FLEXIBILITY AND MOVEMENT: THE SCIENCE BEHIND THE MAGIC

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USA GYMNASTICS NATIONAL CONGRESS

2025

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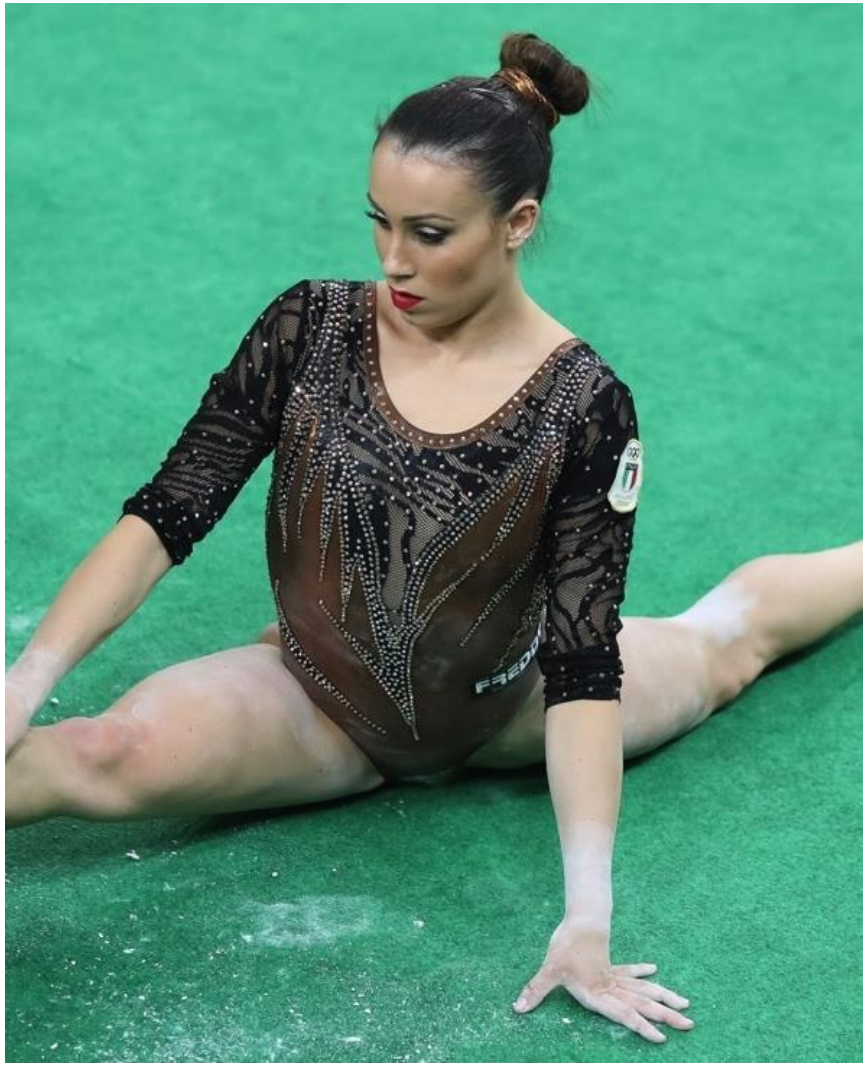
WHAT IS FLEXIBILITY?

1. The **ability** for the muscle to lengthen
2. Total length available (**AvROM)**
3. **Joint motion** to allow the muscles to lengthen
4. The lack of ability of the muscle to fight back, **resting tension**, low = good
5. The lack of **trigger points** (which are reactive, and not flexible)
6. The ability to recover from day before, with flushing lymphatics, to allow the body to ***utilize*** the flexibility that it has
7. **Activation of the opposite** muscle to move the joint, and the passive muscle to allow it
8. Body understanding of simply how to **attain the positions**
9. H-I wave overlay- body lack of fear of being at the end of its rope, per se' (**absence of guarding/apprehension)**



FLEXIBILITY - WHEN

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HOW IS THIS RELATED TO POWER/STRENGTH?

