shoulder blade and end on the humeral head (supraspinatus, infraspinatus, teres minor, subscapularis). These 4 muscles become tendons which form the cuff. Due to the shoulder's inherent instability, the muscles of the rotator cuff must provide stability to allow the humeral head to stay centered and articulate properly in the socket. Without the function of the rotator cuff, the humeral head moves upward in the joint increasing contact pressure/time with the acromion. In time this will lead to arthritis.



ARTHROSCOPY OVERVIEW



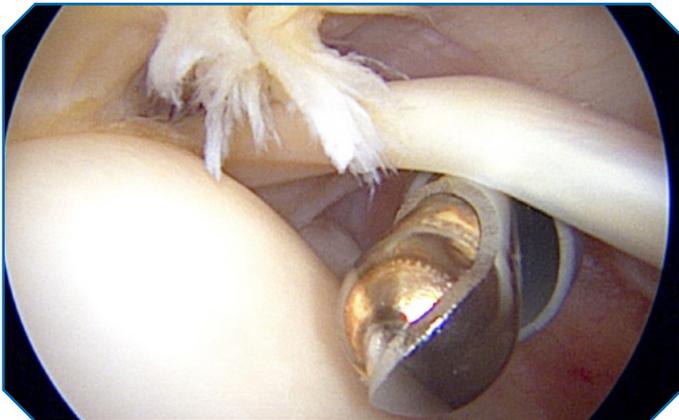
ARTHROSCOPY

Arthroscopy is a common minimally invasive surgical procedure that is used to examine and repair the inside of the shoulder. The instruments allow Dr. Norberg to use a pencil like camera to view the inside of the shoulder. The arthroscope is initially used as a diagnostic device and to detect the extent of the injury. Specialized instruments and fixation devices are then used to repair the damage found in the shoulder.



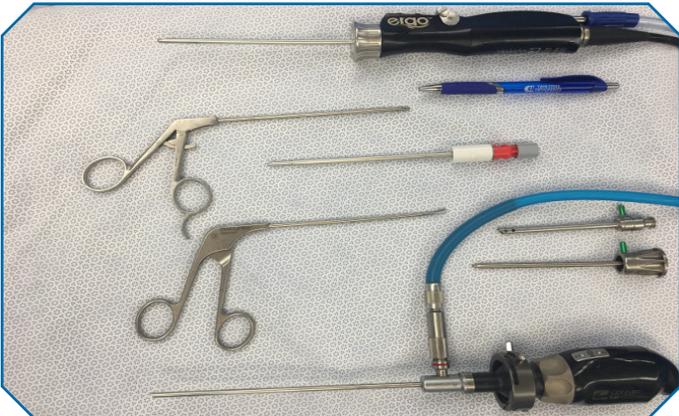
ARTHROSCOPY

This picture shows a left shoulder arthroscopy. Dr. Norberg is standing behind the patient. The patient is lying on their right side with the left arm suspended in traction.



SCOPE PICTURE

This scope picture shows a left shoulder joint with the arthroscopic shaver blade lifting up the biceps tendon with undersurface tearing of the subscapularis rotator cuff muscle.



EQUIPMENT

This picture shows specialized equipment used in shoulder arthroscopy. The arthroscope (scope) is 4mm in diameter. It is passed through a canula that is inserted through a 1/4" inch incision in the skin. Arthroscopy provides much better visualization than open surgery. Additional instruments are used to perform the superior capsular reconstruction, these include an arthroscopic suture passer, shaver, grasper, and radio-frequency ablator.

SUPERIOR CAPSULAR RECONSTRUCTION

The superior rotator cuff tendons along with the thin superior capsule keep the humeral head centered in the socket. This centering is critical for shoulder function and elevating the arm. If there is a large or irreparable tear of the rotator cuff, allograft tissue (human cadaver) can be used to reconstruct the capsule and re-center the humeral head.

The procedure was developed by Dr. Terushia Mihata in Japan. The modified technique that Dr. Norberg performs has been done in the United States since 2014.

WHO SHOULD HAVE A SUPERIOR CAPSULAR RECONSTRUCTION?

The indications for superior capsular reconstruction (SCR) are fairly specific and include:

- large irreparable tear of the superior rotator cuff;
- intact or repairable subscapularis tendon (anterior cuff);
- minimal or no arthritis; and
- failed conservative care with ongoing pain or marked dysfunction.

Patients who are not candidates for SCR may meet criteria for a Reverse Total Shoulder (modified shoulder replacement).

