



**Virtua Reconstructive Orthopedics**  
**SPORTS MEDICINE & ARTHROSCOPY**

## **Sean Mc Millan, DO, FAOAO**

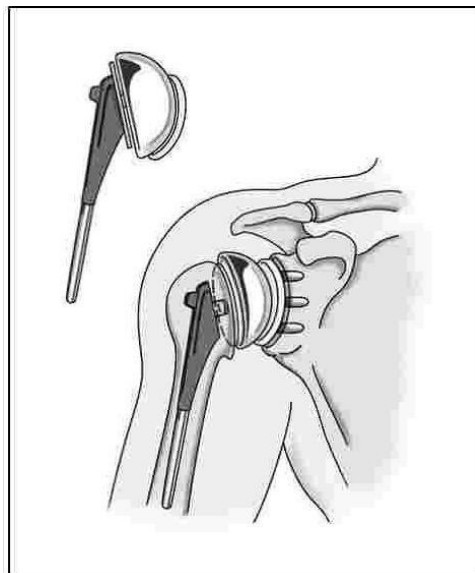
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## ANATOMIC SHOULDER ARTHROPLASTY

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.

Many people know someone with an artificial knee or hip joint. Less common, but just as successful in relieving joint pain is a **shoulder replacement** (arthroplasty). This procedure may be recommended if arthritis or degenerative joint disease makes your shoulder stiff and painful, or if the upper arm bone is fractured so badly that tissue death may result.

Shoulder replacement surgery replaces damaged joint surfaces with artificial parts (prostheses). Usually there are two components: The humeral component replaces the head of the upper arm bone. It is made of metal (usually cobalt/ chromium-based alloys) and has a rounded ball attached to a stem that fits into the bone. This component comes in various sizes and is a modular unit.



The glenoid component replaces the socket (the glenoid depression). It is made of an ultra-high density polyethylene (plastic). Depending on the damage to your shoulder, you may have just the humeral head replaced (**hemiarthroplasty**) or both the humeral head and the glenoid replaced (**total shoulder replacement**). The components are held in place with either acrylic bone cement (cemented) or rely on bone ingrowth (press fit, or cementless). As in the native joint, the surrounding muscles and tendons provide stability for the prosthesis.

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

- Infection
- Instability of the joint replacement
- Fracture of either the humerus or glenoid bone
- Nerve injury
- Loosening of the joint replacement
- Anesthesia problems
- Hematoma or blood clots

### **Postoperative Instructions**

You will wake up in the operating room with a sling in place. You will go to the recovery room at the hospital and then to a private room (often on the 3<sup>rd</sup> floor) after a few hours. You can get out of bed when you wish. You should continue to apply ice to your shoulder to reduce pain and swelling.

Pain is usually controlled for the first 24 hours with intravenous narcotic medications through a patient controlled anesthesia (PCA) machine. This machine delivers the pain medication to you when you push a button. Afterwards you will be transitioned to oral pain medications such as oxycontin and oxycodone.

While a blood transfusion is rare, it is occasionally necessary. You may discuss donating your own blood in advance so it can be given to you should you require a transfusion after surgery.

You may be discharged home on either the first or second postoperative day. You will need someone to assist you at home, so family should be aware that you will need help with simple daily living chores such as dressing, cooking, and feeding yourself. In some instances it is necessary to go to a supervised rehabilitation facility for a period of time until you can begin effectively using your arm.

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

1. Please call with any concerns: (609) 747-9200
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 finger several times a day. Begin the pendulum exercises several times a day. Put the sling back on when you're done with these exercises.
4. After two days it is okay to shower but do not get the wound wet for at least two weeks after surgery. Do not submerge the wound as you would in a bathtub or hot tub for at least 4 weeks after surgery. 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.
5. 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.
6. It is important to look out for signs of infection following joint replacement surgery. These can include: fever (temperature > 101.5<sup>o</sup>, chills, nausea, vomiting, diarrhea, redness around your incision, or yellow or green drainage from your incision. Should any of these be present please contact Dr. Mc Millan's office immediately.
7. You will need to take prophylactic antibiotics before dental procedures, colonoscopies or other invasive procedures. This consists of Amoxicillin (2 grams one hour prior to your procedure), or if you have a penicillin allergy you should take Clindamycin (600mg one hour prior to procedure). Your dentist or Dr. Mc Millan can prescribe this.
8. You will have an office visit scheduled approximately 10-14 days after your surgery

