ASANA 103: SEQUENCING

naadayoga

Objectives

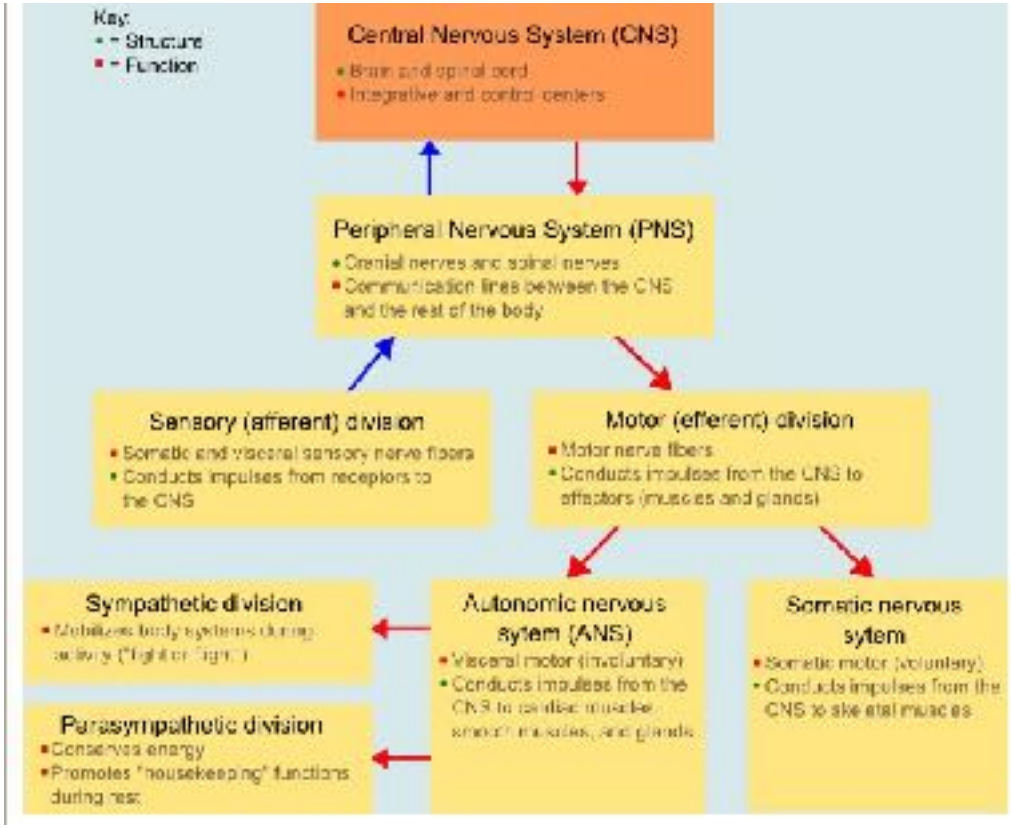
- To learn to how use a general framework (methodology) for creating effective and creative yoga class sequences.
- To further explore yoga anatomy and mechanics with intentions for enhancing functionality and purpose in practice design.
- To strengthen ability to modify, accommodate, and proactively structure practices for different levels and demographics.
- To overall develop greater confidence in organizing sequences that are integrity driven.

“Remember, it doesn’t matter how deep into a posture you go – what does matter is who you are when you get there.”

~ Max Strom

Hatha Yoga Methodology

- Hatha Yoga is a delivery system of applying (ideally) positive stress.
- Takes advantage of tapping into our parasympathetic pathway while also engaging the physical body ('controlled stimulation').



Hatha Yoga Methodology

Doshas and Styles of Yoga Practice: Vata

- Calming and grounding poses are ideal (including standing poses like Mountain and Tree)
- Fast-paced vinyasa or flow can aggravate (prone to anxiety, overexertion and fatigue)
- Extend length of time in each pose and use slower, more deliberate transitions
- Engage lower back and thighs (major regions of Vata dosha)
- Benefit from doing long, deep savasanas

Hatha Yoga Methodology

Doshas and Styles of Yoga Practice: Pitta

- Benefit from having a more relaxed, nurturing attitude and releasing competitive tendencies
- Tendency toward excess heat, avoid profuse sweating and choose cooling poses
- Avoid long held inverted poses
- Postures that release excess heat including those that compress solar plexus or open the chest

Hatha Yoga Methodology

Doshas and Styles of Yoga Practice: Kapha

- Benefit from invigorating poses and stimulating sequences including warmth
- Have most stamina and strength of all doshas, but when out of balance, suffer from lethargy and excess weight
- Important to be mindfully challenged and to create heat in body to counter Kapha's natural tendency to feel cold and sluggish

Dosha Test

http://www.naturesformulary.com/contents/dosha-test

Hatha Yoga Methodology

General Sequencing Approach

- centering + pranayam
- warming and assessment phase
- engagement phase
- cooling phase
- pranayam (grounding)
- savasana
- closing / meditation

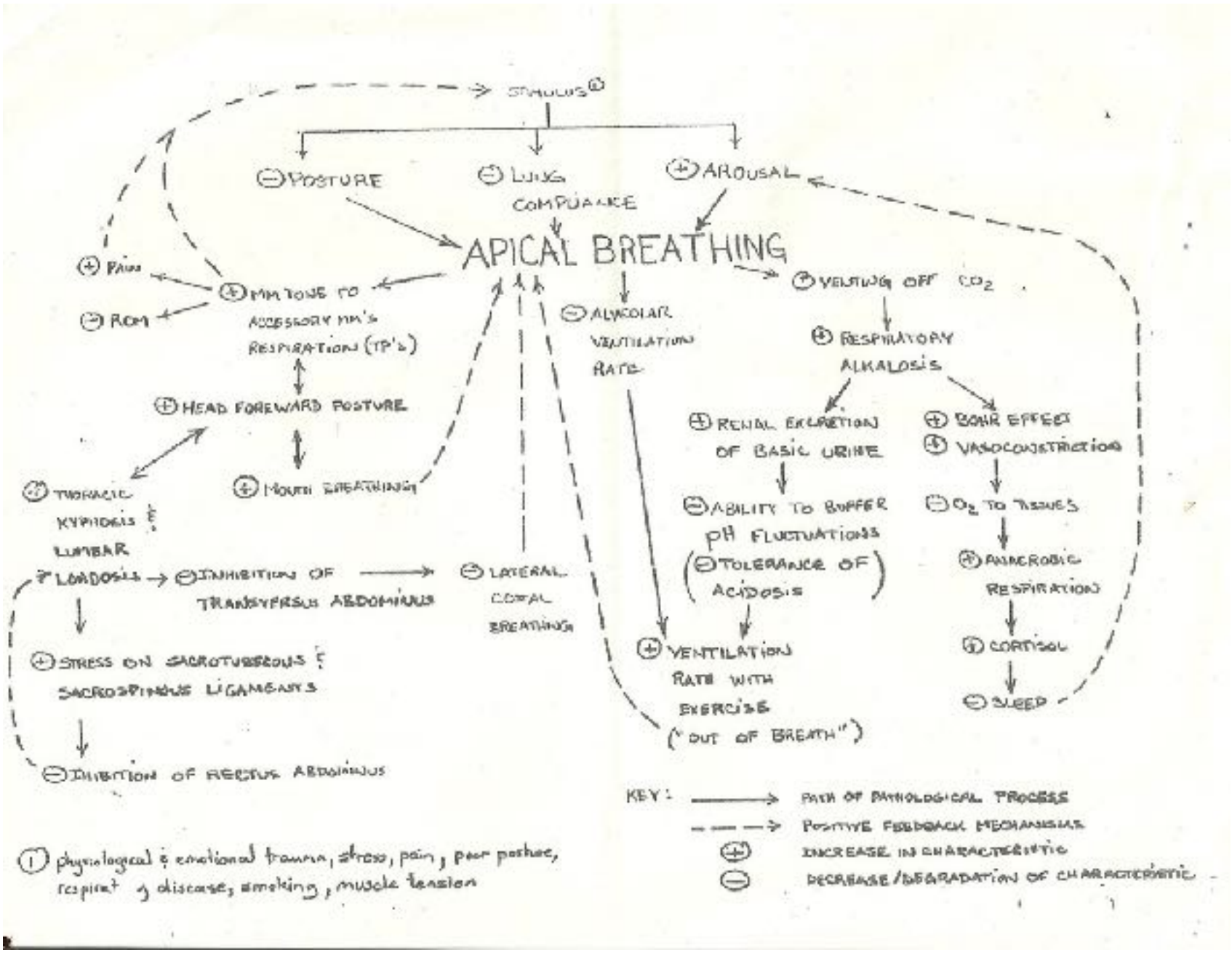
Sequencing Considerations

- Style, lineage, and appropriate level.
- Setting goals, themes, intentions (sankalpa) or creating a physical focus in our practices?
- Know demographics and structure practices appropriately as well as retain consistency with studio format.
- When piecing asanas together into sequences, consider scale of symmetry, need for rest of excessive joint loading and maintain basic principles of counterposes and tension balance.
- Proactive planning (sequence list / room setup and space / prop placement / ease of modifying).

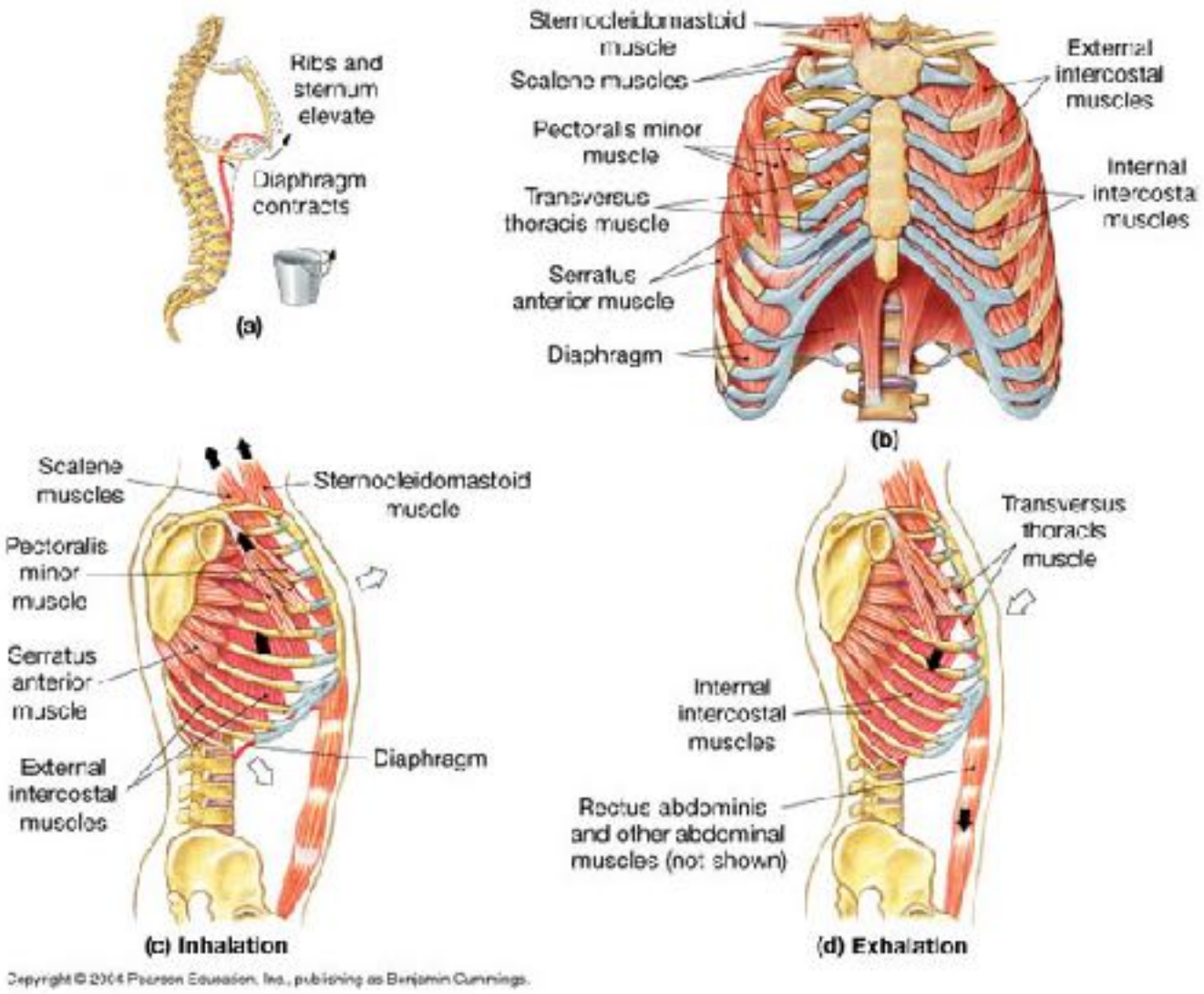
Hatha Yoga Methodology

Centering

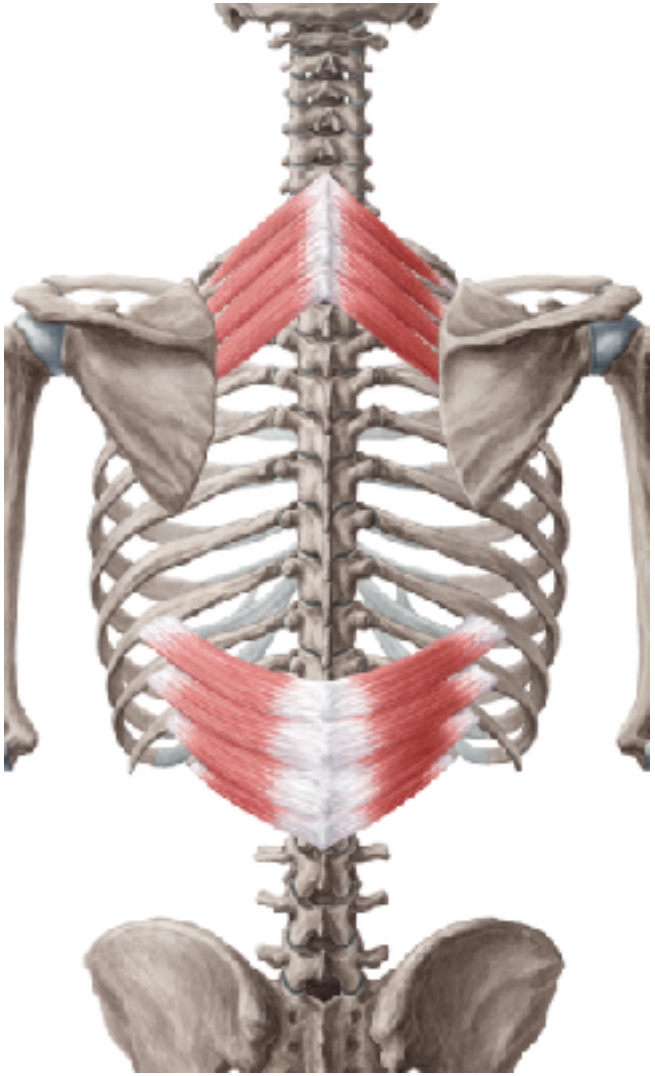
- 3-10 minutes
- Essential component of ‘Hatha Yoga’ practices to establish a holistic wellness ‘foundation’ and give opportunity to settle into the 3 layers of practice
- Opportunity to explore intention setting (sankalpa)
- Give ‘space’ for students to find their inner gaze / silence as important as giving cues
- Utilize centering postures that are accessible to group, that complement the energetic tone, and that provide fluid transition
- Integration of mudras (?)
- Integration of breath connection and pranayam


STIMULUS ⊕
⊖ POSTURE
⊖ LUNG COMPLIANCE
⊕ AROUSAL
APICAL BREATHING
⊕ PAIN
⊖ ROM
⊕ HYPERTONE TO ACCESSORY MM's RESPIRATION (TP's)
⊕ HEAD FOREWARD POSTURE
⊕ MOUTH BREATHING
⊕ THORACIC KYPHOSIS & LUMBAR LORDOSIS
⊖ INHIBITION OF TRANSVERSUS ABDOMINUS
⊖ LATERAL COSTAL BREATHING
⊕ STRESS ON SACROTUBEROUS & SACROSPINOUS LIGAMENTS
⊖ INHIBITION OF RECTUS ABDOMINUS
⊖ ALVEOLAR VENTILATION RATE
⊕ VENTILATION RATE WITH EXERCISE ("OUT OF BREATH")
⊕ VENTING OFF CO_2
⊕ RESPIRATORY ALKALOSIS
⊕ RENAL EXCRETION OF BASIC URINE
⊖ ABILITY TO BUFFER pH FLUCTUATIONS (⊖ TOLERANCE OF ACIDOSIS)
⊕ BOHR EFFECT
⊕ VASOCONSTRICTION
⊖ O_2 TO TISSUES
⊕ ANAEROBIC RESPIRATION
⊕ CORTISOL
⊖ SLEEP
(1) physiological & emotional trauma, stress, pain, poor posture, respirat'y disease, smoking, muscle tension
KEY:
PATH OF PATHOLOGICAL PROCESS
POSITIVE FEEDBACK MECHANISMS
⊕ INCREASE IN CHARACTERISTIC
⊖ DECREASE/DEGRADATION OF CHARACTERISTIC

Pranayam & Anatomy of Breathing Review



Serratus Posterior



Breath Work and Pranayam

- General breath connection (mechanics, pacing, and pattern)
- Diaphragmatic training
- Costal Breathing / Posterior Thoracic Breathing

- Grounding
  - Dirga breathing
  - Vagal tone activation
  - Alternate Nostril Breathing
  - Bhramari (humming breath)
  - Ujjaiya **
  - Directional breath visualization (body scanning)

- Engaging
  - Kapalabhati
  - Bhastrika (traditional/energizer arm flow/twisting)
  - Agni Sara (Heart of Yoga)

Hatha Yoga Methodology

Warming and Assessment Phase

- 5-15 minutes
- Combination of postures and transitions that engage with little requirement of large ROM in restrictive joint movements (varies depending on level of class)
- Utilize key poses to assess: ROM/joint variability, alignment awareness, tension/posture imbalances, energy levels, strength/stamina capacity
- Utilize heating pranayam with experienced students (kapalabhati and bhastrika variations)
- Ideal to thread poses together in flowing, logical movement pattern … consider enhancing accessibility for more complex movement patterns

Warming Phase Postures

Warming and Assessment Phase

- test body awareness and motor control
- test strength capacity
- explore ROM capacity
- retain breath connection
- assess imbalances/dysfunction and movement patterns
  - Wrist and hand alignment, loading and weight distribution
  - Default locking into joints (knees and elbows)
  - Collapsing arches / lack of organized feet
  - Lack of lateral hip engagement or strength
  - Lack of shoulder girdle stabilization
  - Tendency for shoulder impingement patterns
  - Tendency to default into flexed lumbar loading (plus twists)
  - Genu valgum (inwards knee collapse) patterns
  - Improper cervical and head positioning (especially in horizontal twists)
  - Defaulting into outer hamstrings lines (lateral thigh rotation)
  - Over firing of upper gluteus maximus (lateral thigh rotation)
  - Overall general lack of core awareness, spinal alignment and use of stabilization trains

Hatha Yoga Methodology

Engagement Phase

- 15-30 minutes
- Utilizes warming phase foundation to further build and sustain warmth
- Complementary sequencing of poses to develop ROM further
- Awareness of fatigue and stimulation thresholds (resting poses and release transitions?)
- Goal pose is often positioned in this phase

Hatha Yoga Methodology

Cooling Phase

- 10-20 minutes
- Transition into grounding, stretching postures
- Ratio of warming postures decreases – maintain warmth, but keep them subtle
- Ideal to apply additional guided/directional breathing
- Tidy up ‘coverage’ of body
- Integrate ‘restorative’ postures just prior to savasana

- Integration of cooling pranayam (sitali, alternate nostril breathing, diaphragmatic breathing)

Hatha Yoga Methodology

Pranayam

- Integration of breathing exercises and techniques to manipulate prana and overall energy
- Beginning phases: can be grounding and/or energizing
- Before savasana: grounding and cooling
- Note time of day, experience levels, and any contraindications

Hatha Yoga Methodology

Savasana

- 5-15 minutes (approx 3-5 min for every 30 minutes of asana)
- Support for knees (beginners / low back pain)
- Supinate / open hands (reduce stimulation)
- Savasana vs another restorative pose?
- Guided relaxation vs self-guided?
- Assisting and direct engagement?

