

# The Swimming Shoulder



Andrew F Neeld, MS, LAT, ATC



# The Swimming Shoulder

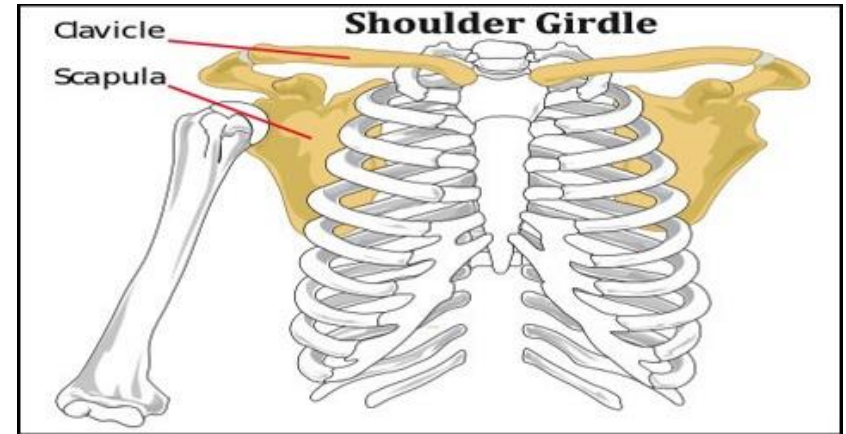
---



- Anatomy of the shoulder girdle, shoulder joints and associated musculature
- Swimming Posture
- Injury trends I have seen in the last 3.5 seasons
- Injury prevention

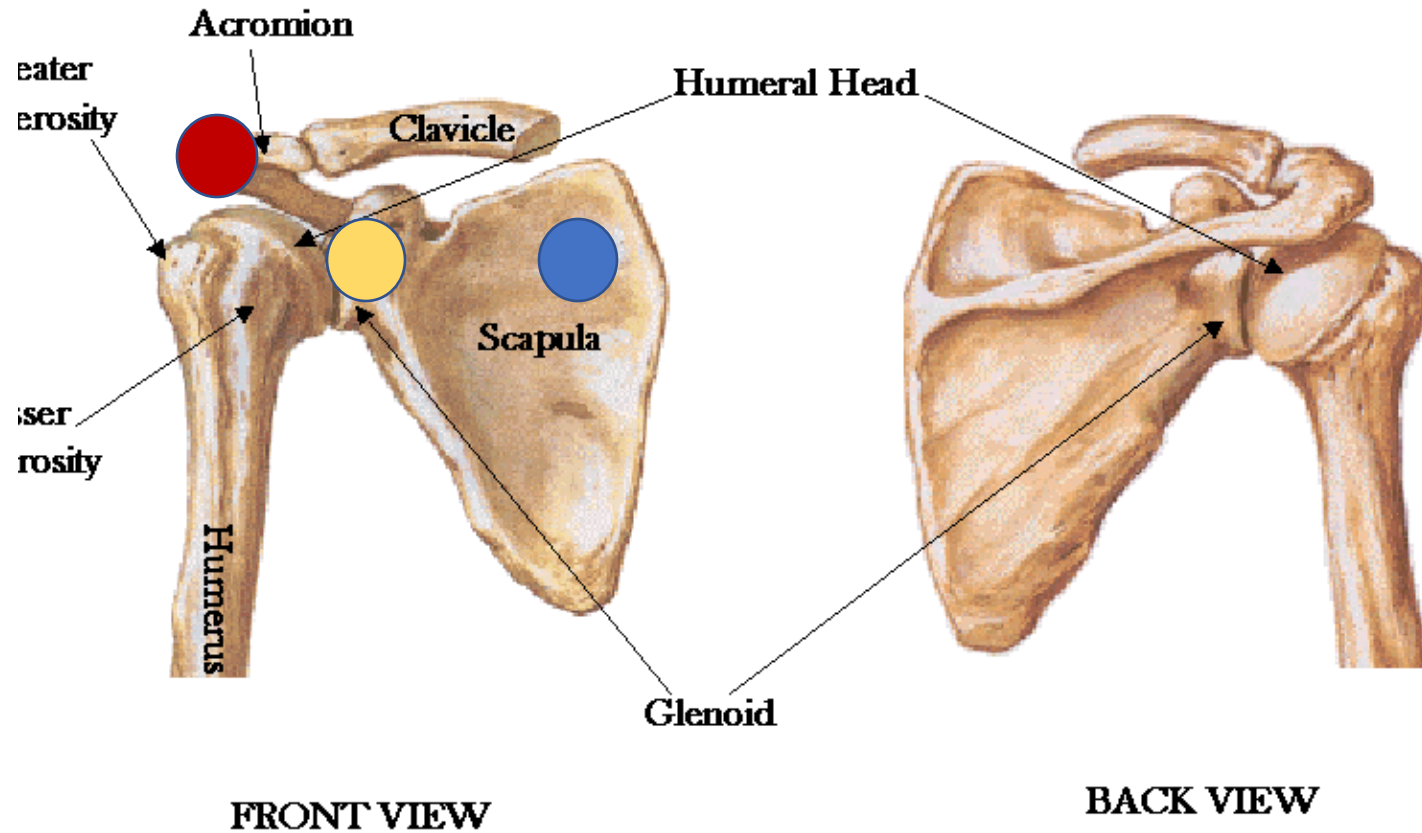


# The Shoulder Girdle



- What is the shoulder girdle?
  - The shoulder girdle is comprised of two bones; the scapula, and the clavicle
- The scapula or "Shoulder Blade" is a flat bone that floats and lies on the back on the rib cage and only connects to the body via muscles
- In addition the scapula serves as the headquarters where all 4 rotator cuff muscles can be found
- The scapula has three distinct bony landmarks:
  - The spine of the scapula, the acromion, and the coracoid process