1. Theories of how the more flexible you are, the less power you can have
2. If you increase flexibility in the muscle (Remember this means… length, lack of tension, lack of guarding, increased joint motion, decreased tension and trigger points) then…
    1. You must educate the body on how to maintain stability since there is more available range
    2. You must educate the body how to *use* this new available range
    3. Example: shoulder flexion vs intercostals, abs and lats
    4. Example: spine extension vs abs

BASIC PEARLS

1. Louder and repetitive does not mean learning.
2. AR= Available Range
3. AF = Opposite (antagonist) flexibility
4. FS = Functional Strength

* AR= AF + FS

KEY TO FLEXIBILITY!!!!!!!!!!

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PEARLS CONT.

5. Form follows function
6. Stability over mobility in extremities
7. Mobility over Stability in spine
8. NEVER push! Sometimes assist

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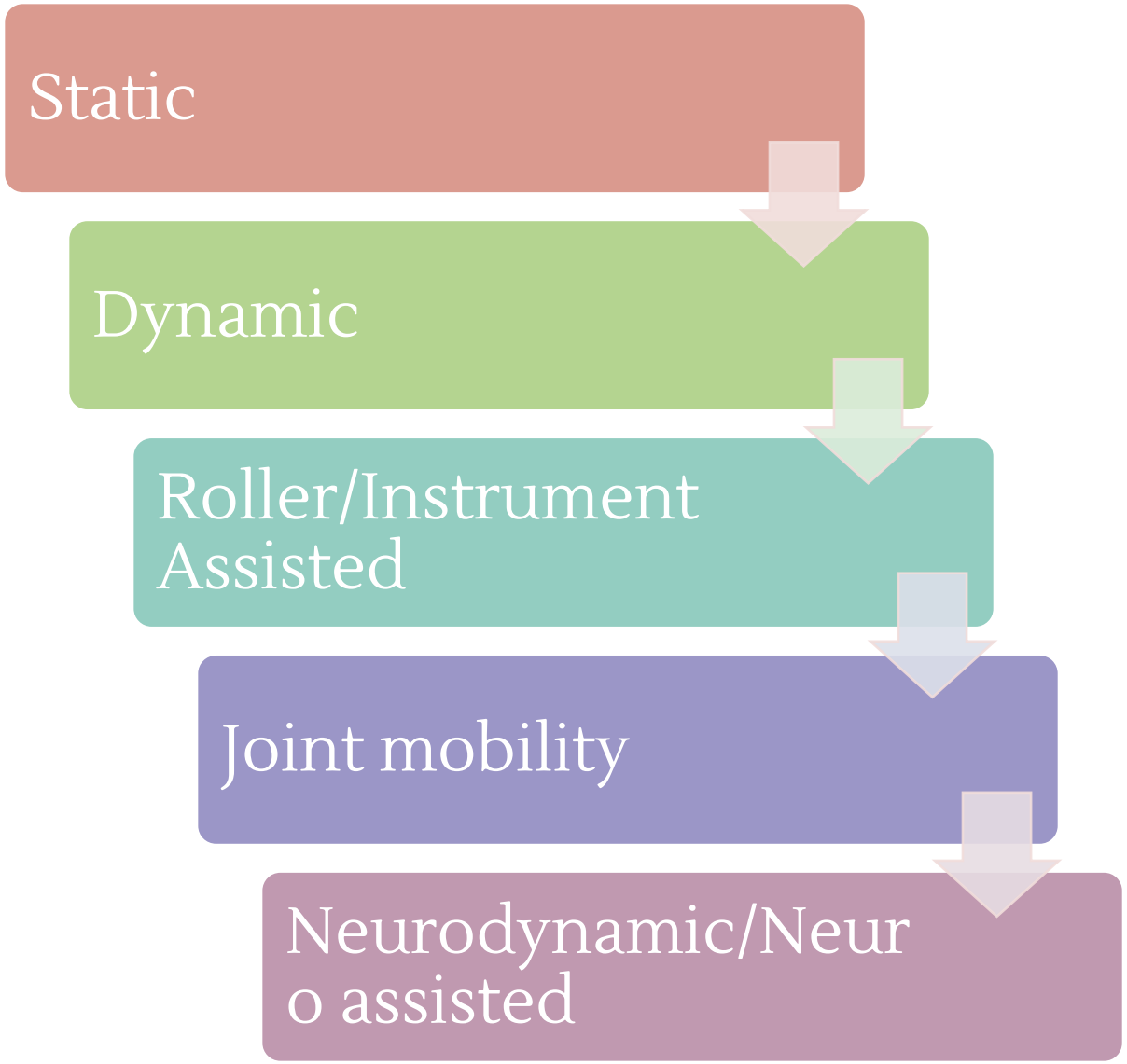
TYPES