Final Closing

- Slow exit from savasana / leave in savasana?
- Accessible sitting posture
- Closing mudra (complements theme / intention)

Sound Integration

- External and internal sound
- Bhramari pranayam
- Ujjaiya pranayam
- Humming / releasing breath / Dirga breathing
- Chakra toning
- Silent sound (mantra internalization … ie So Hum - I Am That)

Chakra Toning

Number	Common English Name	Location	Chakra Tones: Vowels*	Chakra Tones: Bijas	Note	Color	Relates to
1	Root Chakra	Base of spine	uh (as in "up")	Lam	do	Red	Survival
2	Sacral Chakra	Low abdomen	ooo (as in "too")	Vam	re	Orange	Life energy, creativity
3	Solar Plexus Chakra	Upper abdomen between navel & sternum	oh (as in "so")	Ram	mi	Yellow	Personal power, self-esteem
4	Heart Chakra	Center of chest	ah (as in "saw")	Yam	fa	Green	Unconditional love, healing
5	Throat chakra	Base of throat	i (as in "fly"))	Ham	sol	Light blue	Communication, self-expression
6	Brow chakra, Third Eye	Forehead, between and slightly above eyebrows	Aye (as in "play")	Sham	la	Indigo	Insight, intellect
7	Crown Chakra	Top of head	eee (as in "see")	Om	ti	White or violet	Transcendence, pure consciousness

**Chakra expert Anodea Judith uses different vowels as chakra tones. Starting with Chakra 1, they are: O as in home, U as in cool, A as in father, A as in hay, E as in feet, nim, and ng as in ring. Just silence can also be used for the seventh chakra. Use whatever works best for you.*

Loka Samastah Sukhino Bhavantu

May all beings everywhere be happy and free, and may the thoughts, words, and actions of my own life contribute in some way to that happiness and to that freedom for all.

lokah: location, realm, all universes existing now

samastah: all beings sharing that same location

sukhino: centered in happiness and joy, free from suffering

bhav: the divine mood or state of unified existence

antu: may it be so, it must be so (antu used as an ending here transforms this mantra into a powerful pledge)

Vinyasa Sequencing

- Vinyasa, is a breath initiated practice, that connects every action of our life with the intention of moving towards what is sacred, or most important to us.
- The term Vinyasa is derived from nyasa, meaning "**to place**," and vi, meaning "**in a special way**." This indicates that we are not "throwing our bodies around" but are bringing consciousness to each movement in each moment.
- "**Transitions**" are what connect one posture to another in Vinyasa. They are the in-between part. What is not always appreciated is that transitions are considered postures themselves.
- A hallmark of Vinyasa Flow classes is the **variation in sequence from class to class**.

Surya Namaskar A

Surya Namaskar B

Vinyasa Sequencing

Functional considerations:

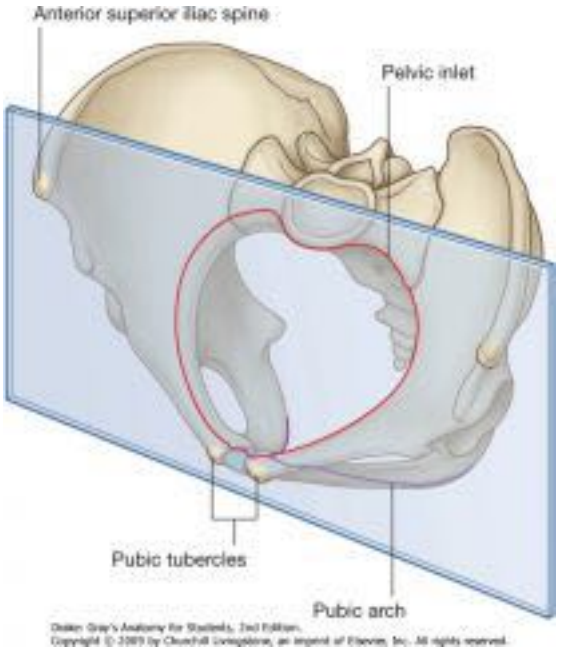
- foundation and experience?
- establishing stabilization and mindful mechanics
- pacing principles (including stretch reflex adaptation)
- accessibility (strength / stamina / ROM / coordination / body awareness)

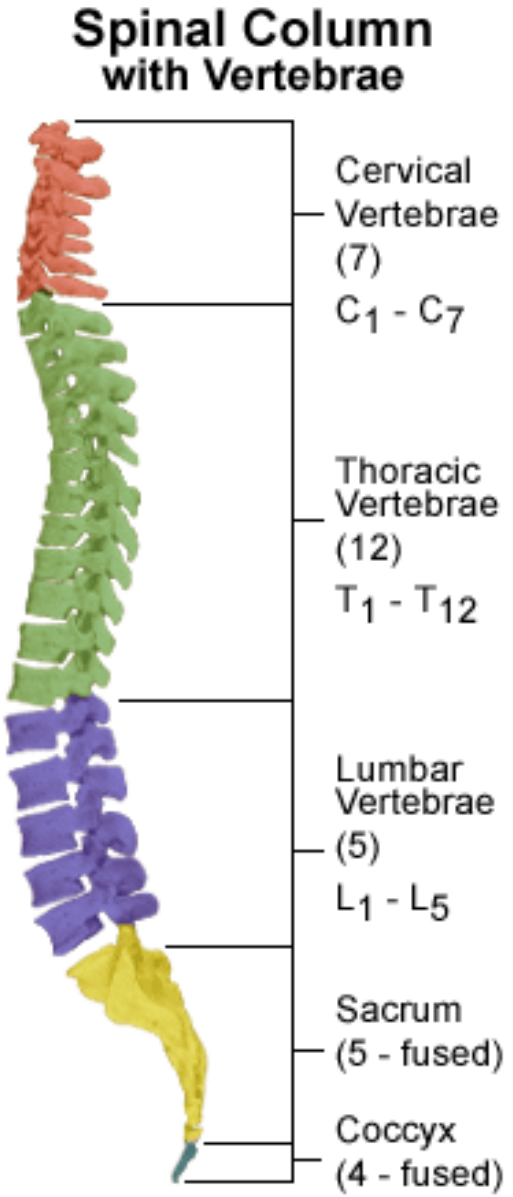
Modifying vinyasa sequences:

- increasing accessibility while retaining engagement and challenge
- understanding manipulation of lever length changes
- modifying traditional posture alignment to accommodate structural variability

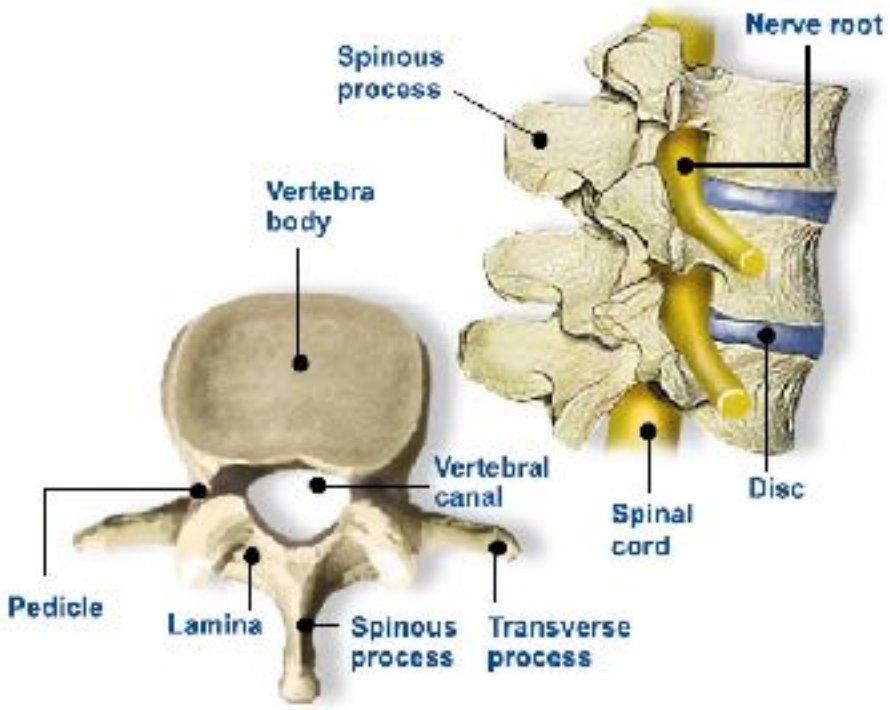
Vertebral Column

- 24 articulating vertebrae, and 9 fused vertebrae in the sacrum and coccyx
- separated by intervertebral discs
- houses and protects the spinal cord in its' spinal canal + structure/function
- numbering the vertebrae from top down





Vertebral Column



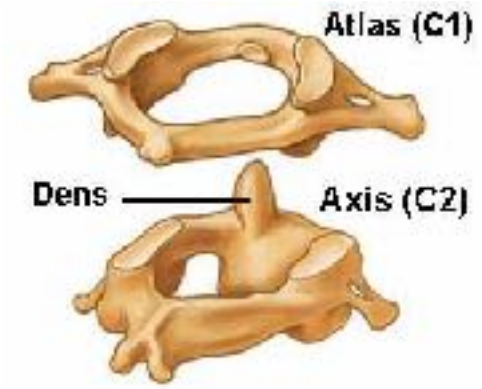
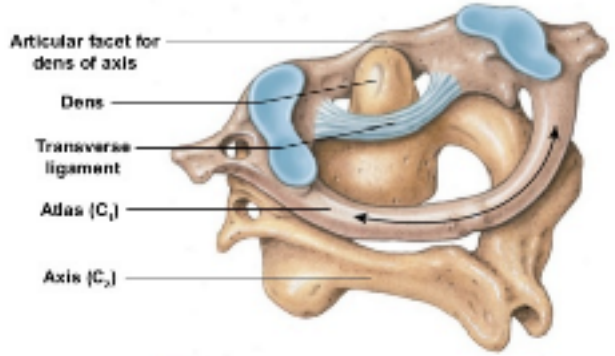
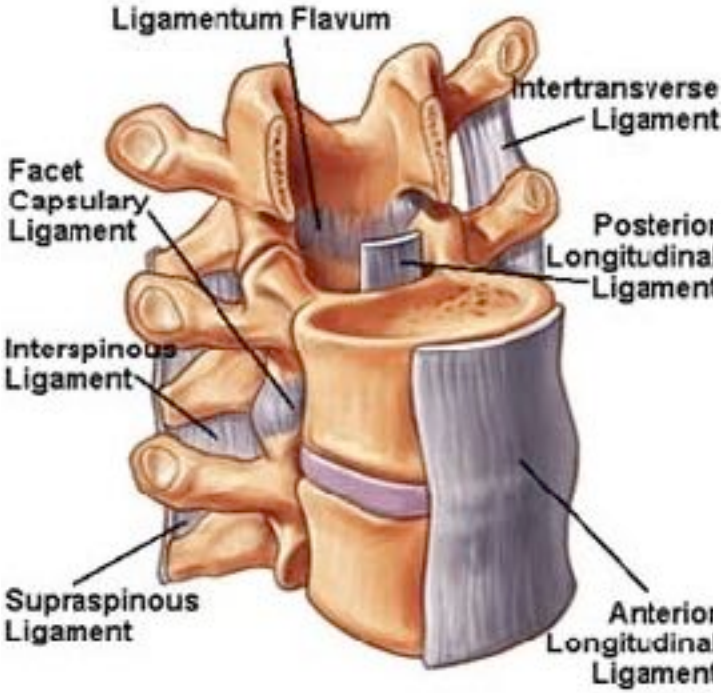


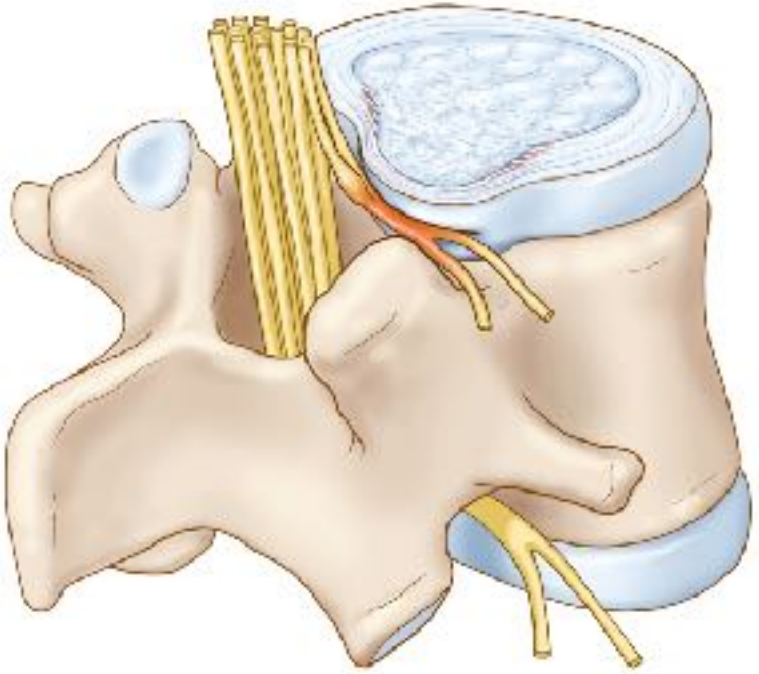
Figure 6.22f Atlas and Axis



f The articulated atlas (C_1) and axis (C_2) showing the transverse ligament that holds the dens of the axis in position at the articular facet of the atlas

Vertebral Column



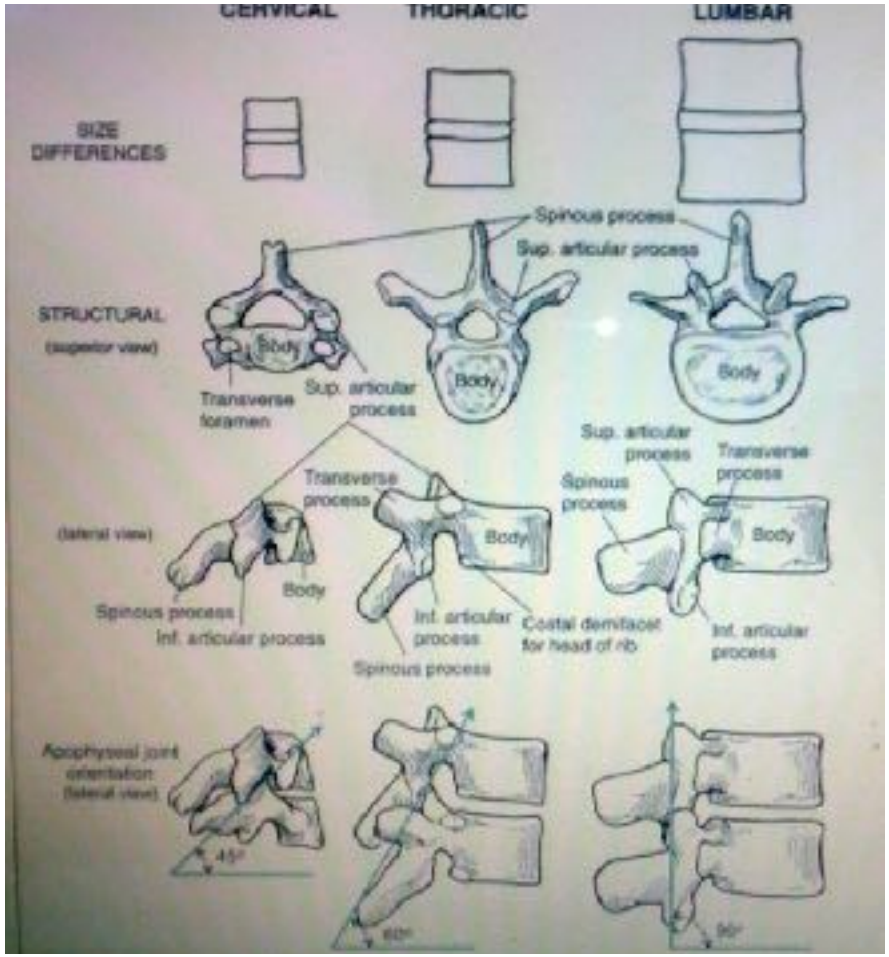


Facet Joints and Mobility

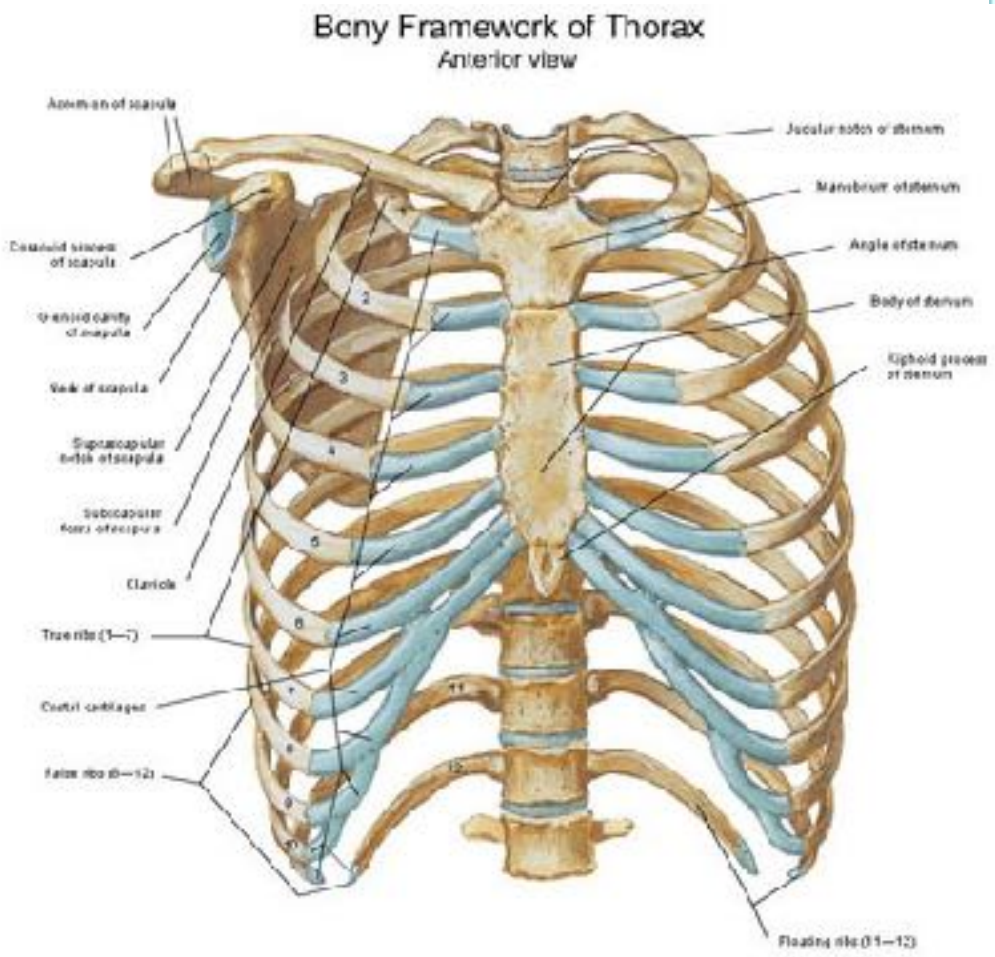
Cervical
- horizontal to 45 degrees
- all ROM movements (greatest)

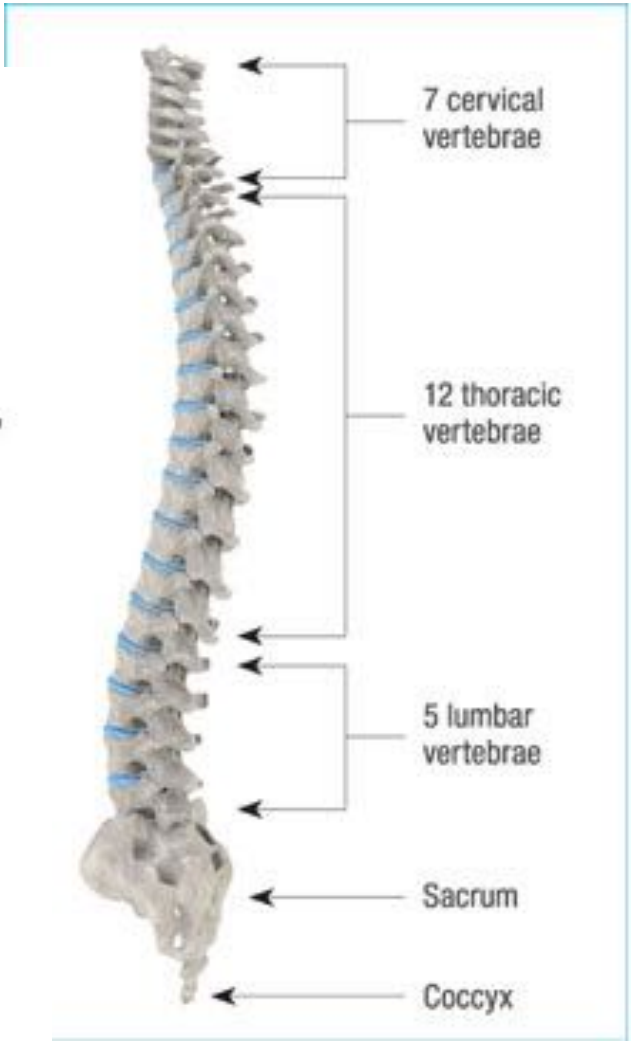
Thoracic
- 60 degrees (limits flexion)
- flexion/extension 3-12 degrees
- upper = 2-4 degrees
- lower = up to 20 degrees
- spinous process limit extension