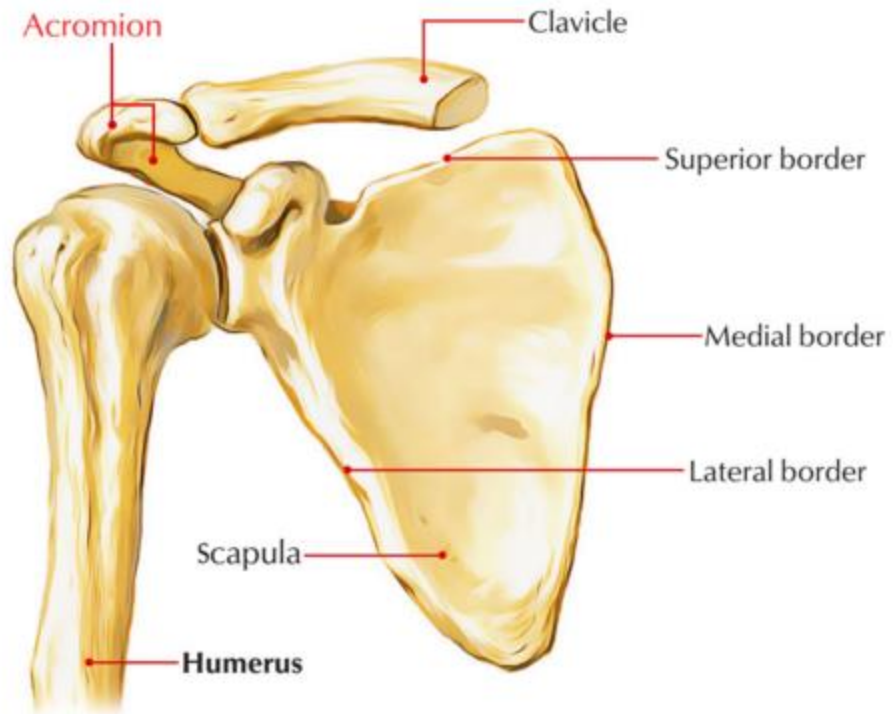
- The shoulder girdle is not just one joint, but rather a network of bones, ligaments, muscles, and tendons that work together to allow the arm to have both strength and range of motion
- It serves to connect the appendicular skeleton to the axial skeleton (connect the limbs to the head and vertebrae of the body)

## Shoulder Girdle



# The Shoulder Girdle

The Shoulder Girdle



The Rotator Cuff Muscles



# Shoulder Joints

## **Glenohumeral Joint:** "Shoulder Joint"

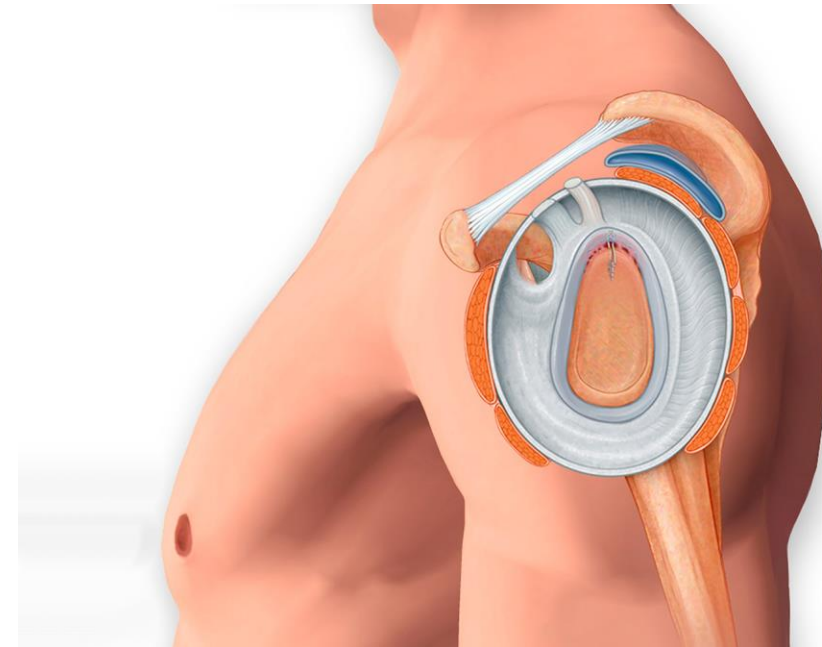
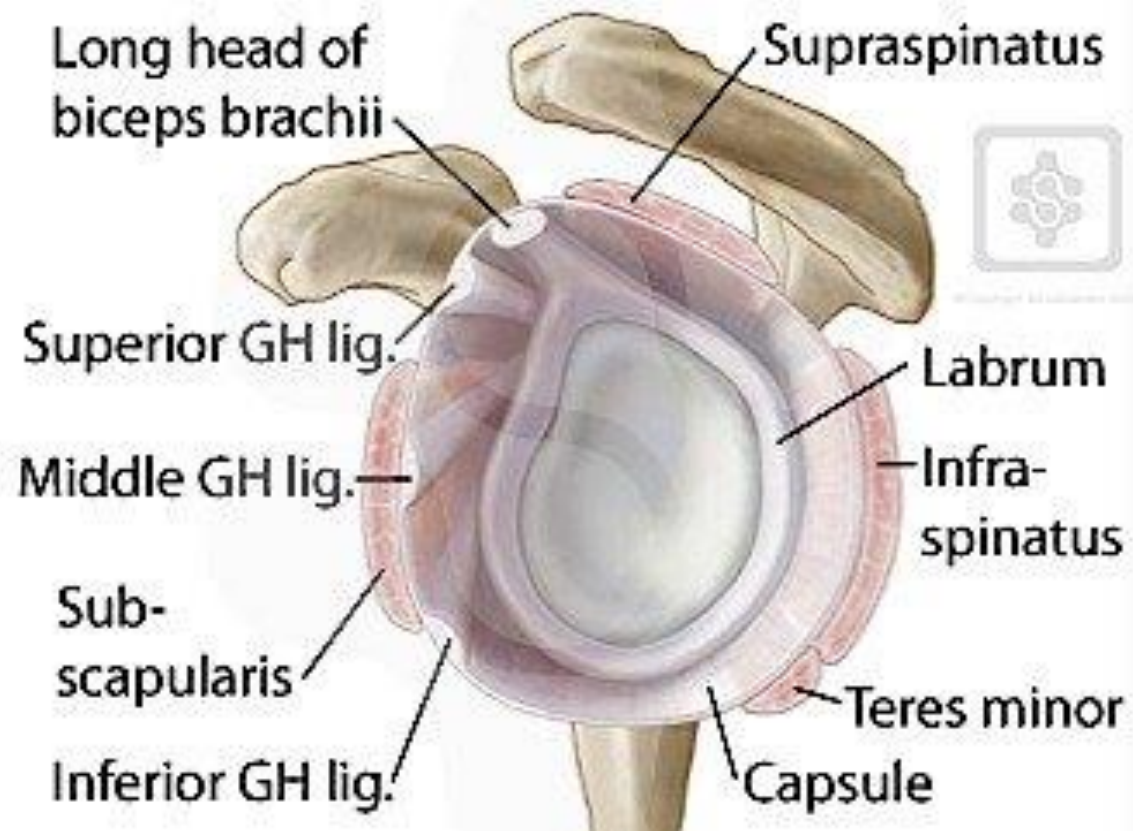
- Joint of the head of the humerus (arm) and the cavity of the scapula
- Rarely in swimming is the GH JT dislocated, but often the repetitive overuse aspect of swimming can lead to chronic injuries

