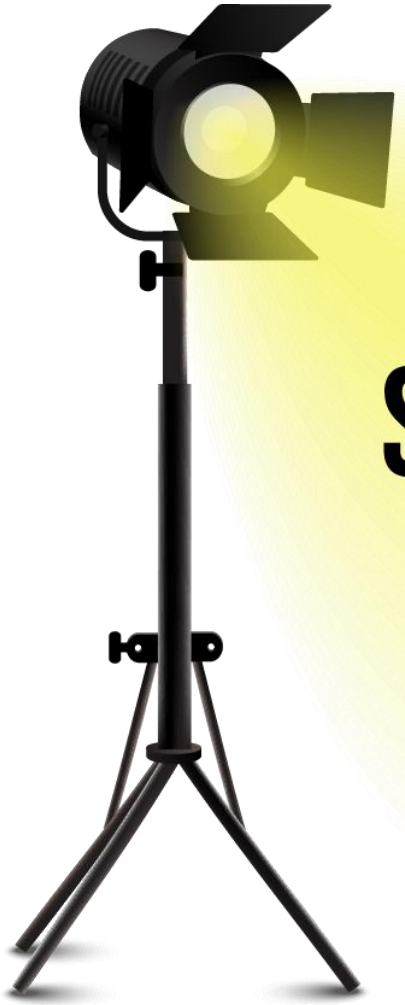
SCOREBUILDERS



SPOTLIGHT
Series

Need 2 Know: Thoracic Spine

Presented by
Daniel J. Lee, PT, DPT, PhD, GCS, COMT

Purpose

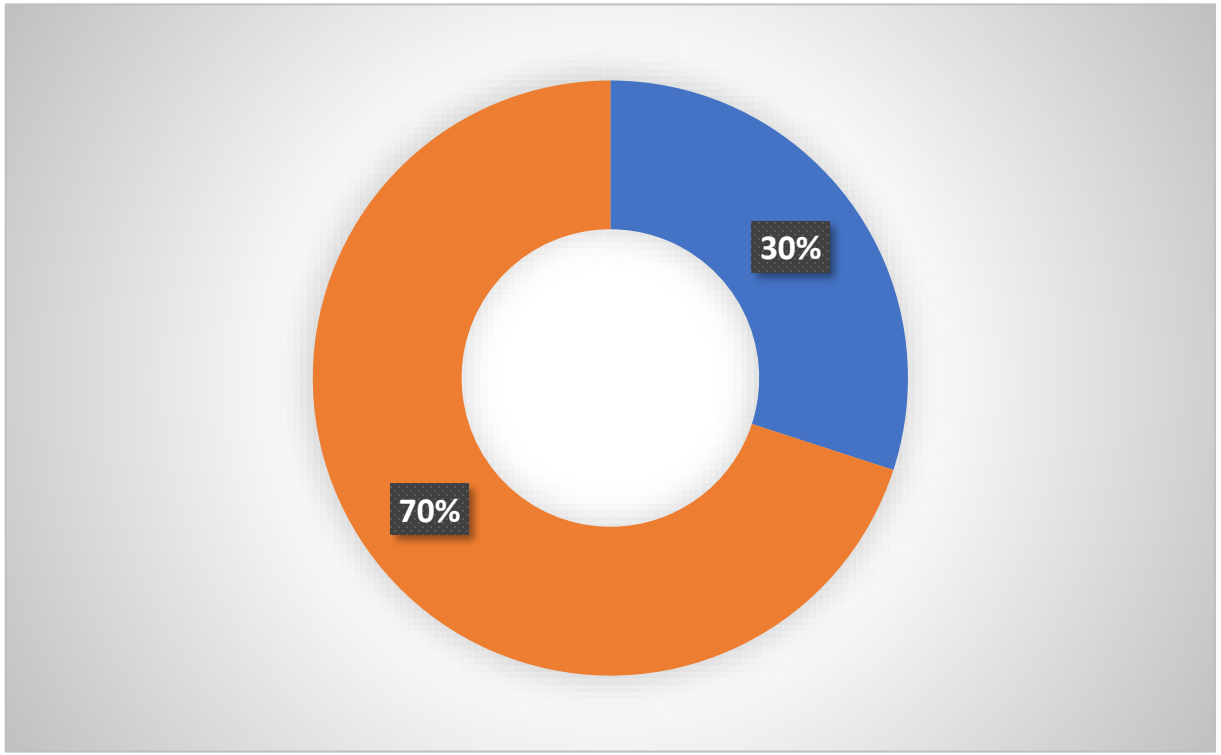
1. Identify areas of focus for your study plan.
2. Prepare you for thoracic spine content that could be encountered on NPTE.