Lumbar
- 90 degrees (vertical)
- flexion/extension 8-20 degrees

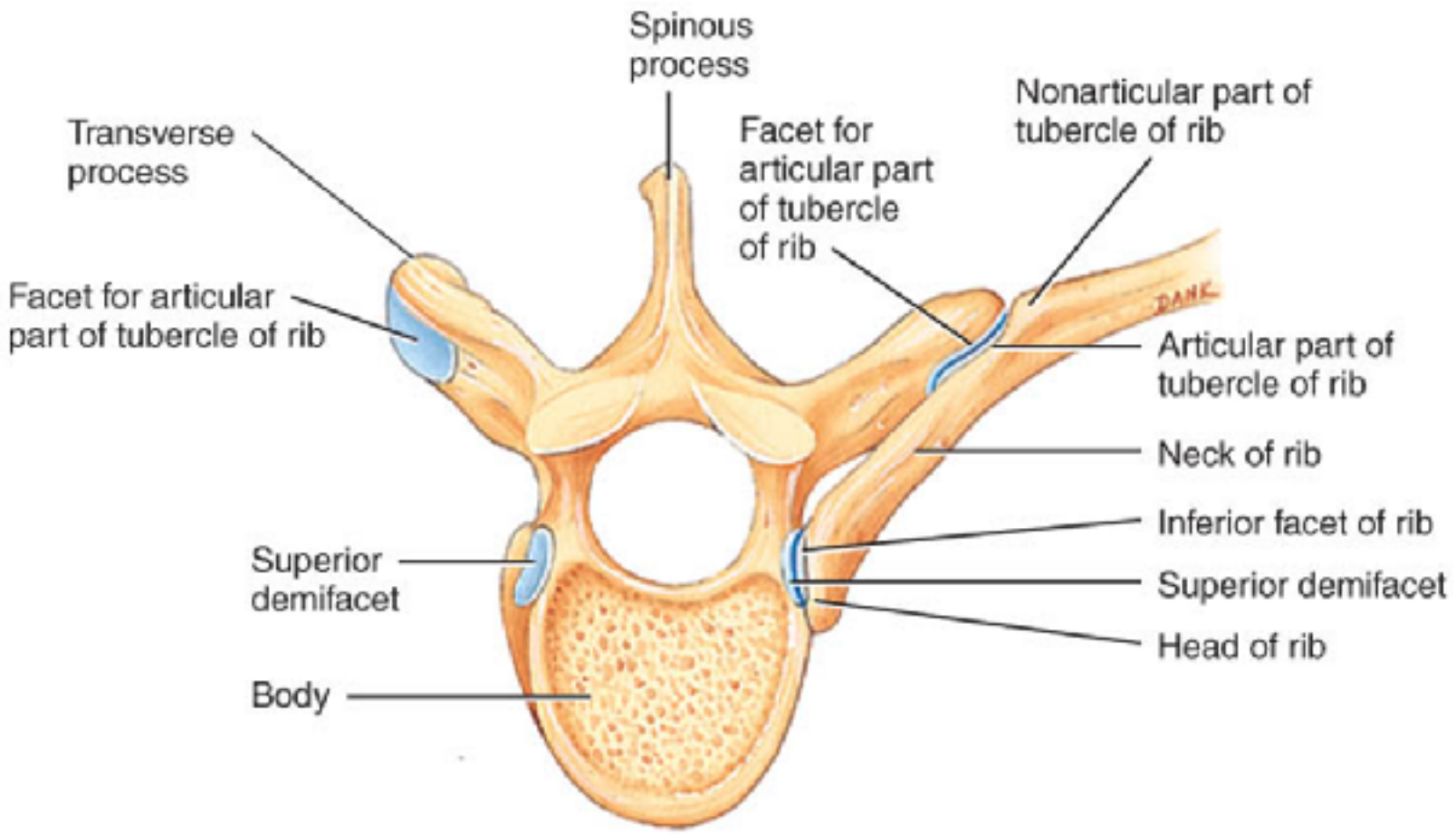


Thoracic Skeleton Mobility



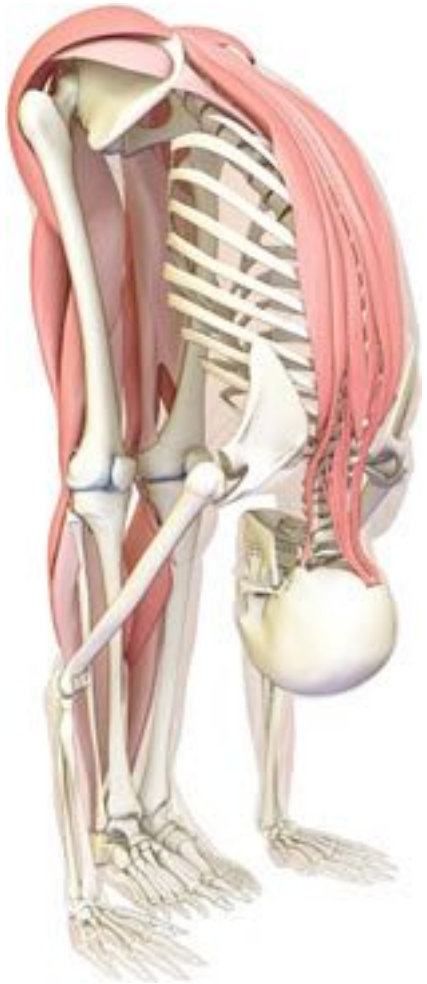


Thoracic Skeleton Mobility

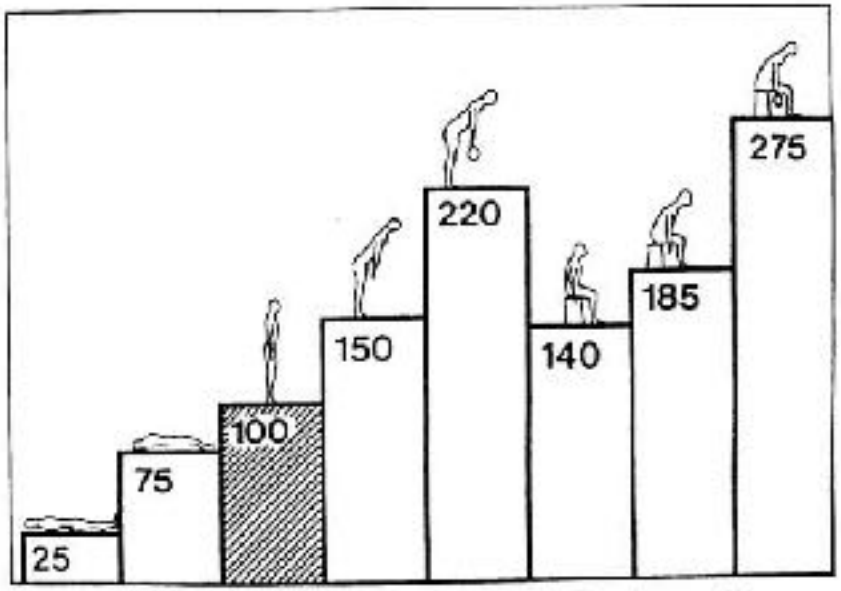


Forward Bends and Spinal Flexion

- **Spinal Flexion = trunk and neck**
- Are we actually aiming for hip flexion?
- Performance vs benefits?



Force Loads on Different Postures



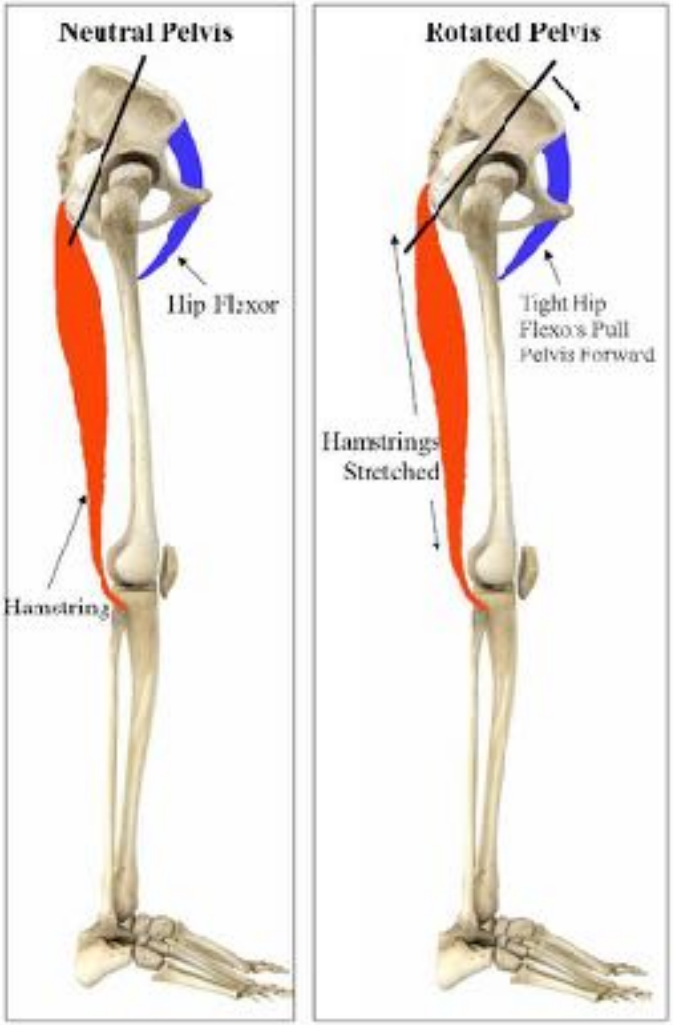
Relative change in pressure (or load) in the third lumbar disc in various positions.
Taken From Nachemson A. (1975).

Chart: Loads on Discs

POSITION	kg's
lying on back	25
standing	75
sitting	140
sitting bent forward	185
sitting slouched	275
walking	85
coughing/sneezing	110
bending forward	150
lifting with the back bent	220
lifting 20 kg with back bent	340

Hip Flexion Restriction

- Flexion limitations from hip extensors (hamstrings and gluteus maximus)
- Further ‘flexion’ transmitted into vertebral column and SI joint

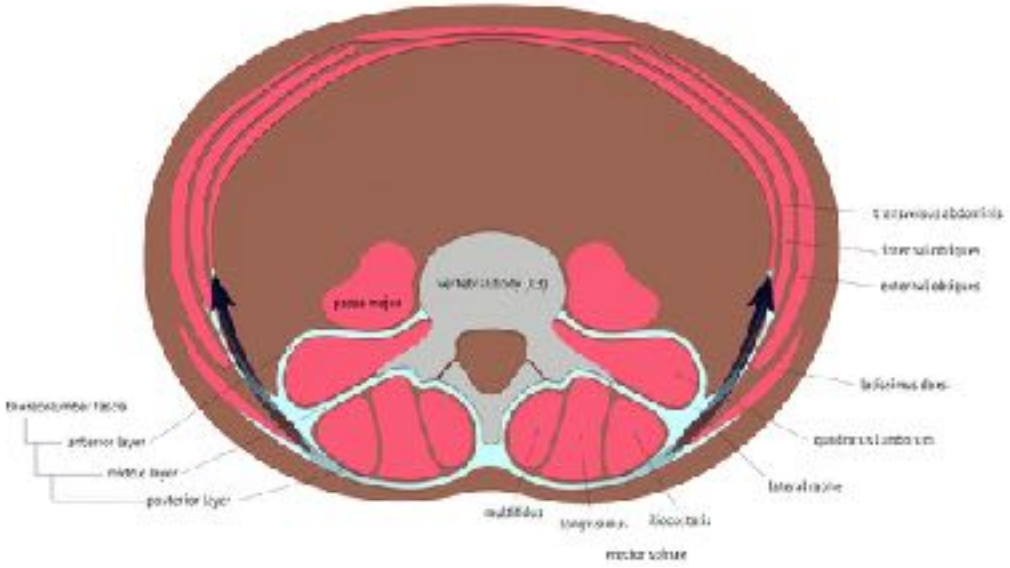


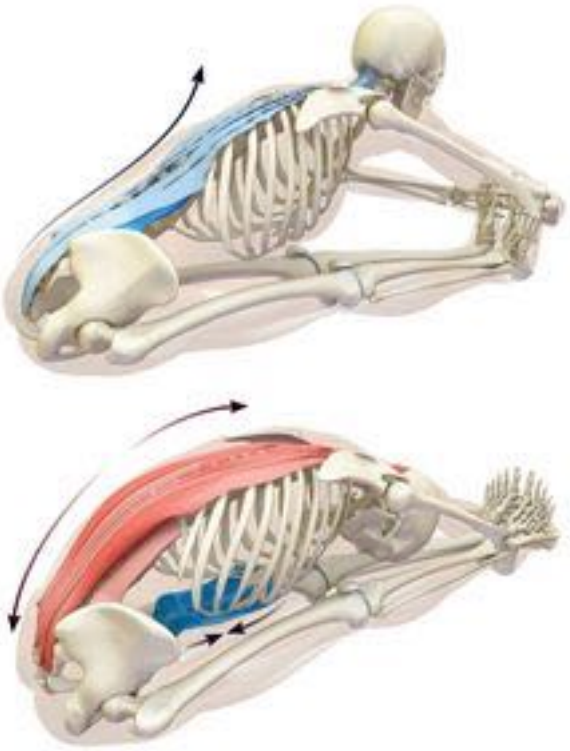
Forward Bending Applications

- Intra-abdominal pressure
- Hip flexor engagement
  - Rectus fermoris
  - Iliacus/Psoas
  - Tensor Fascia Latae/groin
- Force Closure for SI joint
  - Pelvic floor / transverse engagement
- Origin / Insertion isolations
- Reciprocal Inhibition / contract and relax technique

Forward Bending Applications

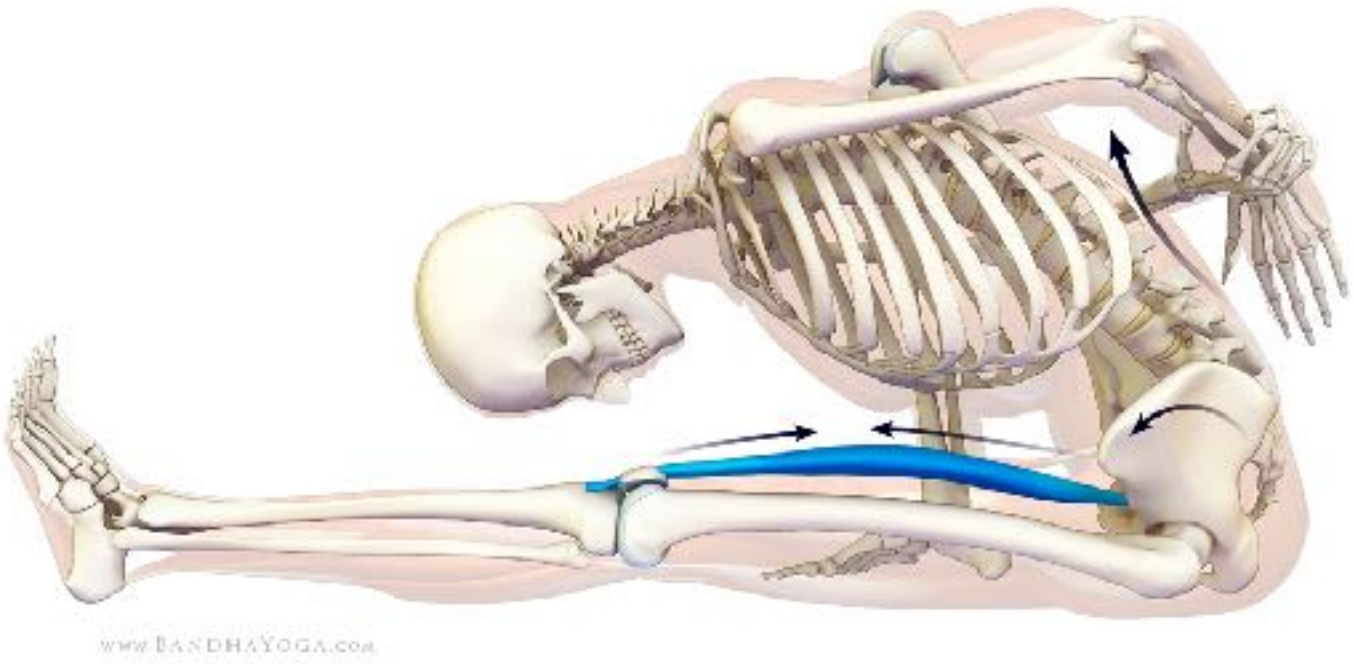
- Using intra-abdominal pressure via transverse abdominals





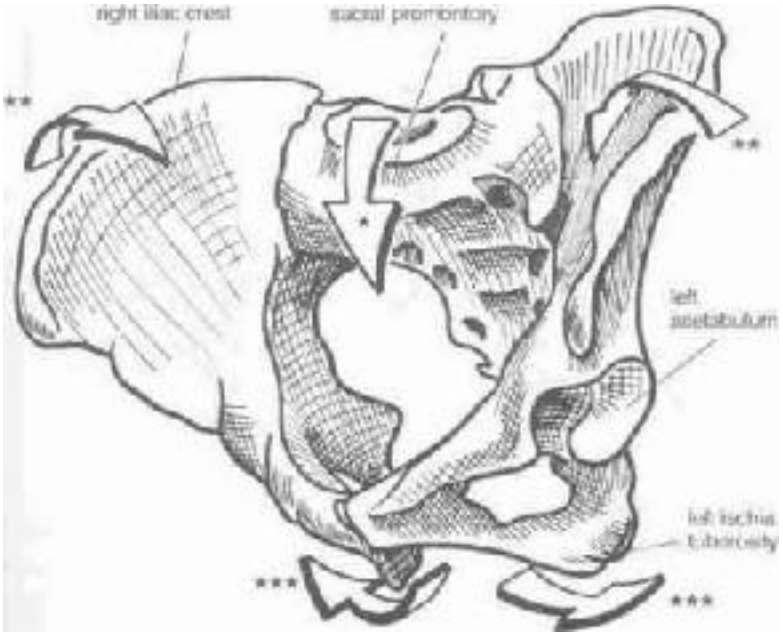
Forward Bending Applications

- Enhancing hip flexion through hip flexor engagement



Forward Bending Applications

- Support via deep musculature and applying **force closure** stabilization in forward bending poses with adducted legs
  - Pelvic floor
  - Transversus abdominis

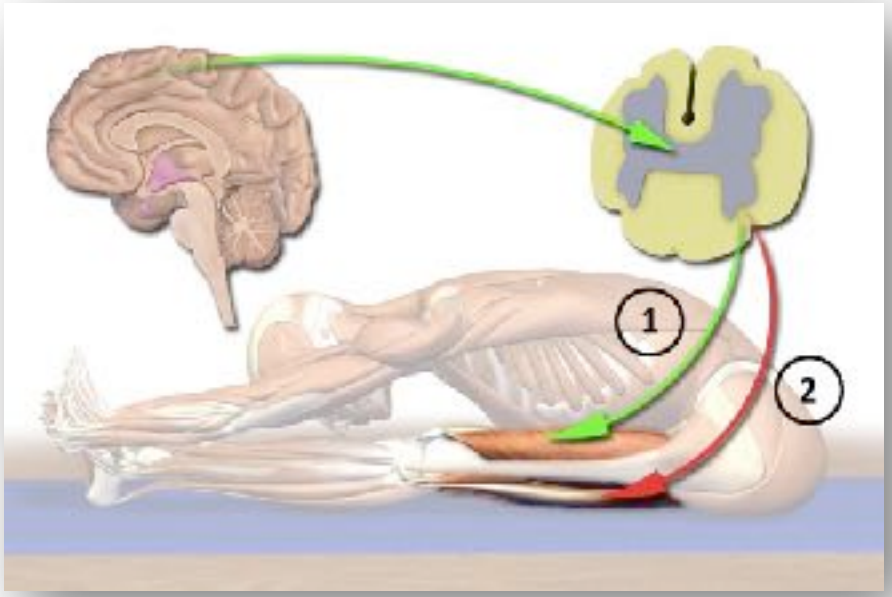


Forward Bending Applications

- Recognize muscular restrictions and how to manipulate their **origin and insertions** more effectively while retaining spinal quality

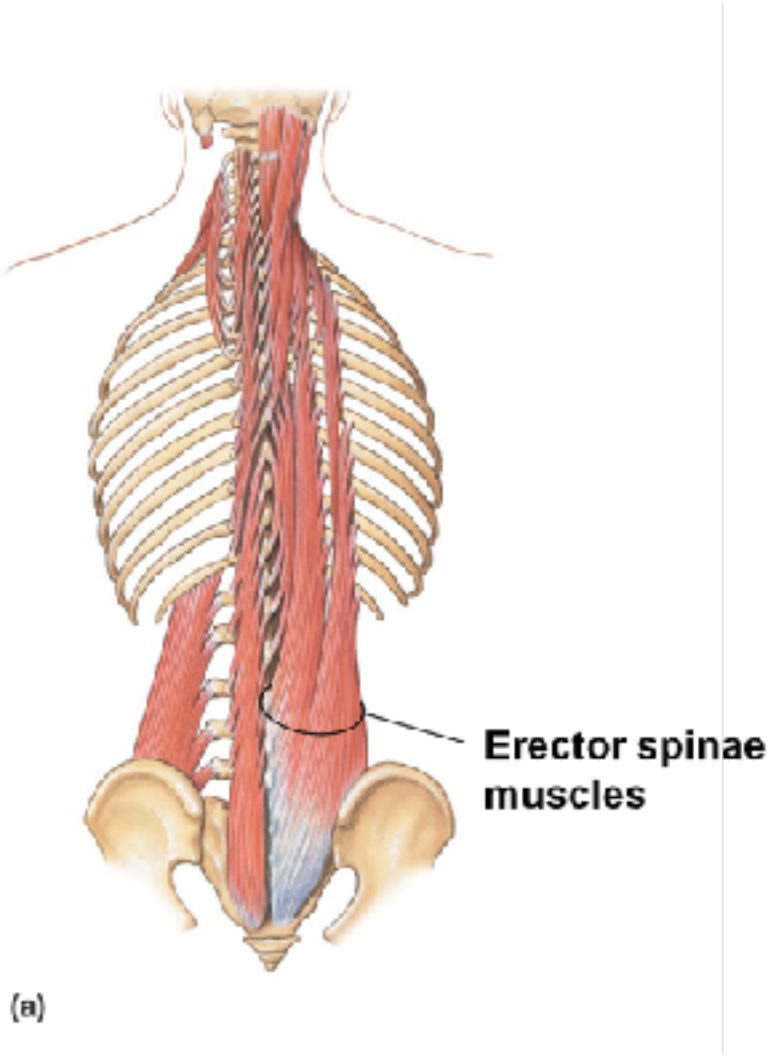
Reciprocal Inhibition

- manipulation of the muscle receptors (muscle spindles)
- contract / relax technique
- common applications in yoga
- cautions and considerations?