WHAT IS AN IRREPARABLE ROTATOR CUFF TEAR?

Your rotator cuff tear is irreparable if the torn segment cannot be placed back over its original position on the humeral head. We refer to this as the footprint. We diagnose irreparable rotator cuff tears based on parameters and research defined by Hamada et al., Dwyer et al., Yoo et al., Goutallier et al. A majority of the time irreparable tears can be predicted, however, arthroscopy is the the only way to definitively diagnosis it.

BENEFITS OF SCR

Recent studies have shown 80% of patients are satisfied with their shoulder three to four months after surgery. Pain is usually markedly reduced or absent at rest and with limited use. The degree of return of strength and overhead function is difficult to predict, but many patients are able to use their arm above shoulder height.

LONG TERM RESULTS

There are no long term studies of outcomes with SCR. The few quality studies that have been done have less than three years of follow-up. The long term durability of the SCR has yet to be confirmed. SCR is the only option at this time for the difficult problem of irreparable superior cuff tears in the younger population.

Reverse total shoulder replacement is an excellent option for patients over 65 years but has limitations that are permanent and increased risk of complications. This makes it an inferior choice in patients who meet criteria for an SCR.

CURRENT RESEARCH

Superior Capsular Reconstruction is a new procedure with most of the research performed in Japan. The two-year patient results and data look promising with early returns in range of motion.

Clinical Results of Arthroscopic Superior Capsule Reconstruction for Irreparable Rotator Cuff Tears (Mihata et al.)

Biomechanical Role of Capsular Continuity in Superior Capsule Reconstruction for Irreparable Tears of the Supraspinatus Tendon. (Mihata et al.)

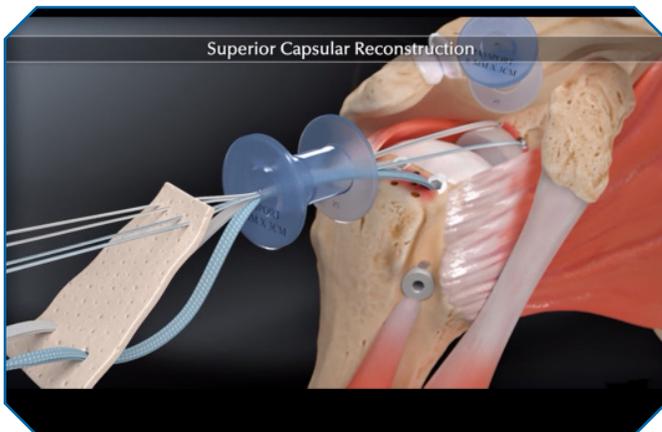
Arthroscopic Superior Capsular Reconstruction for Treatment of Massive Irreparable Rotator Cuff Tears (Hirahara et al.)

SUPERIOR CAPSULAR RECONSTRUCTION OVERVIEW



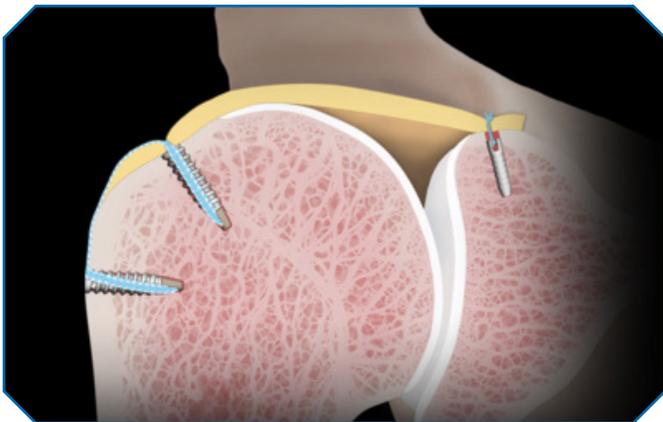
IRREPARABLE ROTATOR CUFF TEAR

This picture shows a large irreparable cuff tear. The edge of the socket and cuff attachment area are prepared with a motorized shaver and radio-frequency ablator, to prepare for graft placement.



GRAFT PASSAGE

Once the anchors have been placed, sutures from each anchor are passed through the prepared graft. The graft is measured to fit the width and length of the defect. Additional sutures are passed through the remaining rotator cuff to bring the edges of the rotator cuff back over the top of the graft.



GRAFT FUNCTION

This crosssection demonstrates the positions of the anchors. The goal of SCR is to replace the torn cuff and capsule with a graft that keeps the head of the humerus centered in the socket during use.



