Conservative Treatment of Rotator Cuff Injuries to Avoid Surgical Repair

Prepared for: Dr. Consuelo Romanski, Ph.D.
Writing 227

Prepared by: Jill Schuldt, LMT

March 16, 2009
Memo

Date: March 16, 2009
To: Dr. Consuelo Romanski, PhD
From: Jill Schuldt, LMT
Subject: Research Project: Conservative Treatment of Rotator Cuff Injuries to Avoid Surgical Repair.

Attached are my research findings and recommendations concerning the effective use of conservative treatment to correct rotator cuff injuries and avoid surgical repair. This report provides a complete analysis of the cause and effect of rotator cuff injuries, and the reasons why conservative treatment is the effective and preferred method of care. Shoulder injuries, specifically of the rotator cuff, have become increasingly prevalent and can be successfully corrected through conservative, non-surgical treatment eliminating the need of more expensive and invasive surgical repair.

This study has provided me with a tremendous opportunity to collectively increase the awareness of others and expand my insight of a very important concern: the quality of life and effective healthcare. I want to thank you for allowing me this experience. I want to also thank Michele Wyzga, LMT and Olivia Schane for the expertise and knowledge they generously contributed to this project. If you have any questions or comments please feel free to contact me.
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Abstract

“Conservative Treatment of Rotator Cuff Injuries to Avoid Surgical Repair”

by Jill Schuldt, LMT

Through a systematic investigation, the rotator cuff was studied to evaluate and define its associated injuries and how conservative treatment of these injuries leads to corrective resolution, eliminating the need for surgical repair. The methods used to explore this subject included investigative research and interviews. Information regarding anatomy, pathophysiology, injury types, cause, rate of occurrence, diagnosis, treatment, and treatment outcomes was collected and interpreted.

Research studies, experimental data, and clinical documentation confirmed that conservative treatment of rotator cuff injuries results in pain reduction and improved flexibility, but no increase in strength. With the exception of tears, successful treatment of rotator cuff injuries is accomplished with conservative methods. In the case of a tear, the size of the tear may not change with conservative treatment, but symptoms often diminish, therefore eliminating the need for surgical repair. Surgery is only a consideration when conservative methods have failed after six months of treatment, and significant pain and dysfunction are present.

Keywords: rotator cuff, conservative treatment, surgical repair
Introduction

Across all ages and activity levels, rotator cuff injuries are one of the most common causes of shoulder pain. “Over 15 million patients in the United States are at risk from disability related to rotator cuff injuries” (Tingstad, Edwin M. 2007). A rotator cuff injury involves any type of irritation or damage to the rotator cuff muscles or tendons. This can be caused from traumatic injury (falling on an outreached arm), lifting, or repetitive arm activities done overhead, such as throwing a baseball or placing an item on a shelf (Mayo Clinic 2008). These injuries can be as simple as a strain or tendonitis, and as severe as a partial or complete tear of one or more of muscles that make-up the rotator cuff complex. The incidence of rotator cuff damage increases with age and is most frequently due to degeneration of the tendon, rather than injury from sports or trauma (American Academy of Orthopaedic Surgeons 2007).

Injury to the rotator cuff can be resolved through conservative treatment or surgical repair. The severity of symptoms, functional requirements of the patient, and the presence of other health conditions that may complicate treatment, are factors that will determine the proper course of action (American Academy of Orthopaedic Surgeons 2007). However, not all rotator cuff injuries require surgical repair and it is only recommended if the patient experiences

- significant pain and dysfunction after several months of conservative treatment
- repeated dislocation of an unstable joint
- a complete tear of the rotator cuff (Clark, JM 718)
In most cases, rotator cuff injuries treated through conservative, non-surgical treatment recover, reducing the need for expensive more invasive surgical procedures.
Anatomy

The glenohumeral joint (shoulder joint) consists of a combination of bones, muscles and tendons. It is this very intricate design that gives the joint its broad functional range. The scapula, clavicle and humerus provide the structure, while the muscles of the rotator cuff complex, in tandem with the deltoid muscle, surround the joint to provide stability and movement. The muscles that make-up this complex are known as the SITS muscles and include the supraspinatus, infraspinatus, teres minor, and subscapularis (Figure 1).