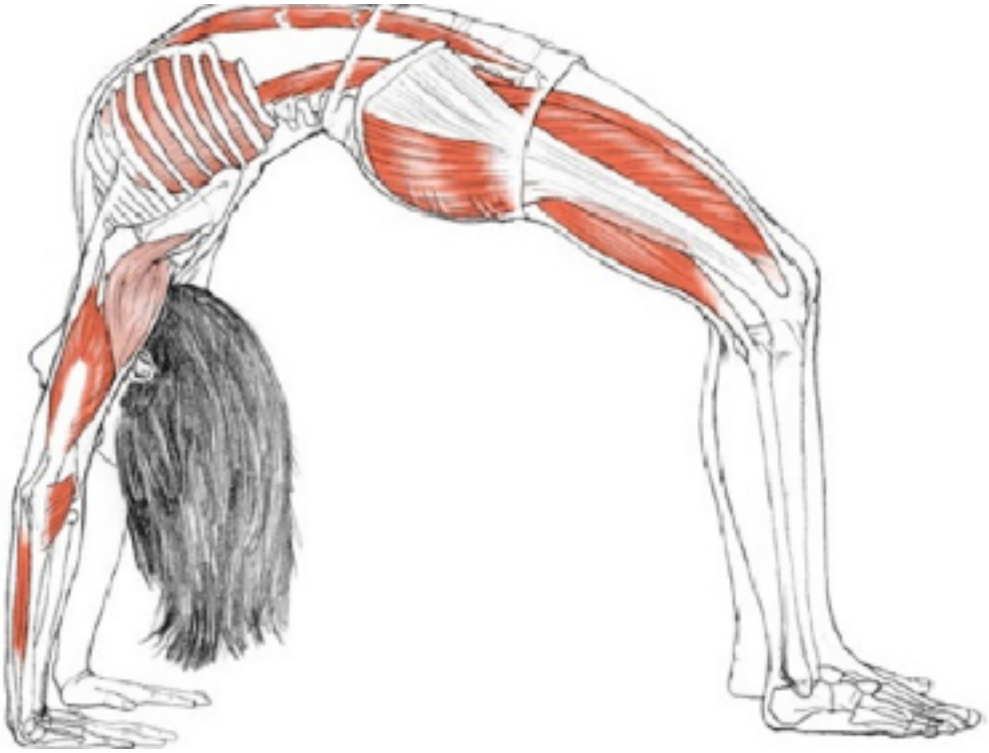
Spinal Flexion and Stretching

- Isolate spinal flexion independent of hip flexion restrictions?
- Cervical spine considerations



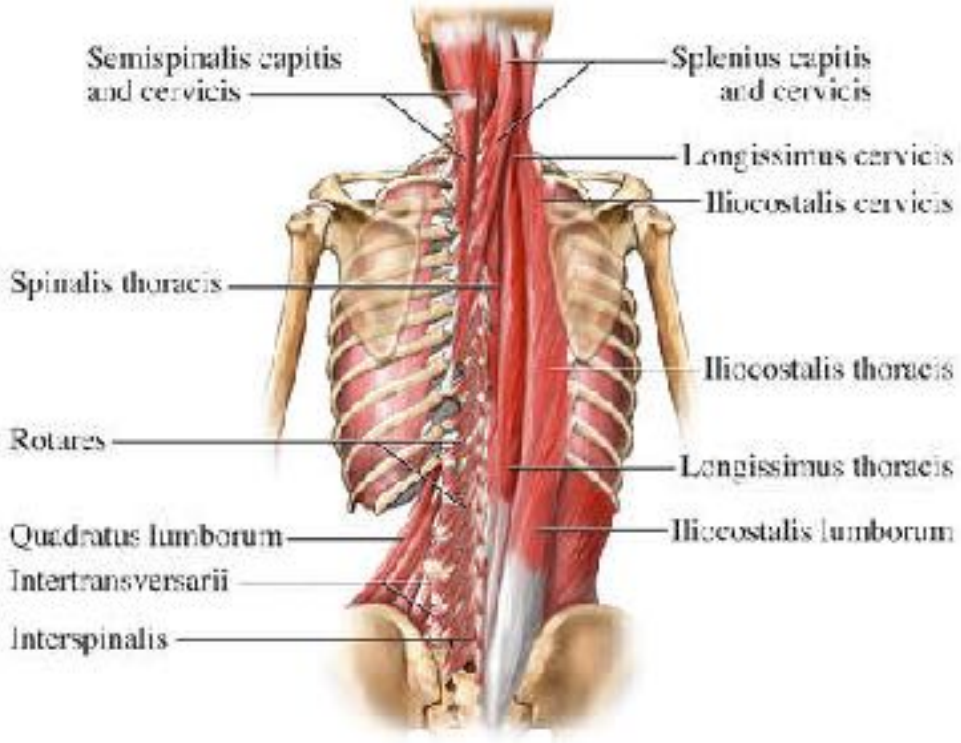
Back Bends and Spinal Extension

- **Spinal Extension = trunk and neck**
- Are we actually aiming for hip extension and isolating hip extension restrictions?
- Performance vs benefits?



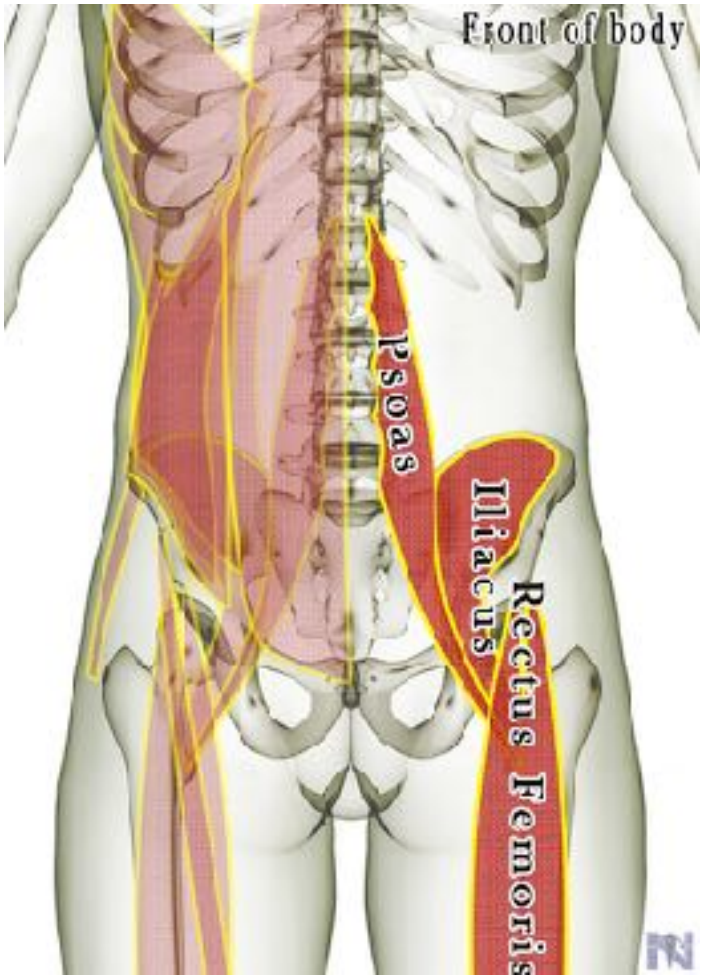
General Muscles Working in Back Arching Poses

- Engaging
  - Lumbar extensors
  - Thoracic extensors
  - Cervical extensors
  - Gluteus maximus / proximal hamstring
  - *stabilizers



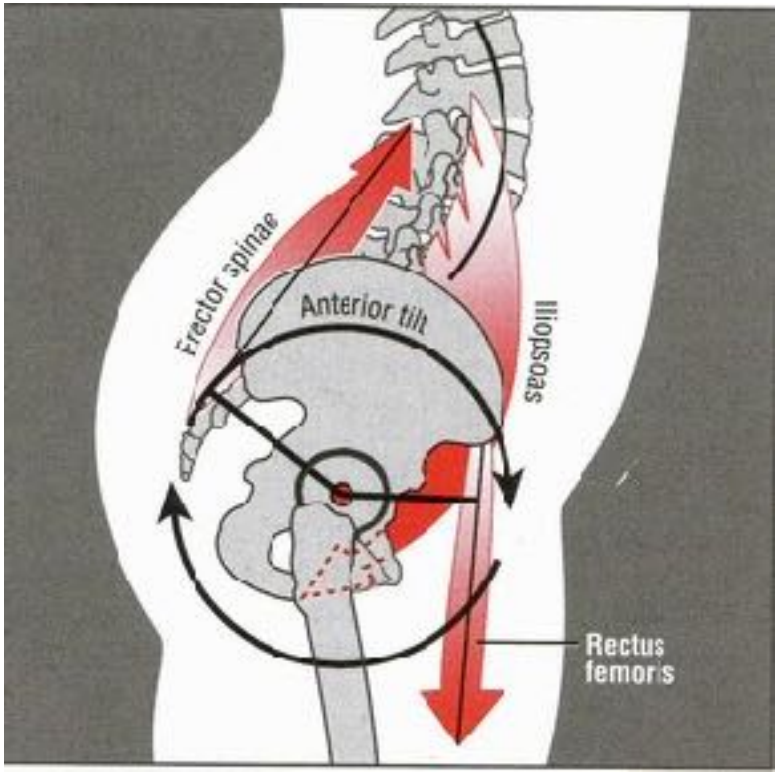
General Muscles Stretching in Back Arching Poses

- Stretching
  - Rectus Abdominis
  - Obliques
  - Transverse Abdominis
  - Hip Flexors
  - Deep neck flexors
  - SCM / scalenes



Back Arching Motions and Restrictions

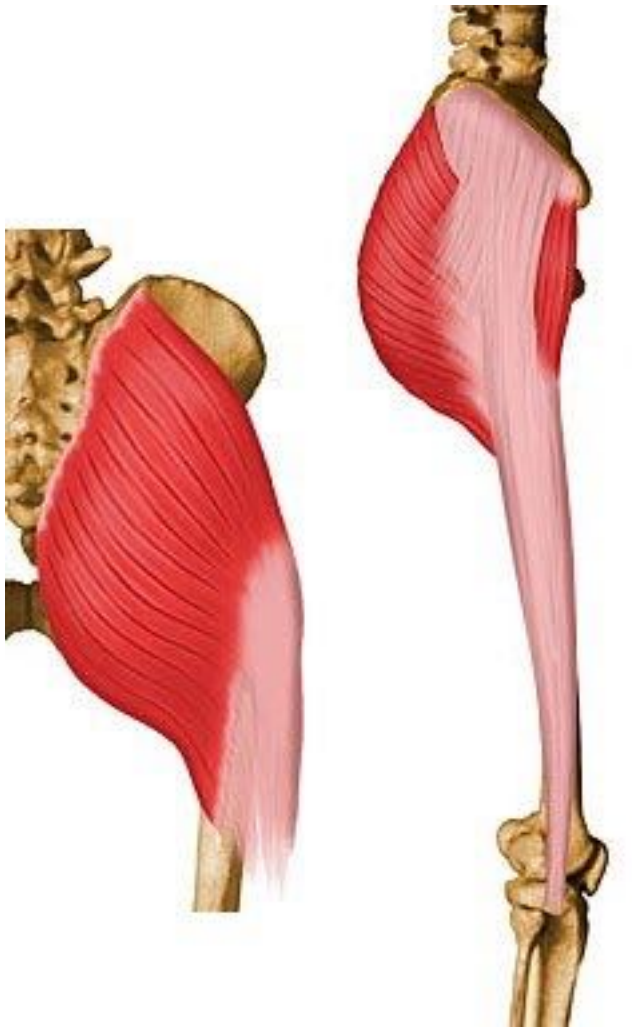
- Motion of back arch receives resistance from hip flexors = anterior tilt
- Arching moves into most mobile regions = lumbar / cervical
- Sacrum nutates
- Limitations
  - Thoracic structural restrictions
  - Hip flexor tension



General Glute debate

Using Hip Extensors

- Pelvis typically must undergo some element of hip extension
  - Isolate lower fibers of Gluteus maximus
  - Avoid lateral thigh rotation
  - Proximal hamstrings will assist



Abdominal Exploration

- Lack of pelvic isolation = rib thrust
- Airbag technique
- Distribution of back arch

Cervical Extension

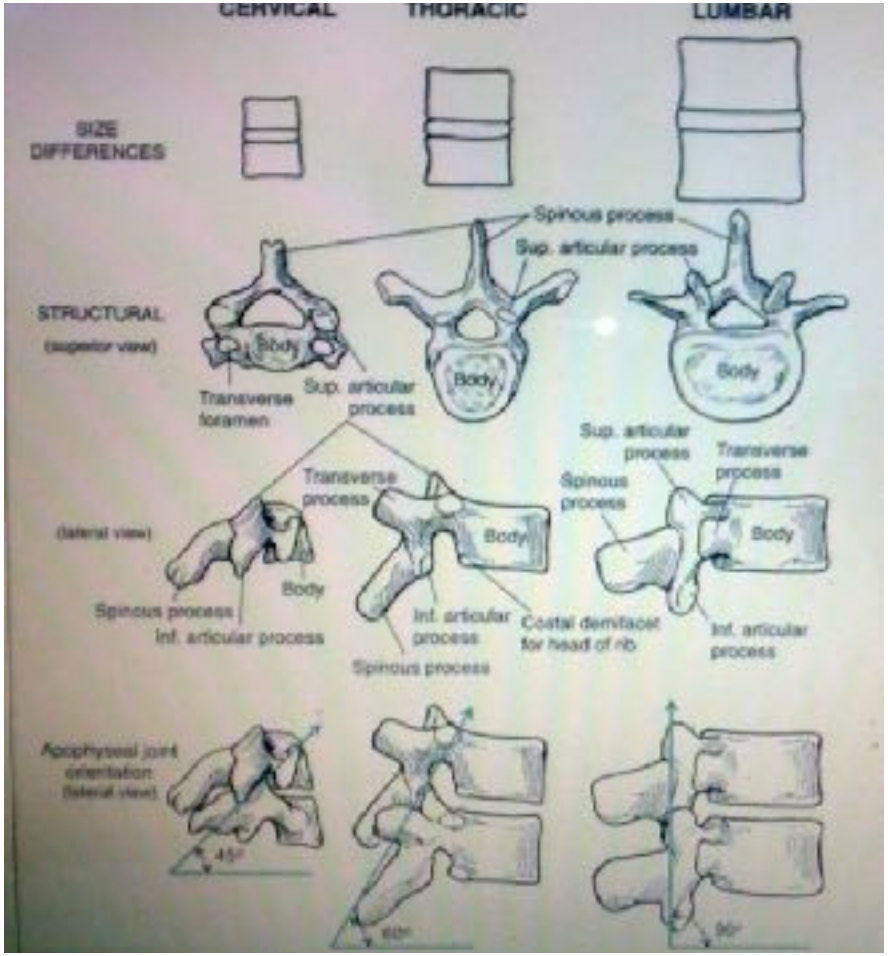
- Axial elevation
  - Reduce suboccipital congestion
  - ‘cervical flexion’ to distribute arch
- Positioning T1
  - Horizontal, supine arches like Camel
  - T1 parallel to mat before arching neck

Facet Joints and Rotation

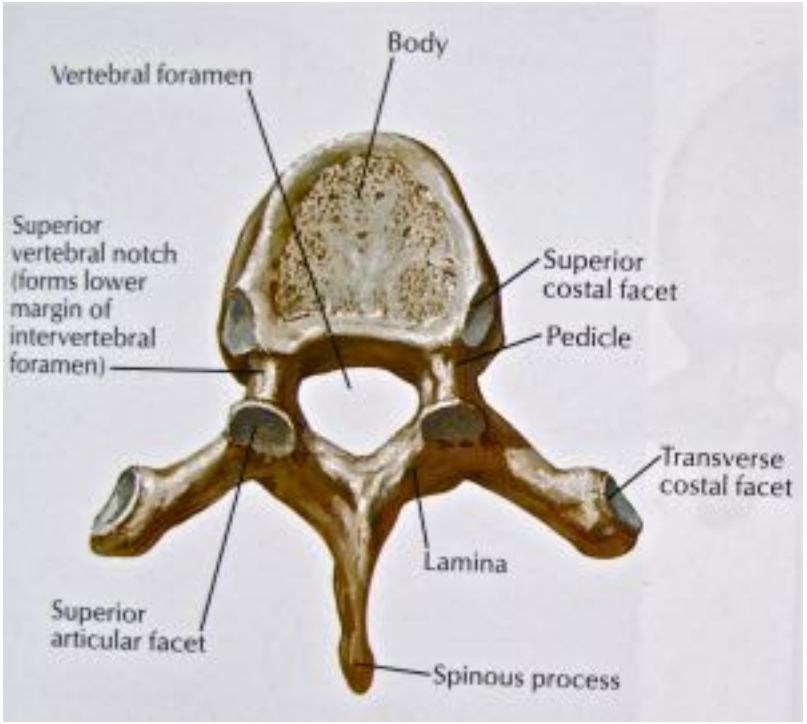
Cervical
- horizontal to 45 degrees
- 50% rotation at C1/C2

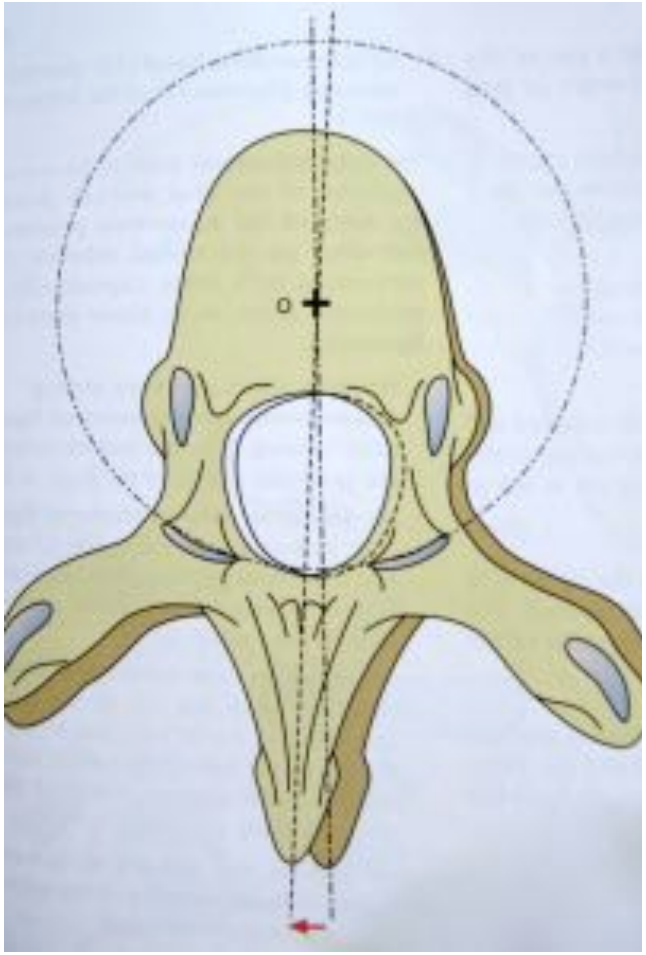
Thoracic
- 60 degrees
- rotation 2-9 degrees each level
- max in upper thoracic
- rotation decreases in lower

Lumbar
- 90 degrees (vertical)
- little rotation 1-2 degrees each level
- collective rotation 9-18 degrees



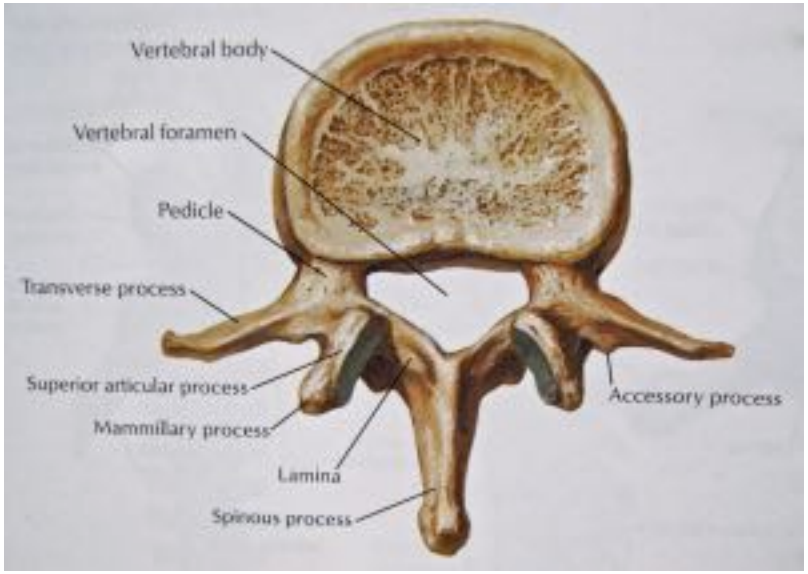
Thoracic Facet Joints and Rotation

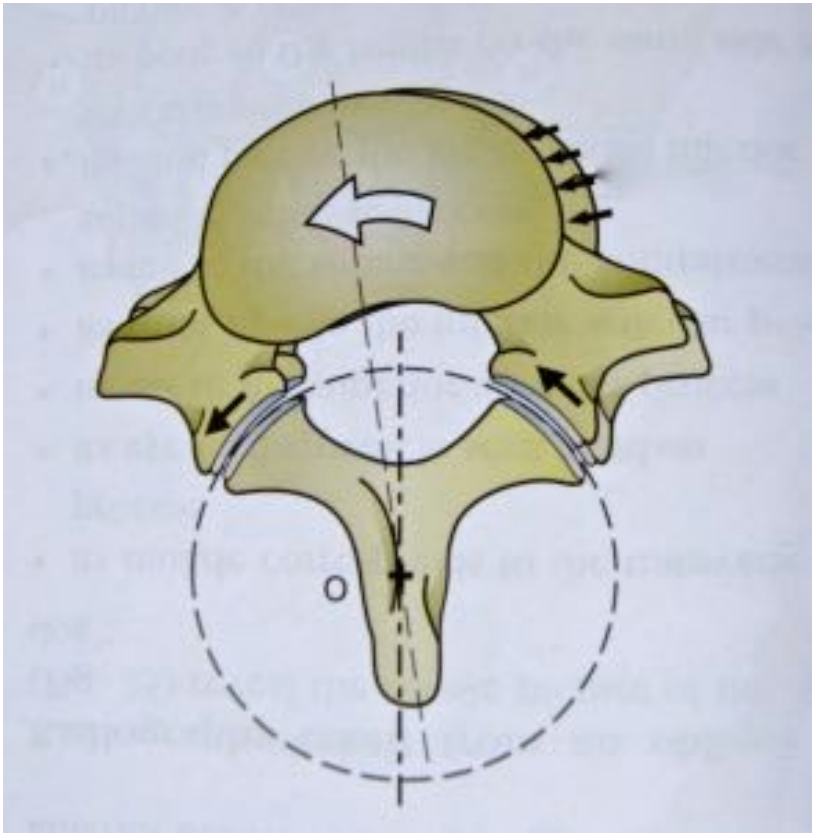




- thoracic facets face posteriorly
- axis of rotation at center of body + disc
- low shear – functional for rotation

