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clinical conduit

What's the best way to stretch the pectoralis minor?

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The pec minor is a muscle prone to hypertonicity and chronic adaptive shortening secondary to postural faults and habits. The muscle originates from the 3rd, 4th and 5th ribs near the sternocostal junction and courses in a superolateral direction to insert on the coracoid process of the scapula. It functions to tip, depress, and downwardly rotate the shoulder blade. During elevation of the arm the pec minor must lengthen to allow the scapula to upwardly rotate, externally rotate ("unwing"), and tip in a posterior direction about the scapular plane axis. This tipping is particularly important as many studies have shown that the role of the serratus is to facilitate a posterior tilt during elevation allowing increased clearance in the subacromial space. According to Kibler, a common scapular dysfunction that contributes to impingment pathology and rotator cuff diesease is an inferior dysfunction where the coracoacromial hood is lowered secondary to this combination of weakness (serratus) and tightness (pec minor). This structural deformity is easily recognized with an increased anterior tilt of the scapula and the inferior angle of the scapula projecting posterioly.

Since the pec minor seems susceptible to adaptive shortening that could negatively alter scapular kinematics, what would be the best stretching technique to maximally elongate the muscle? In a recent study in the Journal of Shoulder and Elbow Surgery, Borstad, et al, looked at three different

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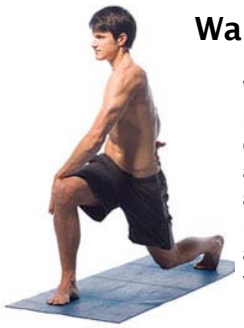
Figure 1: Unilateral corner stretch with shoulder and elbow at 90°

Figure 2: Sitting manual stretch of scapula into external rotation

Figure 3: Supine manual stretch in 90/90 position and towel roll in thoracic spine.



Warm Up and Stretching

Warm-up and stretching are not the same thing and the terms should not be used interchangeably. "Warm-up" is a group of activities used to elevate the core body temperature and prepare the muscles for vigourous activity. These movements not only increase tissue temperature but allow a "rehearsal" of the upcoming event. A common component of the warm-up rotuine may include dynamic stretching. This type of stretching utilizes agonists and synergists to actively move a limb through a range of motion with the functional antagonists being stretched.

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Remaining 2006 Schedule

Knee Course
Dec 9-10 Tulsa, OK

Cervical Course
Aug 19-20 Chicago, IL
Oct 28-29 Plano, TX

Pilates Course
2007 dates TBD

Shoulder Course
Oct 7-8 St. Louis, MO

Lumbopelvic Course
Jul 15-16 Chicago, IL

Foot-Ankle Course
Sep 9-10 Chicago, IL
Nov 18-19 St. Louis, MO

A detailed description of the course content and learning objectives is is available at our web site — www.continuing-ed.cc

Pectoralis Minor Stretching continued …

References

Borstad JD, Ludewig PM. Comparison of three stretches for the pectoralis minor muscle. *J Should Elbow Surg.* 2006. 15(3):324-330.

Borstad JD, Ludewig PM. The effect of long vs. short pec minor resting length on scapular kinematics in healthy individuals. *J Orthop Sports Phys Ther.* 2005l 35:227-238.

Kibler B, McMullen J. Scapul-lr dyskinesis and its relation to shoulder pain. *J Am Acad Orthop Surg.* 2003; 11:142-51

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stretching techniques to evaluate the actual change in pectoralis minor muscle length. The three stretches evaluated are shown in Figures 1 -3 on the previous page.

50 subjects without shoulder pathology were examined for changes in muscle length during each stretch with the assistance of an electromagnetic motion capture system. To my surprise the stretch with a significantly greater separation of origin to insertion was the simple corner stretch (Figure 1) with a 2.24 cm change in length. The second most effective stretch was the supine manual stretch (Figure 3) with an average change in muscle length of 1.69 cm. The least effective stretching technique was the sitting manual stretch (Figure 2) with only a .77 cm change in length.

The common theme with the two most effective stretches was the position of the glenohumeral joint in 90° of abduction and external rotation. The authors theorize that this position maximizes the posterior tipping and external rotation of the scapula to effectively increase the distance between the coracoid insertion and rib origin of the muscle.