Figure 1

![Muscles of the Rotator Cuff](https://www.kcassistedliving.com/ArmInjuries/image013.jpg)

The rotator cuff is important in allowing the shoulder to function through a wide range of motions elevating and rotating the arm. Defined as a diarthrosis (freely movable) joint, the shoulder has the greatest range of motion of any other joint in the body. With this wide range of functional capacity, comes a degree of compromise. The greater the range of motion allowed in a joint the less stable it will be, making it vulnerable to injury.
Types, Causes, and Risk Factors

A rotator cuff injury involves any type of irritation or damage to any of the muscles or associated tendons including:

- Strain
- Tendonitis
- Bursitis
- Impingement Syndrome
- Tear (partial and full)

The supraspinatus muscle is most frequently involved in degenerative tears, but more than one tendon may be affected. When rotator cuff tendons are injured or damaged, the bursa often becomes inflamed and painful. Pain, loss of motion, and loss of strength may occur when one of the rotator cuff tendons become weak or tears. A tendon tear may be either partial (a gap or hole in the tendon) or full thickness (a complete tear from its attachment on the humeral head). Figure 2 represents a shoulder impingement and partial rotator cuff tear. A bone spur is also present on the undersurface of the acromion.

Figure 2

Like most orthopedic conditions, the most common mechanisms of injury to the rotator cuff are repetitive use and traumatic injuries. “In repetitive use injuries to the rotator cuff, repeated activities cause damage to the rotator cuff tendons. Over time, the tendons wear thin and a rotator cuff tear can develop within the tendons. Patients with repetitive use injuries to the rotator cuff often have complaints of shoulder bursitis prior to developing a rotator cuff tear through the tendons” (Cluett, Jonathan 1 2008).

Traumatic injuries (falling on an outreached arm) can also result in a tear. This mechanism is much less common than repetitive use injuries. Tears occurring in patients younger than 60 years of age are usually due to traumatic injury (Cluett, Jonathan 1 2008).

A classic example of repetitive use injury involves a 19-year-old female who began swimming competitively at an early age. During a typical swim practice, Olivia (age 16) became aware of pain and a clicking/grinding sensation in her right shoulder. Apprehensive about telling her coach that she was in pain, she continued to push through believing that it would just go away. After two months of chronic pain, she conceded and saw a physical therapist for evaluation. Olivia’s diagnosis was a rotator cuff tear (Schane, Olivia “Patient Interview”).

Given the option of surgery or conservative treatment, she elected to take the conservative track in an attempt to heal naturally with rest and functional rehabilitation therapy. Olivia continued to swim while attending physical therapy sessions, but the discomfort was still too great and ultimately stopped swimming completely. The combination of rest, activity modification, and physical therapy resulted in the
elimination of pain and symptoms. She will admit that she is not consistent with preventative practices, and has difficulty with lifting heavy objects and overhead motions. It has taken almost three years, but Olivia has regained 90% of her functional levels and avoided surgery (Schane, Olivia “Patient Interview”).

**Frequency and Susceptibility**

Though found to be more common in older populations, rotator cuff injuries do not discriminate and occur in males and females of all ages. Due to the aging process, the muscle and tendon tissues of the rotator cuff loses elasticity, become more susceptible to injury, and are more frequently damaged while performing everyday activities. In a study conducted by Castro, Jerosch, and Muller (Fig. 3), examination of shoulders in 122 autopsy specimens ranging from 58 to 95 years of age found 28.7% with partial and 30.3% with full rotator cuff tears. All tears involved the supraspinatus muscle and frequency increased with age (124). In younger patients, these injuries are typically due to unusually high demand of the shoulders or a traumatic injury.

