## New Advice For Patients After Rotator Cuff Surgery

# Physical Therapy in Greenville for Shoulder

Any time the rotator cuff is torn and surgery is required to repair or reconstruct the damage, patients are placed in a sling postoperatively to protect the healing tissue. Patients are then given a standard set of shoulder exercises called Codman's or pendulum exercises to keep the shoulder joint from getting stiff or freezing up.

But there's a concern that these exercises could put too much tension on the repair and cause a retear. In fact, there's evidence to show that with large tears (complete rupture), the retear rate is as high as 75 per cent. That's three out of every four patients! Are these retears in any way linked with doing the prescribed shoulder exercises incorrectly? That's what this study was meant to help find out.

Thirteen healthy adults (18 and older) without any shoulder problems were the main subjects. Each one was hooked up to wire electrodes placed on the surface of the skin over the muscle being tested. The electrodes can record muscle activity for the muscles of the rotator cuff and transmit this information to a computer for storage and analysis. The participants went through each of the Codman's exercises -- first doing them correctly and then repeating the movement patterns incorrectly.

When performed right, these exercises are done by using the trunk to generate motion of the arm. The patient is standing holding on to a supportive surface with the uninvolved hand while leaning forward and allowing the involved arm to dangle. The trunk and hips are rocked forward and back, side-to-side or in a circular motion. Overflow of motion from the trunk moves the arm forward and back, side-to-side, and in circles clockwise and counterclockwise. The motions can be large or small depending on how much swing the person puts into the hips and trunk.

When done incorrectly, the shoulder generates the motion. This makes the exercises active (using the rotator cuff muscles) instead of passive (protecting the muscles). Test procedures were carried out doing these exercises four different ways: two correctly and two incorrectly. The first set of correct exercises were done using large movements. The second set of correct exercises were done using small movements. Both large and small motions were repeated doing them incorrectly (using the shoulder to move the arm rather than using the trunk to move the shoulder).

The people in the study were also tested doing three other commonly performed daily activities using the arm: typing, brushing teeth, and drinking from a water bottle. These activities were measured as if nothing were wrong with the arm and then repeated with the arm in a sling like the one worn after rotator cuff surgery.

The results showed that muscle activation was observed when the subjects were drinking from a water bottle and while making large movements (correctly or incorrectly). The authors suggest that large movements are either just more difficult to do passively or simply can't be done passively at all.

Until the results of this study were published, Codman's exercises were routinely prescribed without knowing if this is really a good idea or not. The goal has always been to keep normal shoulder joint motion without putting any stress on the repair. Now we know that it is possible to do these pendulum exercises in such a way that activates the muscles. The muscle most active was the supraspinatus which is also the rotator cuff muscle that is most often injured.

Although the authors conclude that it might be best to avoid large pendulum exercises in the early days after rotator cuff surgery and to use the uninvolved hand to drink from a bottle, there are some things to note. This study was done on a group of healthy, young individuals. Patients with rotator cuff injuries are often older and obviously the muscle is no longer intact and healthy. Those differences in subject/patient populations could make a significant difference.

Muscle activity was measured using electromyography (EMG). EMG is a measure of muscle activity but not muscle force. The equipment used could tell them that there was muscle activity but not how much or the amount of force. Those details might be important before making any solid recommendations about performance of the exercises and activities measured in this study.

More study is needed to really know for sure the extent to which Codman's exercises activate the rotator cuff. Repeating the study on a group of rotator cuff patients and comparing the results with normal healthy adults is the next step. The effect of other activities such as pushing a door open, pulling a drawer forward, and picking up a purse or bag after rotator cuff surgery should also be tested.

Reference: Joy L. Long, MD, et al. Activation of the Shoulder Musculature During Pendulum Exercises and Light Activities. In Journal of Orthopaedic & Sports Physical Therapy. April 2010. Vol. 40. No. 4. Pp. 230-237.