Lumbar Facet Joints and Rotation





- lumbar facets face inwards
- axis of rotation lies to base of spinous process
- greater shear on disc and decreased capacity for rotation

Twisting Approaches

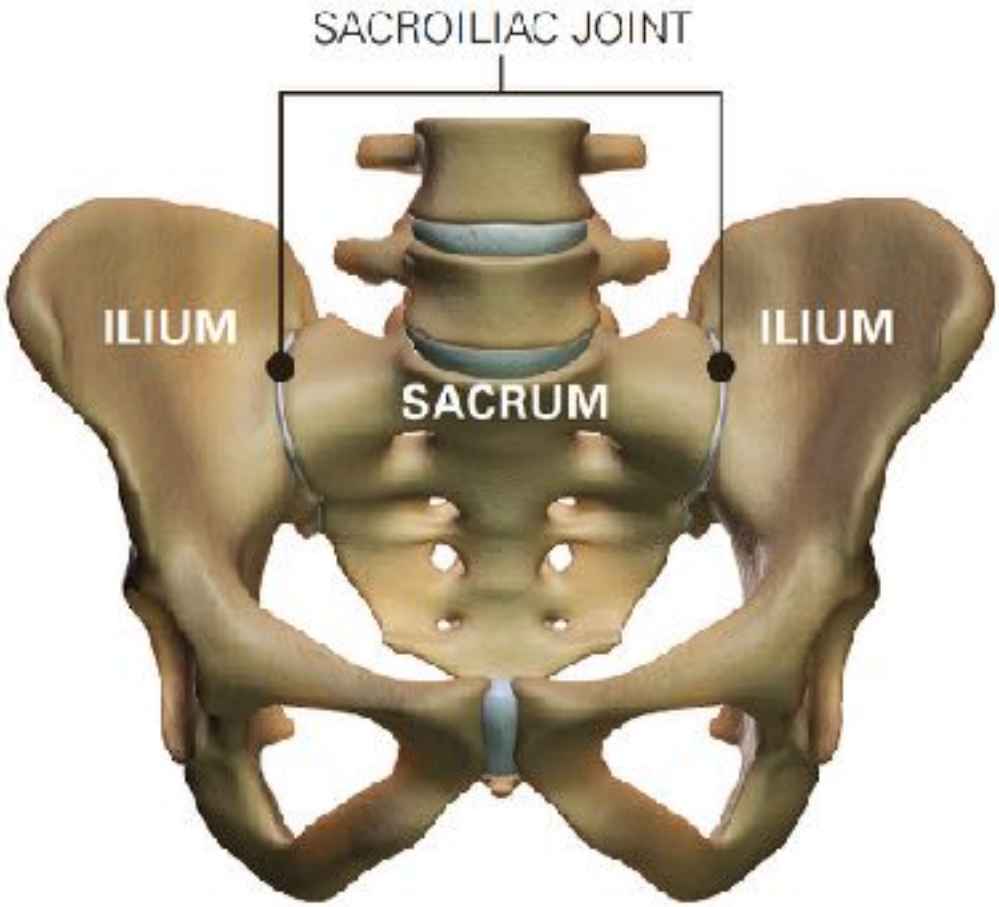
- Align neutral like mountain pose
- Establish curvatures to distribute force loads across all vertebral joints and to minimize localized compression

Twisting Approaches

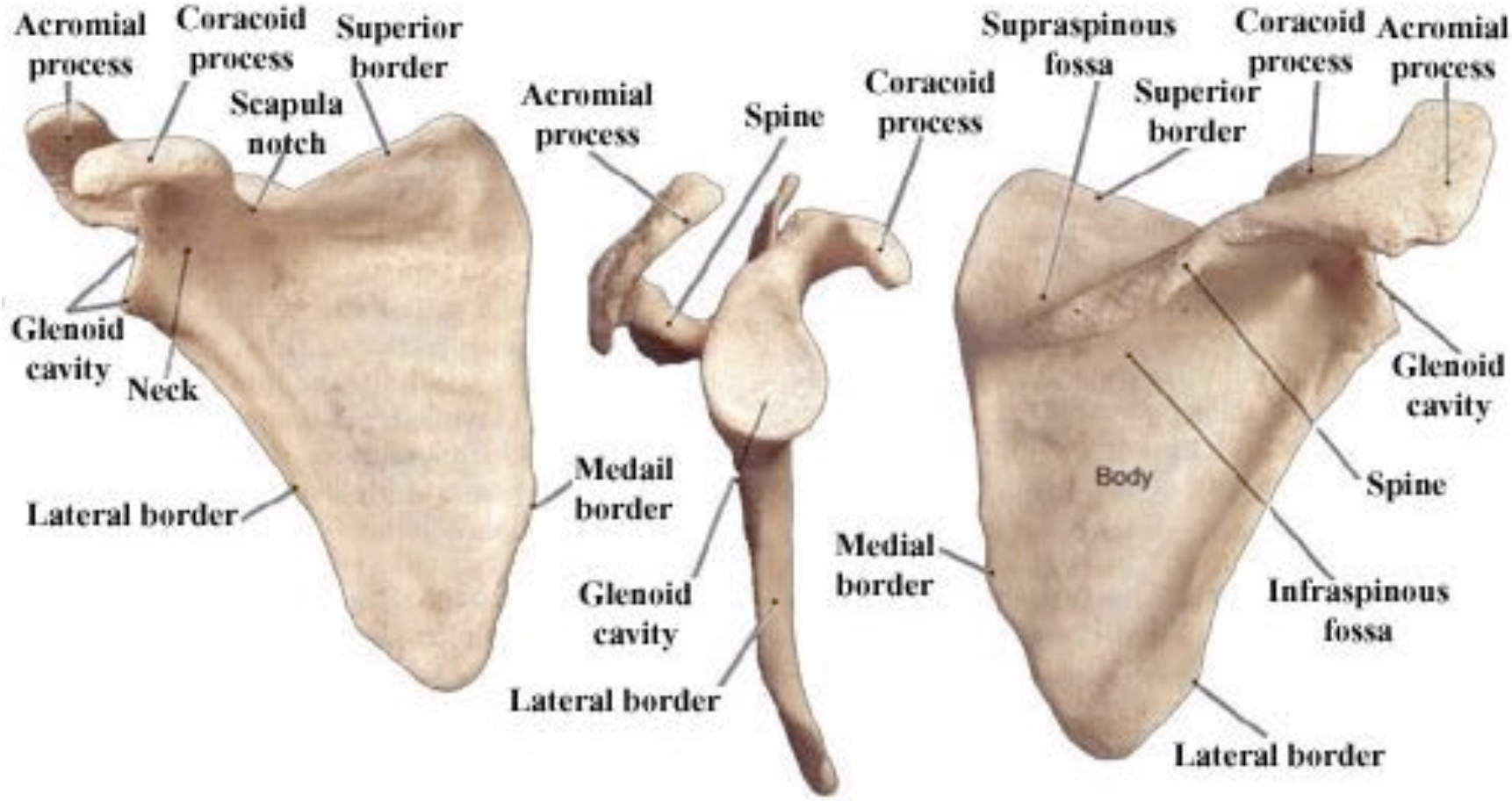
- Rotate with inherent ROM of each region (binds?)
- Keep it simple / less is more?
- Isolate movements / remove kinetic chain lines of resistance?

Twisting Approaches

- Reducing stress on SI joint



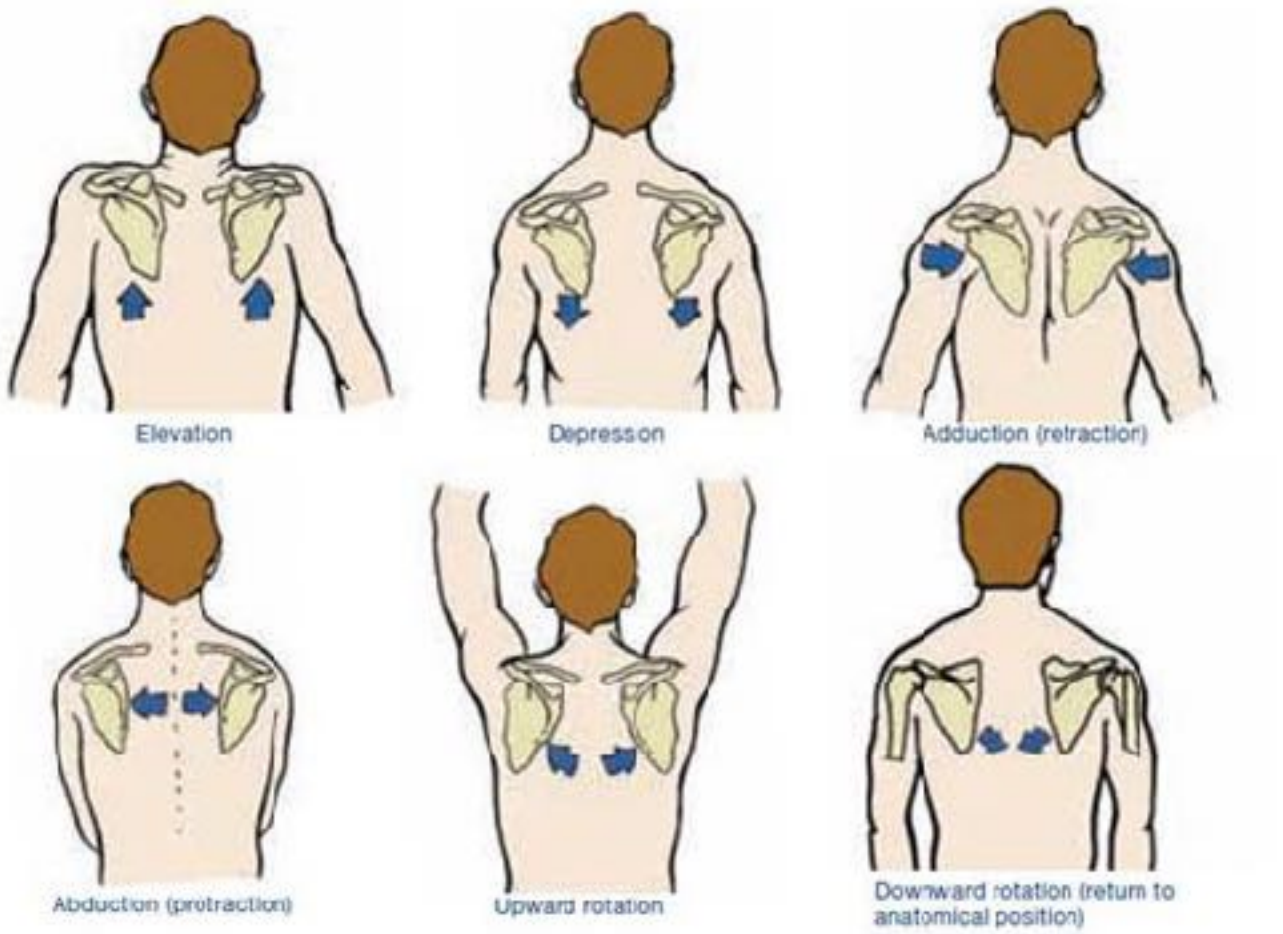
Shoulder and Scapula



All right views

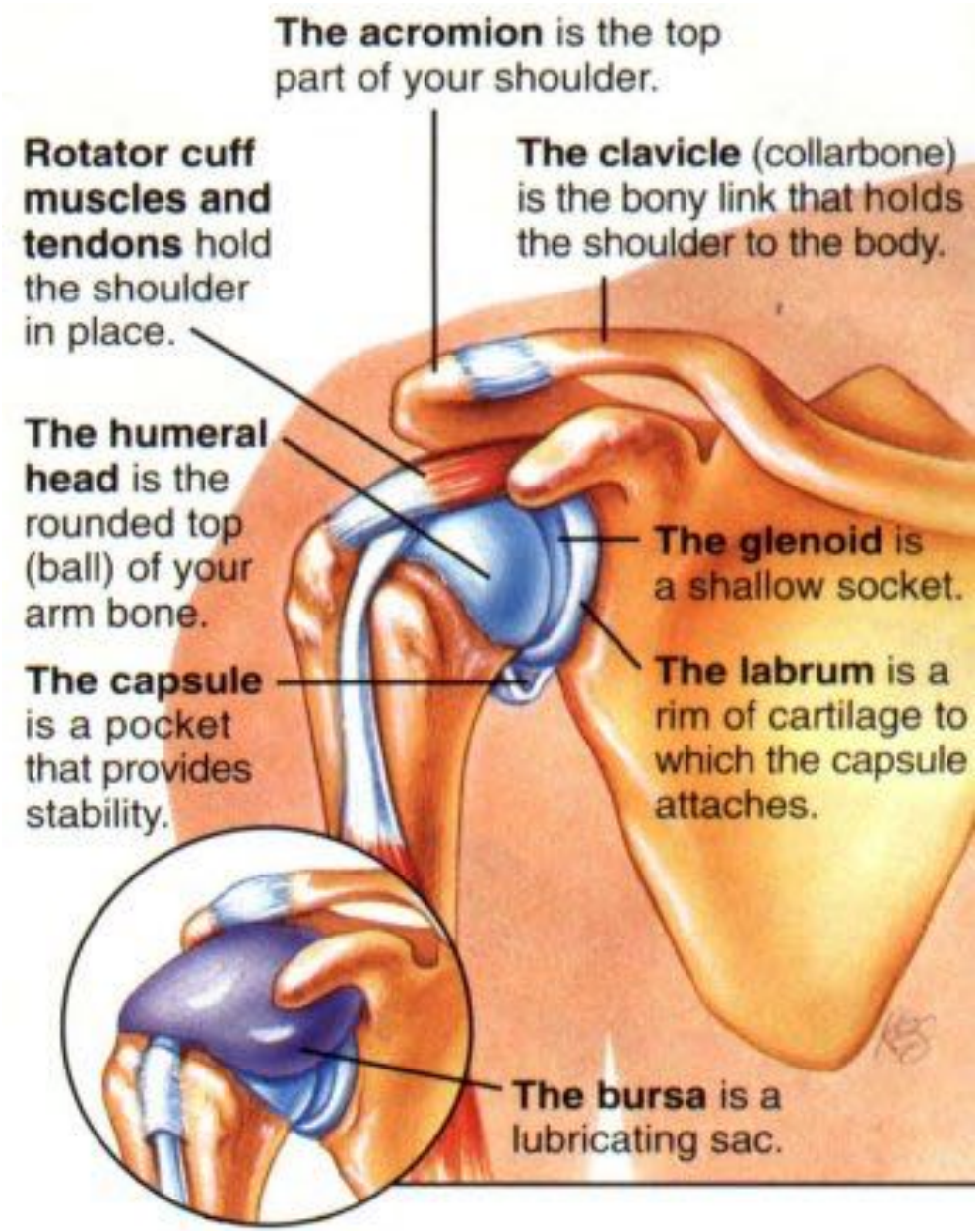
Scapular Movements

Figure 3-34
Scapular movements



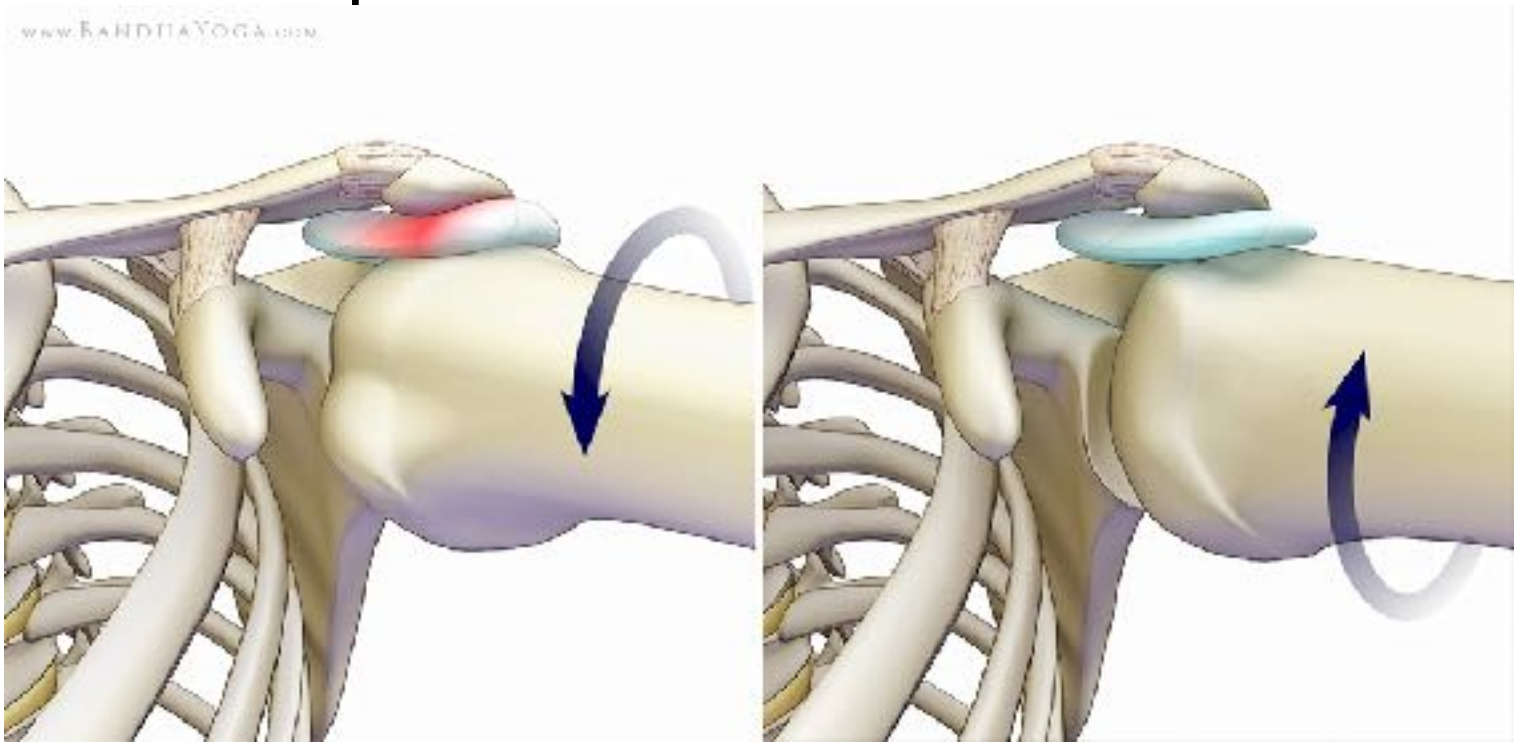
Shoulder Joint

Glenoid fossa (cavity) is shallow and contains the **glenoid labrum (**fibrocartilage**)** which deepens it and aids in stability / most mobile joint but also most unstable.