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ORDER

- Warm up the body, heart rate elevated
- Joint motion- general warm up
- Neuro preparation
- Dynamic joint motion- non end range
- Static
- Advanced Dynamic
  - Good, sport specific
- Skill specific
- Revisiting: rotation and time based

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WHY THIS ORDER?

- Brain has to be prepared
- Body has to be warm
- Tissues have to be receptive
- Muscle spindles and receptors have to be told “it is time” to be ok to let go of resting protective mechanism
- Bookend ranges have to be allowed
- 60-80-100 rule

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②FLEXIBILITY- DYNAMIC

- Stretch with motion- controlled
- Purposeful- in gymnastics – to mimic function of goal (i.e. kicks for switch leaps)
- Stretch with motion- with weight or extra velocity assisted
    - Weight vs. band conversation
- End range, inhibition of end-range protective upchain feedback
- Hamstring- tight pike, reach for toes, or starter stretch

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TIPS~FLEXIBILITY/PLIABILITY DEVICE- ASSISTED

- Trigger Point Roller
- Balls
- TheraCane, self trigger point release
- Heel Rocker
- Sticks, Dowel Rods
- Other Rollers
- Hamstring- wheel in hamstring or ball in gluteals, attachment to the ischial tuberosity

FLEXIBILITY BUILDS

Preschool:	Developmental	Advanced

• Shaping
• Proper alignment during flexibility
• Understanding how joints move, end ranges, why
	• Making sure athlete understands WHY they need each stretch
	  • Skill performance and advancement
	  • Injury mitigation
	• Body shaping
	• Importance of proper holding techniques
	  • Breathing
	  • Positioning
	  • Alignment
	  • Muscle focus
		• Skill 2 year prediction
		• What is needed to GET skills
		• What is needed to keep end range from causing issues (switch leaps, blinds)

WHAT NOT TO DO IN FLEX/STRETCH INJURY?

Static stretch (dynamic motion, non end range instead!)

Ice (heat, blood flow!)

Complete rest (movement, blood flow)

NSAIDS (you want inflammation body response for healing!)

Strength train at 100% (instead- BFR!)

Leave it alone (you want to encourage lymphatics, muscle contraction, blood, eccentric when ready)

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- With any split, there is increased lumbar stress on the side of the back leg because of hip extension in combination with lordosis

- She is square, however, as you can see by the 'nearly' vertical aspect of the tibia

