# 5 Joints Webinar Series

The Shoulder

Dr. Grove Higgins

With Master Trainer Pat Marques

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# Outline

- Introductions – Dr. Kevin Steele
- Thank you and more to come
  - BONUS 2 Part 5 Joint Online Assessment Webinar
  - August 4th, 2020 Gait Assessment Webinar
  - Fall 2020 Exclusive Hands On Anatomy Intensive in Colorado
  - Working on much much more
- Overview of the 5 Joints Webinars
- Anatomy
  - Shoulder Basic Anatomy
- Biomechanics
  - Shoulder Movement
  - Posture/Gait
  - Functional Movement Assessment
- Assessment
  - In person
  - Online
- NeuroBiomechanics
  - Drills and Tips
- Q&A

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# 5 Joints Assessment Series

What you will learn

- Practical client assessments for each of the 5 Joints
- How to instruct clients to set up and use smart technologies for assessments and training for best results
- How to cue movement assessments to get accurate/useful results
- Techniques & cutting-edge apps for amazing assessments

Thursday June 4th & 11th at 10am PST

*Exclusive $10each  ($20 for both days) for 5 Joint participants*

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# Introduction

- Dr. Grove Higgins
  - Chiropractor & Soft Tissue Practitioner
  - Speaker and Educator
  - Functional Anatomy Instructor
  - Strength & Conditioning
  - Research
    - Biomechanics Gait and Foot Development
    - Anatomy of Lower Leg Modeling
    - Exercise & Hormonal Response
  - Been in Medicine Since 1993
- Patrick Marques
  - Lt. Col. USA Ret.
  - BS Exercise Science, CPT, ZHealth Master Trainer & Instructor
  - Speaker and Educator
  - Corrective Exercise Therapist
  - Research
    - Exercise & Hormonal Response, Sleep

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# Introduction

- Neuroathlete & Clinic in Monument CO
  - Use a “Neural Lens” to address performance, pain, and recovery
  - Online – assessment and training all over the world
    - USA, Sweden, & 18,000ft on Mt Everest
  - Clinic – manual therapy, chiropractic, exercise therapy, neuropsychology
  - Work with trainers online and provide mentoring and tools

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# 5 Joints


Foot/Ankle – April 30th


Knee – May 7th


Hip – May 14th


Shoulder – May 21st


Elbow – May 28th

Thursdays
11:00-12:30PM MST

* Pay What You Can

https://www.medfitclassroom.org/five-joints/

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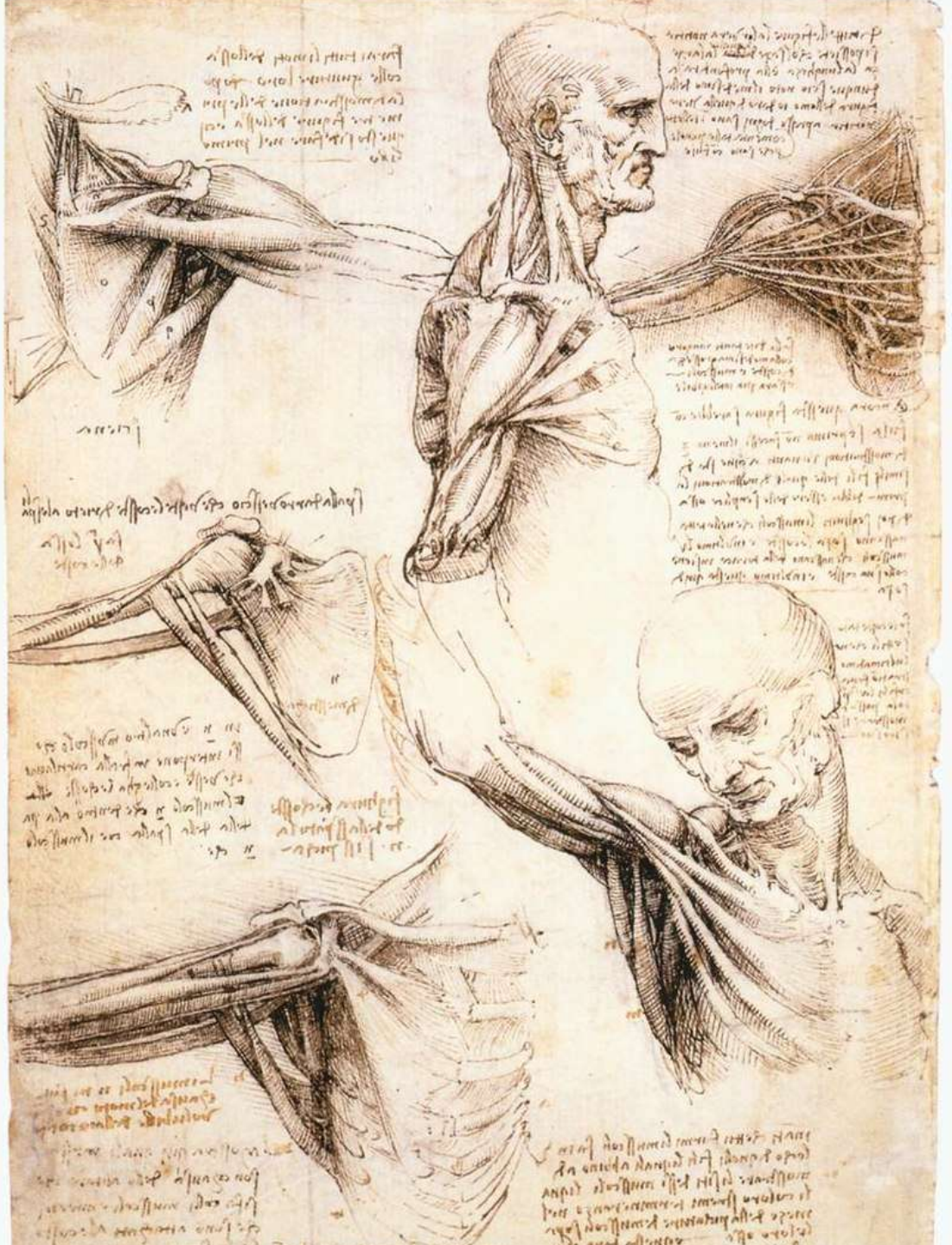
# Anatomy of the Shoulder



Leonardo da Vinci. Anatomy of the leg bones. 1510-1511. Codex Windsor, RL 19008

# Shoulder – Anatomy

- 4 Joints
- 12 Major Ligaments
- Extensive Capsule
- Labrum
- 2 Discs
- 17 Muscles Cross
- 12 Nerves Drive

Interesting Facts

- Most Mobile Joint in the body
- Most unstable joint in the body
- Largest surface area of muscle to bone
- Complex balance of muscular control


Collection of Auckland Museum
Tamaki Paenga Hira, col.2748

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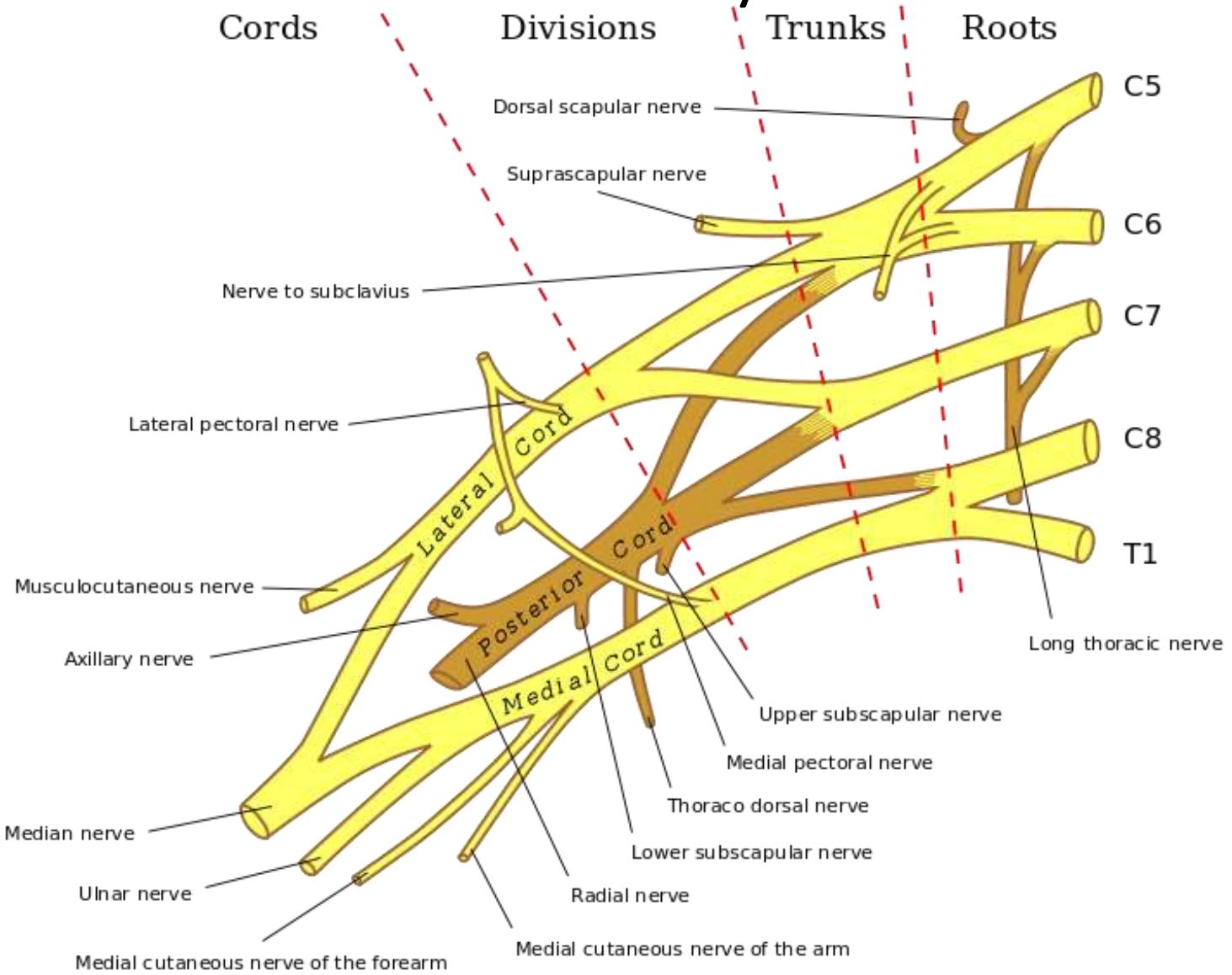
# Shoulder – NeuroAnatomy




1918 Edition of Gray's Anatomy.
http://www.bartleby.com/107.

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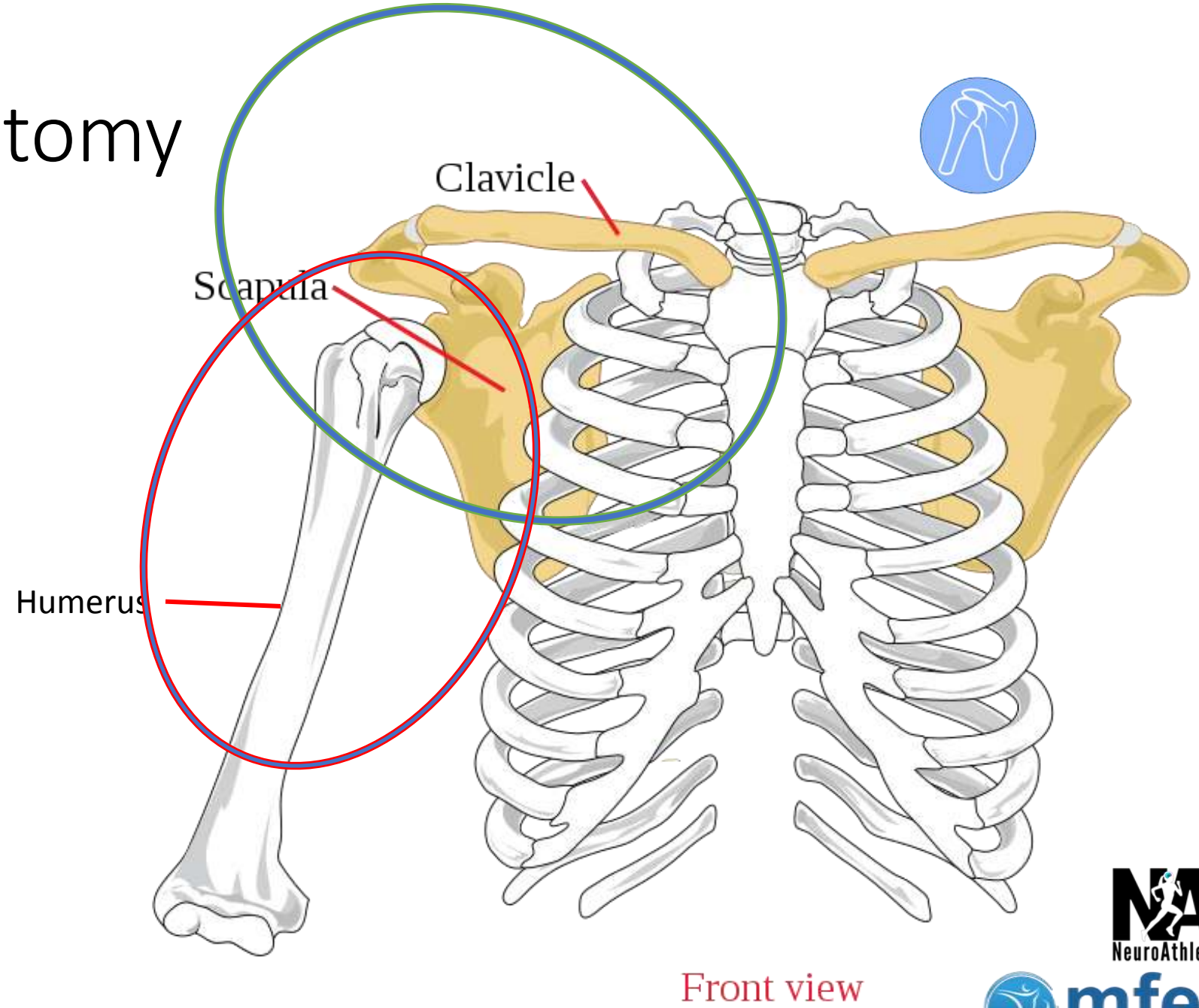
# Shoulder – Anatomy