## REHABILITATION AFTER TOTAL SHOULDER ARTHROPLASTY

**Phase I:** 0-6 weeks after surgery (may progress to Phase II when criteria met)

**Goals:**

1. Protect the shoulder arthroplasty
2. Ensure wound healing
3. Prevent shoulder stiffness

**Activities:**

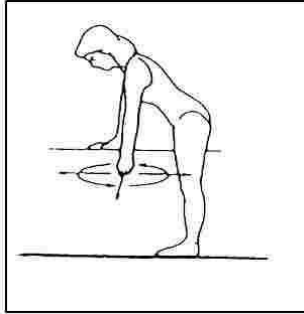
1. Use your sling during this period. When you are at home and not moving it is okay to come out of the sling as long as you are careful and keep the shoulder safe. Your elbow should be “tucked in” to your side whenever you are out of your sling. Put the sling on when you are outside or in a crowd. Keep the sling on when sleeping at night for the first 4 weeks.
2. You may use the hand on your operated arm as long as you do not rotate your shoulder away from your body. You should bend your arm at the elbow and use your fingers and hand such as to reach up and touch your face. Keep your elbow in front of you.
3. You may shower as previously described. Do not submerge the wound under water.
4. Begin the phase one exercises. Supine exercises should be done with a small rolled towel placed behind the elbow to avoid shoulder hyperextension and anterior capsular stretch.
5. Continue to use your ice: 7 days per week, 4-5 times per day, 15-20 minutes per time.
6. You will see Dr. Mc Millan at 2 weeks after surgery and again at 6 weeks after surgery.

**Exercises:**

ALL EXERCISES SHOULD BE DONE SLOWLY TO MAXIMIZE MUSCLE AND SOFT TISSUE INVOLVEMENT. DISCOMFORT IS ALLOWED – PAIN IS NOT. IF THE PAIN LINGERS AFTER THE STRETCH, THAT IS TOO FAR.

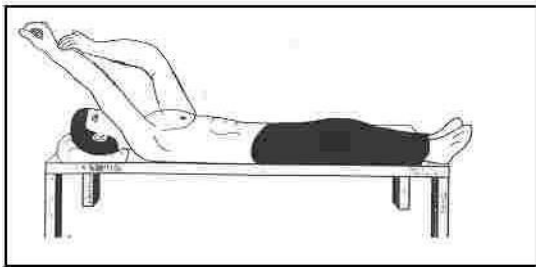
Program: 7 days per week, 4-5 times per day

Pendulum exercises	1-2 sets	20-30 reps
Supine external rotation	1-2 sets	10-15 reps
Supine forward arm elevation	1-2 sets	5-10 reps
Shoulder blade pinches	1-2 sets	5-10 reps
Internal rotation	1-2 sets	10-15 reps



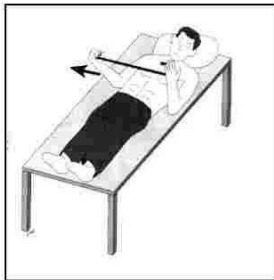
*Pendulum exercise*

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.



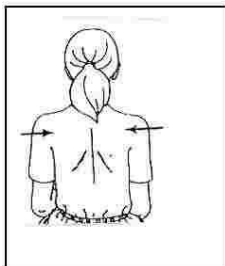
*Supine forward flexion*

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.

*Passive internal rotation to chest.* While sitting in a chair or standing, remove the sling and slowly push the operated arm into your chest.

**Phase II:** approximately 4-6 weeks after surgery (not to begin before 4 weeks post-surgery to allow for healing). May progress to Phase III when criteria met.

