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### REHABILITATION PROTOCOL XENOGRAFT ROTATOR CUFF REPAIR

The shoulder is a ball and socket joint that enables you to raise, twist, bend and move your arms forward, to the sides and behind you. The head of the upper arm bone (humerus) is the ball and a circular depression (glenoid) in the shoulder bone (scapula) is the socket. A soft tissue rim (labrum) surrounds and deepens the socket. The head of the upper arm bone is coated with a smooth, durable, covering (articular cartilage) and the joint has a thin, inner lining (synovium) for smooth movement. The surrounding muscles and tendons provide stability and support.

The shoulder is moved and also stabilized by the muscles of the rotator cuff. The rotator cuff is composed of four muscles and their tendons that attach from the scapula to the humerus. The rotator cuff tendons (subscapularis, supraspinatus, infraspinatus and teres minor) are just outside the shoulder joint and capsule. These muscles help stabilize the shoulder and enable you to lift and rotate your arm as well as reach overhead and take part in activities such as swimming, throwing and tennis.

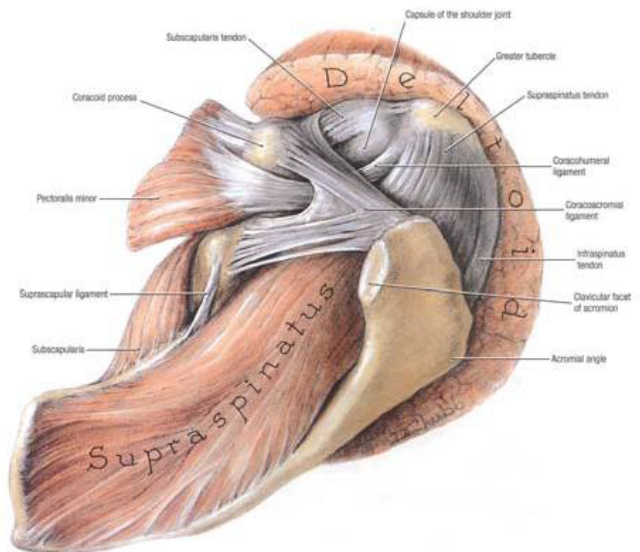
The rotator cuff can tear as an acute injury such as when lifting a heavy weight or falling onto the shoulder or elbow. The shoulder is immediately weak and there is often pain when trying to lift the arm. A torn rotator cuff due to injury is often treated by prompt surgical repair. The rotator cuff can also tear as a result of degeneration. This type of tear may or may not need to be repaired surgically, or it may not be possible to repair it surgically. However, if the tear is causing significant pain and disability, surgery may be a good way to relieve pain and improve shoulder function.

It is currently believed that:

- Rotator cuff tears that are small, tend to become larger
- Rotator cuff tears that are asymptomatic (causing no pain) tend to become symptomatic (cause pain)
- Rotator cuff tears that are straightforward to repair at one point in time can become more difficult to fix at a later point in time. This is due to degeneration of the tendon as well as atrophy of the muscle.

Rotator cuff tears that are not repaired may progress to developing painful arthritis many years later. This type of arthritis, called cuff tear arthropathy (CTA) is very difficult to treat and the longstanding tear in the rotator cuff may be irreparable.

Surgical repair of the rotator cuff is done either arthroscopically (with small incisions through which instruments are passed and the tendon is repaired) or open (with a larger incision through which the tendon is repaired). The decision to repair the rotator cuff open or arthroscopically is based on several factors and will be discussed by you and your surgeon.



The risks of the surgery include but are not limited to:

- Infection
- Nerve injury
- Failure of the repair
- Stiffness
- Pain, postoperative and/or persistent
- Arthritis
- Blood clots

### **Postoperative Instructions**

You will wake up in the operating room with a sling and pillow in place and ice on your shoulder. You will then be brought to the recovery room for a few hours while the effects of anesthesia run their course. You will be discharged from the recovery room after a few hours and will need someone to drive you home.