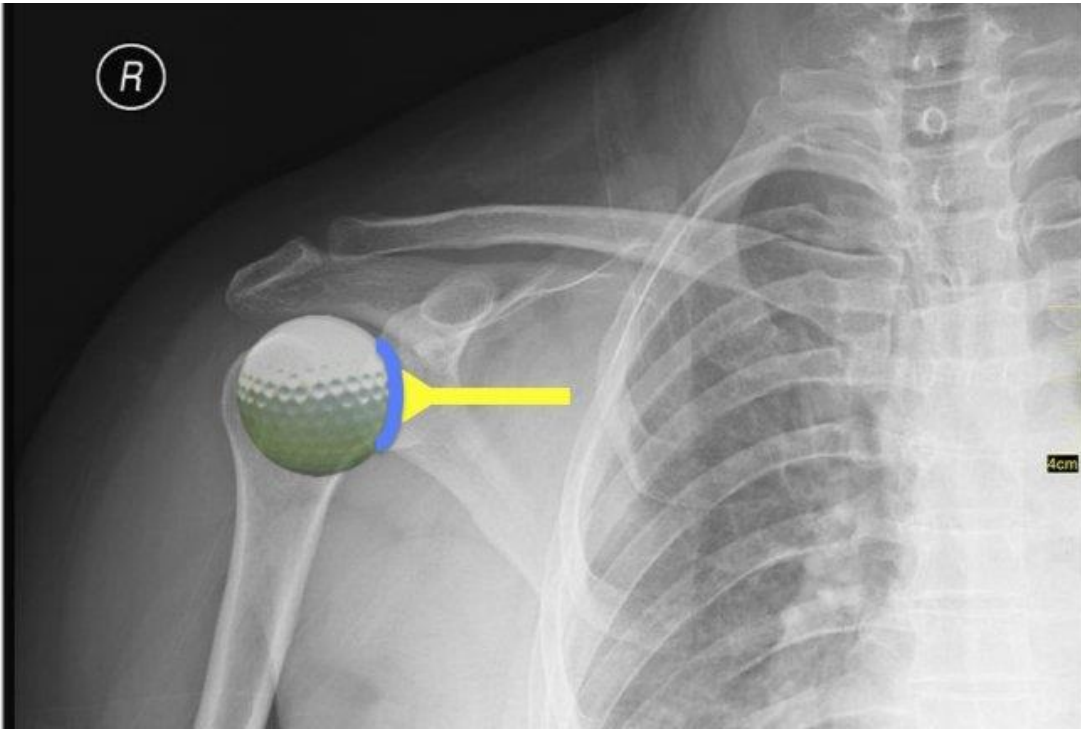
## **Acromioclavicular joint:** Joint of the acromion process of the scapula and the end of the clavicle

- Commonly referred to as the "Separated Shoulder" when injured
- Can be injured during swimming if an athlete runs into the wall , slips on the deck, etc...



# Glenoid Labrum





## Glenohumeral Joint

- The convex (rounded portion) surface of humerus articulating (moving on) with the concave aspect of the scapula allows for a great deal of motion at the shoulder, but sacrifices stability
- Think of your shoulder as golf ball on a tee and imagine the labrum of your shoulder as a thin layer of rubber that lays on top of the tee to keep the golf ball stable





## Acromioclavicular Joint

- Mechanism of Injury: Most of the time is from falling directly on the shoulder with the arm tucked into your side or direct impact to the shoulder
- Could still occur during swimming when a swimmer loses track of where they are relative to the wall



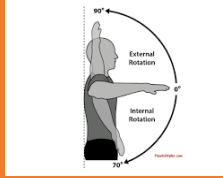
# Sternoclavicular Joint & Scapulothoracic Joint

---

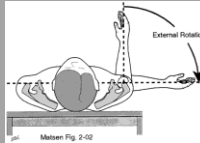
- **Sternoclavicular joint:** Is the articulation of the sternum and the clavicle
  - It truly takes a lot of force to disrupt the SC Joint, but could be possible from a kick to the shoulder, back or chest during practice
  - More likely to be seen during wrestling or football where an athlete is tackled to the ground
- **Scapulothoracic joint:** Is the articulation of your scapula with your posterior ribs



# Musculature Associated With The Shoulder



**Internal Rotators:** Teres major, Pectoralis Major, Subscapularis, Latissimus Dorsi, and Anterior Deltoid



**External Rotators:** Infraspinatus & Teres Minor

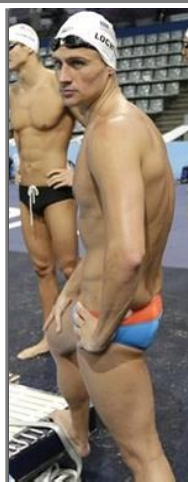


**Shoulder Flexors:** Anterior Deltoid, Lateral Deltoid, Pectoralis Major and Coracobrachialis



**Shoulder Extenders:** Latissimus Dorsi, Teres Major, Teres, Minor, and Posterior Deltoids      **Scapular Retractors:** Trapezius, Rhomboids, Latissimus Dorsi,





# Swimming Posture

---



You know you're a  
swimmer when...



people are constantly telling you  
to sit up straight.