2 major Divisions

- Pectoral Girdle
  - ScapuloThoracic Joint
  - SternoClavicular Joint
  - Acromioclavicular Joint
- Glenohumeral

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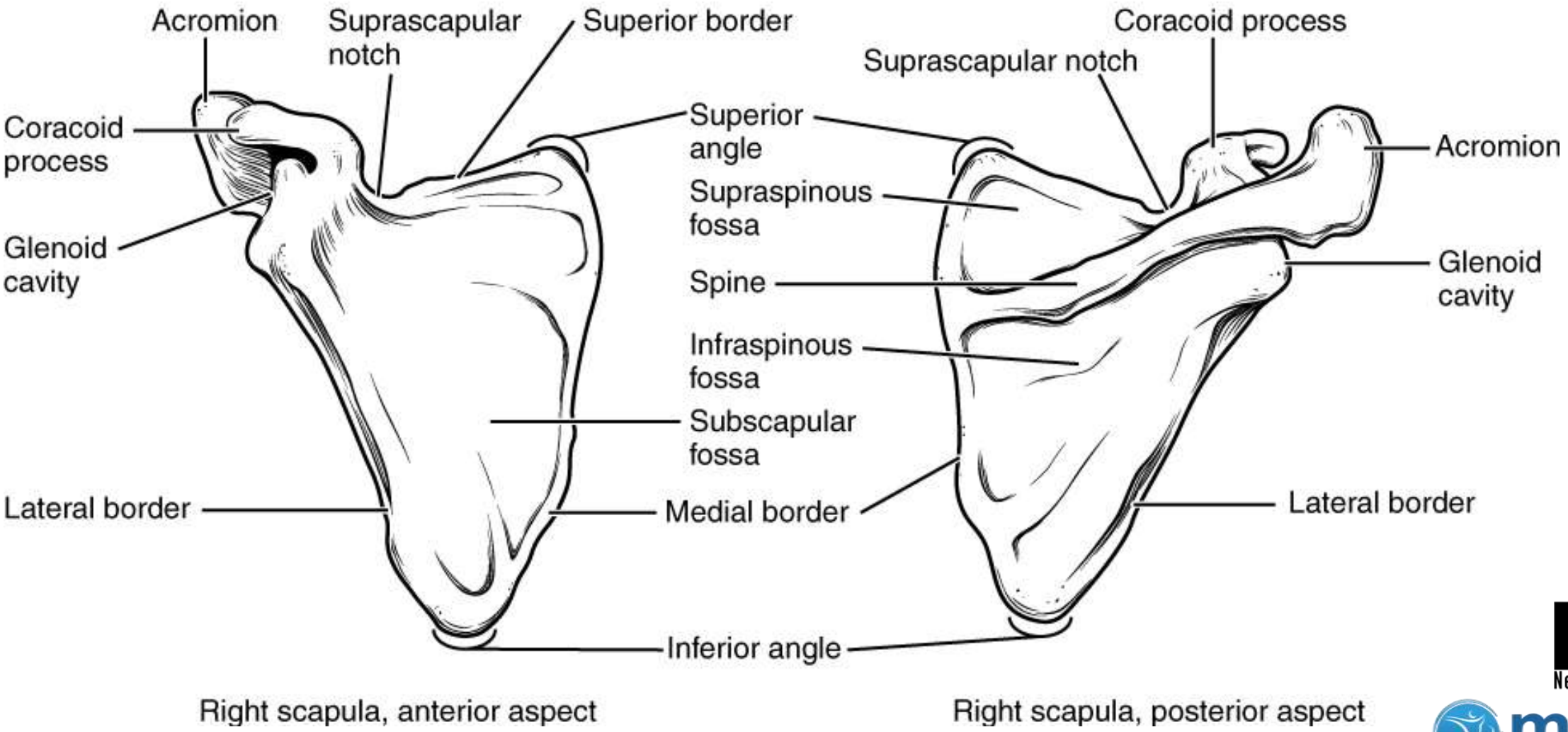
# Shoulder – Scapula

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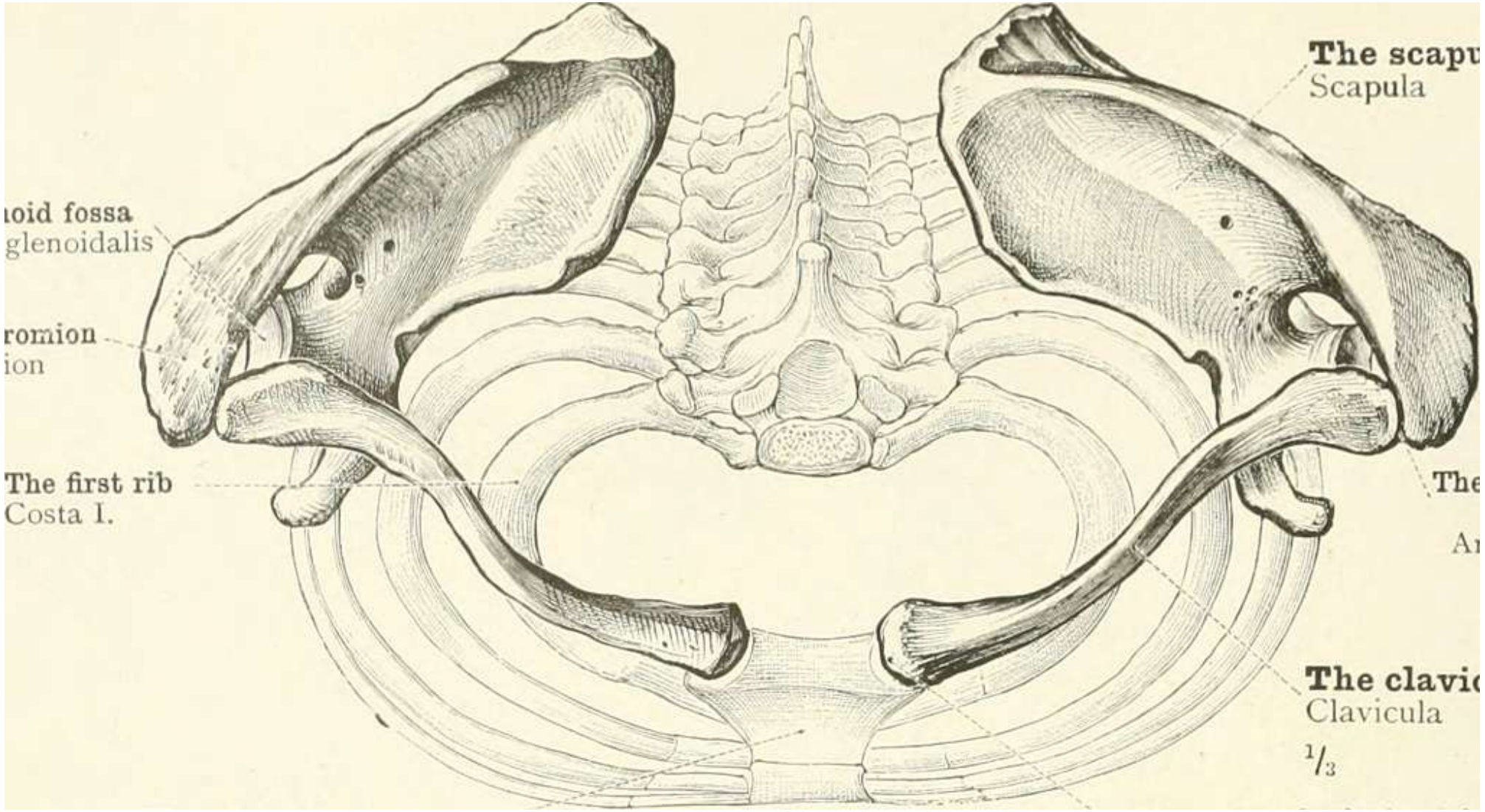
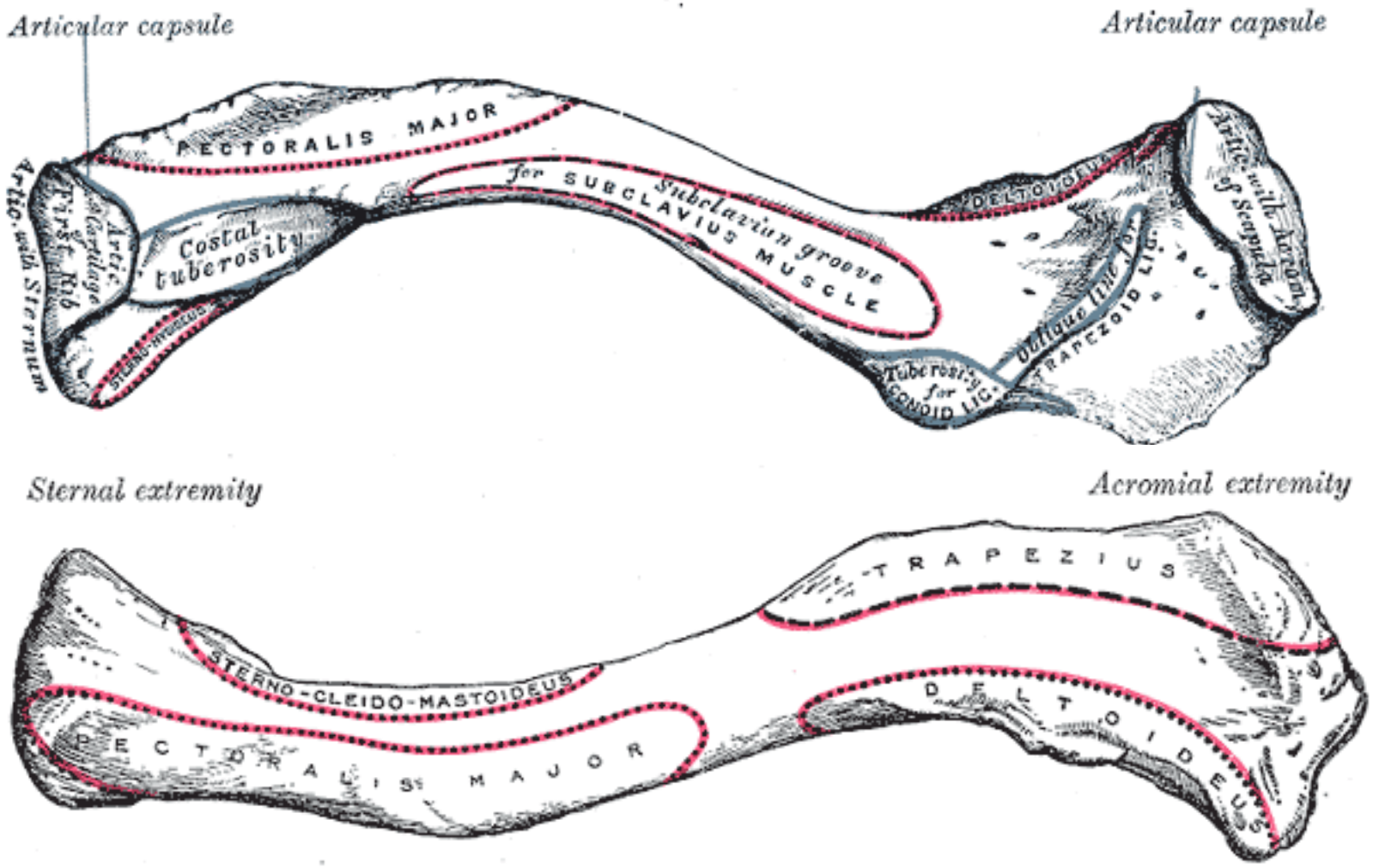
# Shoulder – Scapulothoracic Joint




Toldt, C., Paul, M. E., & Rosa, A. D. (1919). *An Atlas of human anatomy for students and physicians*.

# Shoulder – Clavicles

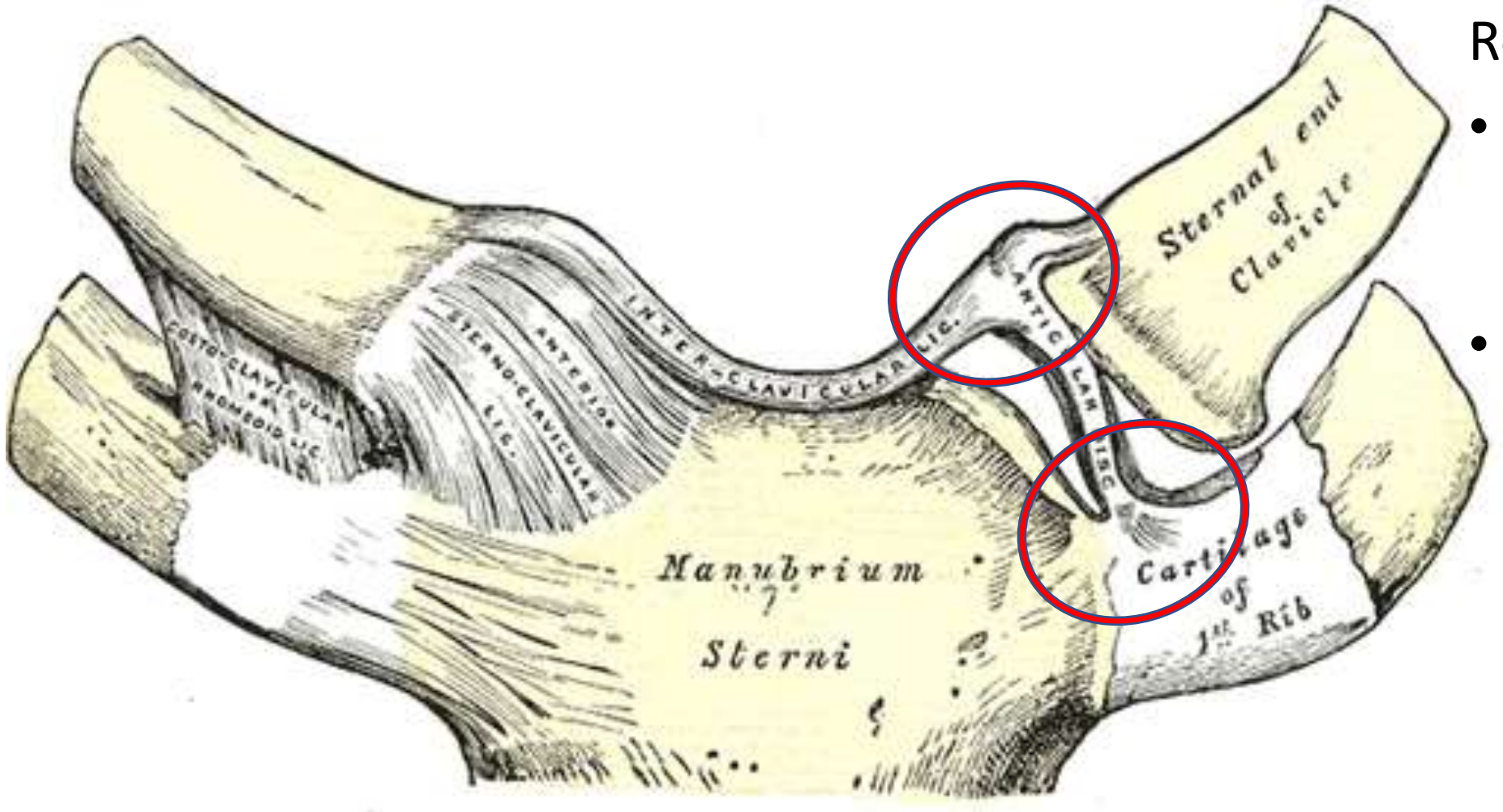



Inferior View

Superior View

Toldt, C., Paul, M. E., & Rosa, A. D. (1919). *An Atlas of human anatomy for students and physicians*.