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2

Example- Hips/Split

Should be unable to see right (far) ASIS from opposite side lateral view

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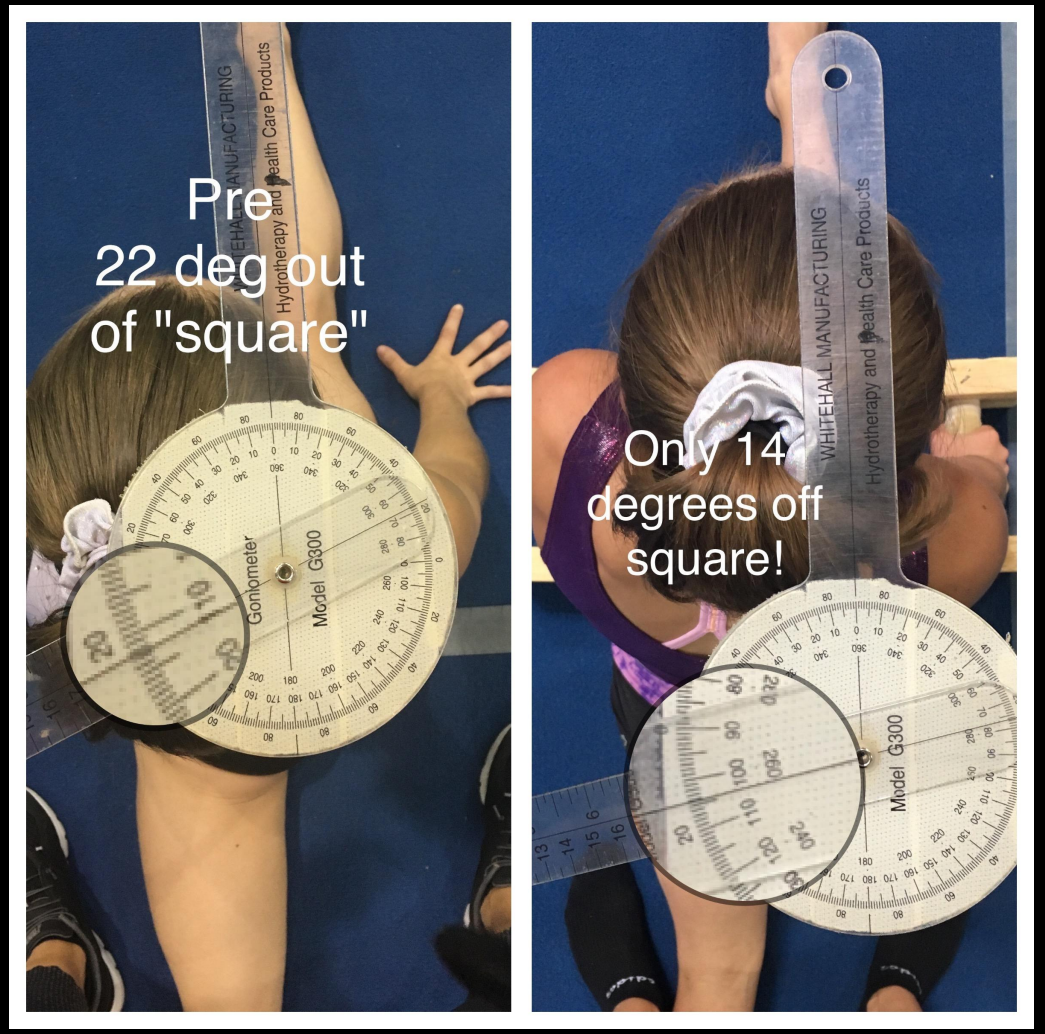
EXAMPLE - HIPS

- Hips:
  - The more flexibility in the capsule and anterior musculature, the more the hip can work without the lower back arching, or jamming, and without the hips turning out, or externally rotating

UNSQUARE SPLIT POSITION TO SQUARE ADJUSTED

- Focuses on the FRONT leg hamstring



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Square with the use of mats to raise body, un-”arch” the back, and square the hips to as high as the athlete needs- MEASURE angle between two femurs (thighs)

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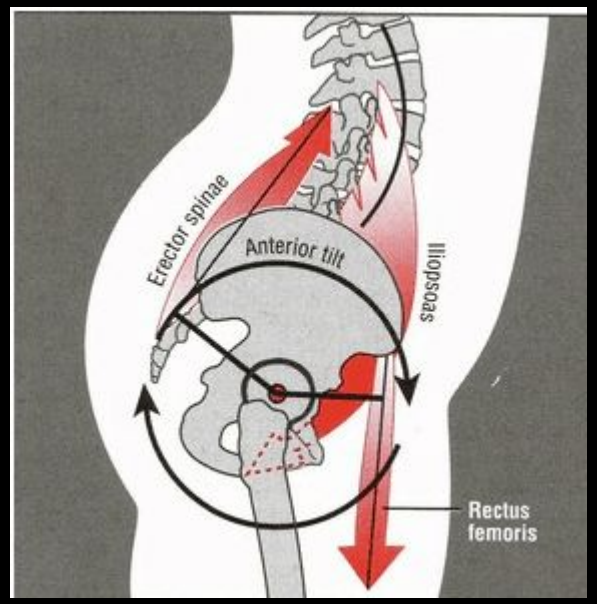
Hip Flexibility – Rotation of the pelvis

- Anterior Rotation
  - Place hands on hips, fingers in front (ASIS) thumbs in back around hips
  - Dump the bucket forward
  - Fingers drop below thumbs
  - Arch in back (lordosis)



(Image MSK Neurology)