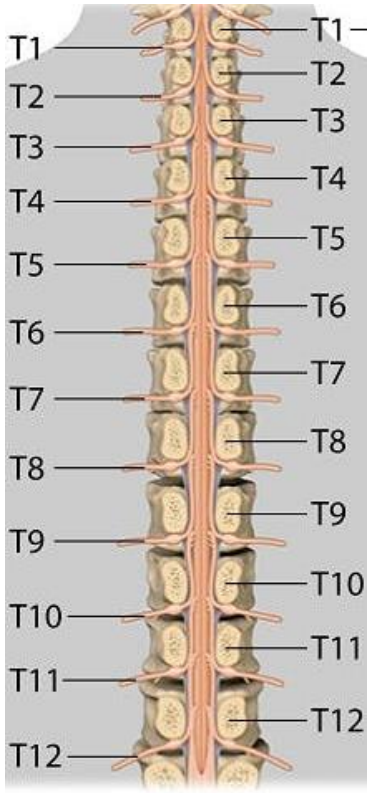
NOT

1. Comprehensive course on the thoracic spine (but covers a lot!).
2. Rehash of Scorebuilders book.

BIG PICTURE

- There are 51-60 items on the NPTE specific to the MS system





Who FSBPT is testing…

Likely Questions

- Anatomy of the t-spine
- Kinesiology of the t-spine
- Diagnosis
- Differential diagnosis

Question 1

- A 15-year old male child bends forward for a scoliosis screening. The therapist identifies that the right rib cage is more elevated when viewing the child from behind. What is the **MOST** appropriate description for the observed deformity?

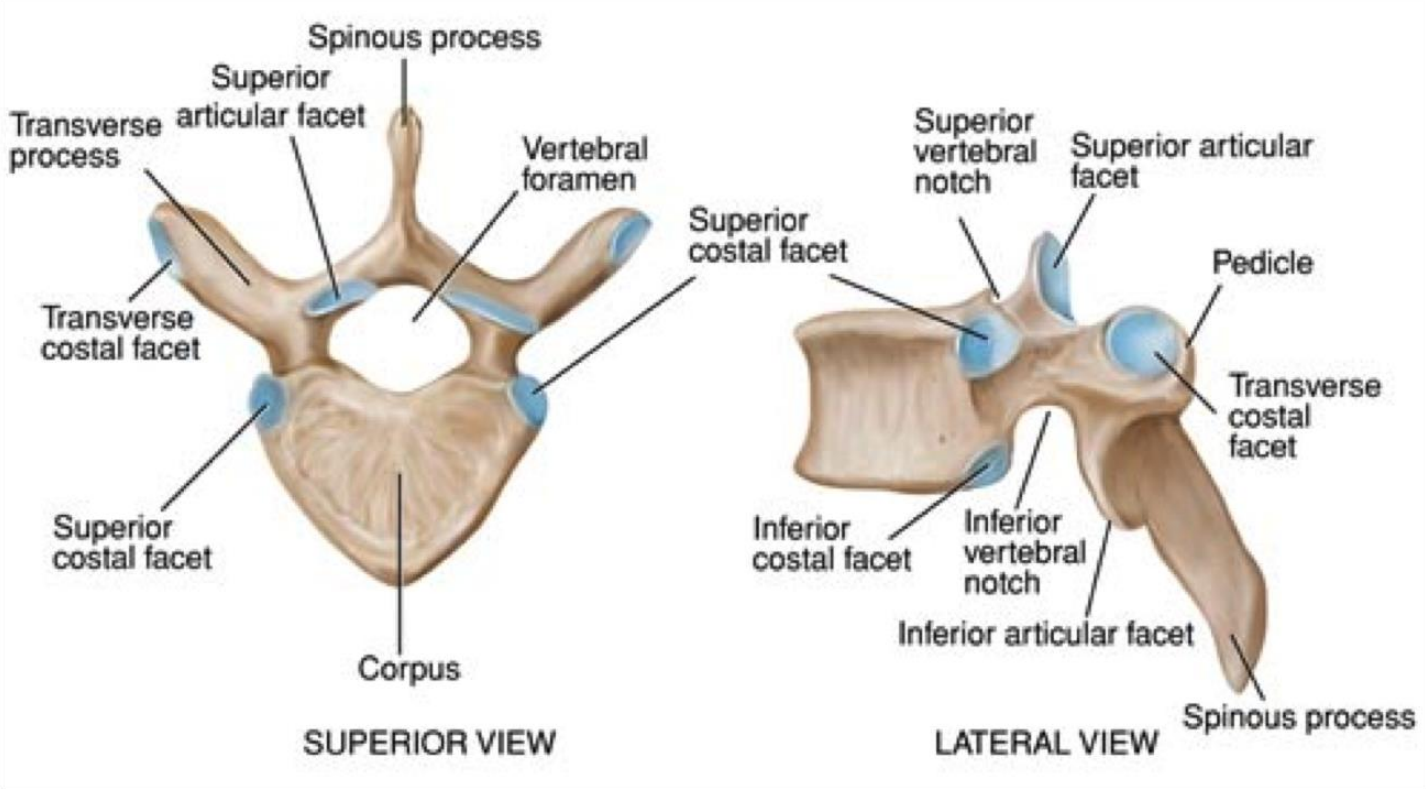
- 1- right scoliosis
- 2- left scoliosis
- 3- extended-rotated side bent left
- 4- flexed-rotated side bent right