If you had a nerve block placed you will likely have numbness and pain relief for 6 or more hours afterwards. It will be important to begin taking pain medicine prior to this wearing off, as it is always important to “stay ahead of the pain.” You will be prescribed oxycontin and oxycodone to help with your pain control for the first several days.

### **Activities and advice for in the hospital and while at home:**

1. Please call with any concerns: (860) 832-4666
2. Apply ice to the shoulder, as it will be quite helpful. After two days, you can change the dressing to a smaller one to allow the cold to better get to the shoulder. Be sure to leave the little pieces of tape (steri-strips) in place.
3. Remove the sling on the first day after surgery. Move your elbow, wrist, hand and fingers several times a day. Begin the pendulum exercises several times a day. Put the sling back on when you're done with these exercises. It is likely the sling will be used for 4-6 weeks.
4. If you have a purely arthroscopic procedure, it is okay to shower and get the wound wet after two days, but do not soak the wound as you would in a bath tub or hot tub. If you have an open procedure it will be necessary to keep the wound(s) dry for two weeks.
5. It is important to look out for signs of infection following surgery. These can include: fever (temperature > 101.50, chills, nausea, vomiting, diarrhea, redness around your incision, or yellow or green drainage from your incision). Should any of these be present please contact the doctor's office immediately.
6. To wash under your operated arm bend over at the waist and let the arm passively swing away from the body. It is safe to wash under the arm in this position.
7. DO NOT lift the arm or move the arm at your shoulder using your muscles. This could damage the repair.
8. After shoulder surgery there is a variable amount of pain and swelling. This will dissipate after several days. Continue to take the pain medicine you were prescribed as needed. Remember it is called pain control, not pain elimination.
9. You will have an office visit with Dr. Betz scheduled approximately 10-14 days after your surgery.

## XENOGRAFT ROTATOR CUFF REPAIR - REHABILITATION PROTOCOL

### Phase I: Immediate Post-op Phase (first 5 to 7 days after surgery, prior to starting PT)

#### Goals:

1. Protect the surgical site
2. Ensure wound healing
3. Diminish pain and inflammation
4. Prevent stiffness and regain motion

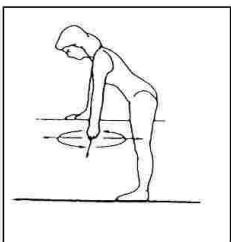
#### Activities:

1. Sling: Use your sling for 24-48 hours. Remove the sling 4 or 5 times a day to do pendulum exercises. You will need to sleep with your sling and pillow in place. It is often more comfortable to sleep in a recliner or on several pillows.
2. Use of the affected arm: You may use your hand on the affected arm in front of your body. It is all right for you to flex your arm at the elbow. Continue to move your elbow wrist and hand to help circulation and motion. Also:
  - a. No lifting of objects over 5 lbs.
  - b. No excessive shoulder extension
  - c. No excessive stretching or sudden movements
  - d. No supporting of body weight by hands
3. Continue to ice on a regular basis. At least 20 minutes at a time, 4-5 times per day.
4. Your first therapy appointment should be within 5-7 days after your surgery.

#### Exercises:

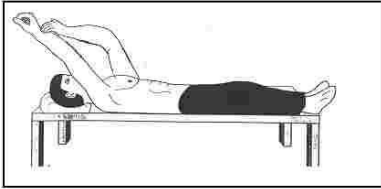
Program: 7 days per week, 4-5 times per day

Pendulum exercises	1 to 2 sets	20 to 30 reps
Supine external rotation	1 to 2 sets	10 to 15 reps
Supine passive arm elevation	1 to 2 sets	5 to 10 reps
Scapular retraction	1 to 2 sets	5 to 10 reps
Shoulder shrug	1 to 2 sets	10 to 15 reps



#### *Pendulum exercise*

Remove your sling, bend over at the waist and let the arm hang down. Using your body to initiate movement, swing the arm gently forward and backward and in a circular motion.