FINAL RECONSTRUCTION

This illustrates the final result. The biceps tendon is transferred lower on the humerus and the graft has been fully secured through the remaining rotator cuff on the back and front of the shoulder.

RISKS OF SURGERY

With any surgery there are potential risks involved. These include, but are not limited to, infection, continued pain, damage to blood vessels or nerves, decreased motion, and anesthetic complications. Call your doctor's office if you have any signs of infection: redness, warmth, fever, discolored drainage.

QUITTING SMOKING

Studies have shown the failure rate of cuff repairs is tripled in people who smoke. Smoking or using any form of nicotine or tobacco products (including cessation products), can delay your body's healing process. Smoking makes your blood vessels constrict (become smaller), which reduces the amount of oxygen-rich blood delivered to healing tissues. Smoking can cause your blood to clot faster, which can lead to heart and blood flow problems. If you are going to stop smoking around the time of your surgery, you should not use a nicotine-based program or cessation products.

BEFORE SURGERY

Shoulder arthroscopy is performed on a same day basis. You will return home several hours after the surgery. You shouldn't take anti-inflammatories (i.e. Ibuprofen or Aleve) or aspirin for 4-7 days prior to surgery, unless cleared by your doctor. Arrange for a ride to and from the hospital. Let all medical providers know of any allergies you may have and medications you are taking. Please bring a list of medications and supplements.

AFTER SURGERY

You will be placed in a sling to be worn at all times for six weeks. You may remove your sling or immobilizer for a shower or bath. You should wear the sling to sleep. You will be given pain medication. Your first appointment after surgery will be 7 - 10 days after surgery with Kayla Mork, Dr. Norberg's Physician Assistant.

INCISION CARE

- Keep the dressings dry and do not remove until day third after surgery. If you have any drainage, you may replace with a new bandage. Small tape strips (steri-strips) will be placed over all incisions. Leave in place until they fall off. Usually this is 10-14 days.
- Do not poke anything into your dressings.
- Do not apply lotion, cream or powder to your incision.
- You can shower safely three days after surgery, without covering the incision. The incision may get wet, but should not be submerged in water for at least two weeks after the surgery.
- Do not soak or scrub the incisions until fully healed.
- Watch for signs of infection: increased redness or drainage from the incisions, fever, and or chills.
- Wash twice a day under your affected arm and dry that area well. Do not use your shoulder to raise your arm after surgery. Place your hand on a counter and take a small side step away to give access to your underarm without lifting your operative arm.
- Put a dry washcloth under your arm to help with sweating and to keep your skin from getting irritated.
- When getting dressed, put your shirt on the arm that had the surgery first.
- No sutures will need to be removed at your first post-operative visit. They will dissolve in 2-3 weeks and remain under the skin.

RECOVERY TIME:

SCR: You will be in an immobilizer for 6 weeks. It will take about three months before you feel comfortable moving your arm to shoulder level. Patients can continue to make progress up to 18 months before reaching their end result

RESTRICTIONS FOLLOWING SURGERY:

Following a rotator cuff repair we recommend all patients take 4 weeks off of work to rest and manage pain efficiently. All patients will be released to work with restrictions following the 4 weeks. The restrictions will include no lifting overhead for 4 months. While in the immobilizer you will only be able to lift 1-2lbs with the elbow at your side. If your job does not require lifting and is mainly office work (keyboard,mouse,paperwork) then it is likely you can return to work in 1-2 weeks. Jobs that require lifting will determine if they have the appropriate accommodations

RCR ACTIVITY TIMELINE:

0-6 weeks- Elbow remains at side in sling/immobilizer lifting only 1-2lbs.

1-2 months- Discontinue sling/immobilizer, no lifting overhead, working on range of motion with physical therapy

3-4 months- Can usually do personal care, light activity overhead. Start basic Isometric strengthening 11-12 wks.

5-6 months- Return to lifting overhead however this will vary per patient.

12-18 months- To see final results of strength and range of motion.

In some cases the rotator cuff will be repairable and an SCR will not be performed. The rehab will change and will be addressed at the first post operative appointment.