# Swimming Posture

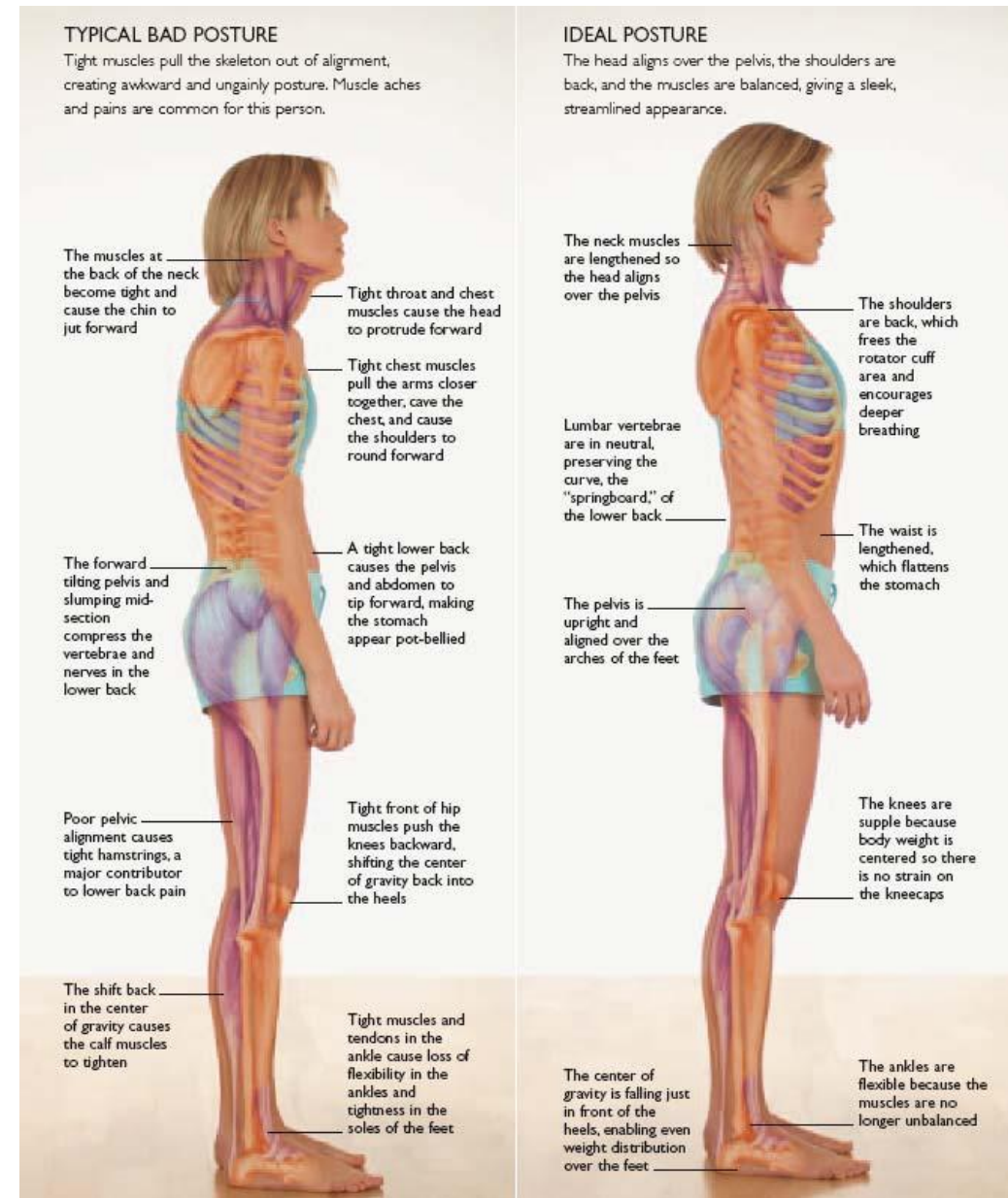
- What is Swimming Posture? →
  - Most typically it's a forward head, rounded shoulders, and excessive thoracic flexion
- Swimmers often overdevelop the chest, back, arms, and shoulders, but... →
  - Under develop the cervical retractors, deep postural muscles of the hip and torso
- Does this posture help swimmers swim faster? →
  - NOOOOOOOOOOOOOOOOOOOOOOOOOO  
Weak hips means a slower start out of the blocks or off the wall, less explosive turn, and weaker kicks.  
Thoracic flexion causes increased drag in the water and lower lung capacity (Oregon Exercise Therapy)



## Why I Stress Posture.....

The short answer = bad posture causes me more work and you the athlete have higher possibility of injury as a result

---



# Injury Trends

## Shoulder Injuries

- Bicep Tendonitis
- Rotor Cuff Tendonitis
- Subacromial Bursitis
- Pec Tendonitis

## Back/Neck Injuries

- Generalized posterior cervical neck pain/tightness
- Upper trapezius pain/tightness
- Medial border scapular pain/ tightness (rhomboid pain)

## Hip/ Lowback Injuries

- Hip flexor tightness
- SI Joint Dysfunction
- Glute/Hamstring/ Quadratus Lumborum miss firing

Most of these injuries are the result of.....

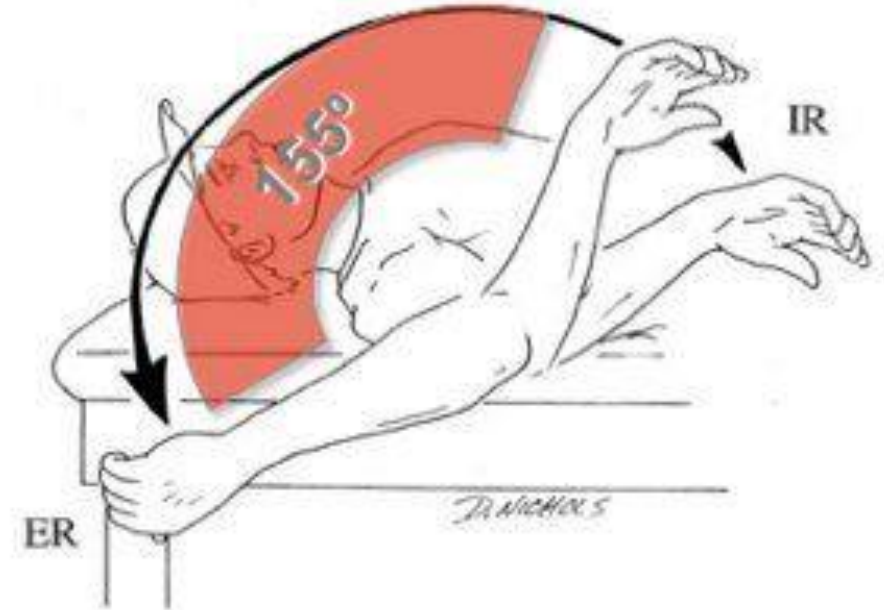
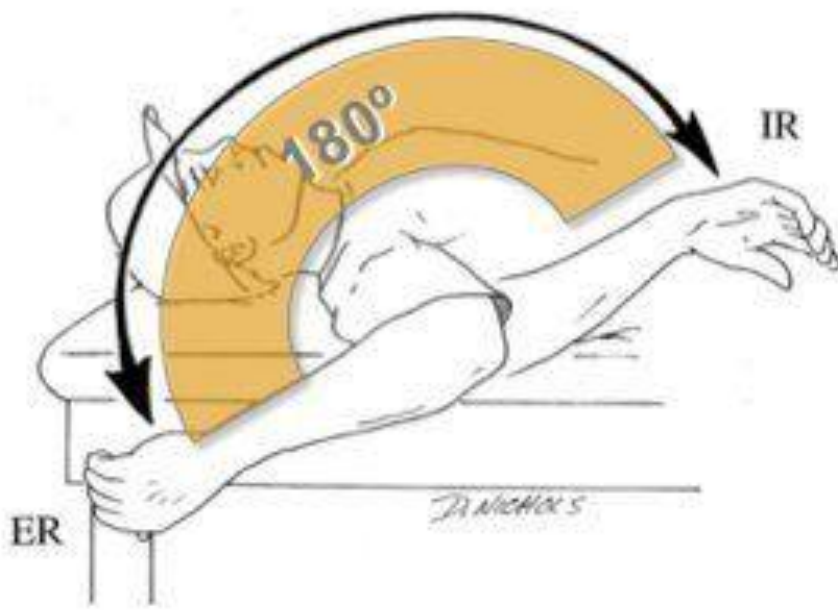
1. The swimmers posture
2. Poor stretching habits post practice/ competition