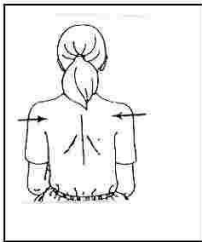
*Supine passive forward elevation*

Lie on your back. Hold the affected arm at the elbow with the opposite hand. Assisting with the opposite arm, lift the operated arm upward, as if to bring the arm overhead. Slowly lower the arm back to the bed.



*Supine external rotation*

Lie on your back. Keep the elbow of the operated arm against your side with the elbow bent 90 degrees. Using a cane or a long stick in the opposite hand, push against the hand of the operated arm so that the operated arm rotates outward. Hold for 10 seconds, relax and repeat. The amount of allowed external rotation will be specified after surgery.



*Shoulder blade pinches*

While standing, pinch shoulder blades backward and together.



## **Phase II: Intermediate Phase (1 to 6 weeks post-op)**

At this point you should begin your formal physical therapy, the instructions that follow are to aid your therapist in maximizing the results of your surgery while still protecting the repair. Bring these instructions to your therapy appointment.

Your therapist will instruct you on how to perform the exercises below and give you a home exercise program. It is important that you stay within the limits demonstrated and that you perform your exercises daily. You should strive to do your home exercise program at least 3-4 times per day, every day. The success of your repair depends on your rehab.

**\*\*\*PT should not hurt. Do not force painful motions.\*\*\***

### **Goals:**

1. Restore non-painful range of motion (ROM)
2. Retard muscular atrophy
3. Decrease pain/inflammation
4. Improve postural awareness
5. Minimize stress to healing structures
6. Independent with activities of daily living (ADLs)
7. Prevent muscular inhibition
8. Wean from sling

### **Activities:**

1. Sling: You should now have weaned out of using your sling. It is a good idea, however, to continue to use your sling when you are away from your house to "send a signal" that others should not hit your shoulder.
2. Continue to ice on a regular basis. At least 20 minutes at a time, 4-5 times per day.
3. Unless instructed otherwise it should be okay to drive at this point.
4. You can actively use your arm for daily living: bathing, dressing, driving, typing on a computer, eating and drinking.

### **Range of Motion:**

- PROM (non-forceful flexion and abduction)
- Active assisted range of motion (AAROM)
- AROM
- Pendulums
- Pulleys
- Cane exercises
- Self stretches

### **Strengthening:**

- Isometrics: scapular musculature, deltoid, and rotator cuff as appropriate
- Isotonic: theraband internal and external rotation in 0 degrees abduction

*Once patient has pain free full ROM and no tenderness, may progress to the following:*

**Strengthening exercises:**

- Initiate isotonic program with dumbbells
- Strengthen shoulder musculature- isometric, isotonic, Proprioceptive Neuromuscular Facilitation (PNF)
- Strengthen scapulothoracic musculature- isometric, isotonic, PNF
- Initiate upper extremity endurance exercises

**Manual treatment:**

- Joint mobilization to improve/restore arthrokinematics if indicated
- Joint mobilization for pain modulation

### **Phase III: Active strengthening phase (6 weeks and beyond)**

#### **Goals:**

- Improve strength, power, and endurance
- Improve neuromuscular control
- Prepare athlete to begin to throw, and perform similar overhead activities or other sport specific activities

#### **Criteria for progression to this phase:**

- Full painless ROM
- No pain or tenderness on examination

#### **Exercises:**

- Continue dumbbell strengthening (rotator cuff and deltoid)
- Progress theraband exercises to 90/90 position for internal rotation and external rotation (slow/fast sets)
- Theraband exercises for scapulothoracic musculature and biceps
- Plyometrics for rotator cuff
- PNF diagonal patterns
- Isokinetics
- Continue endurance exercises (UBE)
- Diagonal patterns

#### **Return to Sport:**

- 12 weeks and beyond once adequate strength achieved for sports specific criteria.