# Shoulder – Sternoclavicular Joint

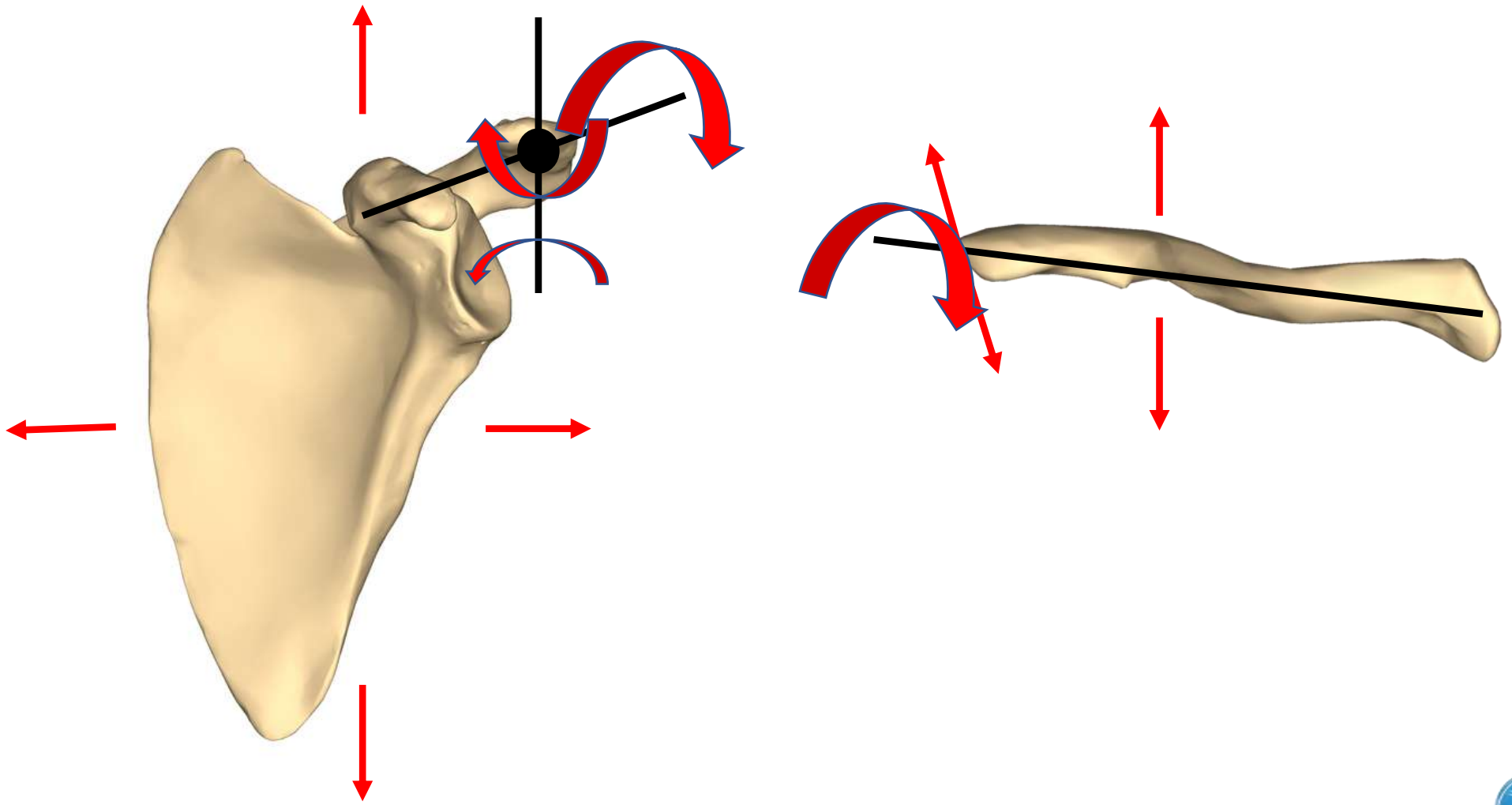



Remember

- Ligaments and capsules have nerve endings
- Menisci and Discs have nerve endings

Toldt, C., Paul, M. E., & Rosa, A. D. (1919). *An Atlas of human anatomy for students and physicians*.

# Shoulder – Freedoms of Motion



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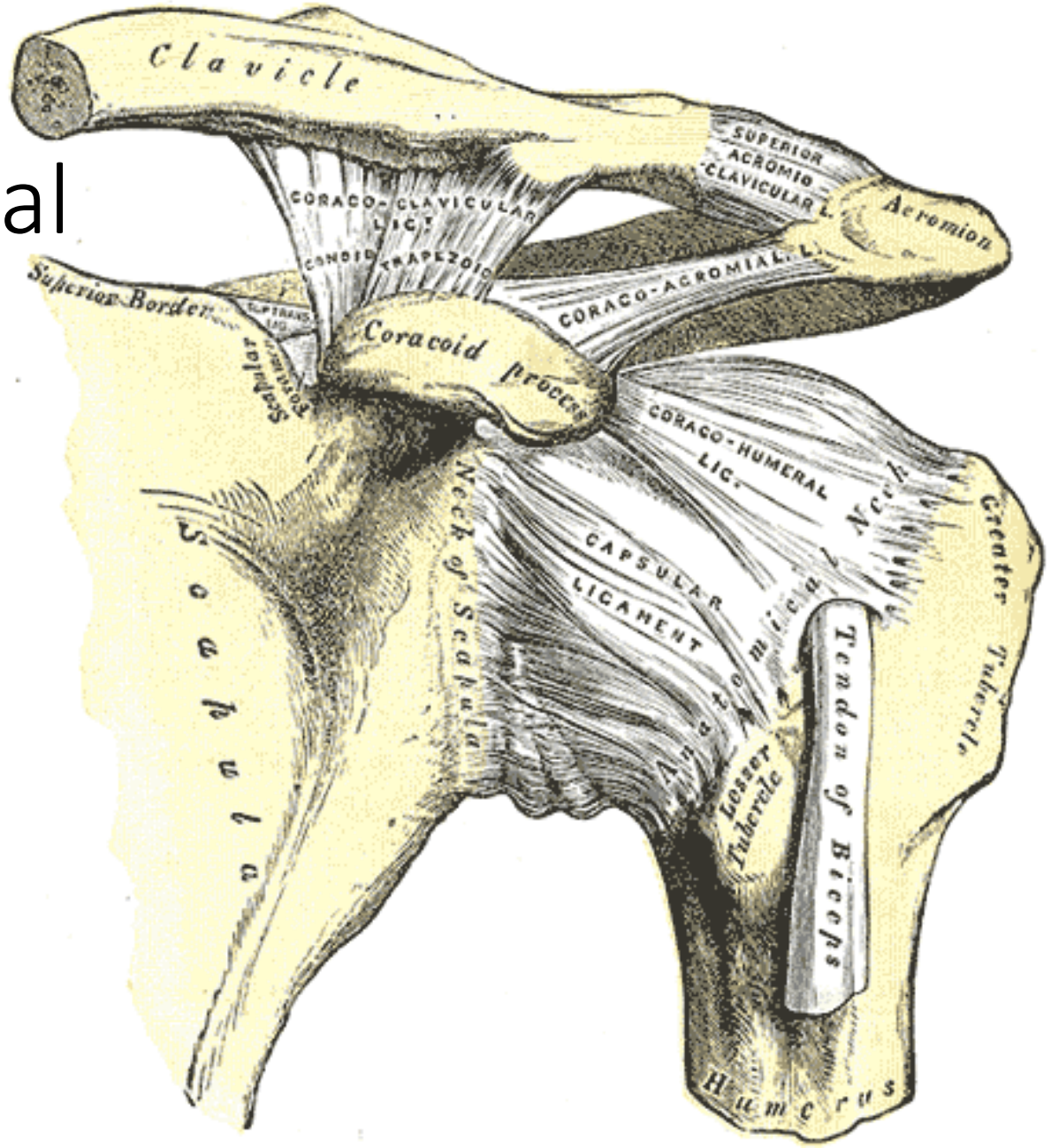
# Shoulder – Glenohumeral Ligaments




1918 Edition of Gray's Anatomy.
http://www.bartleby.com/107.

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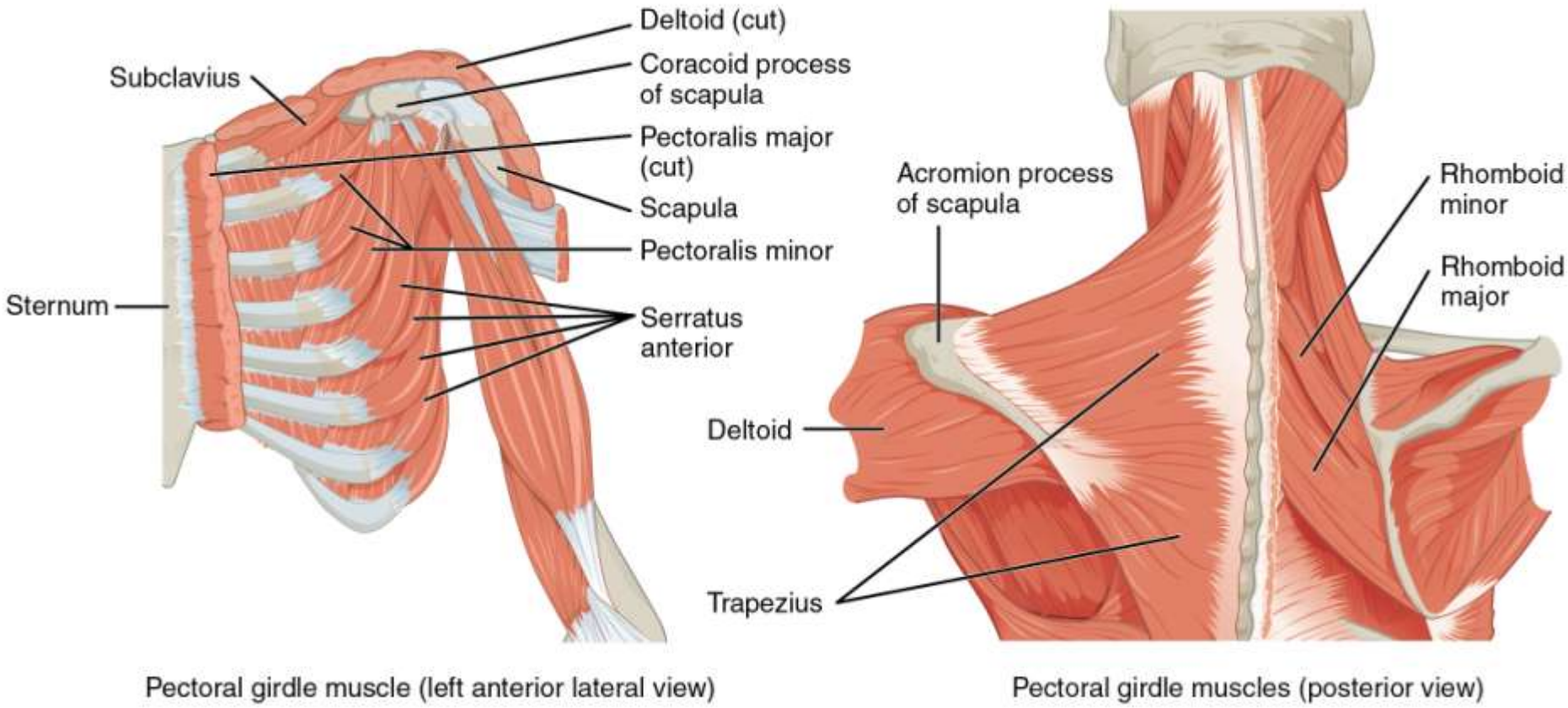
# Shoulder – Anatomy Scapular Movement