# Injury Prevention

- Range of motion(ROM)
  - Internal ROM Norms-0-90degrees (Starkey)
  - External ROM Norms-0-100degrees (Starkey)
- Glenohumeral Internal Rotation Deficit (GIRD)
  - Overhead athletes develop specific adaptations to allow them have more external rotation on their dominant arm. Some of the research shows that shape of humerus and glenoid change while the growth plates are still open allowing for this excessive external rotation in the overhead athlete (Reinold)





# Injury Prevention

- Total arc of motion should be 180 degrees
- The true norms of IR is closer to 50 degrees as opposed to 90 (Reinold)
- The key is to compare bilaterally and encourage posterior capsule stretching, but not taking it to the extremes (Reinold)



# Internal Rotation Stretching

## Modified sleepers stretch



Rotate your trunk away from your arm, then apply a gentle downward pressure on your bent arm, just above your wrist, until you feel a stretch in your shoulder and hold.

## Standing sleepers stretch at wall



Lean into the wall and apply a gentle downward pressure on your bent arm, just above your wrist, until you feel a stretch in your shoulder and hold.



# Internal Rotation Stretching

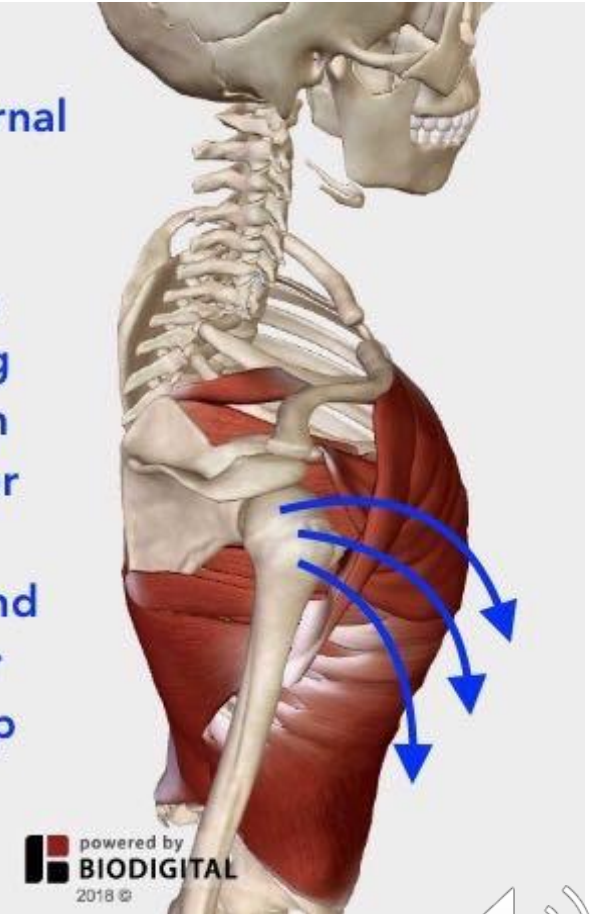
Standing shoulder internal rotation stretch with towel



- Slowly straighten your upper arm, gently pulling upward on the towel, and hold when you feel a stretch.

Above Image and descriptions was taken directly from Medbridge Exercise Builder

The muscles of internal shoulder rotation, along with the abdominal obliques and the surrounding fascia, can pin down and restrict shoulder movement thus resulting in strain and pain in the shoulder and neck muscles up above.