**Criteria for progression to Phase II:**

1. Tolerates PROM program
2. At least 90° passive forward flexion and elevation in the scapular plane
3. At least 45° passive external rotation
4. At least 70° passive internal rotation (measured at 30° abduction)

**Goals:**

1. Protect the shoulder and avoid overstressing the repair
2. Restore full passive range of motion
3. Gradually restore active motion
4. Re-establish dynamic shoulder stability

**Activities:**

1. The sling is no longer necessary. It is advisable to continue to wear it when out in public or large crowds as this may help people to avoid “slapping” you on the shoulder.
2. You may now use your operated arm. Avoid having your arm forcefully pulled.
3. Continue to avoid heavy lifting or manual labor. You should not lift anything heavier than a coffee cup. Any lifting should be done with weight in front of you.
4. Ice as needed for pain control. It is still a good idea to ice after therapy.
5. Check with Dr. Mc Millan regarding driving and getting the wound wet in a pool or bath. Both may be okay at this time.

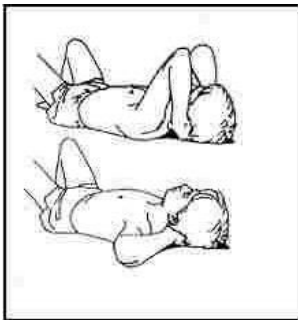
Program: 7 days per week, 3-4 times per day

Pendulum exercises	1-2 sets	20-30 reps
Supine external rotation	1 set	10-15 reps
Standing external rotation	1 set	10-15 reps
Supine passive arm elevation	1 set	5-10 reps
Seated-standing arm elevation	1 set	5-10 reps
Internal rotation	1-2 sets	10-20 reps
Wall climb stretch	1 set	5-10 reps
Supine cross chest stretch	1 set	5-10
Side-lying external rotation	1 set	10-20 reps
Prone horizontal arm raises	1 set	10-20 reps



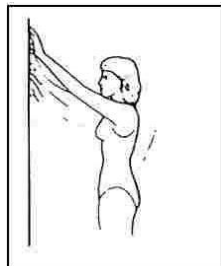
*Standing external rotation*

Stand with the operated shoulder toward a door. While keeping the operated arm firmly against your side and the elbow at a right ( $90^0$ ) angle, rotate your body away from the door to produce outward rotation at the shoulder. Hold for 10 seconds.



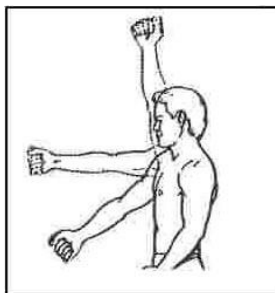
*Supine external rotation with abduction*

Lie on your back. Place your hands behind your head. Slowly lower your elbows to stretch the shoulders. Hold for 10 seconds.



*Wall climb*

Stand facing a wall. Place the fingers of the operated arm on the wall. Using the fingers as “feet,” climb the hand and arm upward. As you are able to stretch the hand and arm higher, you should move your body closer to the wall. Hold for 10 seconds. Lower your arm by pressing your hand into the wall and letting it slide slowly down.

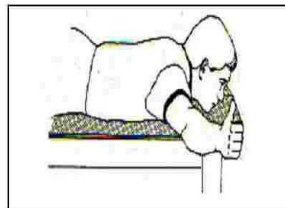


*Standing forward flexion*

Stand facing a mirror with your hands rotated so that your thumbs face forward. Raise the arm upward while keeping the elbow straight. Raise your arm to  $90^0$ . Once you can do 10 repetitions at  $90^0$  without hiking your shoulder blade, do 10 repetitions fully overhead.

*Side-lying external rotation*

Lying on your non-operated side, bend the elbow to a 90° angle and keep the operated arm firmly against your side with your hand resting on your abdomen. By externally rotating your operated shoulder, raise your hand upward, toward the ceiling. Hold for 1-2 seconds then slowly lower your hand.

*Prone arm raise*

Lie face down on your bed with your operated arm hanging freely off the side. Rotate your hand so that the thumb faces away from you. Slowly raise your arm away from your body. Hold for 1-2 seconds then lower slowly.

*Supine cross-chest stretch*

Lying on your back, hold the elbow of the operated arm with the opposite hand. Gently stretch the elbow toward the opposite shoulder. Hold for 10 seconds.