PAIN RELIEF

- Most patients will have a nerve block that will last approximately 12 hours. The block involves an injection of a local anesthetic (Ropivacaine, similar to novocaine). It is injected where the shoulder and neck meet. The block allows the surgery to be performed using much less anesthetic drugs. The block also provides excellent pain relief after surgery.
- You should take some pain medication approximately 8-10 hours after your block is performed, even if you have no pain.
- Strong narcotic medications will be prescribed to help manage your pain after surgery. Typically, oxycodone is prescribed. Dr. Norberg recommends taking them as written the first day and, then, gradually spacing them out and taking them only as needed.
- The pain medications will make your pain manageable but will not necessarily take away all of your pain.
- Do not take Tylenol (acetaminophen) if you are taking Percocet or Norco. You may take Tylenol instead of Percocet. Whether you are taking Percocet (oxycodone), Norco (hydrocodone), or Tylenol (acetaminophen), be careful not to exceed 4,000mg of acetaminophen in a 24 hour period. Dr. Norberg recommends obtaining the 650mg extended release (8-hour) arthritis strength acetaminophen.
- Do not take Advil (ibuprofen) or Aleve (naproxen) for the first week if you have had a SCR, rotator cuff repair, biceps tenodesis, anterior reconstruction, posterior reconstruction, or SLAP (labral) repair. This may slow healing and weaken healing tissue.
- If the pain is still not controlled, please call the clinic (952) 456-7000
- Exceeding the recommended dose or taking medication with alcohol may result in liver damage. If you see that you are running out of pain medication, you must call the office number 952-456-7107 during regular clinic hours (8:30-4:00). Pain medications are not filled after hours or on weekends.
- Take pain medication with food. They can also cause cognitive impairment, so you are not to drive or operate heavy machinery. Another common side effect is constipation. You may use over the counter stool softeners (i.e. Colace or

Dulcolax) to help with this. See packages for recommended dosages.

- For the first several weeks, many patients find it more comfortable to sleep in a recliner or propped with pillows in a semi-sitting position.
- Ice your shoulder continuously for the first 24-72 hours after surgery. Use ice as much as you need to control pain and swelling. Don't sleep with ice on your shoulder.

CALL 952-456-7000 IF

- Your temperature is 101.5 degrees Fahrenheit or more
- You see a large amount of new bleeding or drainage from the incision area. Some drainage the first day after surgery is expected.
- If you notice increased or unusual redness, swelling or warmth in the surgery area.
- If you have a lot of discomfort that doesn't get better with pain medicine, ice and rest.
- If you notice a dramatic change in color, movement or feeling to the fingers or hand.
- If you have any questions or concerns.

DIET

You will need to eat healthy meals to give your body the energy, vitamins and minerals needed to recover from surgery. Return to your usual diet as soon as you are able. Drink six to eight glasses of water each day. Eat more food that has fiber (fruits, vegetables and whole grains) to avoid constipation from the pain medications. Avoid alcohol while taking prescription pain medicine.

FREQUENTLY ASKED QUESTIONS

Do I have to go to physical therapy?

Yes! You will have to do the exercises that we and the physical therapist instruct you to do to get the best result of your surgery. Dr. Norberg and his staff will adjust your therapy as you continue to heal your shoulder.

How long is recovery time?

Patients continue to make progress up to 18 months after their surgery depending on the type of surgery they are having.

Work Status?

You will be off of work until your follow-up appointment in about 7-14 days and then Dr. Norberg will adjust your work restrictions accordingly.

Are there any complications from surgery?

Yes, but they are very rare. Some include, but are not limited to, your repair not healing, infection, stiffness, loss of motion, and nerve injury.

What are the signs of an infection?

Fever over 101.5 degrees, the incision becomes red or swollen, or any foul drainage. If these symptoms occur, call Dr. Norberg's office right away 952-456-7107 or call 952-456-7000 after hours.

Is swelling and pain normal?