# External Rotation Stretching

## Standing PVC External Rotation Stretch



Slowly pull your bottom arm forward and hold when you feel a stretch

## Standing Overhead Shoulder External Rotation



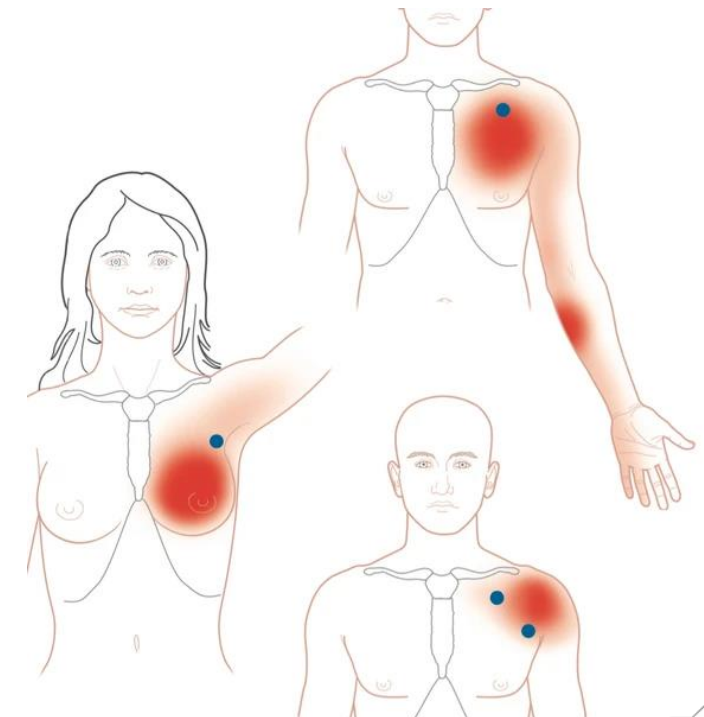
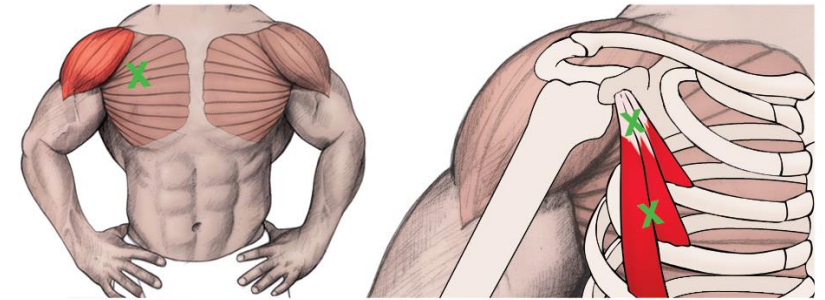
Slowly straighten your bottom arm, gently pulling downward on the towel until you feel a stretch in your top arm. Hold this position.

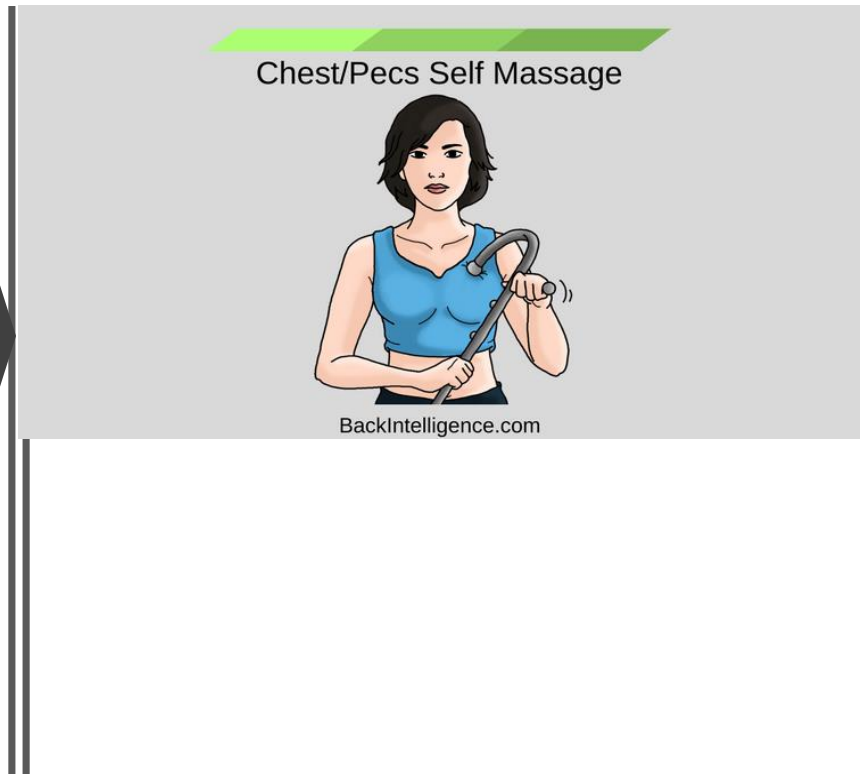
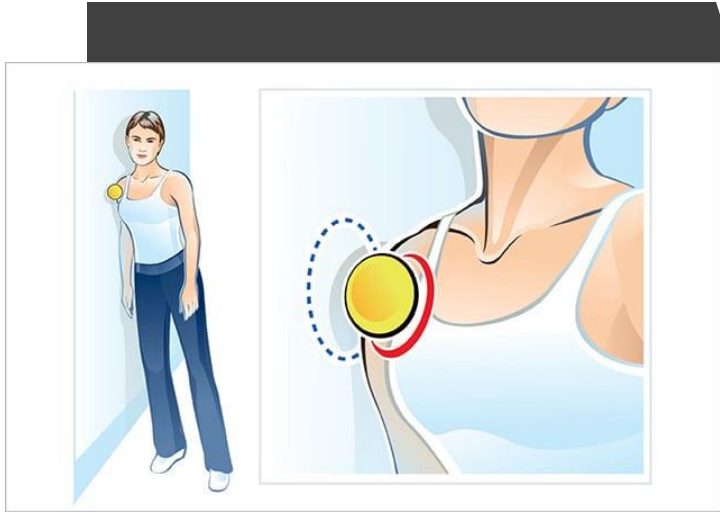
Above Image and descriptions was taken directly from Medbridge Exercise Builder



# Pectoral Stretching

- **Muscle:** Pectoralis Major & Minor
- **Location The pectoralis major:** originates from the clavicle, sternum and upper six ribs->inserts on the humerus
- **Location the pectoralis minor:** originates from the front of the third through fifth ribs-> inserts on coracoid process of the scapula
- **Pectoralis Major Muscle Action:** Flexes, adducts, and medially rotates the arm
- **Pectoralis Minor Muscle Action:** Draws scapula anteriorly and downward
- **Reason for pain:** Overdeveloped chest, impingement of the rotator cuff tendons, weak back muscles, and fatigue.
- **Correction Plan:** Pre practice stretching, foam rolling (self-myofascial release), IASTM (scrapping) various types of rowing exercises combined with a conscious effort to maintain good posture when not swimming.
- **Major Key:** Foam rolling and stretching need to become a part of your daily routine and it is especially important after hard practices or meets!!!!!!!!!!!!