- Posterior Rotation
  - Dump bucket backwards
  - Do not "Frump" with upper body, wrong part
  - Fingers rise above thumbs, or thumbs relatively drop
  - Pubic bone comes closer to breast bone
  - Rounded back (kyphosis)

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2) Pelvic Motion
Split Position- RIGHT

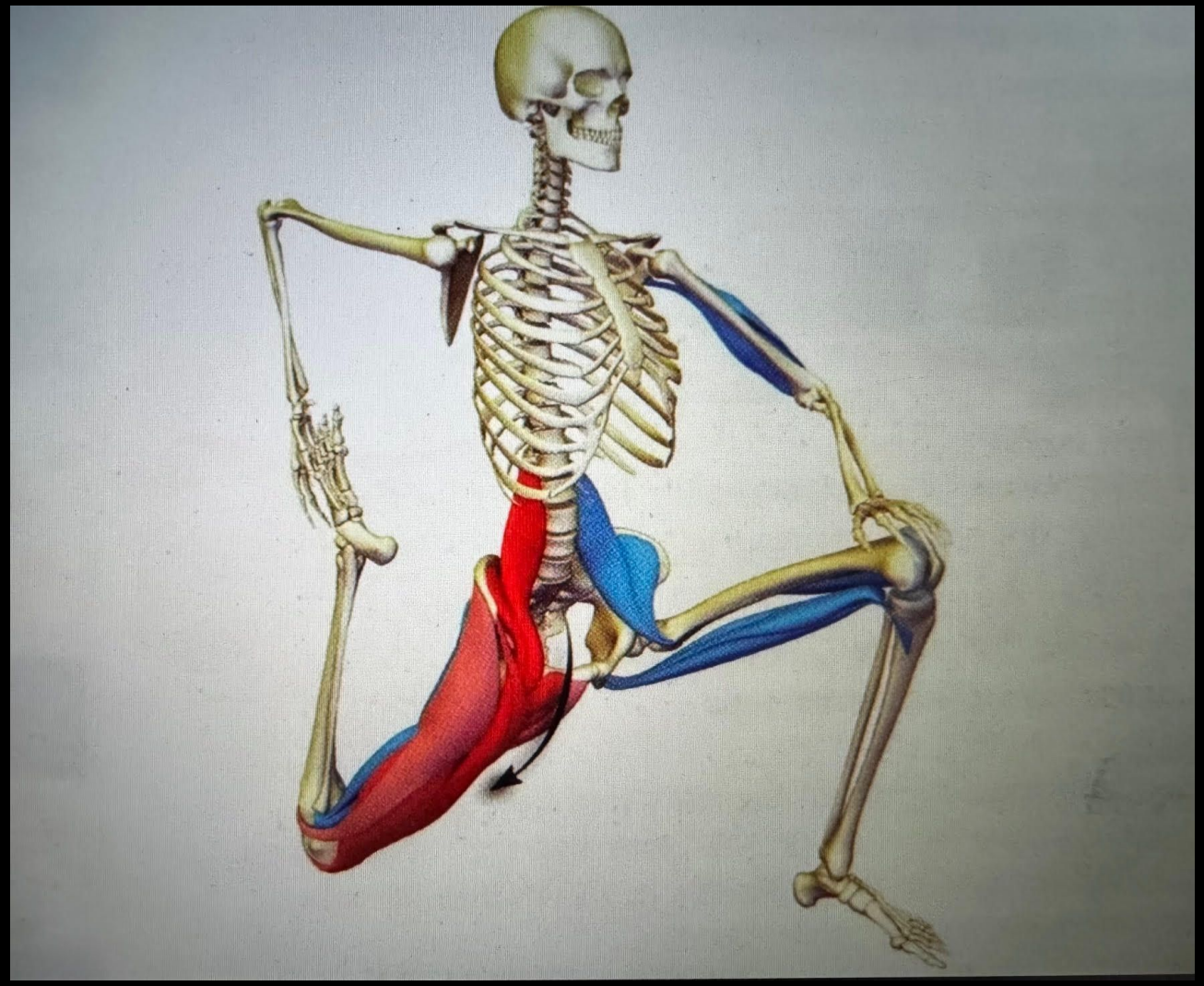
- Front Leg
  - Flex: Hamstring
  - Ilium: Posterior
  - Facets: Open, relatively

Body

Rotate relatively:

- Lower ½ torso opposite (Left)
- Upper ½ torso same (Right)

- Back Leg
  - Flex: Hip Flexors
  - Ilium: Anterior
  - Facets: Compressed



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- Great example of square hips, open arch with no hinge spot.
- No femoral external rotation

Take Home Ideas!