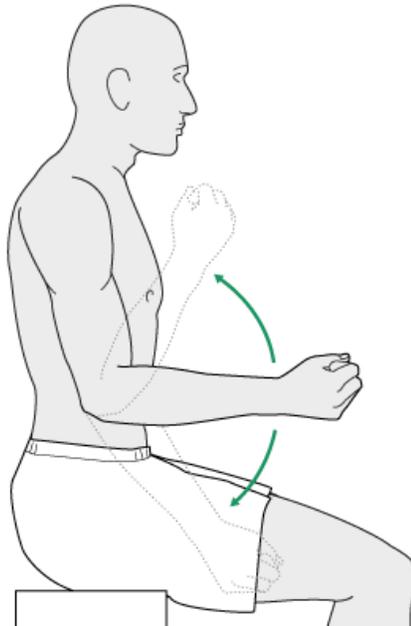
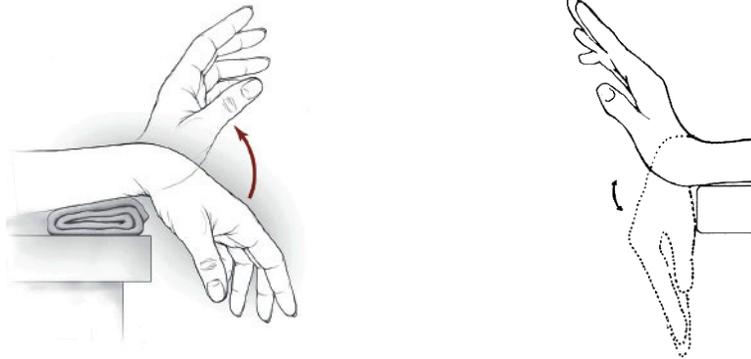
Yes. It is normal to experience some swelling and pain after your surgery. The pain should be manageable with the prescription pain medication given to you after your surgery.

Can I shower?

Yes. You may shower 3 days after your surgery. Do not scrub your incisions. Do not submerge your incision for 2 weeks.

IMMEDIATE POST OPERATIVE EXERCISES - START THE DAY AFTER SURGERY

- Wrist range of motion. Bend your wrist forward and backwards as far as your can. Repeat 10 times. Do 3 sets for 2-3 times per day.
- Elbow range of motion. Gently bring your palm up towards your shoulder and bend your elbow as far as you can. Then straighten your elbow out as far as you can. Repeat 10-15 times for 2-3 times per day.



START EXERCISES AFTER FIRST POST OPERATIVE VISIT



The starting position for this exercise will be with your hands resting in front of you on a counter top. Put your weight on your legs, not on your hands or upper body. Keep your hands in the same position on the counter top. While moving your feet slowly backwards, bend slightly at your waist, stick your buttocks back past the base of your feet. (see picture above) Once you feel a stretch, hold our position for 5-10 seconds. **DO NOT STRETCH TO THE POINT OF PAIN.** Always walk yourself back up.



Start this exercise in a standing position. You may be more comfortable resting against a wall. Bend your affected arm at the elbow. Place your opposite hand on your wrist and gently rotate your wrist outward while keeping your elbow at your side. If you have trouble keeping your elbow at your side, hold a rolled up sock between your elbow and waist. If the sock falls to the floor, you are not keeping your elbow close enough to your body. While gently rotating your wrist outward, continue until you feel a good stretch Hold for 5-10 seconds. **DO NOT STRETCH TO THE POINT OF PAIN.**

PAIN MEDICATION AGREEMENT FOR POST-OPERATIVE PAIN TREATMENT

The official policy of our practice is as follows:

1. Patients will not be provided with narcotic pain medication prior to surgery.
2. After surgery, appropriate prescription pain medications will be prescribed for adequate pain control. The amount of medication prescribed will be based on typical pain control needs for the surgery performed. This is at the discretion of Dr. Norberg.
3. We will not prescribe pain medications longer than **TWO WEEKS** after surgery.
4. Prescription pain medications do not help with healing after surgery. Take prescription pain medications only if pain cannot be controlled with over the counter medications such as Tylenol.
5. If a patient takes prescription pain medication prior to surgery (prescribed by another provider), we will establish a specific pain mediation plan for that patient.
6. Patients should avoid NSAIDs (ibuprofen, naproxen, aspirin, etc.) for at least two weeks after surgery if they have a superior capuslar reconstruction, rotator cuff repair, labral repair, biceps tenodesis, or fracture. NSAIDs have been associated with decreased healing rates.
7. Taking prescription Opiates/Opioids (such as oxycodone, hydrocodone, morphin, hydromorphone) are well known to cause death and addiction/dependency and should never be taken while driving. Prescription opiates/opioids are the leading cause of prescription related deaths.

Patient Name _____

Patient Signature _____

Date: _____

References:

Increases in Drug and Opioid-Invovled Overdose Deaths- United States, 2010-2015. MMWR Morb Mortal Wkly Rep, 64(50-51), 1378-1382.

Dowell D, Haegerich TM, C.R. (2016). CDC Guideline for Prescribing Opioids for Chronic Pain- United States, 2016. MMWR Morb Mortal Wkly Rep, 65(1), 1-49.

O'Neill. (2014). Less is More: Limiting Narcotic Prescription Quantities for Common Orthopedic Procedures. The Physician and Sportsmedicine, 42(4), 100-105.

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