**Figure 3**

![Figure 3](image_url)

*Fig. 3. — In an anatomic study of 122 shoulder specimens we found 72 rotator cuff ruptures. The most frequent type was a superficial rupture, which occurred in 35 joints. Among the complete ruptures there were 5 pure transverse ruptures, 12 tears with retraction, 13 longitudinal splits, and nine massive cuff tears.*

In addition to primary causes of injuries, the risks of developing weakness or injury to the rotator cuff include:

- being an athlete (using repetitive motions, such as baseball pitchers, swimmers, archers and tennis players)
- working in the construction trades (carpenters and painters)
- poor posture
- weak shoulder muscles (Mayo Clinic 2008)

**Diagnosis and Treatment**

The most common symptom of a rotator cuff injury is pain and tenderness of the shoulder, especially when reaching overhead, reaching behind the back, lifting, pulling, or sleeping on the affected side. A general sense of weakness and loss in range of motion in the shoulders, and a tendency to keep the shoulder inactive will also be present. A qualified physician can establish a diagnosis through physical examination and strength tests. If the initial diagnostic evaluation proves inconclusive, diagnostic imaging will better delineate the shoulder joint, muscles and tendons. Recommended tests may include X-Rays, Magnetic Resonance Imaging (MRI), and Ultrasound Scans (Roberts, James R. MD 2007).

After thorough evaluation and diagnosis, treatment will begin. Strains, tendonitis, bursitis and impingement are the most common injuries and are generally managed with full recovery through conservative treatment methods. The first steps of treatment include physical therapy, non-steroidal anti-inflammatory drugs (NSAIDs), cortisone injections (can be detrimental if done too often), and therapeutic treatment modalities
such as ice, heat, and ultrasound. With therapeutic rehabilitation, the patient will generally experience a reduction in pain and symptoms within two to six weeks, but recovery to full strength and activity levels may take up to three months. In some cases, a modification in activity level may be permanent.

“Not all cuff tears diagnosed clinically, or by arthrography or MRI require surgical repair. A rotator cuff tear is not, in itself, an indication for surgery.\textsuperscript{15,16} In fact; survey studies using MRI have shown a high incidence of unsuspected full or partial tears of the rotator cuff in asymptomatic adults.\textsuperscript{17,18}” (Fongemie, Buss, and Rolnick 8-9). Determining when rotator cuff tears require surgery considers multiple factors, which include the degree of symptoms, the patient’s requirements and expectations, and the type of tear. Table 1 represents a diagnostic evaluation and treatment protocol for severe rotator cuff injuries.

Table 1

<table>
<thead>
<tr>
<th>Problem</th>
<th>Presentation</th>
<th>Laboratory/radiographic findings</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impingement</td>
<td>Positive impingement signs, painful motion, night pain</td>
<td>Radiographs may be normal or may show outlet obstruction (spurs, type 2 or type 3 acromion), aided with lidocaine injection</td>
<td>NSAIDs, rehabilitation, subacromial steroid injection, subacromial decompression</td>
</tr>
<tr>
<td>Rotator cuff tear</td>
<td>Weakness, atrophy; end result of chronic impingement, frequently precipitated by injury</td>
<td>Radiographs may show decreased subacromial space, osteophytes; MRI shows tears</td>
<td>Rehabilitation, especially in older patients; surgery in younger patients</td>
</tr>
</tbody>
</table>

NSAIDs=nonsteroidal anti-inflammatory drugs; AC=acromioclavicular; DMARDs=disease modifying antirheumatic drugs (including immunosuppressants); MRI=magnetic resonance imaging.*--Radicular pain reproduced with head compression

While the size of the tear may not change with conservative treatment, the symptoms often diminish. Older patients with rotator cuff tears and impingement syndrome generally respond favorably to therapeutic rehabilitation, where early surgery is recommended for younger patients with traumatic rotator cuff tears (Fongemie, Buss, and Rolnick 10). Research indicates that physical therapy has statistically and clinically significant effects on pain reduction and improving function by more than 50% of those tested (Kuhn, John E. 140). For these reasons, conservative methods of treatment are the initial approach in treating rotator cuff tears. Indications for surgery include

- the presence of significant pain and dysfunction after six months of conservative treatment
- repeated dislocation of an unstable joint
- the presence of a complete tear

If surgery is determined necessary, several effective procedures are available for repair. They include the open repair, the mini-open repair, and arthroscopic repair. In more severe cases, open surgery may involve tissue transfer of a tendon graft. Shoulder joint replacement is also a consideration for extreme cases (Cluett, Jonathan, MD 3).