As a result of this study I would suggest that important considerations when stretching the pectoralis minor include the following (Figure 4):

1. Arm maximally elevated into horizontal abduction and externally rotation to tip the scapula
2. Towel or foam roll in the thoracic spine to prevent scapular contact with the support surface
3. Bilateral stretch or rotation of the trunk away from side being stretched to stabilize the muscle origin
4. Full inhalation to increase rib cage diameter
5. Gentle overpressure on the anterior shoulder in a posterior and lateral direction.

Figure 4: Self stretch of pectoralis minor

"" I have a patient that overpronates in mid-stance but can't afford orthotics. Will the shoes she wears be able to affect her mechanics?

R.M., PT - Connecticut

Question of the Month

I've often said that the initial biomechanical intervention should not be an orthotic but an appropriate pair of shoes. So the question is really what type of shoes or shoe features can minimize or prevent excessive or prolonged pronation?

Our first premise is that the pronation has a structural influence or origin. It stands to reason that if proximal weakness or soft tissue inflexibility were causing the abnormal gait that a motor training and stretching program would be necessary.

But you asked specifically about the shoes. Here are some features to look for if you're trying to control pronation. Generally these types of shoes fall into the "motion control" category meaning they have a straighter shape and board lasting. The medial portion of the midsole may have a denser and more durable polyurethane material or a split heel in the rearfoot's outsole to slow the rate of pronation.

Finally, a snug and stable heel counter will also minimize unnecessary calcaneal motion and enhance rearfoot stability.

Questions you would like addressed in a future issue can be sent to mulliganpt@comcast.net

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Stretching and Warm-up continued –

Many of our patients in therapy could benefit from this type of preparation. Numerous research reports have shown that traditional static stretching has a negative effect on muscular performance while dynamic movements seem to enhance movement performance.

For patients with significant limitations in range static stretching may be more appropriate. Static stretching is defined as elongating a muscle to tolerance and sustaining the position for a length of time (usually about 30 seconds). This type of stretching is considered to be safe and effective for reacquiring lost joint range of motion. The perspectives that static stretching will decrease risk of injury or enhance performance have generally been refuted. Contrary to old beliefs, the best time to work on static flexibility is at the end of the therapy session (or workout), and not at the beginning. In other words … warm-up to stretch NOT stretch to warm-up.

So what type of activity should be used in preparation for our rehabilitation sessions. I would recommend the patient be put through a series of dynamic stretches after a 5-15 minute bout of general warm-up on a bike or upper body ergometer. Here are some examples of this type of dynamic stretching. All of these movements should be monitored for correct technique and appropriate for the type of injury that is present.

1. Lunge Walks – variations include upper body rotation, exaggerated lateral motion, retro steps, etc
2. Walking High Steps
3. High Kicks/Retro Kicks
4. Deep Squats with Overhead Shoulder motion
5. Inchworm
6. Hurdle Dips and Hurdle Steps
7. Windmills
8. Trunk Rotations and Sidebends
9. Carioca

Dynamic flexibility training provides a more patient and injury specific mode of warm-up and tissue preparation. The variety of movements are only limited by the creativity of the therapist designing the program.

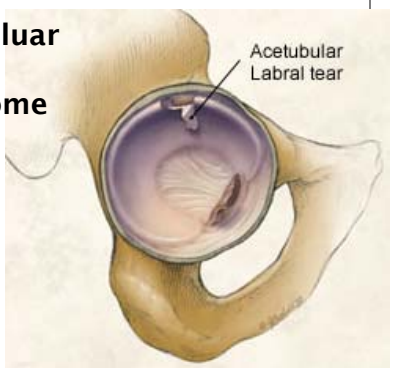
"Featured Internet Link"

Physiotherapy **E**vidence **D**atabase ro

http://www.pedro.fhs.usyd.edu.au/index.html

PEDro was established to give PTs quick access to abstracts of randomized control trials, systematic reviews, and evidenced-based clinical practice guidelines in physical therapy. The site promotes quality of care by answering clinic questions based on current evidence. Specific criteria are used to define which articles are archived in PEDro. Studies are rated for quality, which helps to determine if the trial is valid and clinically useful. Trials are rated with the PEDro scale, a 10-item checklist, which considers aspects of quality. The first, internal validity, consisting of random allocation, concealed allocation, similar baseline groups, blinded subjects, blinded therapists and assessors, 85% of subject outcomes, and intention to treat. The second, statistical reporting looks to see if results of between groups' comparison, point's measures, and variability measures are reported. A trial with an 8/10 score would have a higher quality rating and results have increased validity when compared to a trial with a 3/10 score. I would encourage you to try this site for its applicability and objectivity.