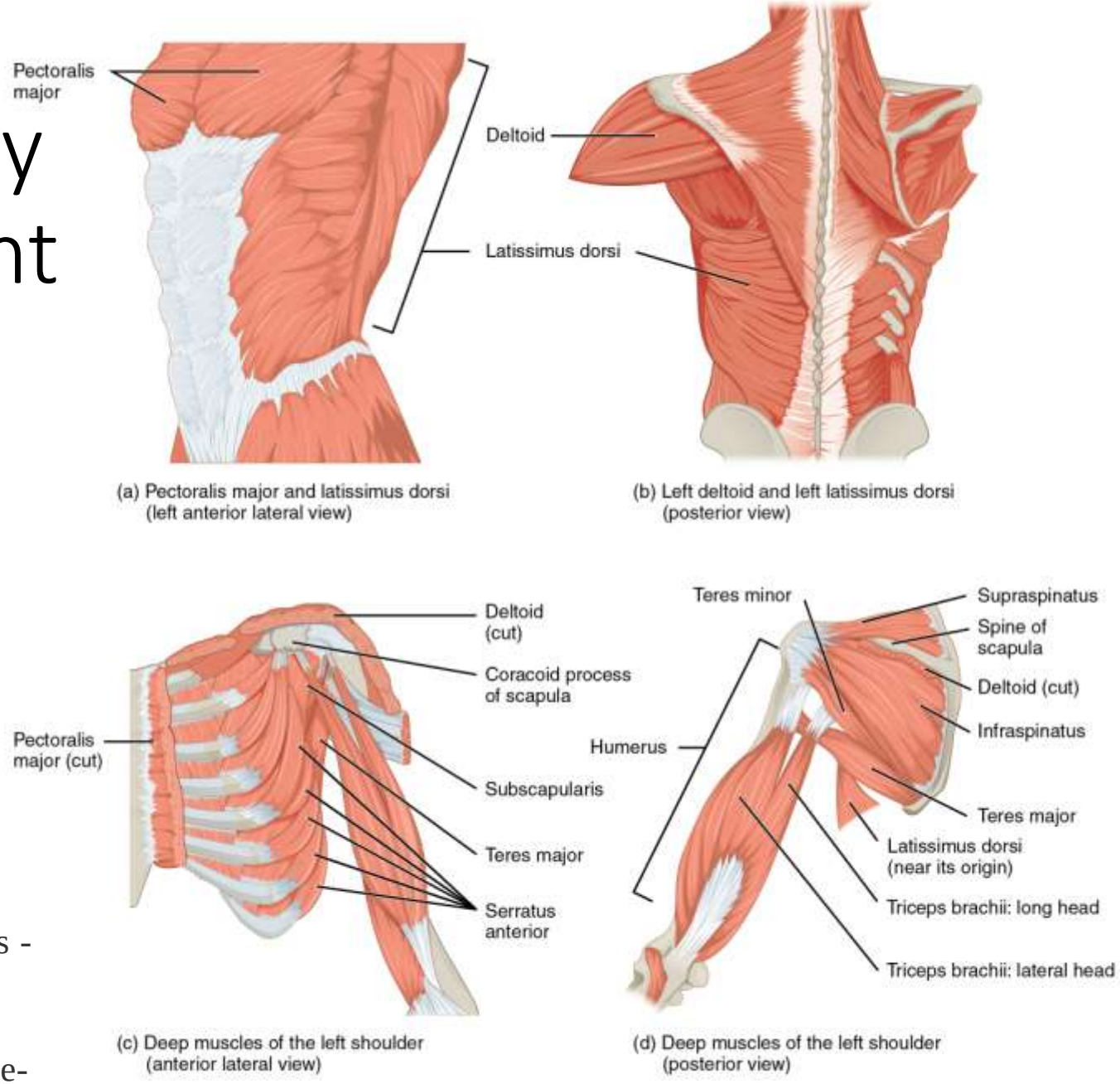



11.5 Muscles of the Pectoral Girdle and Upper Limbs - Anatomy and Physiology. (n.d.). Retrieved from https://openstax.org/books/anatomy-and-physiology/pages/11-5-muscles-of-the-pectoral-girdle-and-upper-limbs

# Shoulder – Anatomy Humerus Movement

## Can’t Forget the Rotator Cuff

- S.I.T.S.
  - Supraspinatus
  - Infraspinatus
  - Teres Minor
  - Subscapularis

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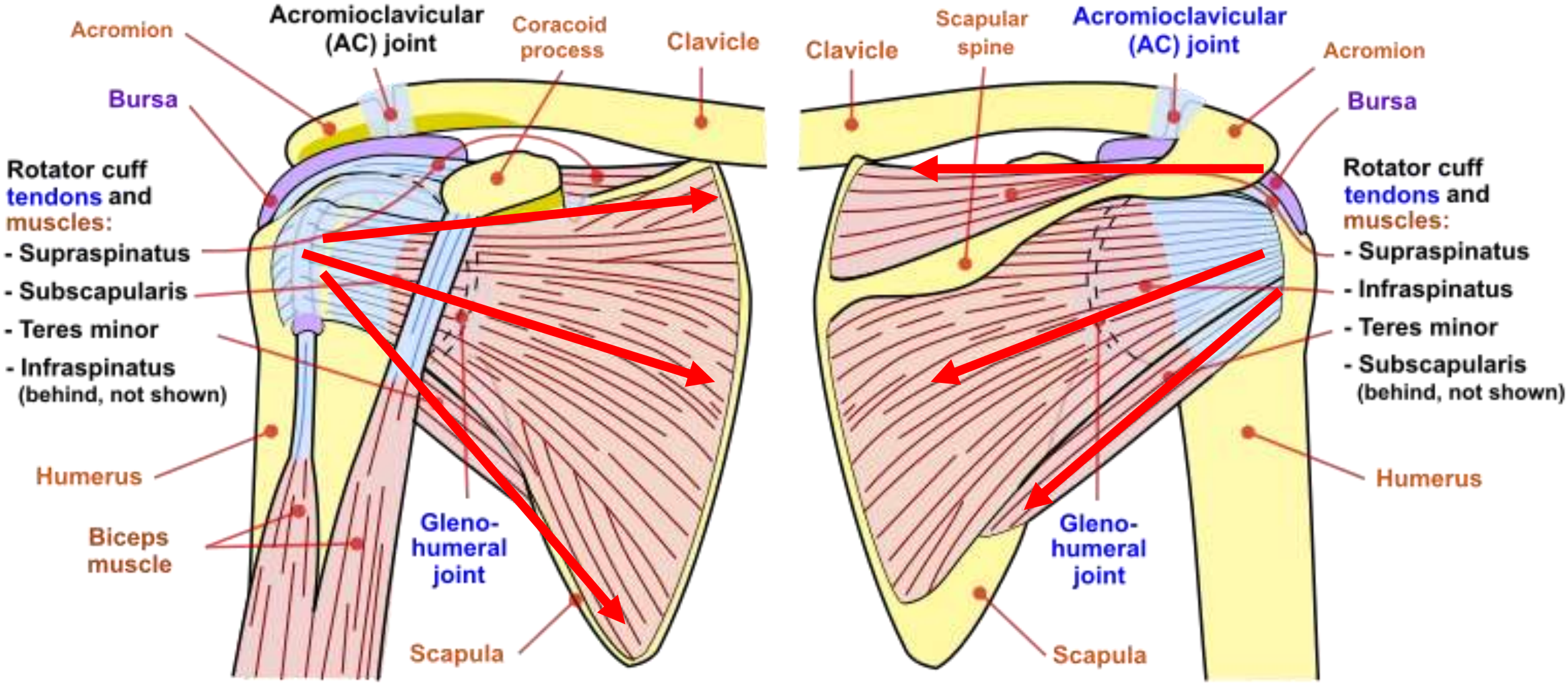
# Shoulder – Rotator Cuff




File:Shoulder joint back-en.svg. (n.d.). Retrieved from https://commons.wikimedia.org/wiki/File:Shoulder_joint_back-en.svg

# Shoulder – Glenhumeral Motions

Fig. 9
Neutral position

Fig. 10
Abduction with adduction with elbow fixed

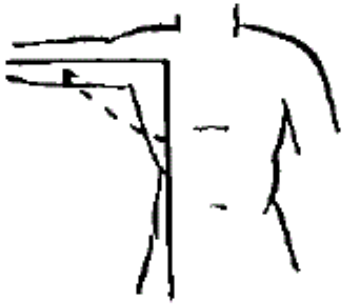


Fig. 11
Abduction with scapula fixed — elbow extended

Fig. 12
Abduction with scapula free — elbow extended

Fig. 13
Forward elevation scapula fixed elbow extended

Fig. 14
Forward elevation with scapula free, elbow extended

Fig. 15
Backward elevation — elbow extended

Fig. 16
Adduction — elbow extended

Fig. 17
External & internal rotation with arm in abduction, elbow at 90°

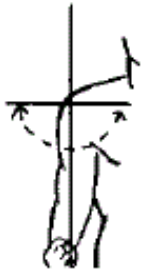


Fig. 18
External & internal rotation with arm at side, elbow at 90°

How to Evaluate Permanent Disability. (2012, January 8). Retrieved from https://dwd.wisconsin.gov/dwd/publications/wc/wkc-7761-p.htm

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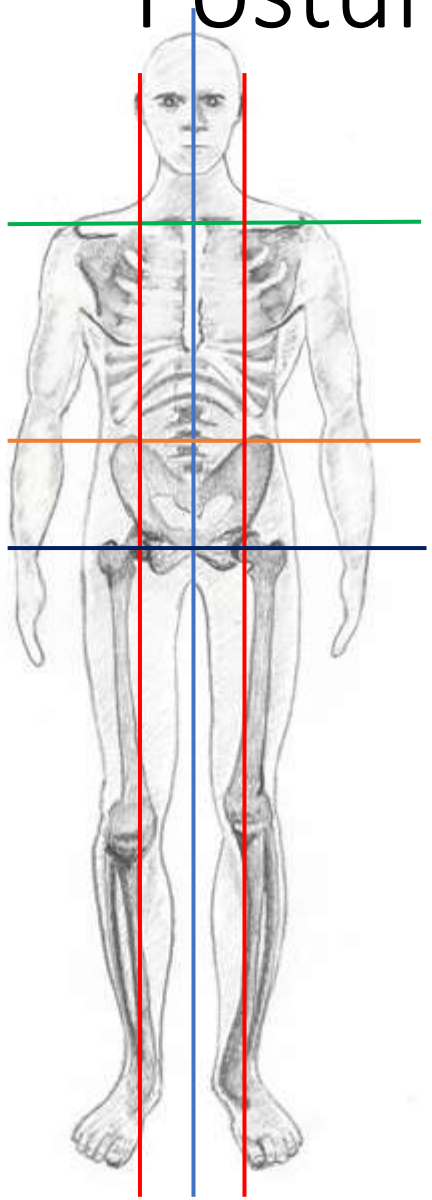
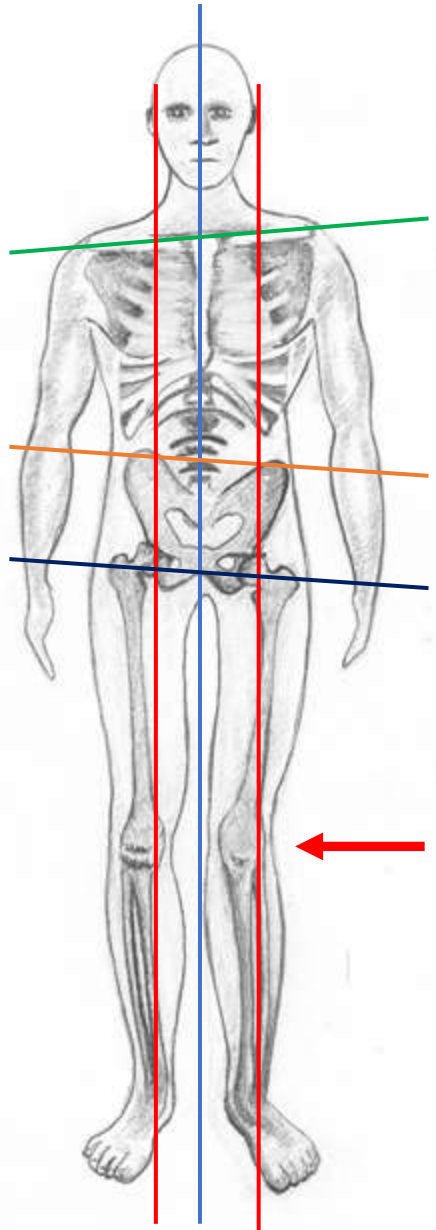
# Shoulder – Posture & Gait





Functional Short Leg

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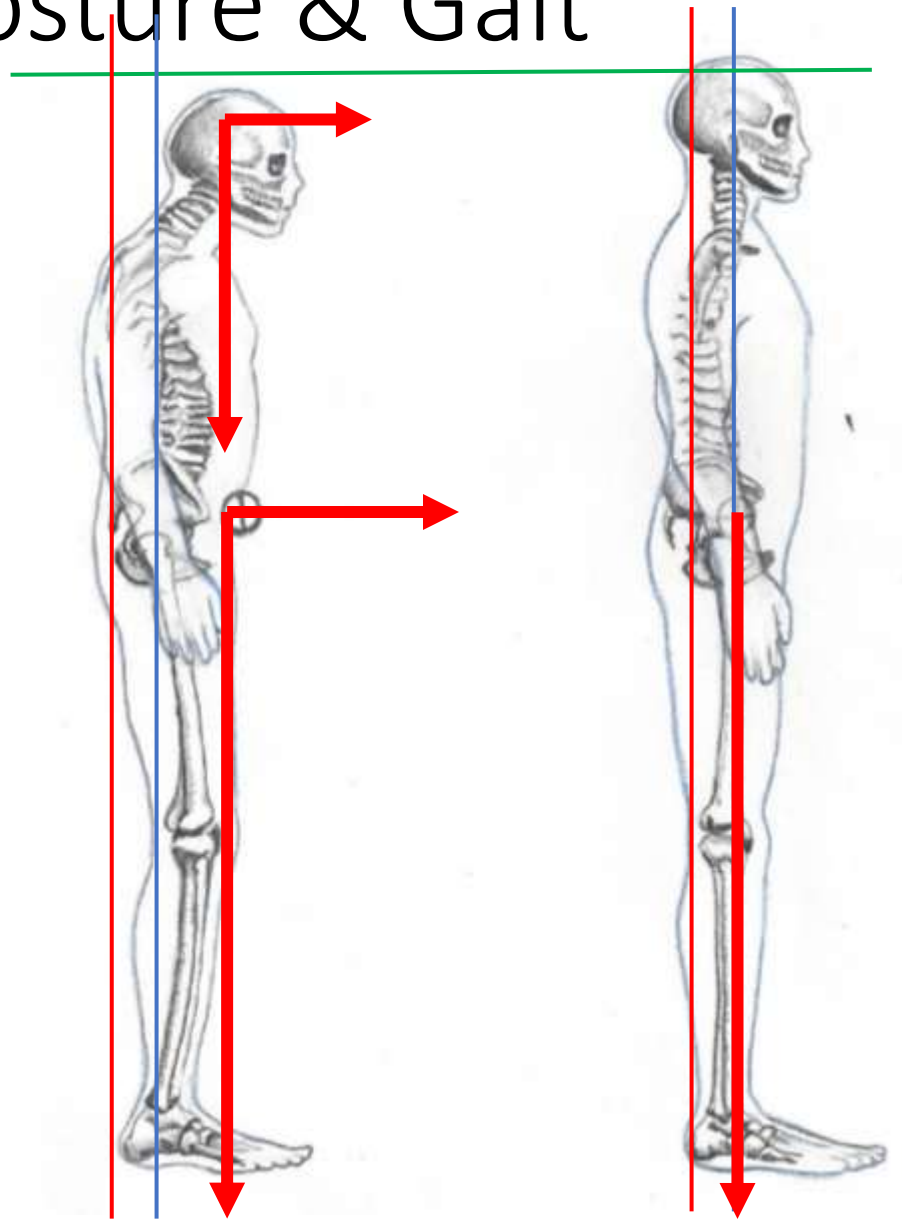
# Shoulder – Posture & Gait