1. Order of stretching BEFORE
2. Importance of cooldown AFTER
3. Mid-Practice re-flex
4. Mid-Practice motion re-introduction (speed, velocity, function)
5. Square position education- have a PLAN for your ENTIRE program (it is a CULTURE!)
6. Pic-Video: Release, safe storage, athlete progress
7. Importance of parent meetings
8. Visual timeline: progression


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Hinge Theory © Connection!
ARCH AND REVERSAL

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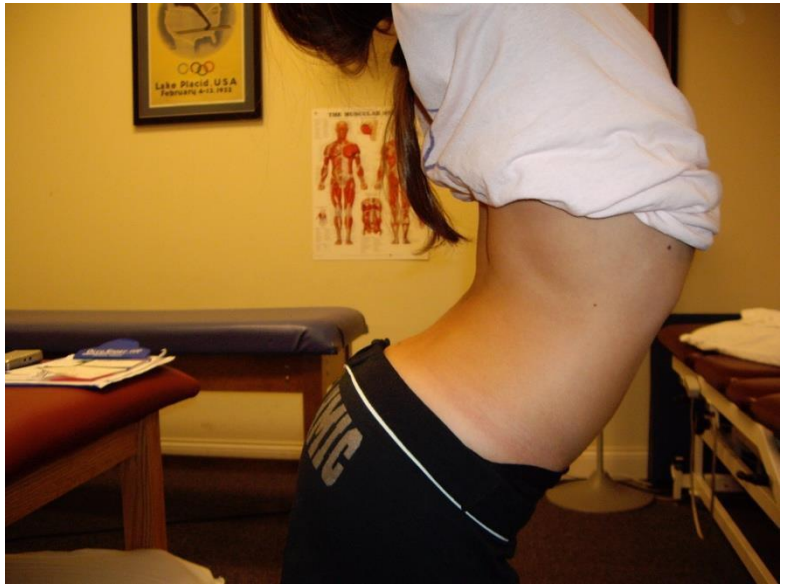
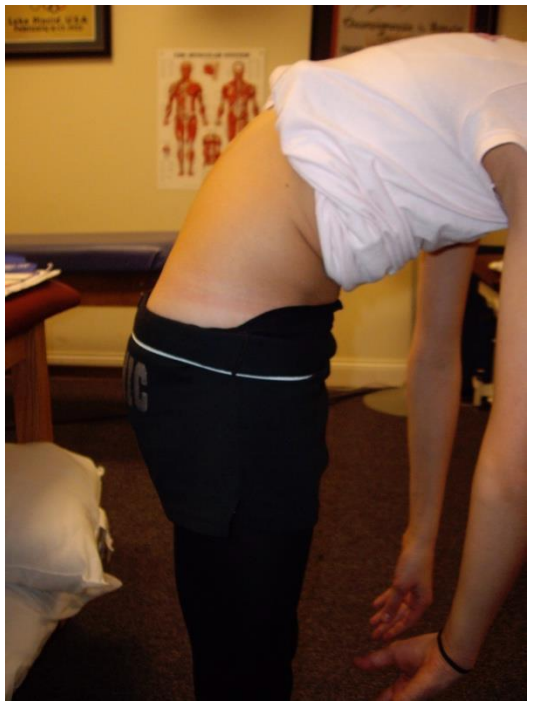
Excessive hinge, can you find it?



Lack of Ability to reverse curvature



CHOREOGRAPHY AND FLEXIBILITY: CONNECTION!

- Visual gymnastics performance
  - Think BIG motions, dance (Netherlands, Canada, Brooklyn Moors, Nastia Liukin)
  - Finishing to fingertips
- Total Range of motion
  - High kick
  - Arabesque
  - Contractions
  - Rib motion in all 4 planes
  - Open arch position

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