**Treatment Outcomes: Benefits and Limitations**

With conservative treatment, the patient generally experiences decreased pain and symptoms within the first two weeks of therapy. Resolution of symptoms with a return to a normal activity level requires four to twelve weeks. At the onset of treatment, the patient typically participates in functional rehabilitation therapy two to three times per
week, to include periodic evaluation and modifications based on progress. Treatment duration will vary based on severity of the injury, commitment level, and health status.

Massage therapy, a method of conservative treatment, is extremely effective in restoring flexibility and range of motion, eliminating scar tissue, and reducing pain. Michele Wyzga, LMT has treated countless cases of rotator cuff injuries during her twenty-year practice. The majority of these cases have involved tendonitis, tears, and a small number of post-operative patients. The primary age group seen was 41-50, followed by 51-60, and then 20-40 years of age. In addition to regular therapeutic massage, specific strength and flexibility programs with postural awareness, and activity modifications were included. Not one of these cases went on to surgery and 75-90% reached full recovery with the elimination of symptoms. Michele recommends preventative maintenance plans, but she estimates that 50-60% of these cases followed through (Wyzga, Michele, LMT “Professional Interview”)

The costs of conservative treatment range from $50.00 to $150.00 per session, and may not be covered by health insurance. Based on a treatment program lasting three months, two to three treatment sessions per week, and an average cost of $100.00 per session, the total cost for conservative treatment would be $2,600.00 to $3,900.00. In addition, the patient avoids surgery and its inherent risks of infection, permanent stiffness, complications due to anesthesia, and “down time”. Most doctors indicate that strength of the affected muscle(s) will not increase, tears may propagate over time, and modified patient activity may be permanent (Andarawis-Puri, Ricchetti and Soslowsky 168). The
patient is required to participate in a preventative maintenance program to manage and maintain the correction.

Surgical repair restores the rotator cuff to its “original” state by reattaching the torn tendon to the humeral head from where it was torn. Successful surgery will result in pain reduction, improved function, and range of motion. However, the patient may not regain complete strength levels. In approximately 80% of procedures performed, patients experience positive results, with one in ten surgeries resulting in complications (Marx, Robert et al. 452). The complications reported are

- minor (loss of motion and infection)
- major (nerve damage, tendon re-tear and muscle detachment)

Following surgery, significant rehabilitation therapy is mandatory. A period of immobilization of the shoulder joint (use of a sling for 4 to 6 weeks) will be required to allow the newly placed sutures to remain undisturbed. Mild physical therapy (passive range of motion exercise), initiated soon after surgery, will progress into strengthening and range of motion exercises for 6 to 12 weeks. Within four to six months, functional range of motion and adequate strength return (Cluett, Jonathan 3).

The estimated average cost for surgical repair is $13,000.00. The majority of this fee is reflective of costs associated with the surgeon and hospital, and does not include post-operative rehabilitation and time loss. In a financial analysis conducted by Savoie, Field, and Jenkins on cost effectiveness of rotator cuff repair in workers’ compensation patients,
the average cost of medical care was $50,302.25 per patient with an average time in returning to unrestricted duty from the date of injury lasting 11 months (1).

This study also indicated that patients referred for treatment immediately following diagnosis had a total cost average of $25,870.64 and returned to work in 7 months. For those patients managed by a “gatekeeper” system (managed care), the average total cost was $100,280.10 with a recovery period of 18 months. The parameters of this analysis included date of initial injury through all evaluations, diagnostic studies, surgical reconstruction, physical therapy and work hardening (Savoie, Field, and Jenkins, 1).