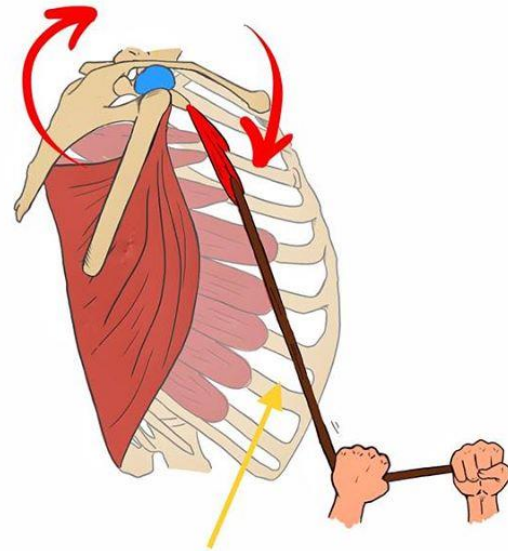
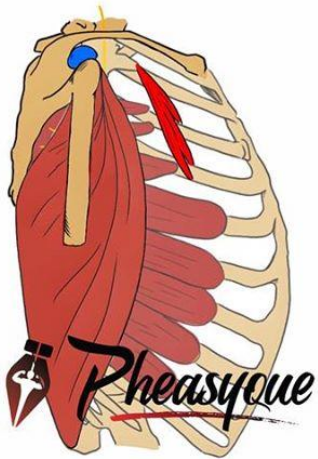
# Self Myofascial Release Of Pec Minor



# Why Your Tight Pecs Cause Shoulder Pain...

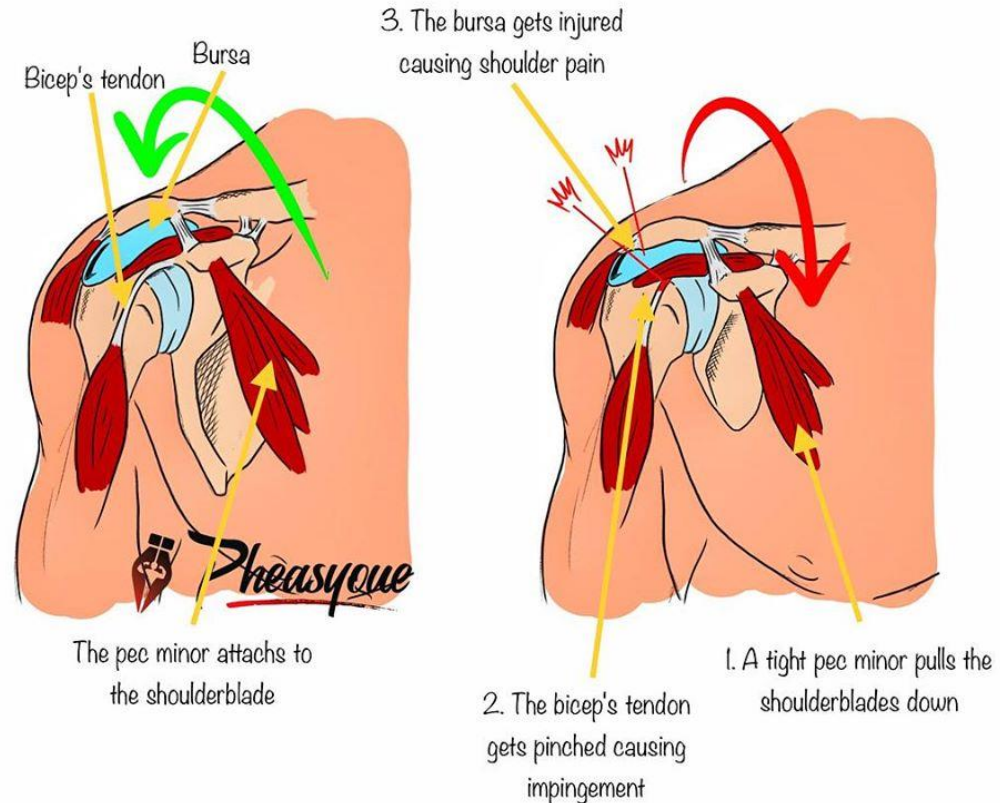
## PULLING ROPE ANALOGY:

### TIGHT PEC MINOR



Forces internal rotation and causes a whole lot of shoulder problems!

## UNDERSTANDING THE PROBLEM:



# Pectoral Stretching

## Corner pec major stretch



Slowly lean forward, taking a small step if needed, until you feel a gentle stretch in the front of your shoulders. Hold this position.

## Corner pec minor stretch



Begin in a standing upright position facing a corner. Keeping your arms straight, place your forearms flat on the wall on each side of the corner



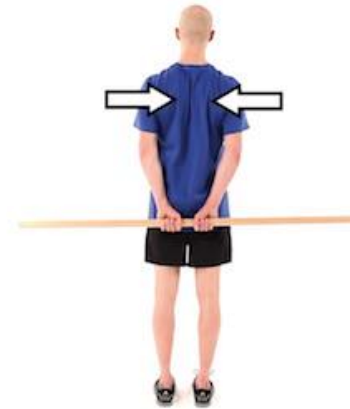
# Pectoral Stretching

Single arm doorway pec stretch at 90 degrees



With your elbow bent, place your forearm on the side of the doorway at a 90 degree angle from your side, then take a small step forward and slightly rotate your body until you feel a stretch in the front of your shoulder. Hold this position.

Chest Stretch with shoulder squeeze



Gently squeeze your shoulder blades together. You should feel a stretch in the front of your chest.



# Cervical Stretching

## Seated Cervical Flexion Stretch With Finger Support Behind Neck



Clasp your hands behind your head. Gently tuck your chin toward your chest, lightly pressing on the back of your head, until you feel a stretch at the base of your head and hold.