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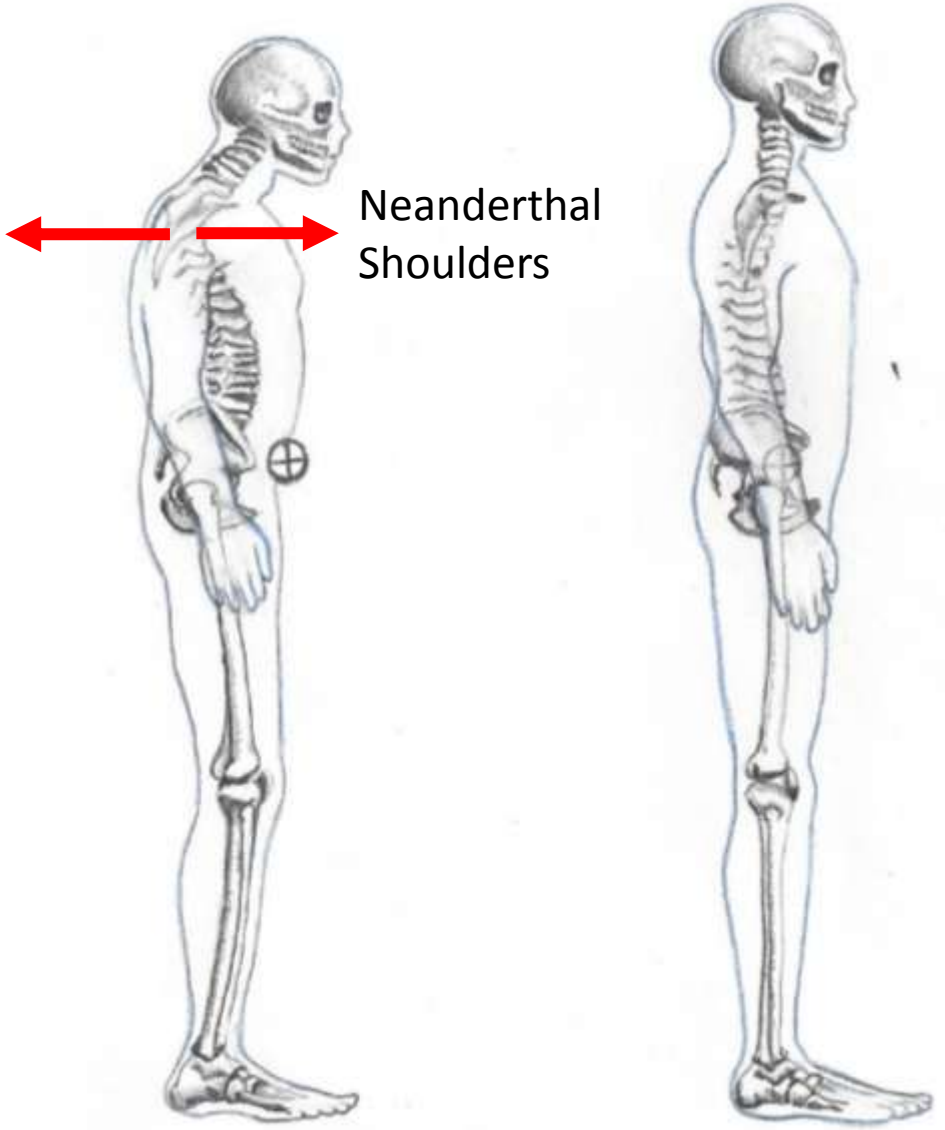
# Shoulder – Posture & Gait

Imaginary Lat Syndrome

Neanderthal Shoulders



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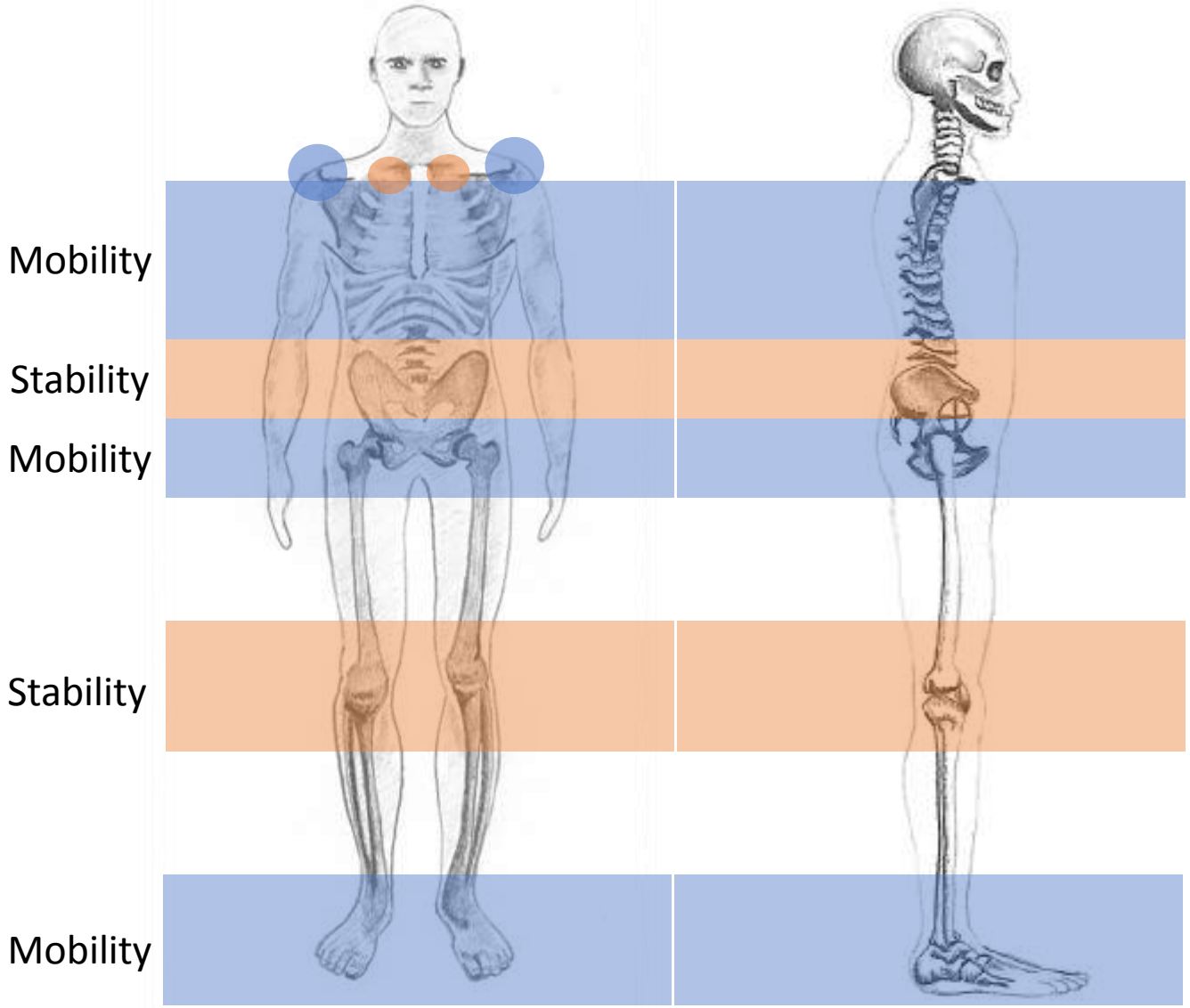
# Joint by Joint Model – Mobility vs. Stabilit




Boyle, M., Verstegen, M., & Cosgrove, A. (2015). *Advances in functional training: training techniques for coaches, personal trainers and athletes*. Santa Cruz, CA: On Target Publications.

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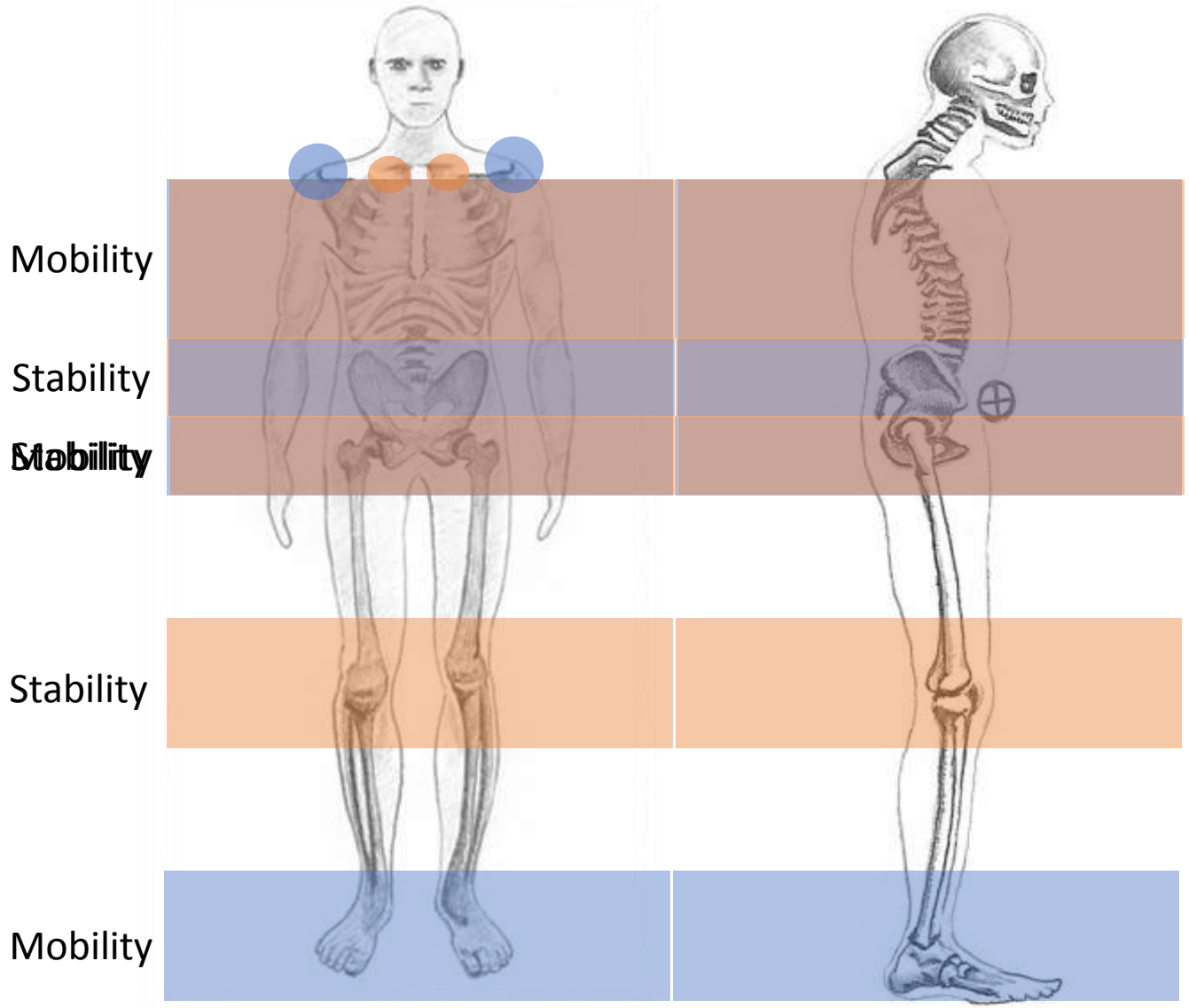
# Joint by Joint Model – Mobility vs. Stabilit

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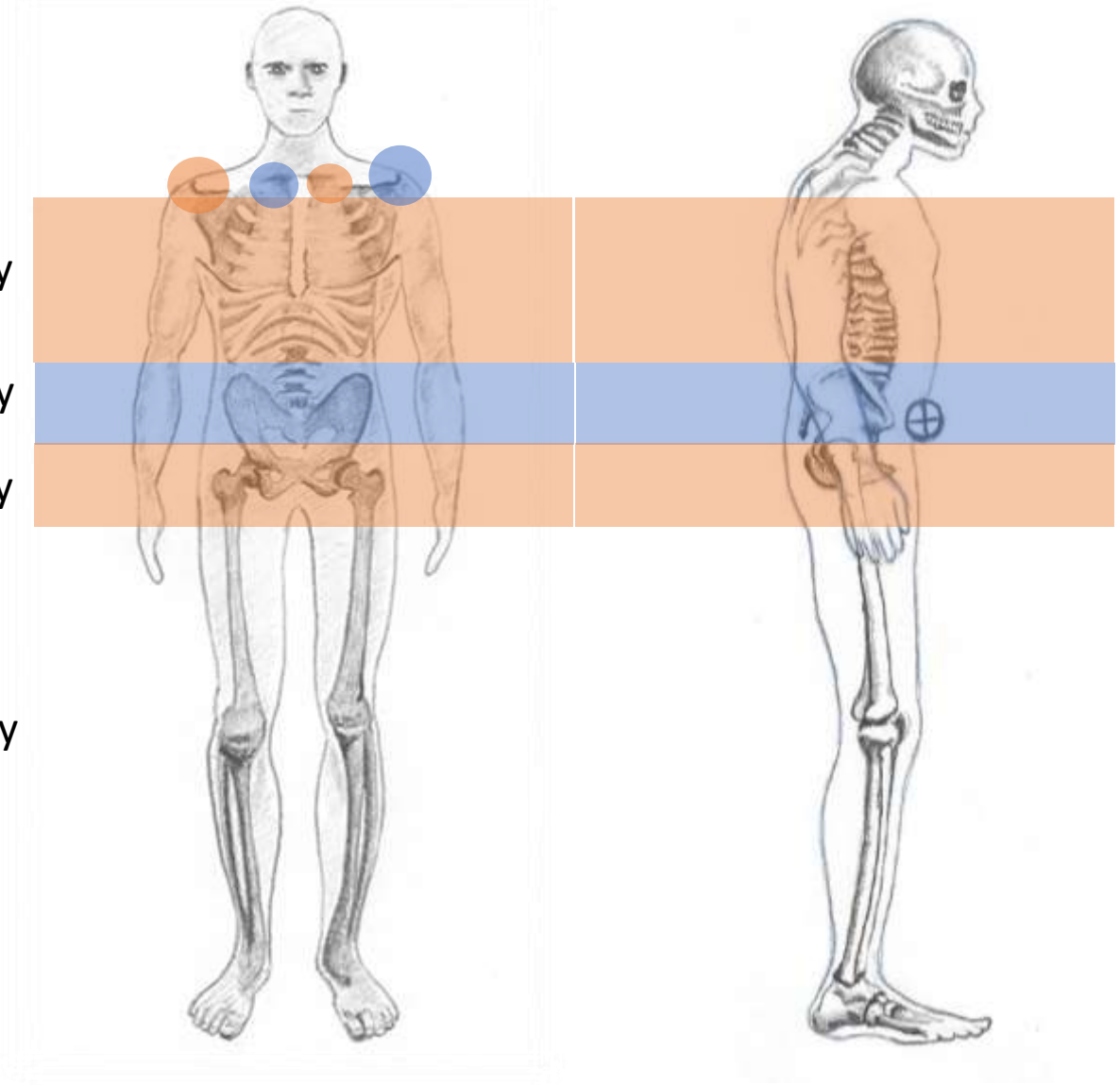

Stability

Mobility

Stability

Mobility

Headaches
Neck stiffness
TMJ pain
Shoulder pain
Back stiffness
Shoulder stiffness & pain
Hand numbness and weakness
Core Dysfunction/Weakness
Low Back Pain

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# Shoulder – Simple Assessment

- Gait – Walking is your #1 Screening Tool ALWAYS!
- FWD Flex
  - External Rot.
  - Internal Rot.
- ABD
  - External Rot.
  - Internal Rot.
- Horizontal ADD
- Scapular Scratch
  - Internal Rot.
  - External Rot.