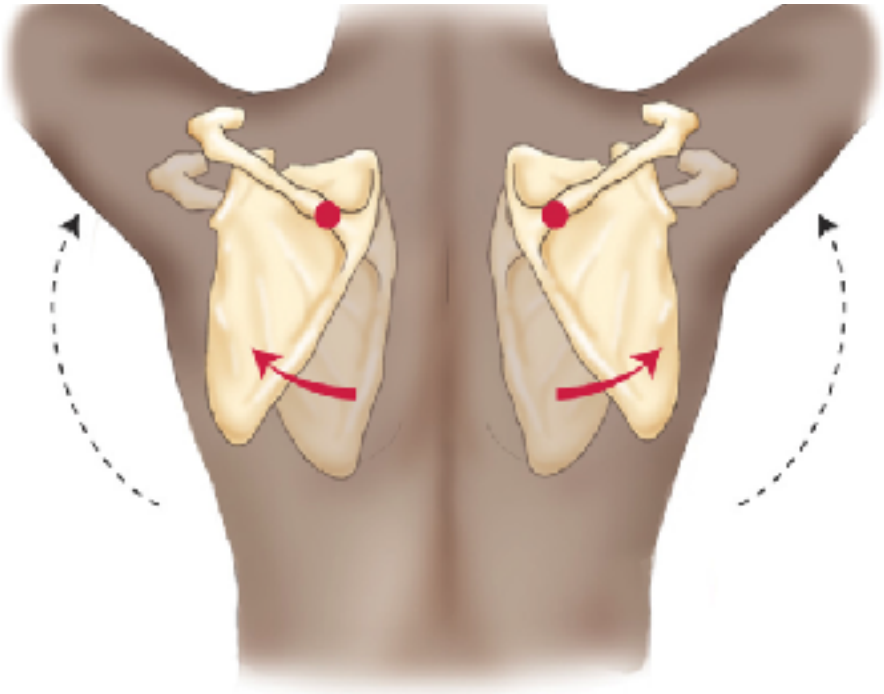


Shoulder Impingement

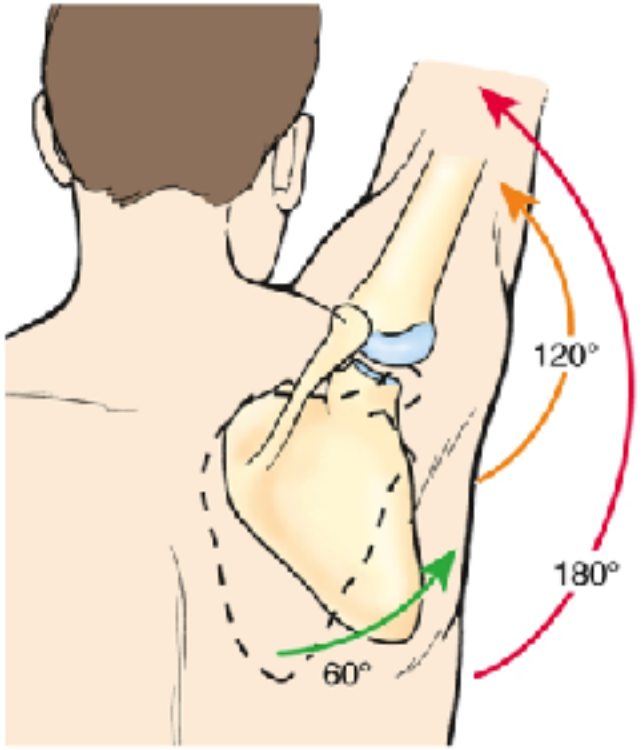
Tendency for internal rotation of humerus (habitual posture of round shoulders and elevated scapula) – use external rotation to reduce impingement of subacromial space



Shoulder Impingement



A Upward rotation

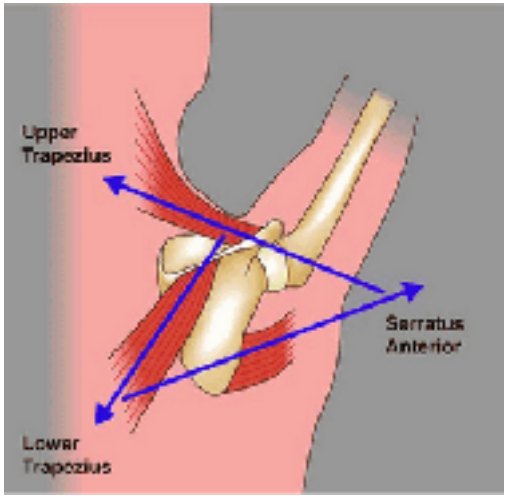


(C) Scapulo-humeral rhythm. The scapula and humerus move in 1:2 ratio. When the arm is abducted 180 degrees, 60 degrees occurs by rotation of the scapula, and 120 degrees by rotation of the humerus at the shoulder joint.

Shoulder Impingement

Kinetic Chain elements

- Serratus Anterior engagement
  - Scapula and clavicle work to increas motion of arm bone
  - Scapular upward rotation to reduce impingement and stabilize shoulder
  - Note difference from elevation and depression



Shoulder Impingement

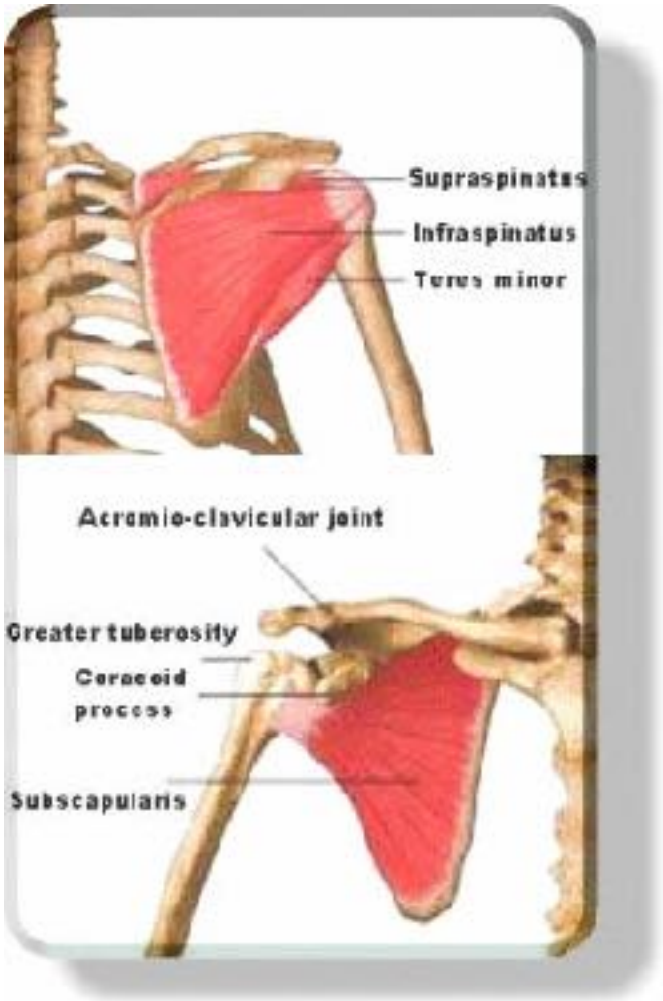
Variability in scapular structure requires us to address uniqueness in posture positioning.

Scapula and Stabilization

- Scapula and Clavicle bones **create a 'strut'** to transfer energy from the thorax, enhance movement of the arm bone, and stabilize overall upper movements
- Serratus Anterior stabilizes scapula to allow for proper energy transfer
- **Destabilization of shoulder girdle** breaks the healthy kinetic chain from thorax to arms AND often resonates back negatively through the chain.

Scapula and Destabilization

- Rotator Cuff
  - stabilizers vs ‘prime mover’ in key poses
  - sheer forces and tension ‘drag’?

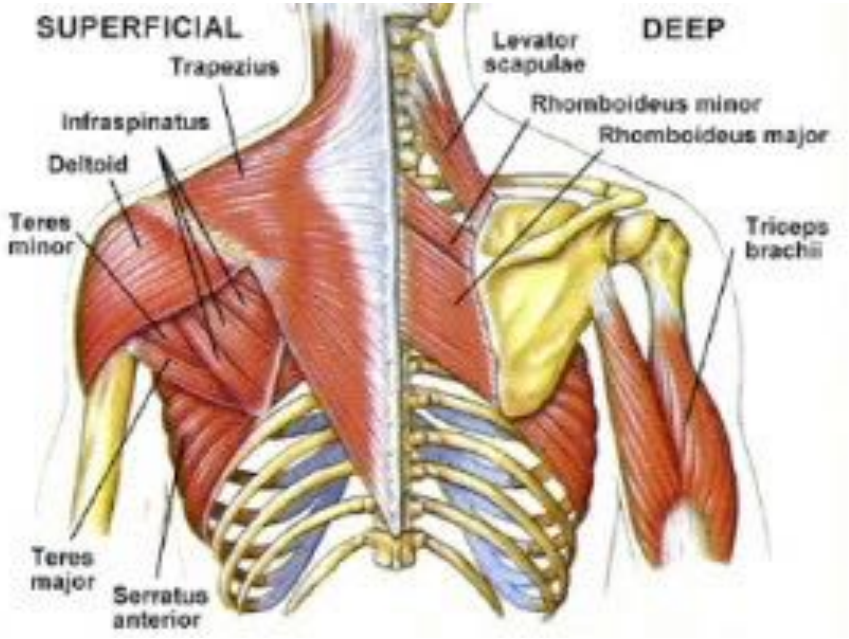


Pecs Minor: Stabilizing Cousin

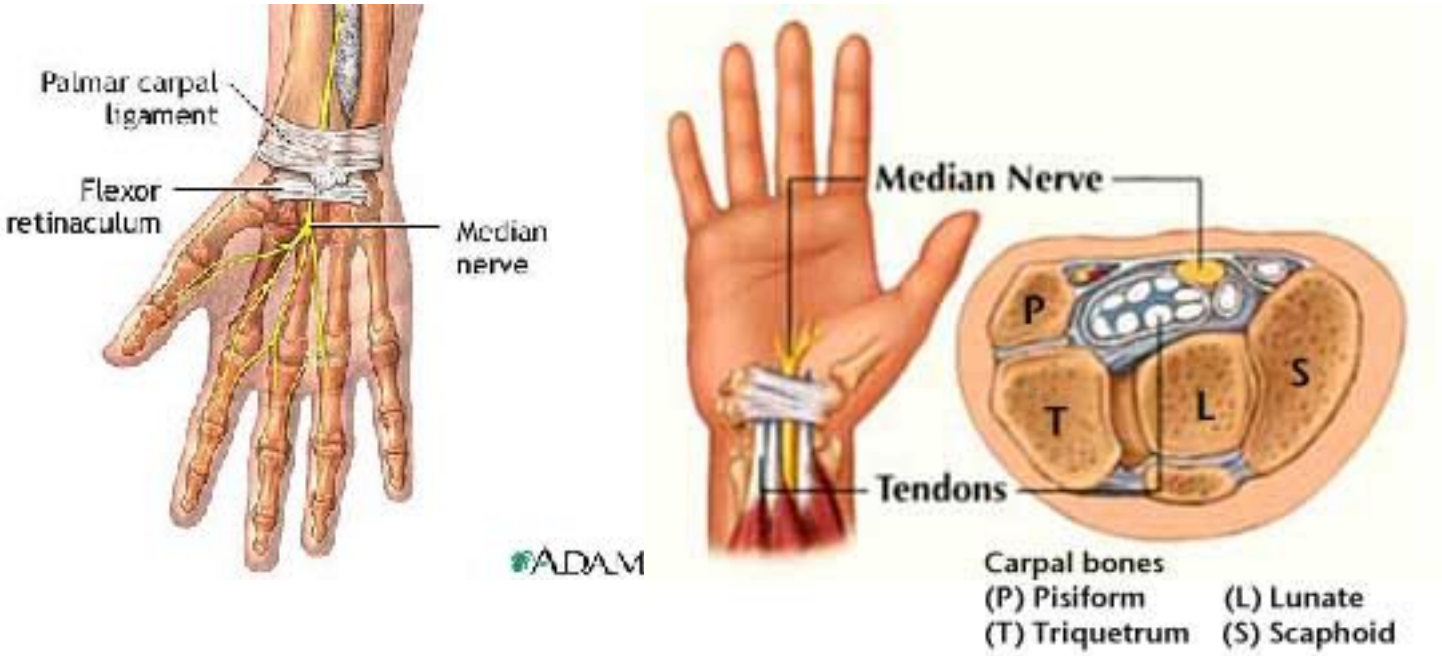
- originates from upper margins and outer surfaces of the third, fourth, and fifth and inserts at coracoid process of scapula
- assists in scapular protraction, depression and downward rotation

Other Stabilizing Cousins

- Rhomboids and middle trapezius retract scapula
- Lower trapezius depress scapula
- Infraspinatus, teres minor, post. deltoids external rotate arm



Wrist Anatomy

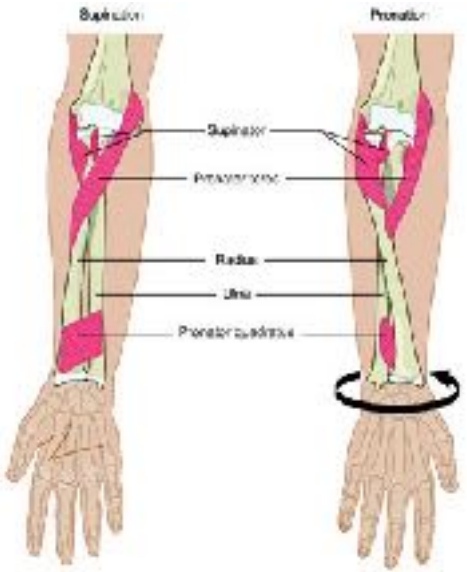


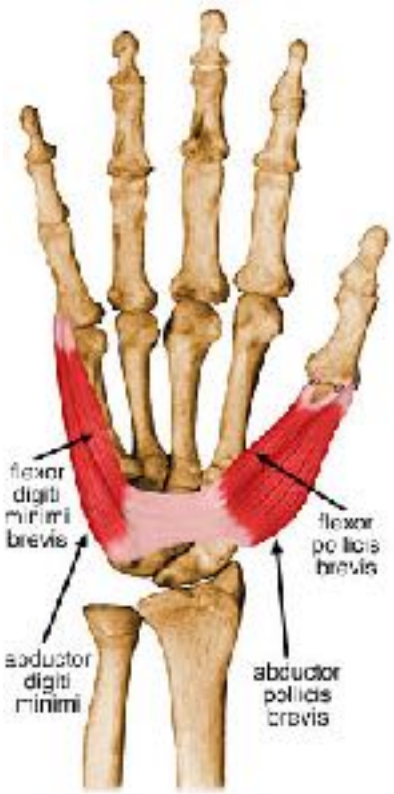
*carpal bones designed to form a ‘tunnel’ for passage of tendons and nerves … inflammation of median nerve leads to carpal tunnel syndrome

Wrist Anatomy

Weight distribution studies:

- Wider hands sends forces into thenar region (thumb)
- Closer hands sends forces into hypothenar region (pinky)
- Implications in various wrist loading postures?



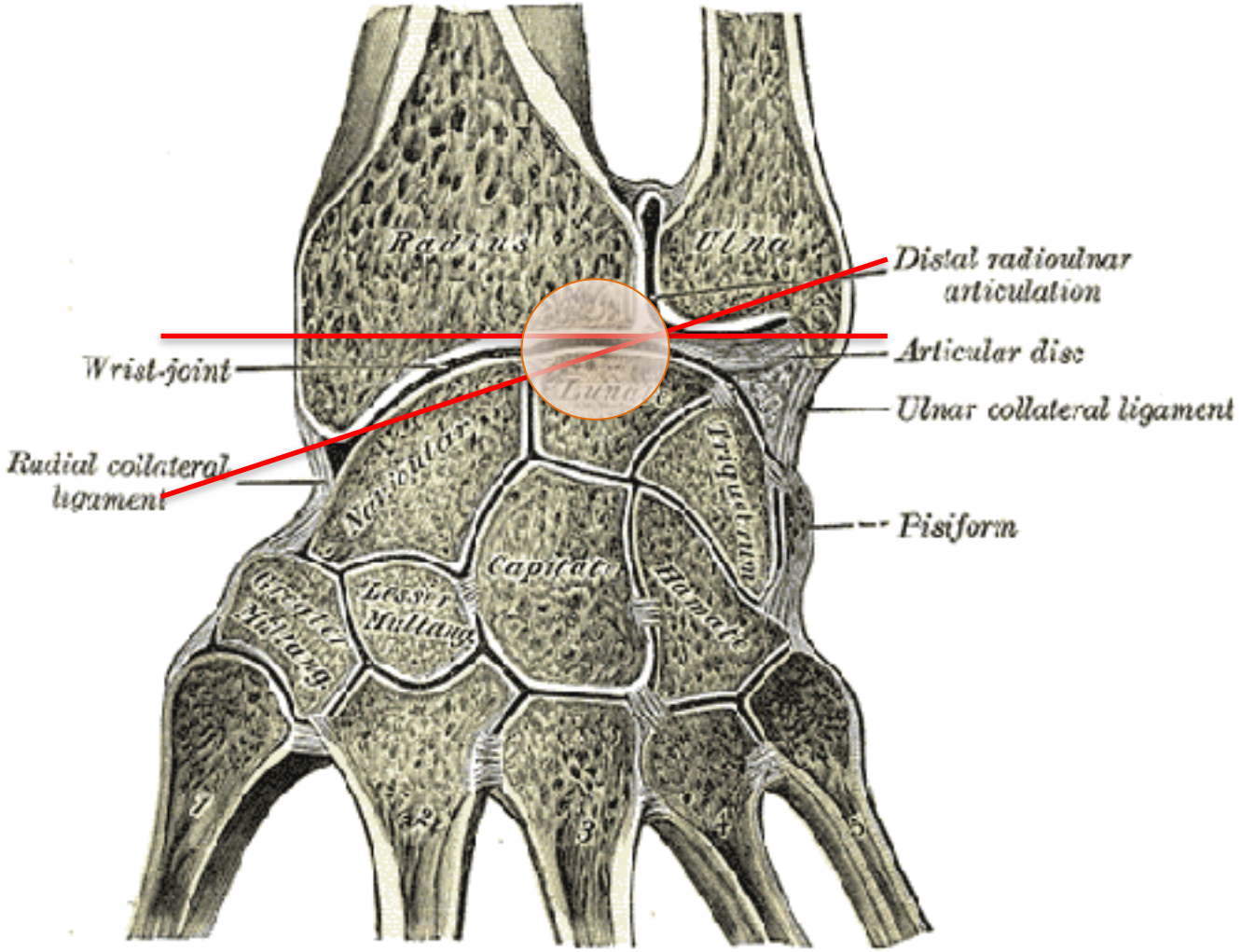


$$\text{Pressure} = \frac{\text{Force}}{\text{Surface Area}}$$

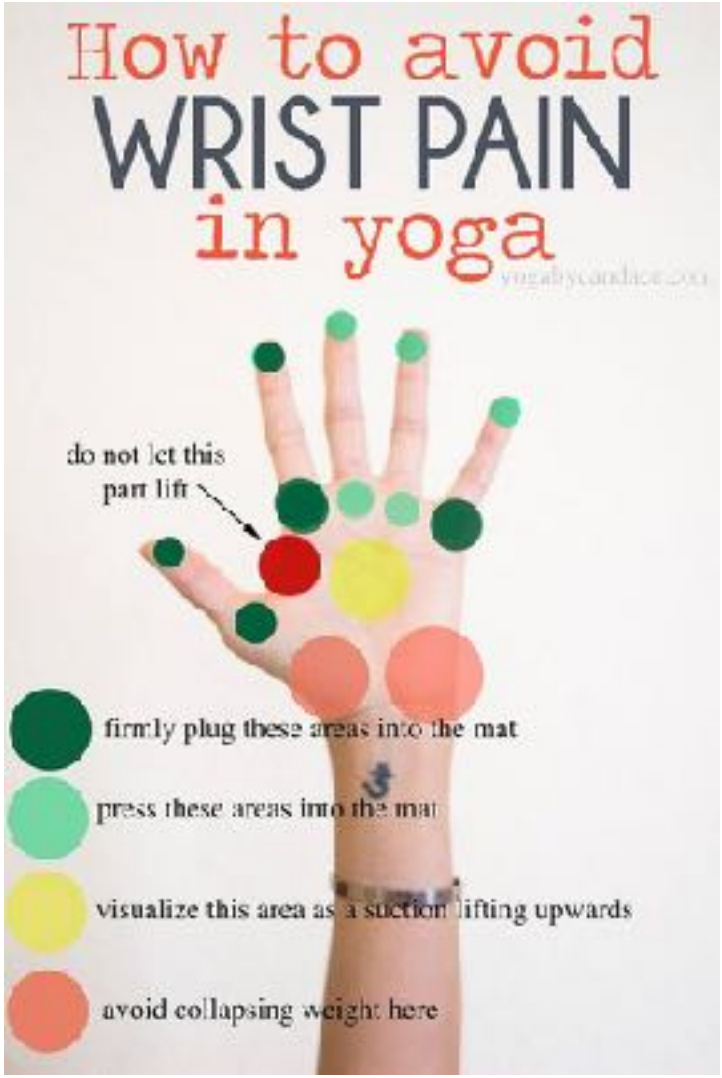
Triangular Fibrocartilage Complex (TFCC)

- Ulna – articulates via TFCC
- Radius 80% / Ulna 20% force loads?
- Without TFCC, Radius 95% load
- Positive ulnar variance