**Phase III:** approximately 10-12 weeks after surgery (not to begin before 6 weeks post-op to allow time for healing).

**Criteria for progression to Phase III:**

1. Tolerates AA/A/PROM program
2. At least 140° passive forward flexion
3. At least 60° passive external rotation
4. At least 70° passive internal rotation (measured at 30° of abduction)
5. Able to elevate shoulder against gravity to 100° (with good mechanics).

**Goals:**

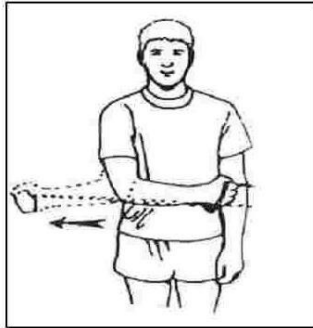
1. Protect the shoulder repair
2. Regain full range of motion
3. Gradual restoration of shoulder strength

**Activities:**

1. No heavy lifting (nothing heavier than 5 lbs). Weights should never go behind the head – you should always be able to see them. For therapy exercises Therabands are preferred over weights as these are more easily controlled.
2. No sudden or jerking motion.
3. Ice as needed after therapy.
4. Continue the active/passive range of motion program from Phase II.
5. You will see Dr. Mc Millan at 3 months after surgery.

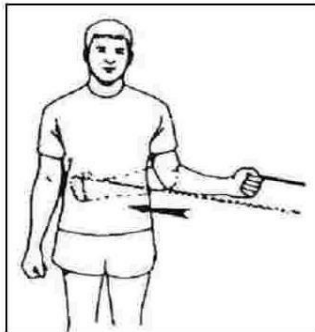
Program: Strengthening/Theraband, 7 days per week, 1-2 times per day  
Continue phase II exercises

External rotation	1-2 sets	15-20 reps
Internal rotation	1-2 sets	15-20 reps
Standing forward punch	1-2 sets	15-20 reps
Shoulder shrug	1-2 sets	15-20 reps
Seated row	1-2 sets	15-20 reps
Biceps curl	1-2 sets	15-20 reps



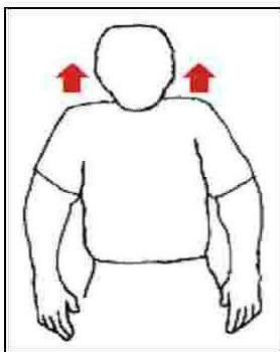
*External Rotation*

Attach the Theraband at waist level to a door jamb. While standing sideways to the door and looking straight ahead grab one end of the band and pull all the way until it is taut. Your elbow is placed next to your side with your hand as close to your chest as possible. Taking the band in the operated arm, move the arm away from the body as far as comfortable.



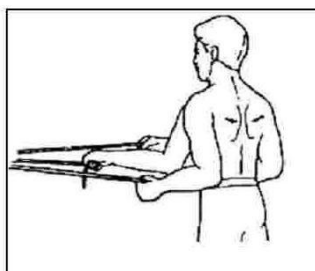
*Internal Rotation.*

Attach the Theraband at waist level in a doorjamb. While standing sideways to the door and looking straight ahead grasp one end of the band and pull until it is taut. Your elbow is placed next to your side and flexed at 90 degrees. Taking the band in the operated arm, move the hand toward the chest as far as comfortable.



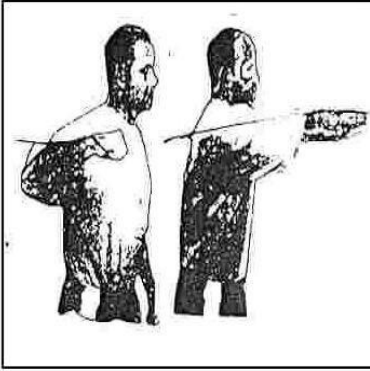
*Shoulder Shrug.*

Stand on the Theraband with your feet at shoulder width apart and look straight ahead. Stand up straight with knees slightly flexed and arms at your sides (palms facing in). Grab the ends of the bands in your hands and slowly raise the shoulders in a shrug, then rotate the shoulders backward in a circular motion. Return the initial position. Constant tension should be kept in the cord throughout the exercise.