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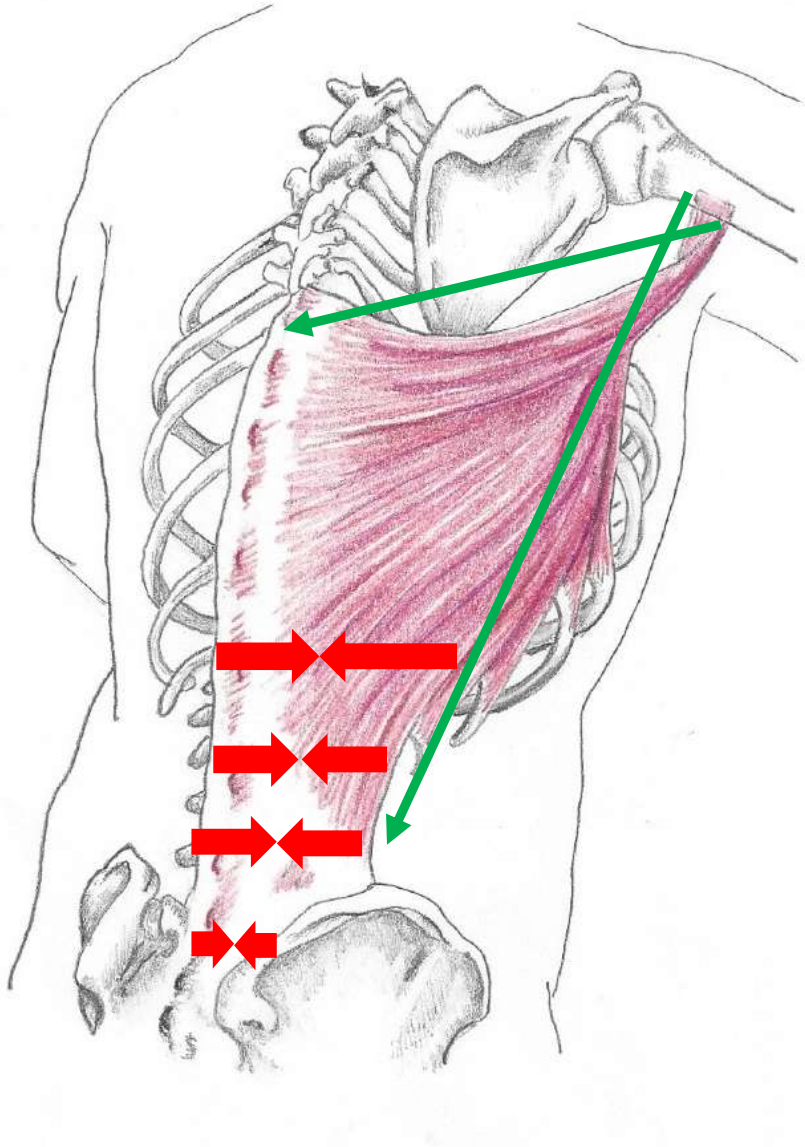
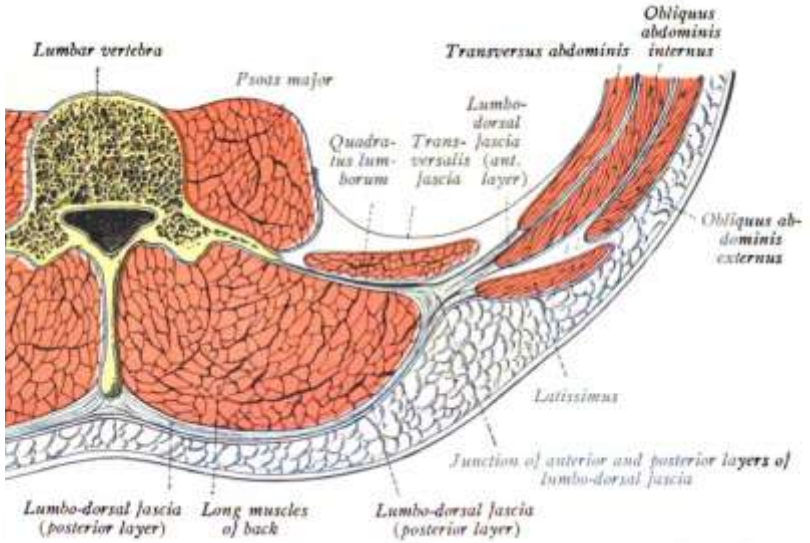
# Shoulder – Bonus Content

- Lats are Twisted
- Thoracolumbar Fascia
  - Compression
  - Sets the foundation for TA and Obliques



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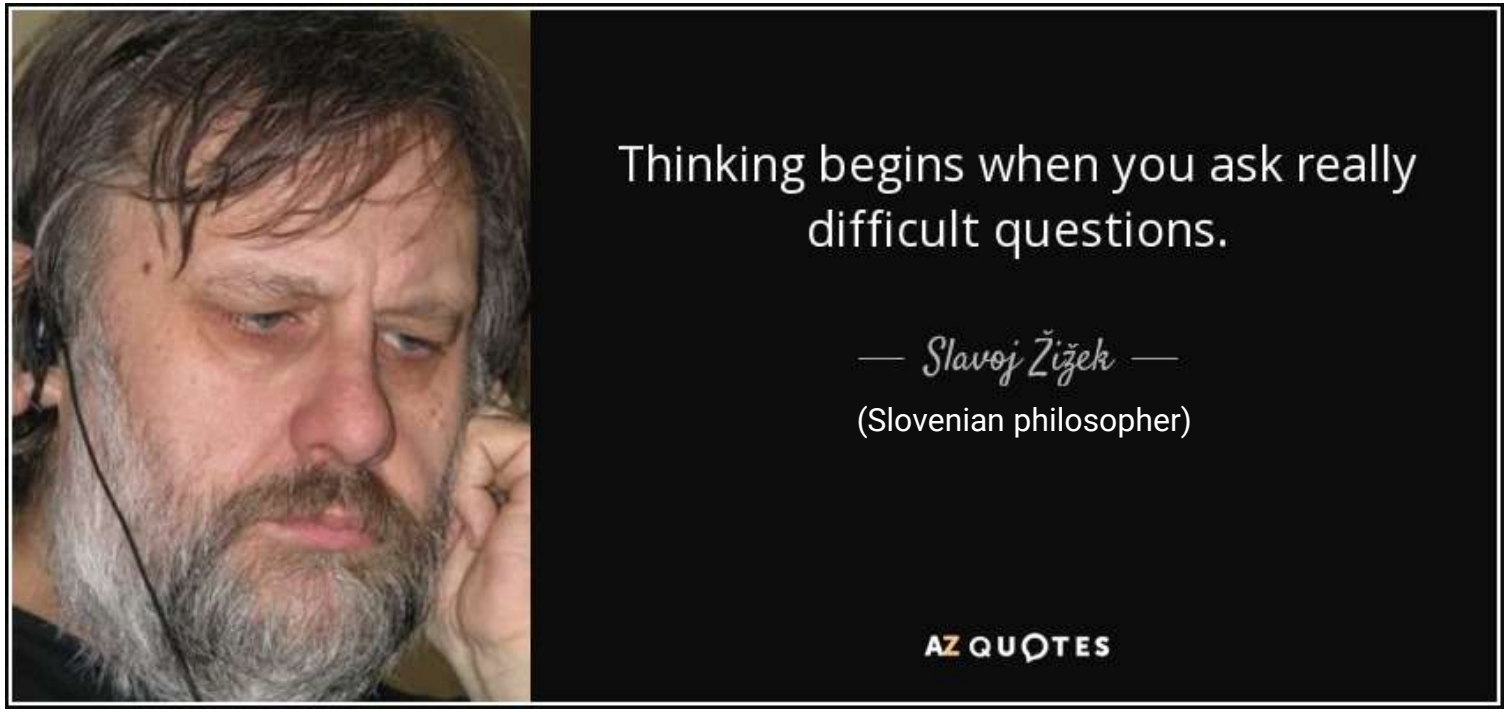
# Questions?

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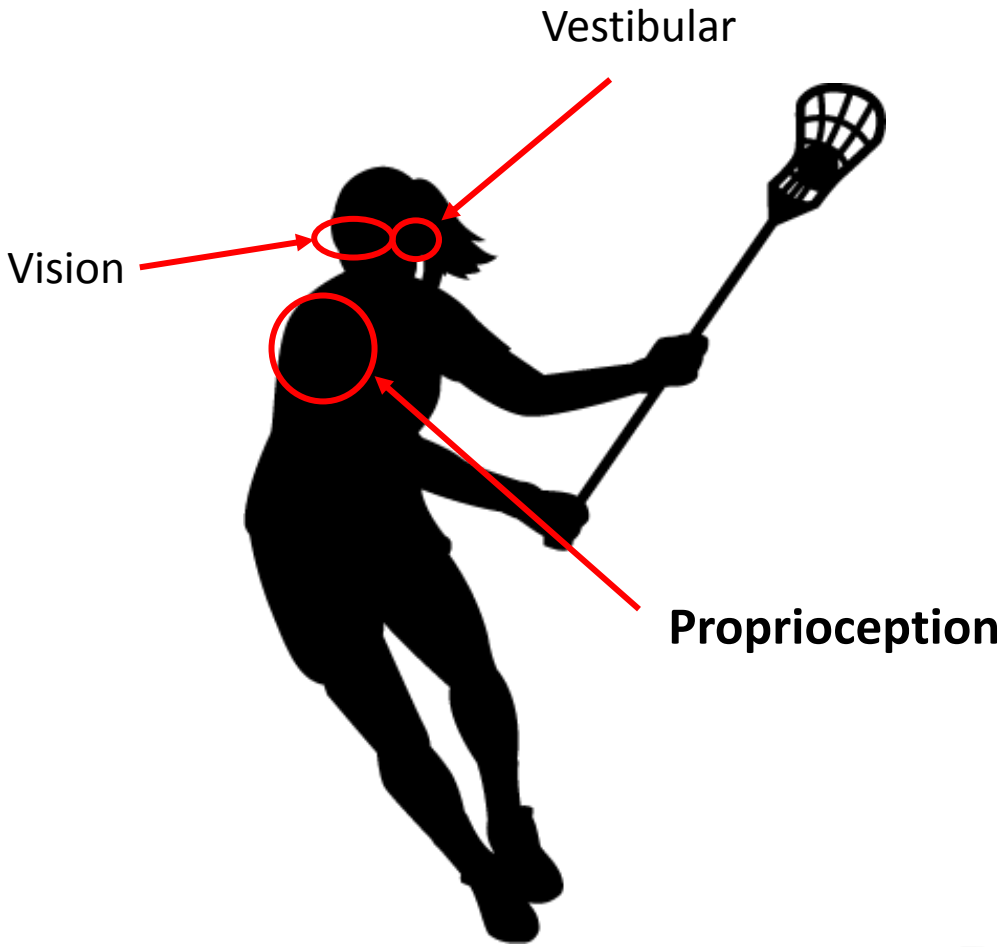
# NeuroBiomechanics of the Shoulder

- Good balance & movement requires input from 3 systems:
  - Vision
  - Vestibular
  - **Proprioception**

- Your Brain is the GPS, these systems are the satellites

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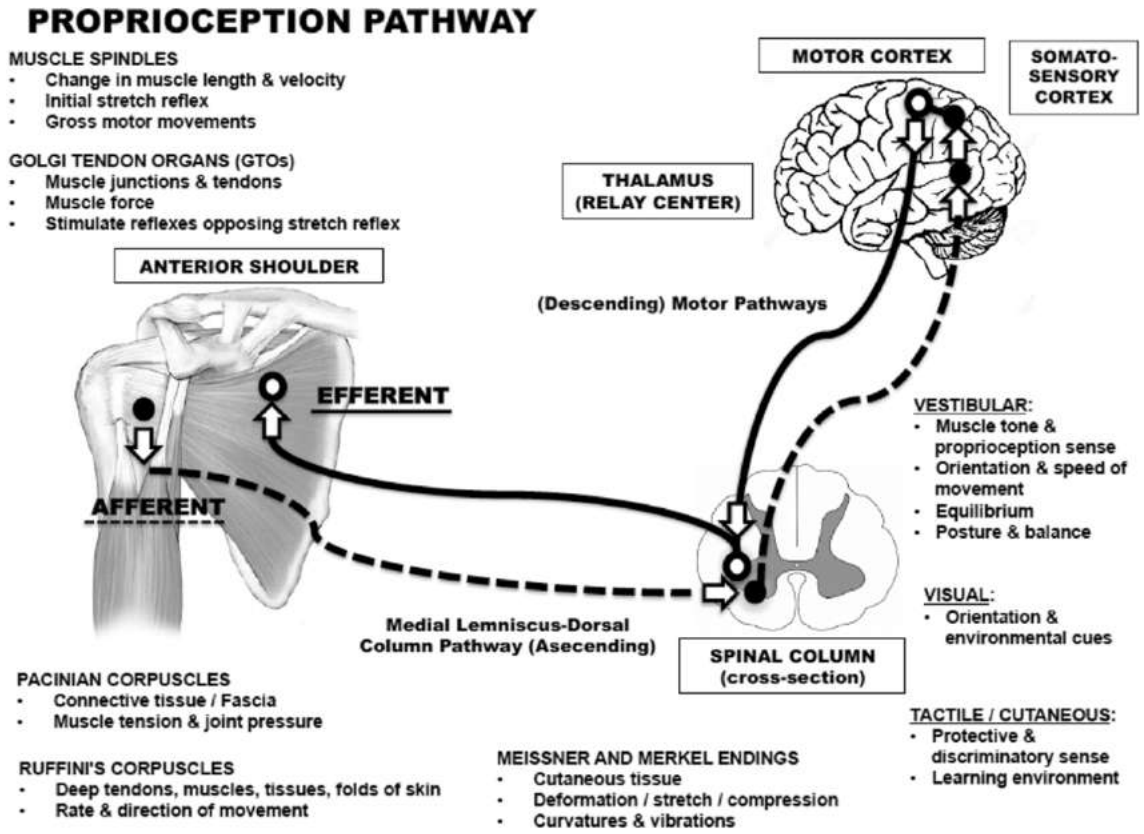
# NeuroBiomechanics of the Shoulder

- Proprioception
  - Lives in the brain
  - Your brain's 3D map of you in time and space

- Nerve endings that provide many different types of information to the nervous system such as:
  - Mechanoreceptors (**end ROM = more input!*)
  - Chemoreceptors
  - Thermoreceptors
  - Baroreceptors
  - Electromagnetic Receptors
  - Nociceptors




Ager, Amanda & Roy, Jean-Sébastien & Roos, Marianne & Fournier Belley, Amélie & Cools, Ann & Hébert, Luc. (2017). Shoulder proprioception: How is it measured and is it reliable? A systematic review. Journal of Hand Therapy. 30. 221-231. 10.1016/j.jht.2017.05.003.