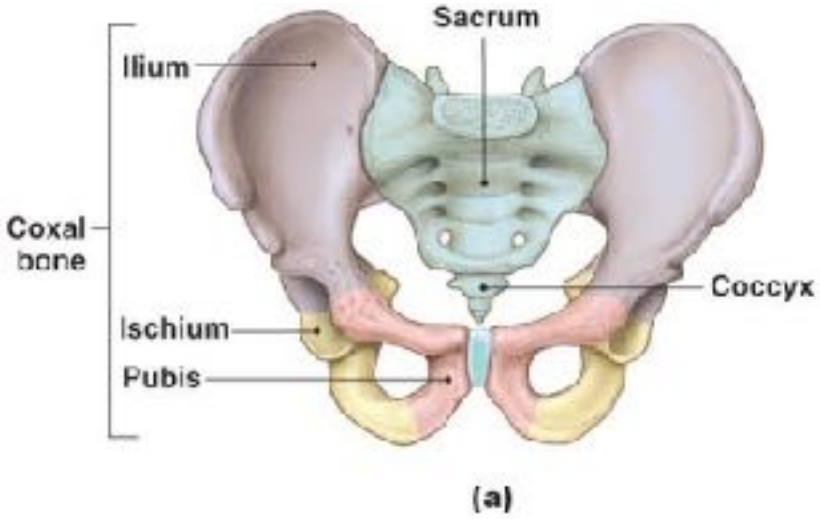
Radial Inclination

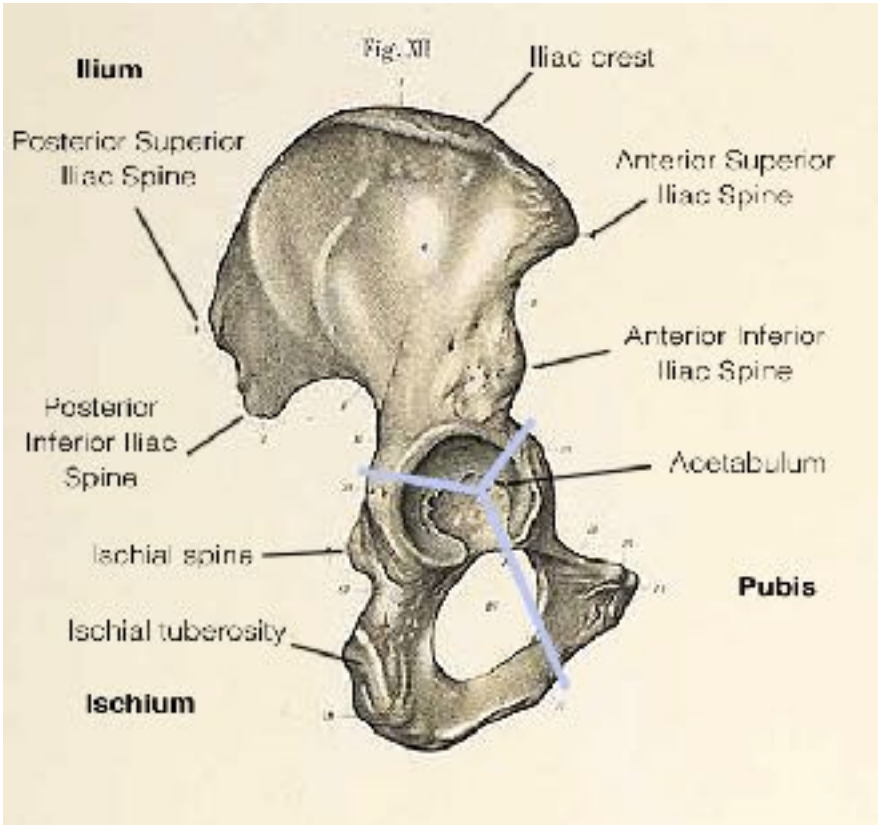


Wrist Loading Applications



Appendicular Skeletal System
Ilium, Ischium, Pubis

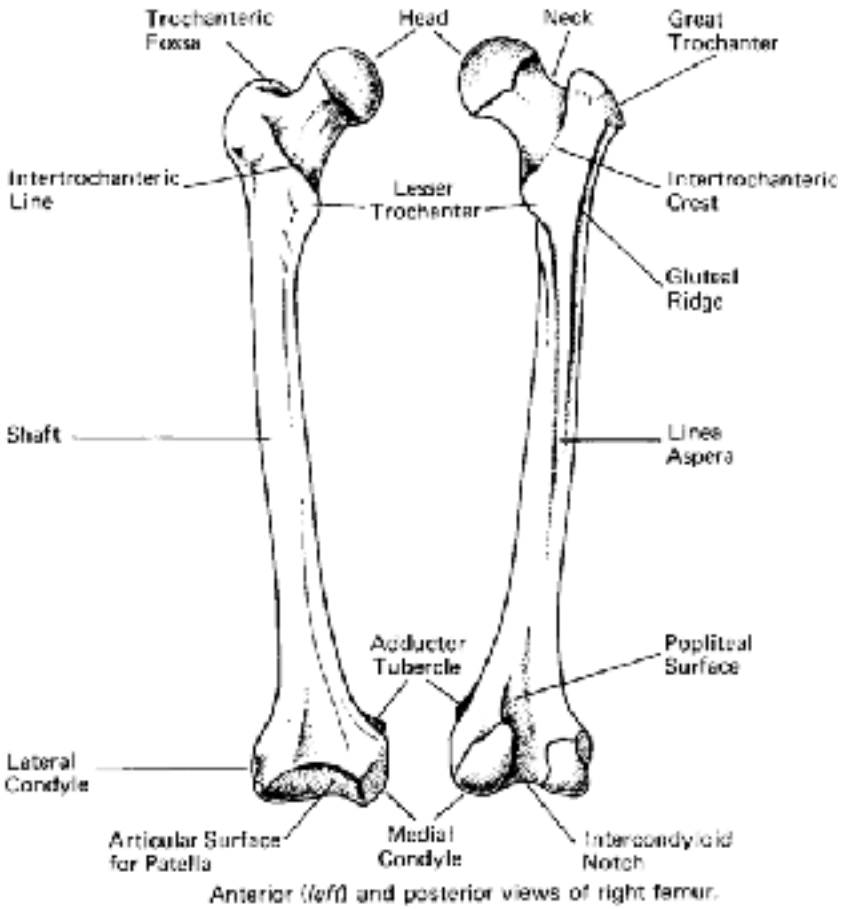




Appendicular Skeletal System
Femur

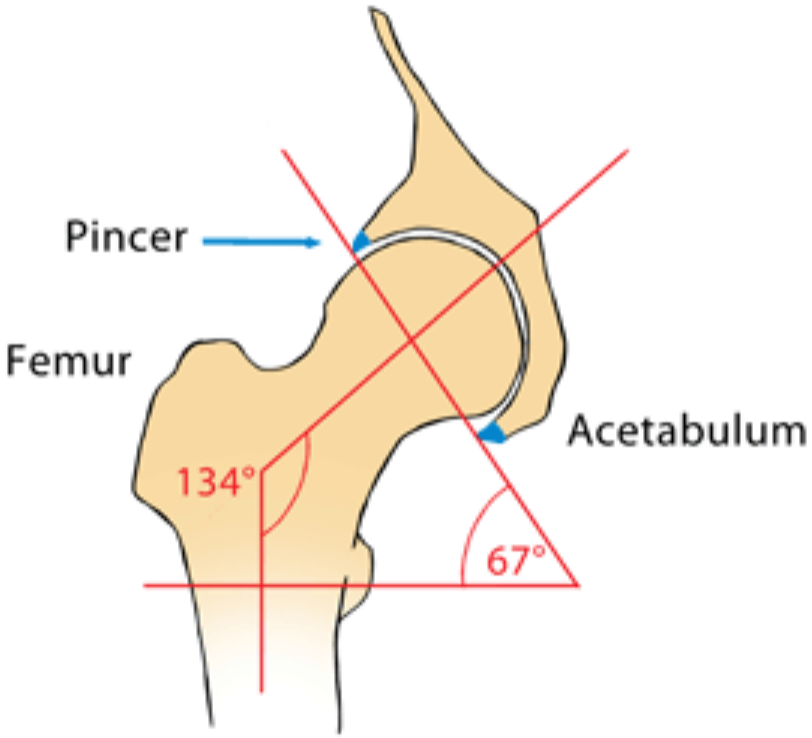
Femur key landmarks

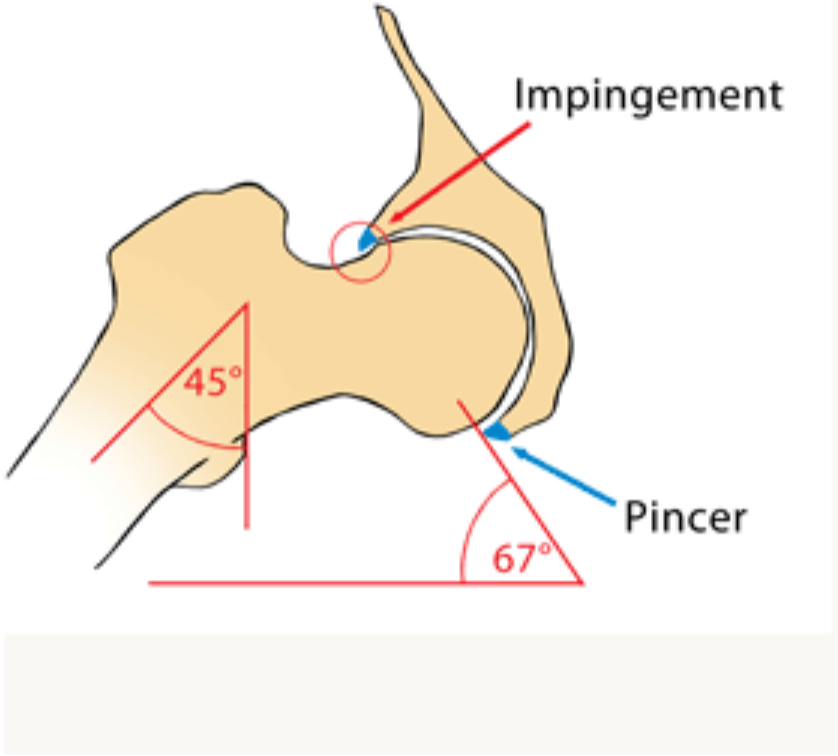
- head
- neck
- greater trochanter
  - attachment for gluteus muscles, lateral thigh rotators, and IT band
- lesser trochanter
  - iliacus and psoas major (hip flexors)
- linea aspera
  - major attachment point for major movers of hip



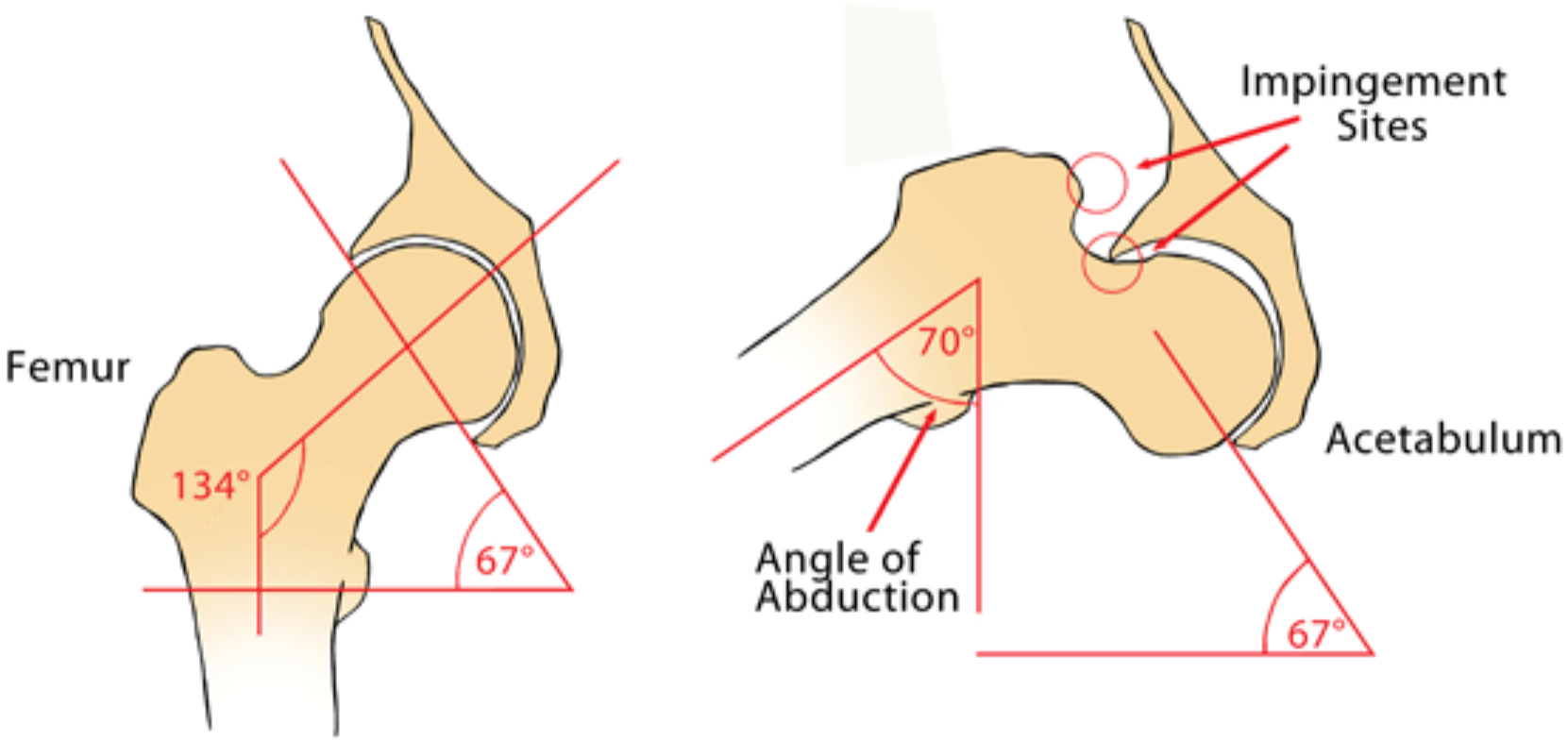
Anterior (*left*) and posterior views of right femur.

Hip Variability – Acetabular Depth

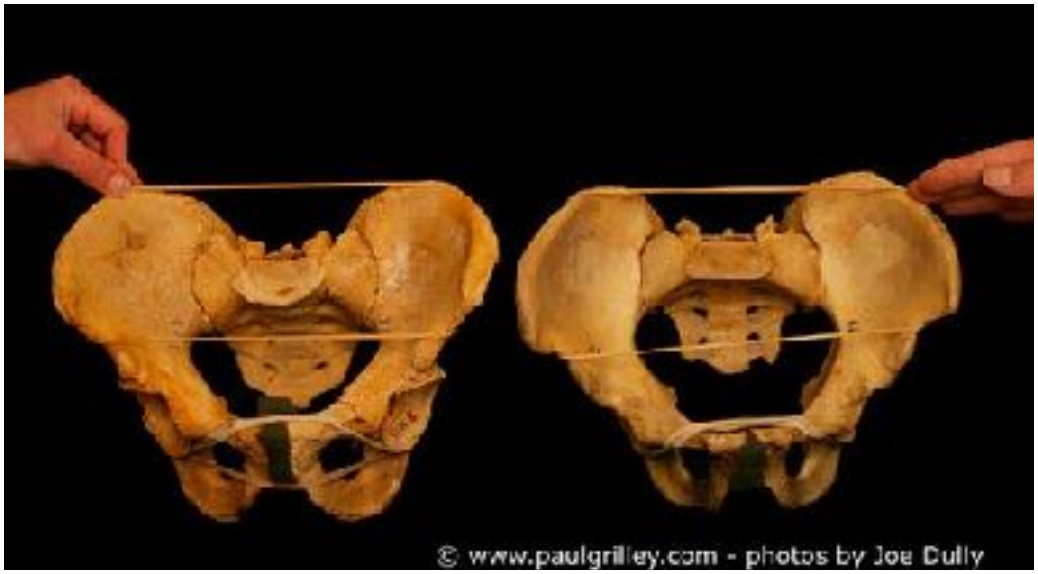




Hip Variability – Acetabular Abduction Angle

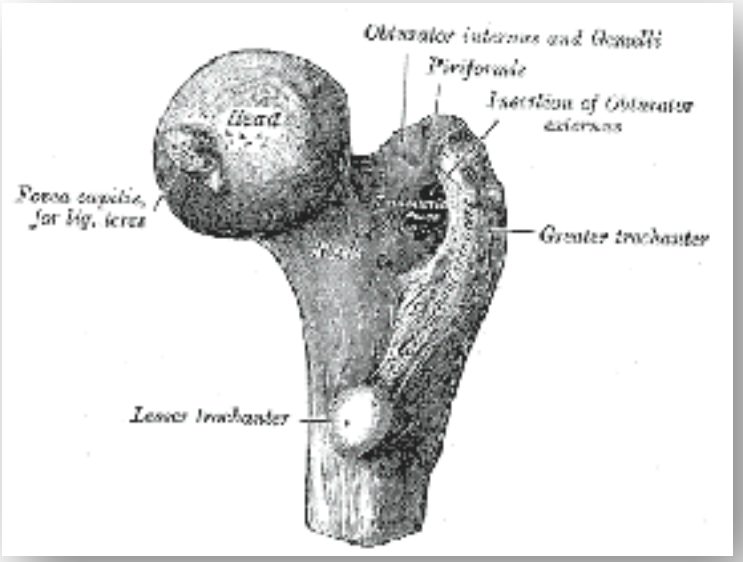


Hip Variability – Acetabular Version



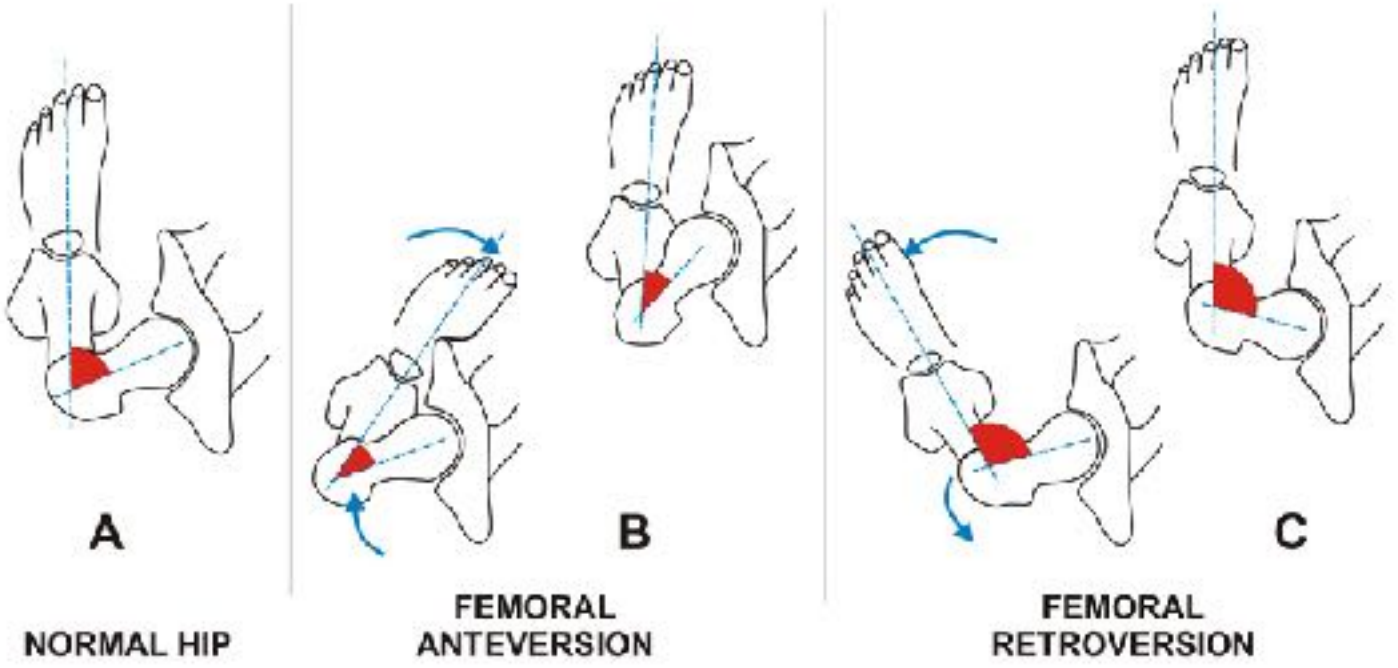
Anteversion vs Retroversion

- **What is femoral anteversion and retroversion?** "Anteversion" literally means "leaning forward." Femoral anteversion is therefore a condition in which the femoral neck leans forward with respect to the rest of the femur. This causes the lower extremity on the affected side to rotate internally (i.e. the knee and foot twists towards the midline of the body).
- Retroversion is a condition in which the femoral neck leans backwards with respect to the rest of the femur.