A national annual report of actual rotator cuff injuries is not available, but experts estimate that approximately 15 million patients are at risk from complications due to rotator cuff injuries (Tingstad, Edwin M. M.D. par.1). In a study conducted by Sherman, et al., between 1997 and 2002 in the State of New York the total annual number of rotator cuff repairs increased from 6,656 to 10,128. In the same period, ambulatory cases increased from 57% to 82% (608). These statistics present strong evidence of the increase in occurrence of rotator cuff injuries. However, of the 6,656 cases in 1997, 2,858 (43%) were inpatients and 3,798 (57%) outpatient, where in 2002 totals reached 10,128 with 1,803 (17.8%) being inpatient and 8,325 (82.2%) outpatient (610). Though total case numbers increased over a five-year period, the shift in treatment method from inpatient (surgical) to outpatient (conservative) was even more dramatic.
Preventative Measures

As is the case for many functional and structural debilitating health conditions, preventative care and lifestyle play major roles in reducing the risks associated with these conditions. Physical condition will also affect rate of recovery. For individuals who have suffered from a prior rotator cuff injury, or are at risk due to job requirements or hobbies involving repetitive shoulder motions, daily shoulder stretches and shoulder-strengthening programs can help prevent a recurrence or actual injury (Mayo Clinic Staff 8). Promoting balanced strength of the shoulder muscles is extremely important. A doctor or physical therapist can assist in creating an effective program. To help prevent a rotator cuff injury

- do regular shoulder exercises (Appendix A)
- take frequent breaks at work from job activities requiring repetitive arm and shoulder motions
- rest the shoulder regularly during sports that require repetitive arm use
- apply appropriate ice and heat therapies to reduce shoulder pain and inflammation

(Mayo Clinic Staff 8)
Conclusions and Recommendations

With the increase in active lifestyles, physically demanding work requirements, and populations of older active adults, the occurrence of rotator cuff injuries has become a common debilitating condition. The general risk factors associated with these injuries include age, being an athlete, working in construction trades, and having poor posture and weak shoulder muscles. The severity of the injuries ranges from tendonitis to an actual tear. Significant pain and dysfunction are associated with each type of injury, but doctors recommend that initial treatment for all rotator cuff injuries be conservative.

The incidence of rotator cuff tears increases with age, presents both symptomatic and asymptomatic, and managed successfully through conservative treatment. The selection of surgical repair is only after conservative treatment has been exhausted, and based on the patient’s pain and dysfunction level, repeated dislocation of an unstable joint, level of tear, and lifestyle. If a tear is present, pain and range of motion will improve with conservative treatment, but strength will not. Large tears, significant weakness, and an acute traumatic event are possible causes of poor outcome with conservative treatment.

Treated conservatively, patients generally respond to treatment immediately. This method of treatment typically involves activity modification, therapeutic exercises for strength and flexibility, anti-inflammatory drugs and/or cortisone injections. Treatment period can take from four to twelve weeks, at a frequency of two to three sessions per week. The average cost for rehabilitative therapy ranges from $50.00 to $150.00 per session and no “down time” is involved.
Surgery may be necessary when a rotator cuff condition does not respond effectively to conservative treatment after six months. Indications for surgery include profound weakness, loss of function, limited range of motion, and tears greater than 3 centimeters. Surgical methods repair the tendon by reattaching it to the humeral head from where it was torn. Post-surgical treatment will require temporary immobilization and extensive therapeutic rehabilitation taking up to one year for complete recovery. The estimated average cost of surgery alone is $13,000 with total costs seen as high as $100,000.00.

The preventative practices of balanced nutrition, regular exercise, and a mindful being can minimize the risks of illness and injury. However, there is the inherent risk of human nature, which tends to lead people to the experiences of illness and injury. If faced with shoulder pain or traumatic shoulder injury, seeking professional attention immediately will reduce the risk of long-term debilitation and surgery.