Acetabluar Rim Syndrome



An often unrecognized or under appreciated source of chronic hip pain are tears in the labral complex that deepens the hip joint's acetabulum. It has been estimated that 20% of athletes with unresolving groin pain and 55% of adults with undiagnosed mechanical hip pain are suffering from labral pathology. The most common area of involvement is the anterosuperior portion of the labrum. The posterior labrum is more commonly involved when there has been a traumatic posterior dislocation.

The mechanism of injury differs with age. In younger individuals it tends to occur secondary to trauma while in older patients the injury is usually degenerative in nature. The risk for injury is increased with congenital hip anteversion or dysplasia.

The signs and symptoms vary but common complaints are deep mechanical symptoms (clicking/catching) with persistent groin pain that is periodically referred to the buttock or lumbar spine area. The patient usually has full passive range of motion but symptoms are reproduced in the quadrant position (hip flexion-adduction-internal rotation). Dependent upon the location of the labral pathology the FABER position may also reproduce deep hip pain. Patients also tend to have increased discomfort with resistive straight leg raises, semi-sit ups, or passive end range hip extension stretches.

Initial management should focus on rest from offending activities (lunges, weight-bearing rotation, sit-ups, cycling, etc) and controlling hyperextension and external rotation forces. If conservative treatment fails the patient could be a candidate for a hip arthroscopy.

References :

Lews CL, Sahrmann, SA. Acetabluar labral tears. *Phys Ther.* 2006; 86:110-21.

Narvani AA, et al. Acetabular labrum and its tears. B J Sport Med. 2003; 37:207-1.

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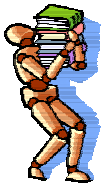

Rehabilitation Exercise Technique

The Plank

"A goal without a plan is called a wish"

The plank is an excellent exercise to develop overall core stability while simultaneously working the transversus abdominus, The exercise starts in a push-up position with the hands directly under the shoulders and the feet close together. The back should be as straight (neutral) as possible with the head, neck, hips, and knees in parallell alginment.

Some tips to remind your patient inlcude:

1. Remembering to breathe normally
2. Pulling their navel into their spine to activiate the transversus abdominus
3. Not letting the hips sag or or move upward into a piked position.
4. Keeping the neck "long", the shoulders retracted, and the chest broad
5. The exercise only continues as long as the appropriate posture can be held. If pain or tightness is felt in the low back the exercise should be discontinued.

Exercise Variations:

As the patient masters the traditional plank position and can hold the posture for 1-2 minutes you may want to progress to some alternative forms of the exercise.

- Alter the position of the isometric hold to include sidelying and supine
- Put the feet or toes on an labile surface like a gym ball, balance board, or foam disc
- Tripod positioning – lift one leg or one arm and progress to pulsed motion with the non-weight bearing extremity
- The exercise can also be altered by shortening the lever arm length (on elbows and/or knees instead of balancing from hands and toes positions)

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Featured Home Study Program

Ethics and Professional Responsibility

What is the difference between ethics and morals? The Greek derivative of ethics" comes from the word *ethos*, which means character. The Latin origin of ethics comes from the term *mores* that means customs. Although "morals" and ethics are sometimes used interchangeably they do have distinct differences.

Ethics is the practical and theoretical structure by which morals are formed. Morals include ethically examined practices, but can also include scenarios or perspectives that have not been ethically analyzed or judged. Examples might include social customs, prejudices, and lifestyles. No one should feel compelled to abide by another person's morality, although individuals are clearly obliged to comply with organized ethical and legal mandates.

Ethical behavior is important because it intrinsically makes people feel better about themselves if they work and act in such a manner. On a professional level, ethics promote good business. A time tested truth is that over the long run, ethical associations perform better than unethical groups. Ethical standards simply push our profession to truly determine what "is best" through disciplined, internal accountability. In fact, the credibility of our profession rests not only on technical competence, but also on the public's trust and expectation that we will judge the quality of our service and validate its legitimacy. Many states now require education in professional conduct. We have a TPTA approved written home study that will meet this requirement and explain the rules and regulations that define our practice and professional responsibilities. Please visit our web site for more information.

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Goniometric Examination	.2 CEUs
Principles of Joint Mobilization	.2 CEUs
Functional Anatomy of the Shoulder	.3 CEUs
Scapular Significance: Ortho Perspective	.2 CEUs
Proximal Humerus Fracture Rehab	.2 CEUs
Examination-Treatment of Hand/Wrist	.3 CEUs
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