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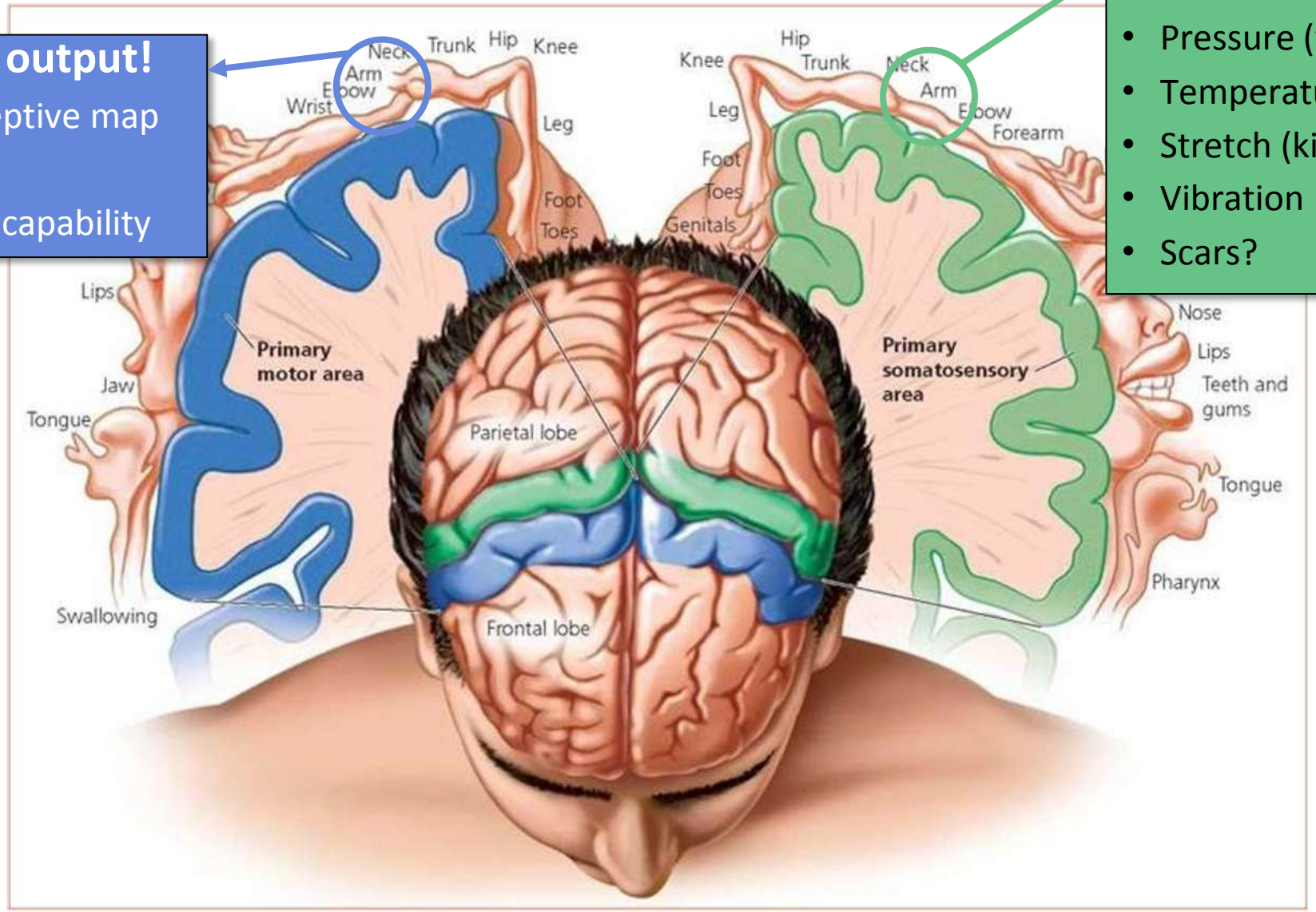
# NeuroBiomechanics of the Shoulder

**2. Better Motor output!**

- Clearer proprioceptive map
- Less threat
- Better predictive capability




**1. Increased sensory input:**

- Skin Stimulation
- Pressure (wraps)
- Temperature (hot/cold)
- Stretch (kinesiology tape)
- Vibration
- Scars?

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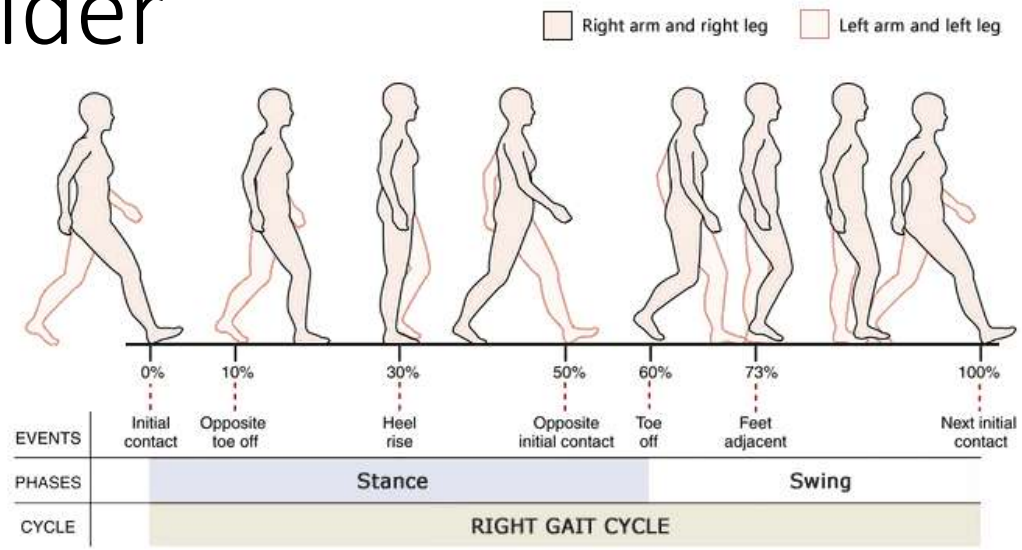
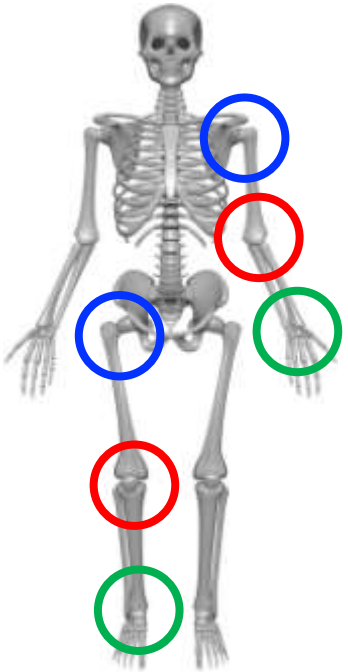
# NeuroBiomechanics of the Shoulder

- The human hard-wired gait cycle opens up opportunities:
  - *Cross Cord Reflexes* - Contralateral hip & shoulder flexion, then extension in walking gait
  - *Opposing Joints concept* - Neurological connection between opposing joints
- A shoulder problem (or solution) may be at the opposing hip!




walkeasy.com

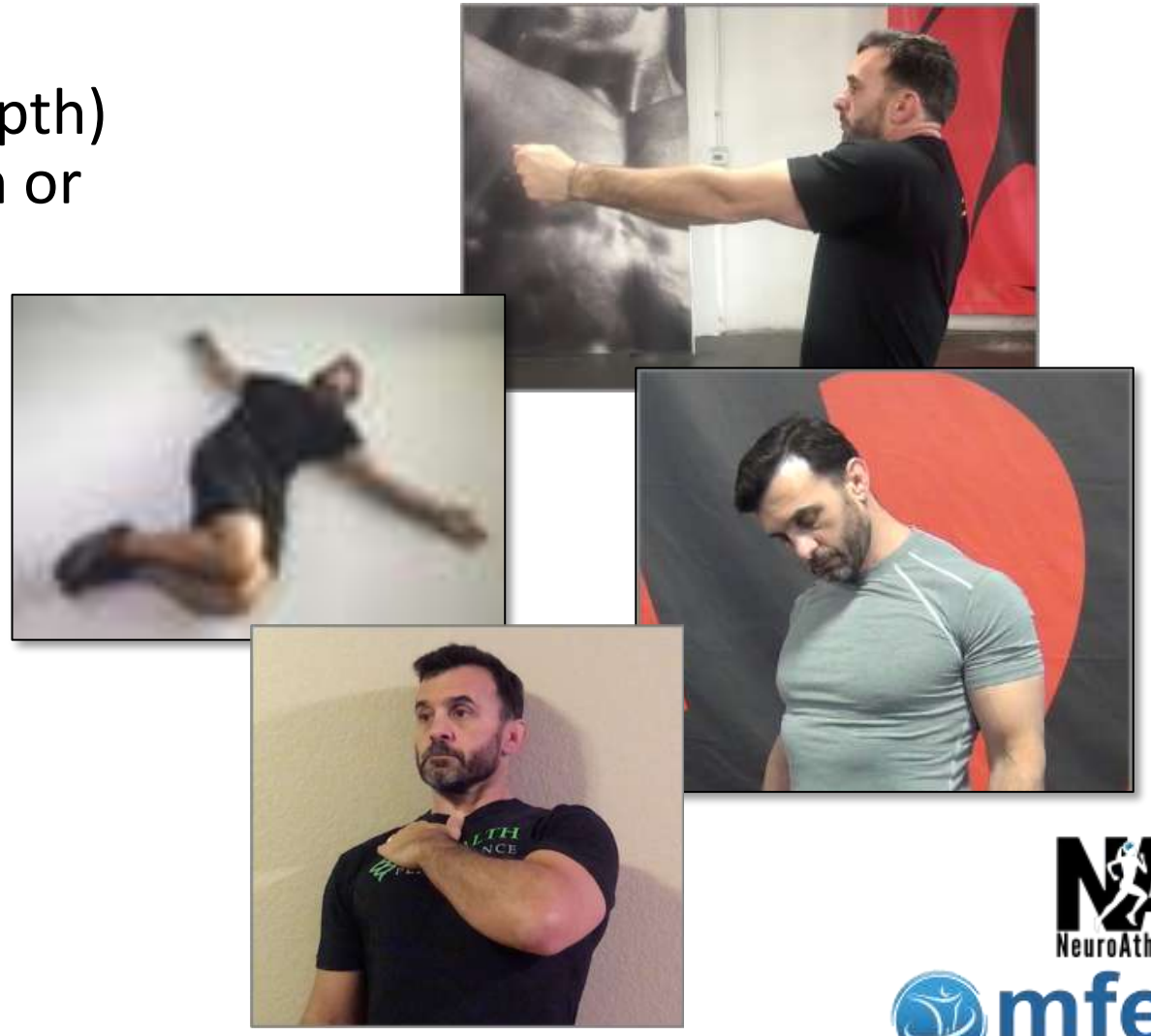


# NeuroBiomechanics of the Shoulder

- Assessments:
  - Push-Up or overhead press (quality/depth)
  - Active Pain-Free ROM (shoulder flexion or internal rotation)

- Individual Joint Mobility Drills:
  - Upper Twists
  - Thoracic Glides
  - Scapular Circles

- Pec Minor Inhale
- Accessory Nerve Glide



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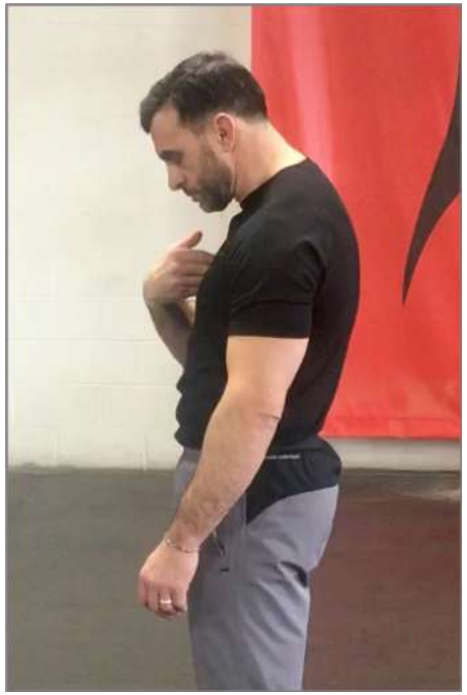
# NeuroBiomechanics of the Shoulder