Shoulder pain is indicative of a rotator cuff injury. Early diagnosis will guide the patient to the proper course of conservative treatment, eliminating long-term disability, and exorbitant medical expenses that may not be covered under health insurance plans. In addition to the overall benefits of conservative treatment, the patient must be actively involved in the healing process. For long-term success in the treatment of rotator cuff injuries, primary prevention, and prevention of recurrent injuries, an injury prevention program is essential. Through these practices, rotator cuff injuries corrected through conservative, non-surgical treatment reduce the need for surgical repair.
In light of the conclusive evidence defending and confirming corrective results with the use of conservative treatment for rotator cuff injuries, I recommend the following:

1. Patients should explore the options and prescribe to conservative treatment before considering surgery.
2. Doctors should always use conservative treatment methods for 6 months before introducing surgery.
3. Athletes should be educated and encouraged to recognize and seek physical therapy for their injuries.
4. All educational, medical, and insurance systems should be mandated to promote and provide preventative health and fitness practice education.
Bibliography


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Glossary of Terms

**Acromion:** the outer end of the spine of the scapula that protects the glenoid cavity, forms the outer angle of the shoulder, and articulates with the

**Anatomy & Physiology:** a branch of biology that deals with the structure and function of life or of living matter (as organs, tissues, or cells) and of the physical and chemical phenomena involved

**Anti-Inflammatory Drugs:** non-steroidal anti-inflammatory drugs (NSAIDs) are medicines that relieve pain, swelling, stiffness, and inflammation.

**Arthrogram:** the radiographic visualization of a joint (as the hip or shoulder) after the injection of a radiopaque substance

**Arthroscopic Repair:** fiber optic scope and small, pencil-sized instruments are inserted through small incisions instead of a large incision. The arthroscope is connected to a television monitor and the surgeon can perform the repair under video control.

**Conservative Treatment:** non-invasive, non-surgical methods of treatment for health conditions and injuries

**Cortisone Injections:** a glucocorticoid (C21H28O5) produced naturally in small amounts by the adrenal cortex and administered in the form of its synthetic acetate C23H30O6 especially as replacement therapy for deficient adrenocortical secretion and as an anti-inflammatory agent.

**Gatekeeper system:** managed-care concept used by some alternative benefit plans, in which enrollees elect a primary care dentist, usually a general practitioner or pediatric dentist, who is responsible for providing non-specialty care and managing referrals, as appropriate, for specialty and ancillary services.

**Impingement Syndrome:** a syndrome in which soft tissue is entrapped or impinged between two hard (bone) tissue structures with resultant inflammation, pain, and dysfunction.

**MRI (magnetic resonance imaging):** a noninvasive diagnostic technique that produces computerized images of internal body tissues and based on nuclear magnetic resonance of atoms within the body, induced by the application of radio waves.

**Mini-Open Repair:** use of an arthroscope and a short incision to get access to torn tendon. By using the arthroscope, the surgeon can also look into the shoulder joint to clean out any damaged tissue or bone spurs. The incision is about 3-4 cm, and the recovery is somewhat less involved than the open cuff repair.
Open Repair: prior to the use of the arthroscope, all rotator cuffs were repaired by looking directly at the torn tendon, through an incision about 6-10 centimeters in length. The advantage is the rotator cuff tendons are easily seen by this method, but the incision is large, and the recovery can be longer and more painful.

Pathophysiology: study of the disturbance of normal mechanical, physical, and biochemical functions, either caused by a disease, or resulting from a disease or abnormal syndrome, or condition that may not qualify to be called a disease.

Physical Therapy: the treatment of disease, injury, or disability by physical and mechanical means (as massage, regulated exercise, water, light, heat, and electricity)

Strain: any of various musculoskeletal disorders (as carpal tunnel syndrome or tendinitis) caused by cumulative damage to muscles, tendons, ligaments, nerves, or joints (as of the hand, wrist, arm, or shoulder) from highly repetitive movements and that are characterized chiefly by pain, weakness, and loss of feeling.

Tendonitis: inflammation of the tendons of the rotator cuff due to overuse from overload, especially in athletes who perform excessive overhead activities such as in tennis or racquetball.