## Seated Cervical Rotation Stretch

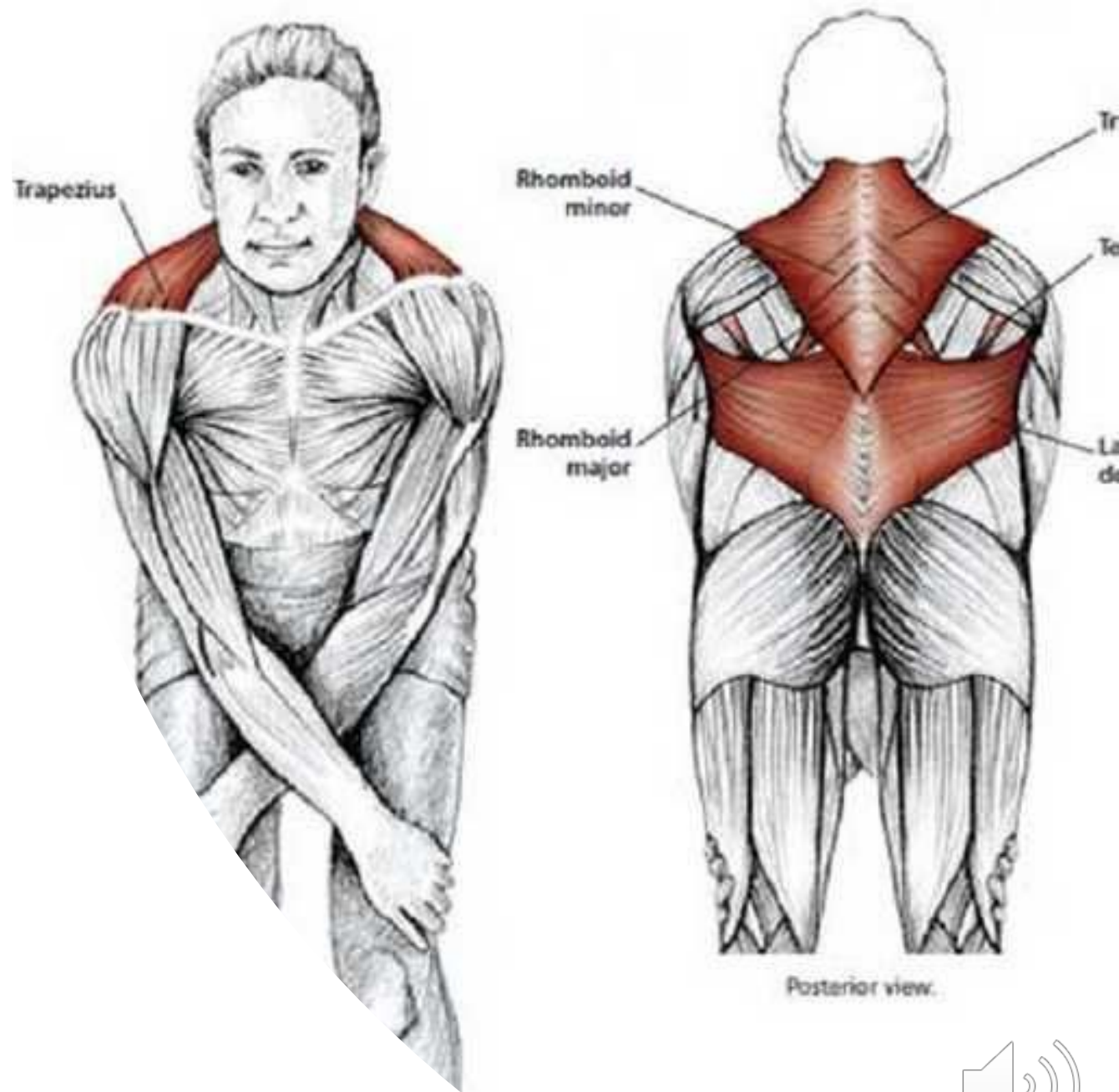


Using your hands to guide your head, gently rotate your head to one side. Hold this position, then return to the starting position and repeat.

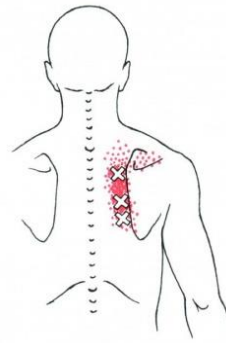


# Rhomboid Stretching

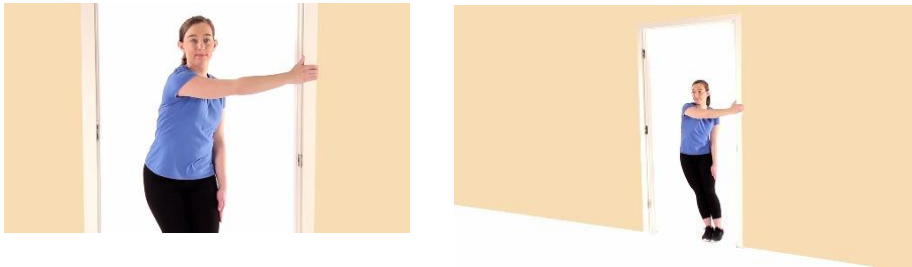
- **Muscle:** Rhomboid Major & Minor
- **Location:** The rhomboids are anatomical located along the medial border of the scapula (shoulder blade)
- **Muscle Action:** They serve to adduct (move shoulder blade together), stabilize and rotate the scapula
- **Reason for pain:** This has been among the most common areas of pain that I treat in ATR. Part of reason this area causes pain in swimmers is the forward head/ rounded shoulder posture. In addition, when you are constantly swimming and over developing the chest musculature the back musculature becomes weak and over stretched
- **Correction Plan:** Lots of various types of rowing exercises combined with a conscious effort to maintain good posture when not swimming



# Rhomboid Stretching



## Doorway Rhomboid Stretch



Hold onto the doorframe across your body at shoulder level with one hand, then slowly lean your body in the opposite direction. Hold, then relax and repeat.

## Seated Rhomboid Stretch



Bend your trunk, rounding your shoulders forward at the same time. You should feel a stretch through your upper back.



# Works Cited

1. “Medbridge Exercise Builder.” *Medbridge Exercise Builder*, Medbridge, 2010, [www.medbridgeeducation.com/patient\\_care/programs/create](http://www.medbridgeeducation.com/patient_care/programs/create).
2. Oregon Exercise Therapy. “Swimmer's Posture: a Recipe for Injury and Decreased Performance.” *Oregon Exercise Therapy*, 12 July 2016, [www.oregonexercisetherapy.com/blog/swimmers-posture](http://www.oregonexercisetherapy.com/blog/swimmers-posture).
3. Reinold, Mike. “What You Need to Know About GIRD: What It Is and What It Isn't.” *Mike Reinold*, Mike Reinold [https://Mikereinold.com/Wp-Content/Uploads/MikeReinold-Small-Signature-Logo-2017-Red.png](https://mikereinold.com/Wp-Content/Uploads/MikeReinold-Small-Signature-Logo-2017-Red.png), 21 June 2019, [mikereinold.com/gird-glenohumeral-internal-rotation-deficit/](http://mikereinold.com/gird-glenohumeral-internal-rotation-deficit/).
4. Starkey, Chad, et al. *Examination of Orthopedic an Athletic Injuries*. 3rd ed., F.A. Davis Company, 2008.