- Upper Twists
  - Lying on side, arms forward & palms together, knees bent at 90$^{o}$, feet & knees together
  - Keeping feet & knees together and on the floor, take upper arm over to opposite side
  - Watch your hand with your head/neck
  - Goal: scapula on the floor and legs on floor
  - Repeat for 3-5 repetitions in each direction

- Thoracic Glides (forward/back)
  - Neutral, long spine stance
  - Take a deep breath in and then exhale while rounding the mid-back
  - Compress around the midpoint of the sternum as you round; relax the head and neck Repeat on opposite side
  - Inhale as you reverse the motion lifting the sternum forward and up
  - Be certain to keep the low back as still as possible
  - Repeat for 3-5 repetitions



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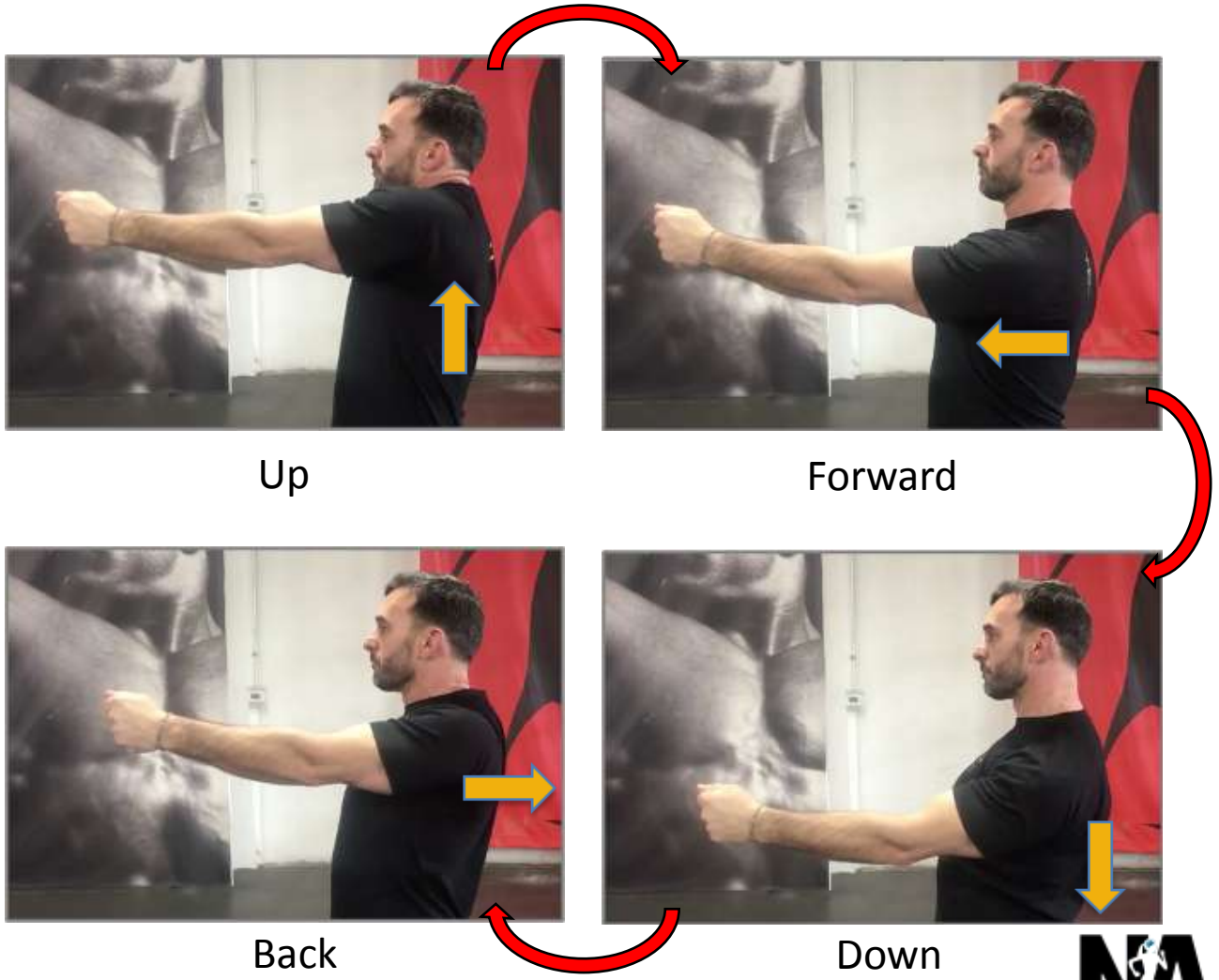
# NeuroBiomechanics of the Shoulder

- Scapular Circles (Camshaft)
  - Neutral stance with a long spine
  - Lock the elbow of the working arm(s)
  - Make a loose fist with the thumb on top
  - Perform circles with the scapula / shoulder blade by sequentially moving it up, forward, down, & back
  - The hand stays fixed – isolate motion to the shoulder
  - Do the circles in both direction
  - Repeat for 3-5 repetitions

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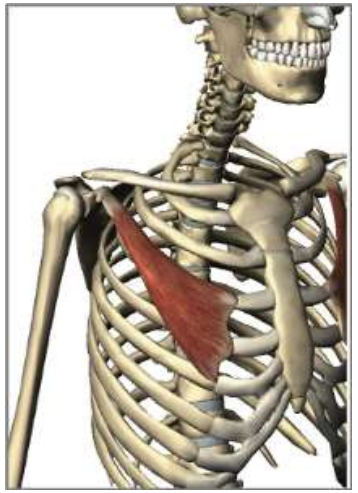
# NeuroBiomechanics of the Shoulder



- Pec Minor Inhale:
  - For the right Pec Minor, stand against a wall, then turn slightly right at about 45º so that the right scapula is lying against the wall
  - Place the left hand on top of the Pec Minor area, on the upper right area of the chest near where the clavicle meets the shoulder
  - Take a deep nasal inhale, attempting to breath “into” your left hand, keeping the scapula against the wall
  - Focus on creating space between the wall and the hand; this is effectively filling the upper right quadrant of the right lung
  - You should feel the left hand raising out and up if done correctly, which is caused by the ribs elevating
  - 5-10 breaths on both sides

**Inhale** – Pec minor contracts for upper ribs expansion out & up

**Exhale** – Pec minor relaxes letting upper ribs depress / collapse

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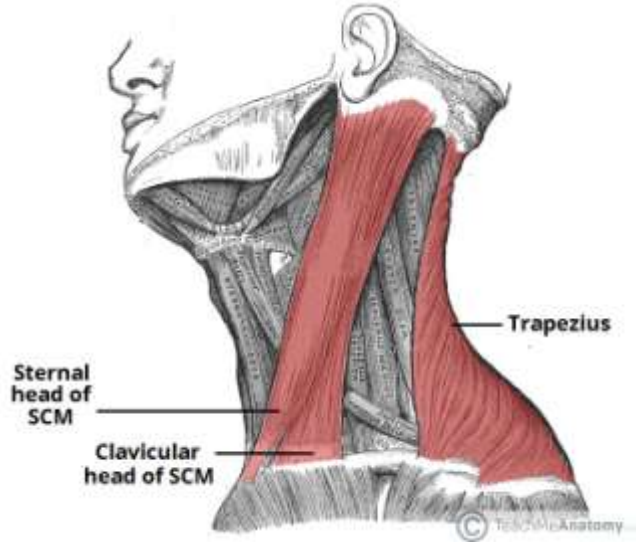
# NeuroBiomechanics of the Shoulder




## Accessory Nerve Glide Tensioning:

- **Tensioning Sequence:**
  - Cervical lateral flexion to opposite side
  - Cervical anterior glide (protraction)
  - Scapular retraction
  - Cervical full flexion

## Accessory Nerve Flossing:

- Taking one joint in and out of the tensioned position:
  - In and out of cervical flexion
  - In and out of scapular retraction
  - In and out of cervical protraction
- 6-8 reps of “flossing”

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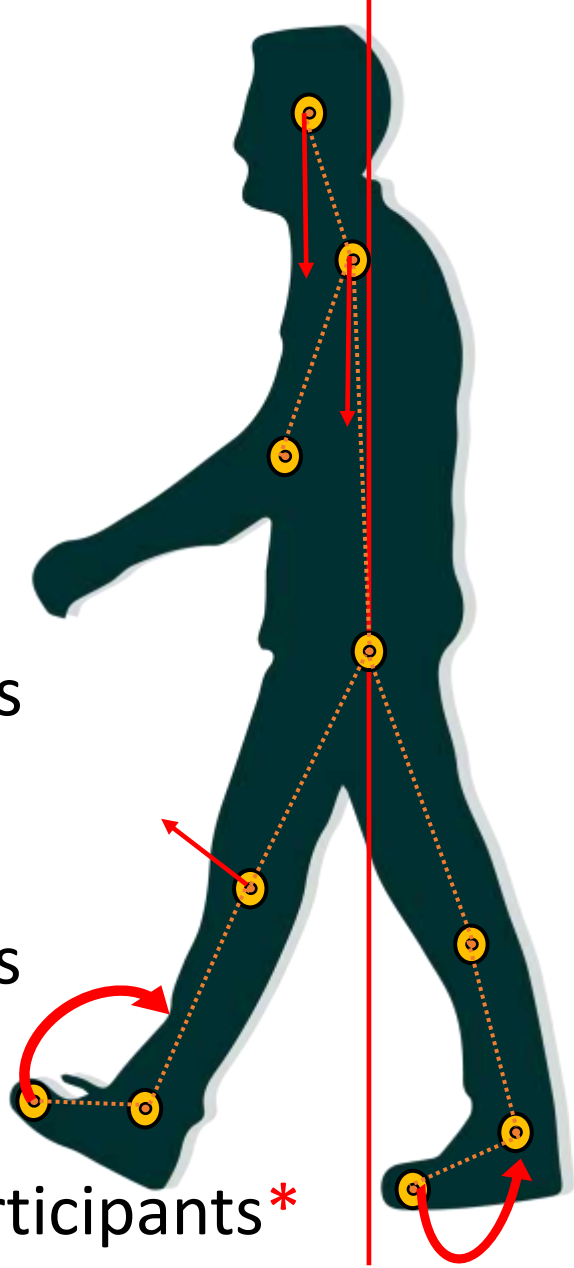
# 5 Joints Assessment Series



What you will learn

- Practical client assessments for each of the 5 Joints
- How to instruct clients to set up and use smart technologies for assessments and training for best results
- How to cue movement assessments to get accurate/useful results
- Techniques & cutting-edge apps for amazing assessments

Thursday June 4th & 11th at 10am PST

*Exclusive $10each  ($20 for both days) for 5 Joints participants*

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# Help us raise awareness & interest

- BONUS 2 Part Joint Online Assessment Webinar
- August 4th, 2020 Gait Assessment Webinar
- Fall 2020 Exclusive Hands On Cadaver Based Anatomy Intensive in Colorado
- Virtual Cadaver Series
- Stroke Exercise Specialist Certification
- More Neurological focused training curriculum

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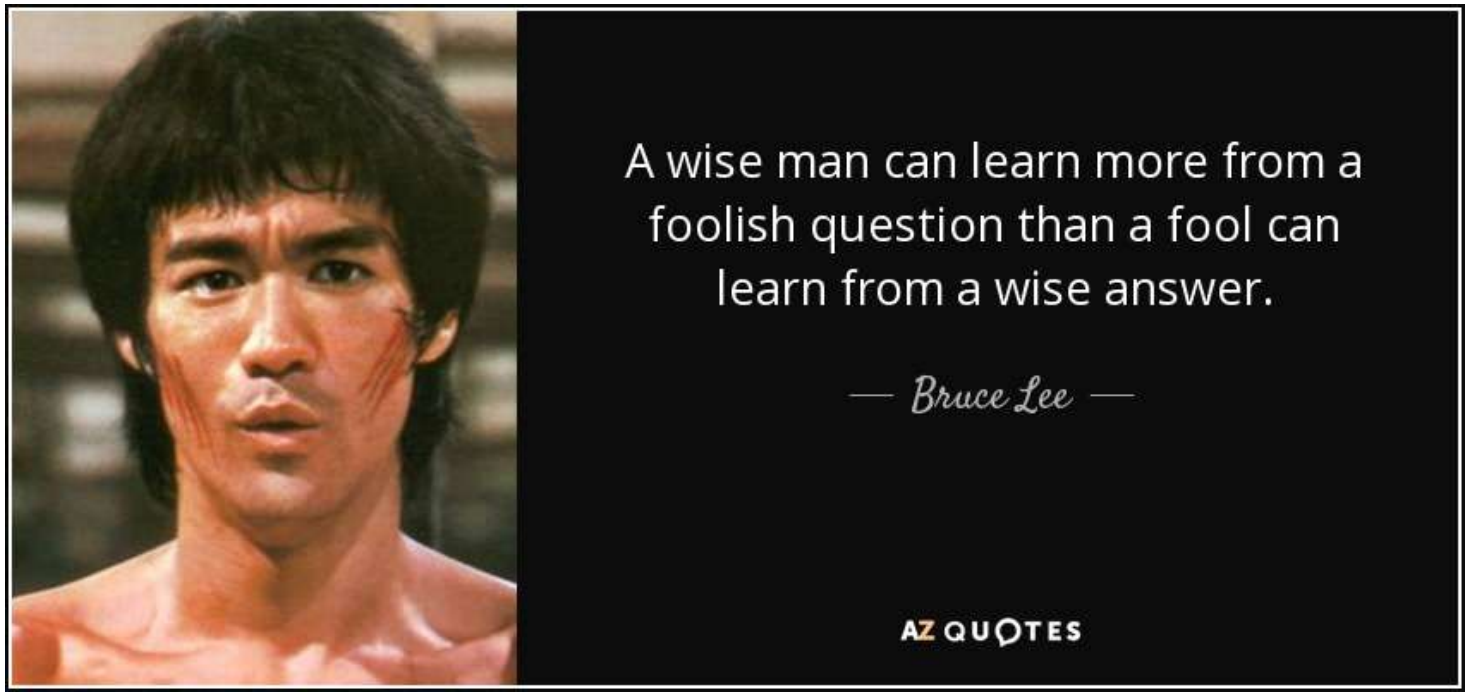
# Questions?

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# 5 Joints Webinar Series


Foot/Ankle – April 30th


Knee – May 7th


Hip – May 14th


Shoulder – May 21st


Elbow – May 28th

NeuroAthlete

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