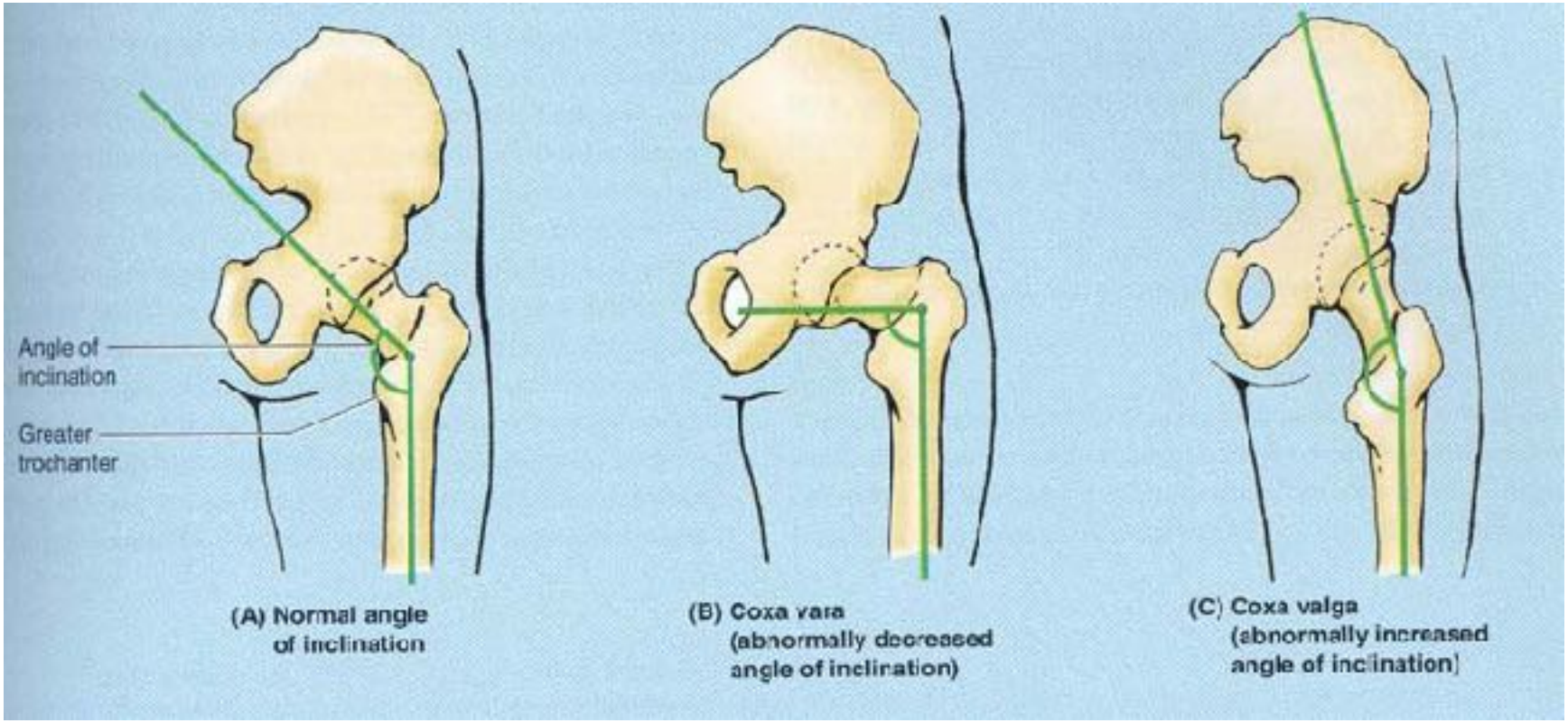


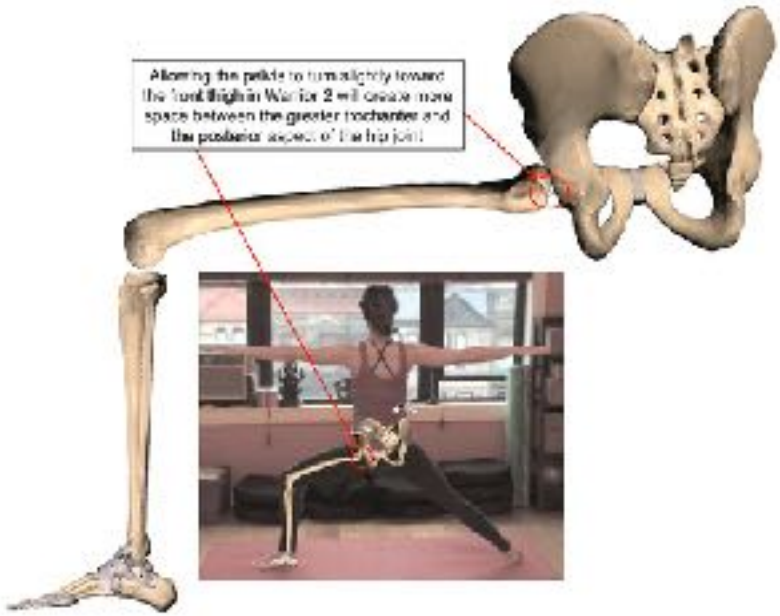
Version of Femur

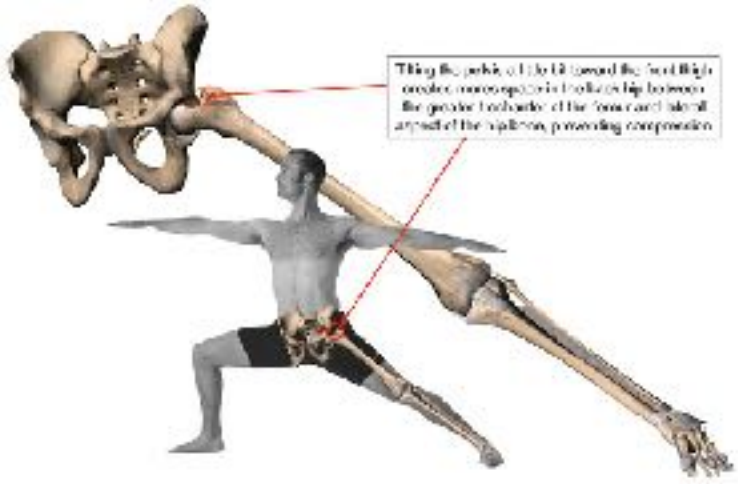
Version of Femur



Hip Variability – Femoral Neck Angle



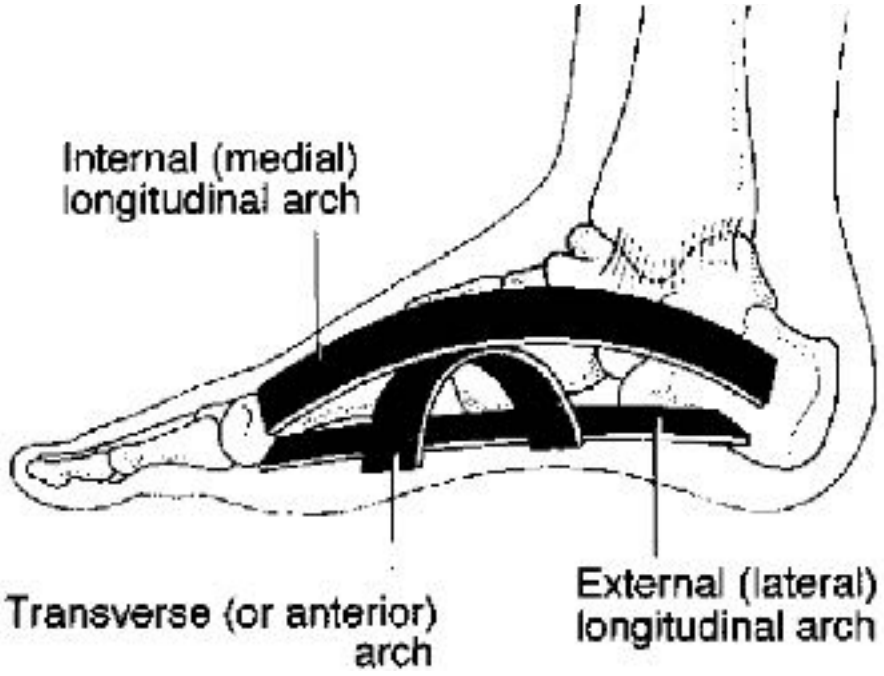

Allowing the pelvis to turn slightly toward the front (right in Warrior 2 will create more space between the greater trochanter and the posterior aspect of the hip joint



Appendicular Skeletal System
Arches of Foot

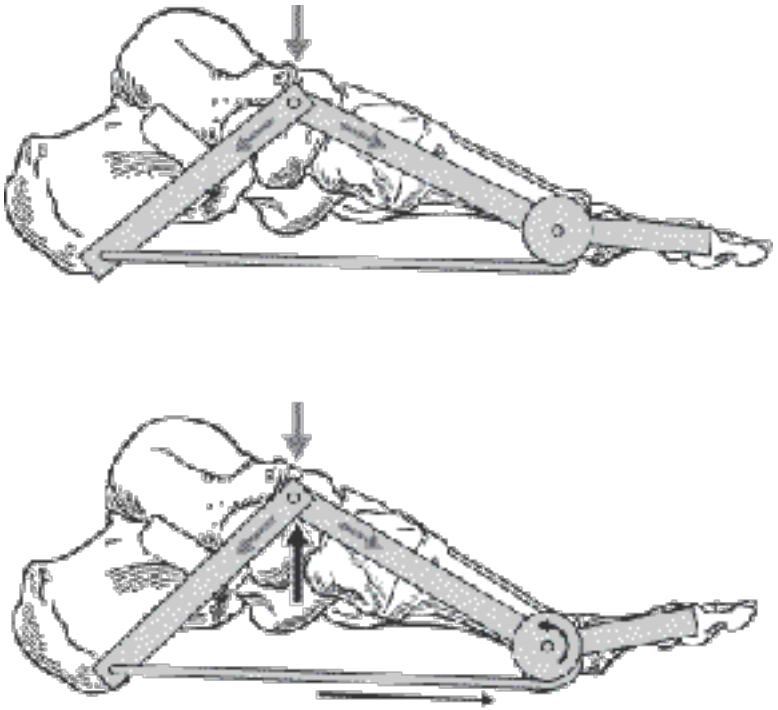
Arches formed by the tarsal and metatarsal bones

- supported by ligaments, tendons, muscles and plantar fascia
- allow foot to support the weight of body in erect posture with lease weight
- shock absorption in biomechanical kinetic chain



Muscle Anatomy

- **Plantar Fascia**
  - thick connective tissue which supports the arch on the bottom of the foot
  - runs from the tuberosity of calcaneus (heel) forward to the heads of the metatarsal bones



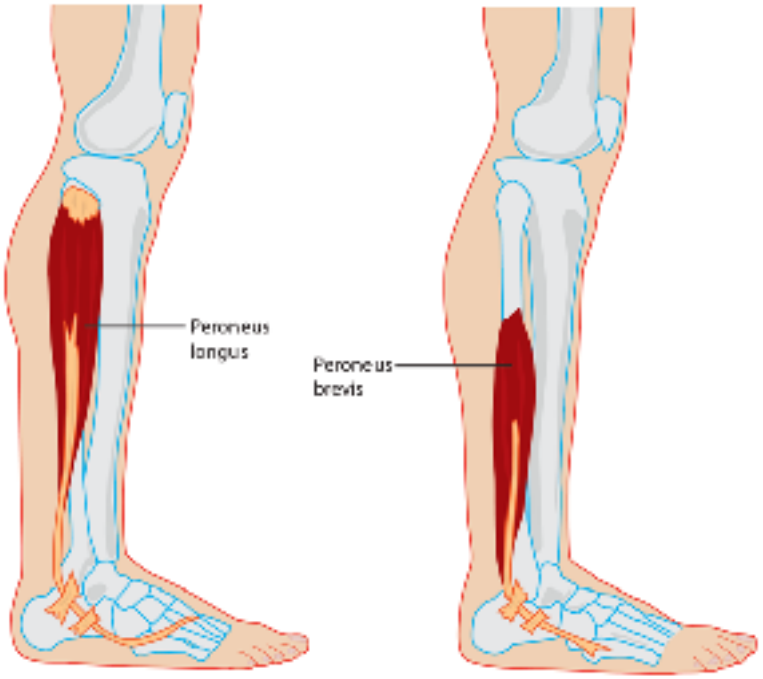
The windlass mechanism puts tension on the plantar fascia and raises the arch passively.
Le mécanisme de treuil applique une tension sur le fascia plantaire et soulève la voûte plantaire de façon passive.

Muscles Aiding Arch Support

Tibialis Posterior

Tibialis Anterior

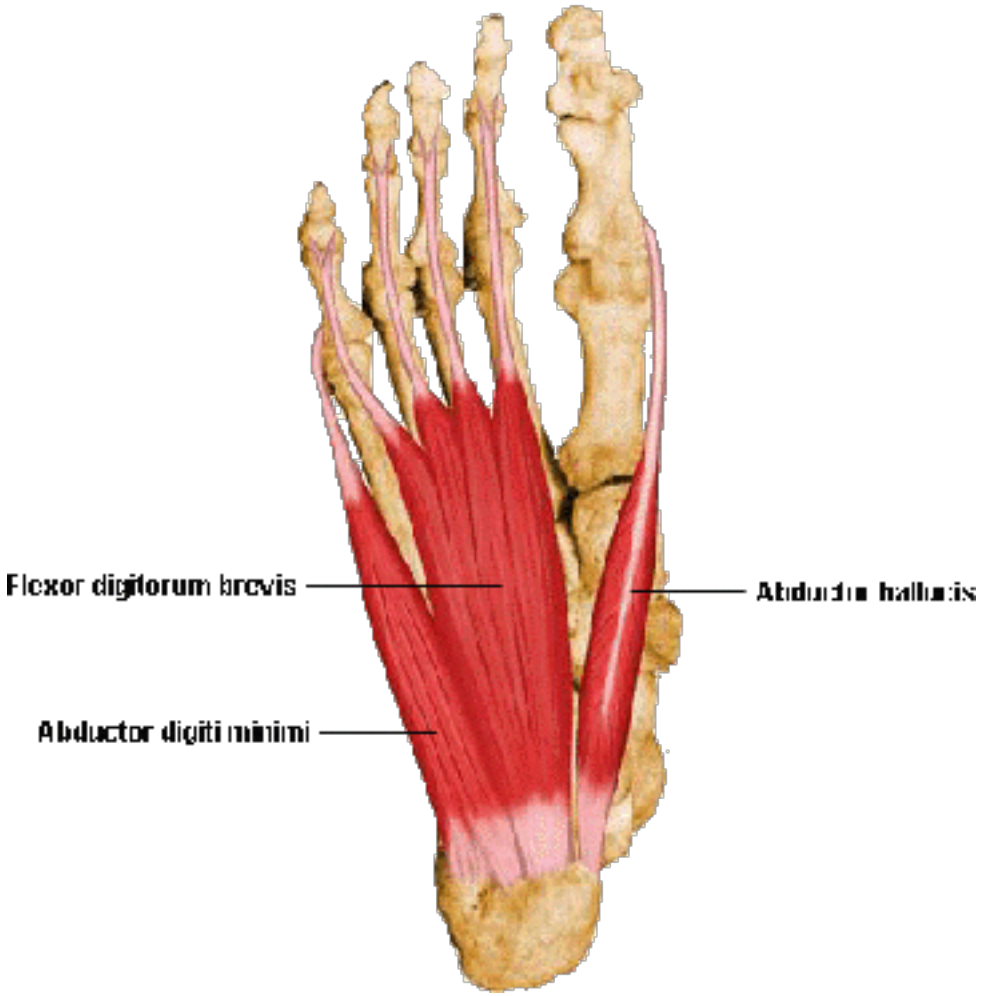
Peroneus Longus & Brevis



Muscles Aiding Arch Support

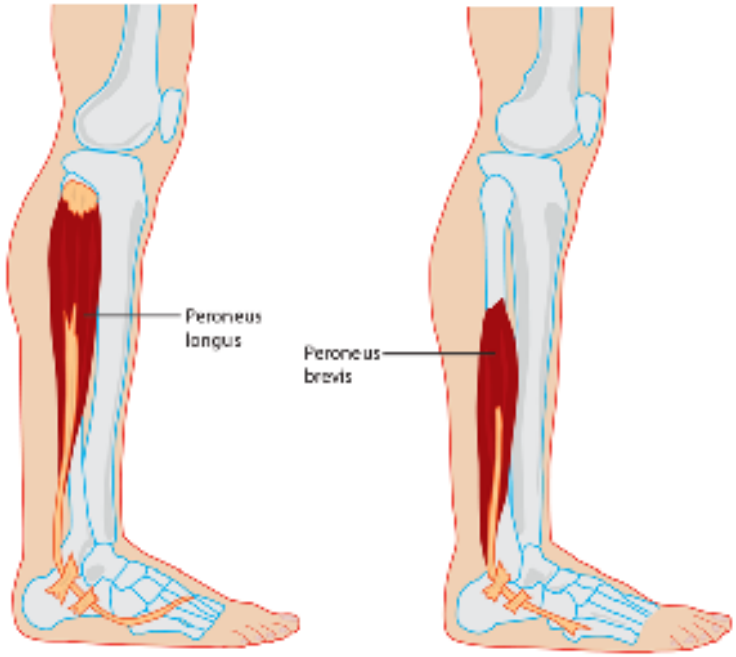
Abductor Hallicus

Flexor Digitorum Brevis



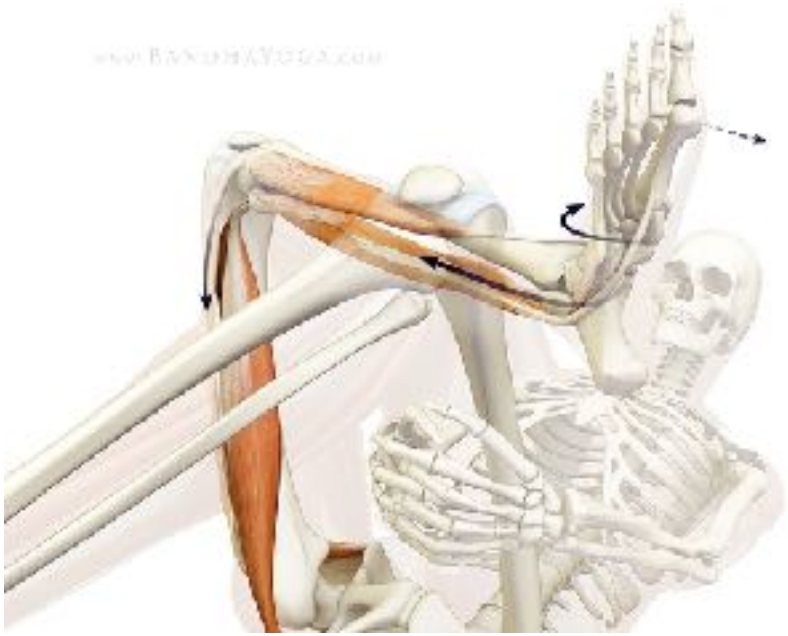
Knee Stabilization

- myofascial connection from Anterior Tibialis, Peroneus Longus and Bervis with IT band/ TFL/Biceps Fermoris



Knee Stabilization

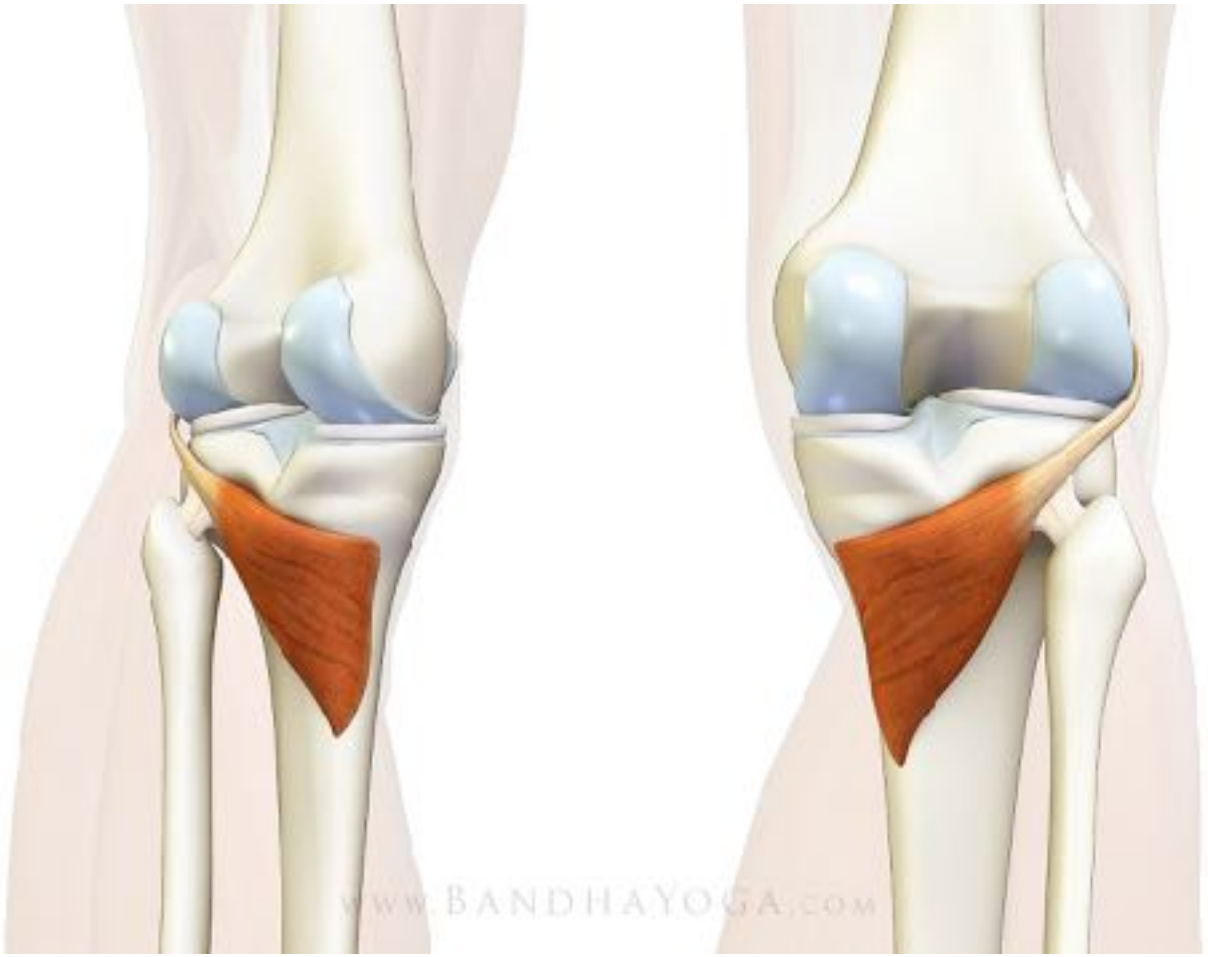
- engagement of peroneals and anterior tibialis can brace lateral aspect of knee, prevent overstretching of lateral capsule, plus facilitate medial knee capsule stability and decompression
- slight external rotation of ankle further engages biceps fermoris (lateral thigh)



Knee Stabilization

- Where this could be applied: pigeon, thread the needle (variations), reverse pigeon, window pose, fire log pose, balancing fire log, janu sirsasana etc

Knee Hyperextension + Locking



Hatha Yoga for Core

Design considerations

- ‘core’ is not just abs
- functional / demographics?
- maintain tension relationships
- integrity and kinetic chain
- fascial interactions
- fatigue and PA benefits