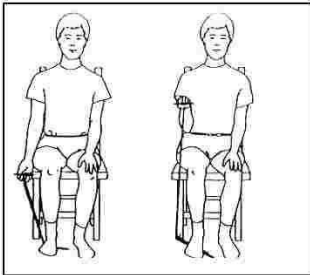
*Seated/Standing Row.*

Attach the Theraband to a doorjamb. Sit and face the door. Use a wide flat-footed stance and keep your back straight. Begin with your arms slightly flexed, hands together at waist level in front of your body, thumbs pointing up and with the cord taut. Pull the cord toward your chest until your hands touch the lower ribs.



*Standing forward punch.*

Attach the Theraband at waist level to a doorjamb. Facing away from the door, stand in a boxing position with one leg ahead of the other. Stand up straight, do not bend at the waist. If the right shoulder is the operated shoulder, grab with your right hand and have your left foot forward. Begin with your arm at waist level and bend your elbow 90<sup>0</sup>. Slowly punch forward in an upward punching motion. The hand should reach approximately neck level with the operated arm almost straight.



*Biceps Curls.*

Place your feet on the Theraband, shoulder width apart, knees slightly bent. Keeping your elbows close to your body, slowly bend the arm at the elbow and curl towards the shoulder.

**Phase IV:** not to begin before 12 weeks post-surgery.

**Goals:**

1. Maintain active range of motion
2. Continue to strengthen shoulder
3. Gradual return to more functional activities

**Activities:**

1. It is important to keep up your home exercise program as this gives the best chance for lasting success of your arthroplasty. **Don't undo all your hard work!**
2. You will see Dr. Mc Millan at 6 months and 1 year after surgery.
3. Okay to return to activities such as golf, tennis and swimming at 4-6 months post-surgery. Check with Dr. Mc Millan prior to resuming activity. It will be important to gradually return to these activities. If necessary we will discuss an interval program for return to sports.

**Exercises**

1. Continue all exercises listed above
2. Prone goal:
  - a. Flexion 160 degrees
  - b. ER at 90 degrees Abd: 75-80 degrees
  - c. IR at 90 degrees Abd: 60-65 degrees
3. Continue to emphasize AROM and strength
4. Progress strengthening exercises
5. Pool exercises and swimming

**Phase V:** return to activity (usually 16 weeks post-op)

**Criteria for progression to Phase V:**

1. PROM:
  - a. Flexion 0-160 degrees
  - b. ER 75 degrees
  - c. IR 60 degrees
2. Strength level 4/5 for ER/IR/ABD

**Goals:**

1. Improve strength of shoulder musculature
2. Neuromuscular control of shoulder complex
3. Improve functional activities

**Activities:**

1. It is important to keep up your home exercise program as this gives the best chance for lasting success of your arthroplasty. **Don't undo all your hard work!**
2. You will see Dr. Mc Millan at 6 months and 1 year after surgery.
3. Okay to return to activities such as golf, tennis and swimming at 4-6 months post-surgery. Check with Dr. Mc Millan prior to resuming activity. It will be important to gradually return to these activities. If necessary we will discuss an interval program for return to sports.

**Exercises:**

- AAROM and stretching exercises
  - Flexion with L-bar
  - ER/IR at 90 degrees abduction
- Strengthening exercises
  - ER/IR tubing
  - Full Can
  - Lateral raises
  - Prone rowing
  - Sidelying ER
  - Prone extension
  - Biceps
  - Initiate interval sport program if appropriate (weeks 20-26)

<b>Post-op Phase</b>	<b>Sling</b>	<b>ROM</b>	<b>Stretching Exercises</b>	<b>Strengthening</b>	<b>Precautions</b>
Phase I (4-6 weeks)	Yes	PROM	No	No	Avoid ER in ABD, avoid IR
Phase II (2-3 months)	Wean	AA/AROM	As per instructions	No	Slowly improve ER
Phase III (3-4 months)	No	Maintain	Continue	Therabands	
Phase IV	No	Maintain	Continue	Continue, progress to weights	See weight training precautions
Afterwards	No	Maintain	Continue for cool down	Therabands/weights	