Ultrasound: a treatment modality used by physical therapists that utilize high or low frequency sound waves. These sound waves are transmitted to the surrounding tissue and vasculature. They penetrate the muscles to cause deep tissue/muscle warming. This promotes tissue relaxation and therefore is useful in treating muscle tightness and spasms. The warming effect of the sound waves also cause vessel vasodilatation and increase circulation to the area that assists in healing. The physical therapist can also adjust the frequency on the machine to use waves that will decrease inflammation.

Ultrasound Scan: the diagnostic or therapeutic use of ultrasound; a noninvasive technique involving the formation of a two-dimensional image used for the examination and measurement of internal body structures and the detection of bodily abnormalities.

X-Rays: to examine, treat, or photograph with X-rays.
Appendix A: Shoulder Strengthening for the Rotator Cuff

Routine For: 

Created By: BILL PEROUTKA, MPT, ATC 

May 06, 2005

SHOULDER - 43 
Strengthening Activities: Active Resisted External Rotation
Using tubing, keep elbow in at side and rotate arm outward away from body. Be sure to keep forearm parallel to floor.
Repeat 20-90 times.
Do _1_2_ sessions per day.

SHOULDER - 44 
Strengthening Activities: Active Resisted Internal Rotation
Using tubing, keep elbow in at side and rotate arm inward across body. Be sure to keep forearm parallel to floor.
Repeat 20-90 times.
Do _1_2_ sessions per day.

SHOULDER - 45 
Strengthening Activities: Active Resisted Diagonal
Using tubing, start with arm across body, palm facing backward. Pull arm across body and over head so palm now faces forward.
Repeat 20-90 times.
Do _1_2_ sessions per day.

SHOULDER - 52 
Strengthening Activities: Resisted Diagonal Shoulder Extension
Group tubing with arm above and behind you, bring arm down across body. Return slowly to starting position.
Repeat 20-90 times.
Do _1_2_ sessions per day.

SHOULDER - 55 
Functional Pattern Strengthening Activities: Serving/Throwing
With tubing behind, pull across body as though serving in tennis or throwing a ball.
Repeat 20-90 times.
Do _1_2_ sessions per day.

SHOULDER - 67 
Progressive Resisted Exercises: Abduction (standing)
Holding _6_5_ lb weights, raise arms out to sides.
Repeat 10-30 times.
Do _1_2_ sessions per day.

SHOULDER - 68 
Progressive Resisted Exercises: External Rotation (side-lying)
Holding _6_5_ lb weight, raise arm toward ceiling.
Keep elbow bent and in at side.
Repeat 20-90 times.
Do _1_2_ sessions per day.

SHOULDER - 69 
Progressive Resisted Exercises: Internal Rotation (side-lying)
Holding _6_5_ lb weight, bring arm up toward body.
Keeping elbow bent and in at side.
Repeat 20-90 times.
Do _1_2_ sessions per day.

SHOULDER - 74 
Supraspinatus Strengthening
Raise arm diagonally from hip to just below shoulder level.
Keep elbow straight and thumb pointing down.
Repeat 10-30 times per set.
Do _1_2_ sets per session.
Do _1_2_ sessions per day.

SHOULDER - 75 
Scapular with External Rotation
Raise arm diagonally from hip, keeping elbow straight and thumb pointing up, raise arm above head.
Repeat 10-30 times per set.
Do _1_2_ sets per session.
Do _1_2_ sessions per day.

SHOULDER - 76 
Prone Horizontal Abduction with External Rotation
Raise arms straight out to sides, bringing shoulder blades close together. Keep elbows straight and thumbs up.
Repeat 10-30 times per set.
Do _1_2_ sets per session.
Do _1_2_ sessions per day.

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Appendix B: Email Interview with Michele Wyzga, LMT

Professional Interview

Title: Conservative Treatments for Rotator Cuff Injuries in Avoiding Surgical Repair

Hypothesis: Rotator cuff injuries corrected through conservative, non-surgical treatment reduces the need for surgical repair.

Name: Michele Wyzga

Title: Michele Wyzga LMT

Profession: Licensed Massage Therapist (practicing 20 years)

Date: 28 February 2009

1. How many cases involving rotator cuff injuries have you treated?

   dozens

2. Of these cases, how many and what type of rotator cuff injuries presented (tendonitis, impingement syndrome/bursitis, full thickness or partial tear)?

   few tears; majority tendonitis-type injury due to humerus not positioned efficiently within scapular fossa; also frozen shoulders

3. Total cases in each of the following age groups:

   <12 yoa _____ 13-19 _____ 20-40 _____ 41-50 _____ 51-60 _____ 61-70 _____ 71-80 _____ 81-100 _____ 100+ _____

   majority of cases in the 41-50 group, followed by the 51-60 group, then 20-40 group

4. What medical persuasion were the referring doctors (DC, ND, OD, MD, LAC, PT)?

   Majority of cases were self-referred; some were seen after not improving after working with PT
5. What other treatment plan did you follow with these patients and did it vary to the injury type?

*out-of-office therapy for clients included specific stretching and strengthening exercises, postural awareness, activity alteration or modification. Treatment plan varied with each individual more so than according to injury type.*

6. Of these cases, how many were post-op?

*1-5% were post-op*

7. Were other treatment methods used in addition to therapeutic massage and if so what type?

*myofacial release, neuromuscular therapy, strain-counterstrain*

8. Of those operative cases, what was the success rate in eliminating pain and recovering full strength and range of motion?

*None of the clients I worked with went on to surgery.*

9. What was the success rate in full recovery and eliminating symptoms (no surgery required)?

*75-90%*

10. To avoid reoccurrence of symptoms or further injury, did the patient follow a preventative maintenance plan?

*Preventative maintenance plans were recommended. Possibly 50-60% followed through.*

Jill,

I have found that rotator cuff injuries are brought on by much more than overuse and misuse of the joint. I am finding that there is a strong relationship involving the pelvic musculature as well as the internal organs (especially the liver and its supporting ligaments). I hope your paper is well received and that you feel satisfied with your results.

Michele
Appendix C: Email Interview with Olivia Schane

Patient Interview

Title: Conservative Treatments for Rotator Cuff Injuries to Avoid Surgical Repair

Hypothesis: Rotator cuff injuries corrected through conservative, non-surgical treatment reduce the need for surgical repair.

Name: Olivia Schane
Profession: student
Date: 3/13/09

1. State the nature of your injury and when it occurred.
   
   A pain in my shoulder when I took a stroke when I was swimming and it happened when I was about 16. I felt a clicking/grinding in my right shoulder.

2. How did you sustain this injury?
   
   I just pushed through it.

3. How soon after the injury did you seek medical attention?
   
   A couple months after I felt it.

4. What type of medical practitioner(s) did you see for this injury?
   
   I saw a physical therapist who gave me some exercises to heal it.

5. What was the diagnosis?
   
   A torn rotator cuff in my right shoulder.

6. Was surgery required?
   
   It was an option but I decided to go with the slower healing plan of just letting it rest.

7. What was the suggested treatment plan?
   
   Doing exercises with bands and stuff to help strengthen it again.

8. How long did your condition require supervised medical treatment before corrected?
   
   I just decided to let it heal naturally and not continue with physical therapy.
9. After your injury healed, did you suffer from physical complications or limitations that affected your activities of daily living? Are you still compromised?

I had a hard time lifting things, like throwing a football really hurt my shoulder. It hurt because my left shoulder was not affecting me but my right one was so I felt unbalanced. I do not have any problems now, but if I work too hard, sometimes I can feel it a little. I mostly feel the muscles in my bicep contracting; it feels like a sting when I stroke in swimming.

10. Have you experienced subsequent injury, weakness or pain to the affected area?

Sometimes I have weakness when I am paddling for surfing. I just try not to push it too hard, so I do not injure myself again.

11. What preventative measures have you taken to avoid future?

Just to not lift heavy things with just that arm, if I do then I will use both arms. I do not want to create permanent damage.

Thank you for taking the time to participate in this interview. Your contribution to my research is greatly appreciated. Jill Schuld, LMT