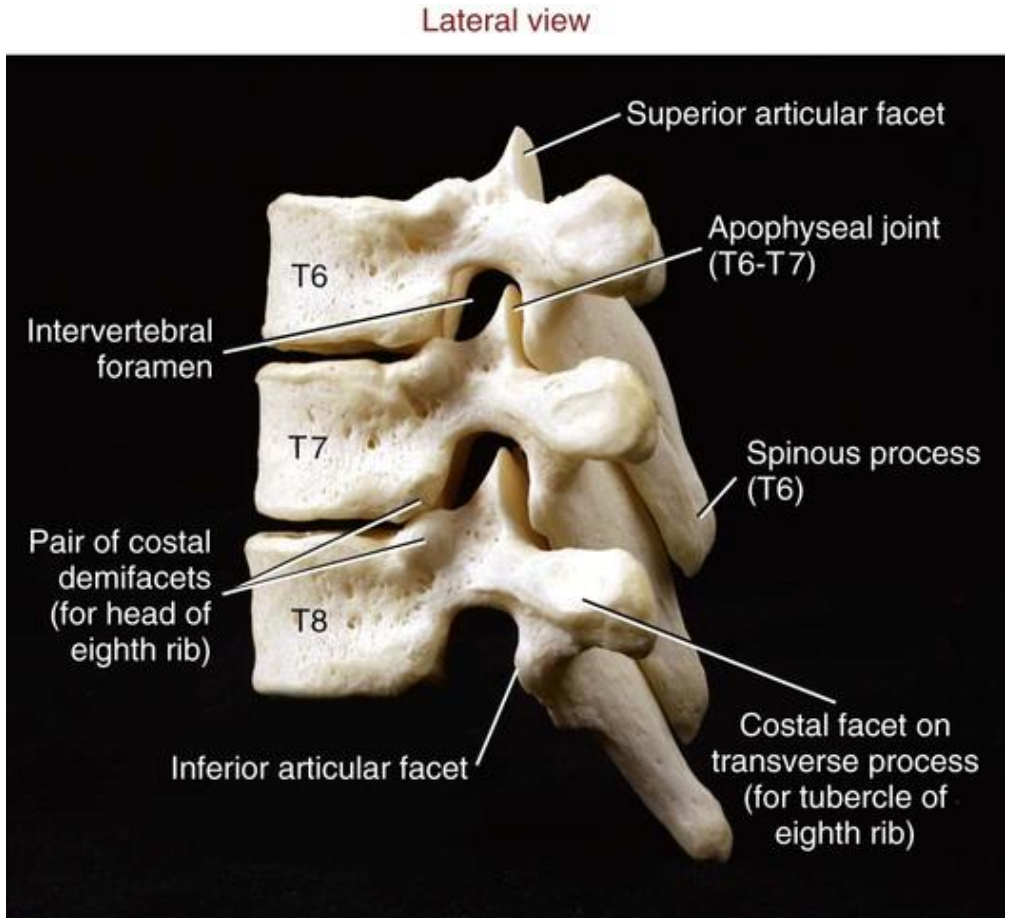
Question 2

- A patient complains of pain in their anterior ribcage. The therapist notes that there is swelling and tenderness along the 2nd and 3rd right sternochondral joints. The patient denies any injury to the area, can aggravate the pain with a deep breath, and relieve the pain with local ice to the area. What is the **MOST** appropriate initial intervention for this patient?

- 1- Refer out for emergency medical services
- 2- Perform thrust manipulation of the thoracic spine
- 3- Request imaging prior to further treatment
- 4- Educate patient on pain-relieving modalities

Anatomy


Spinous process
Superior articular facet
Transverse process
Vertebral foramen
Transverse costal facet
Superior costal facet
Corpus
SUPERIOR VIEW
Superior vertebral notch
Superior articular facet
Superior costal facet
Pedicle
Transverse costal facet
Inferior costal facet
Inferior vertebral notch
Inferior articular facet
Spinous process
LATERAL VIEW


Lateral view
Superior articular facet
Apophyseal joint (T6-T7)
T6
Intervertebral foramen
T7
Spinous process (T6)
Pair of costal demifacets (for head of eighth rib)
T8
Inferior articular facet
Costal facet on transverse process (for tubercle of eighth rib)

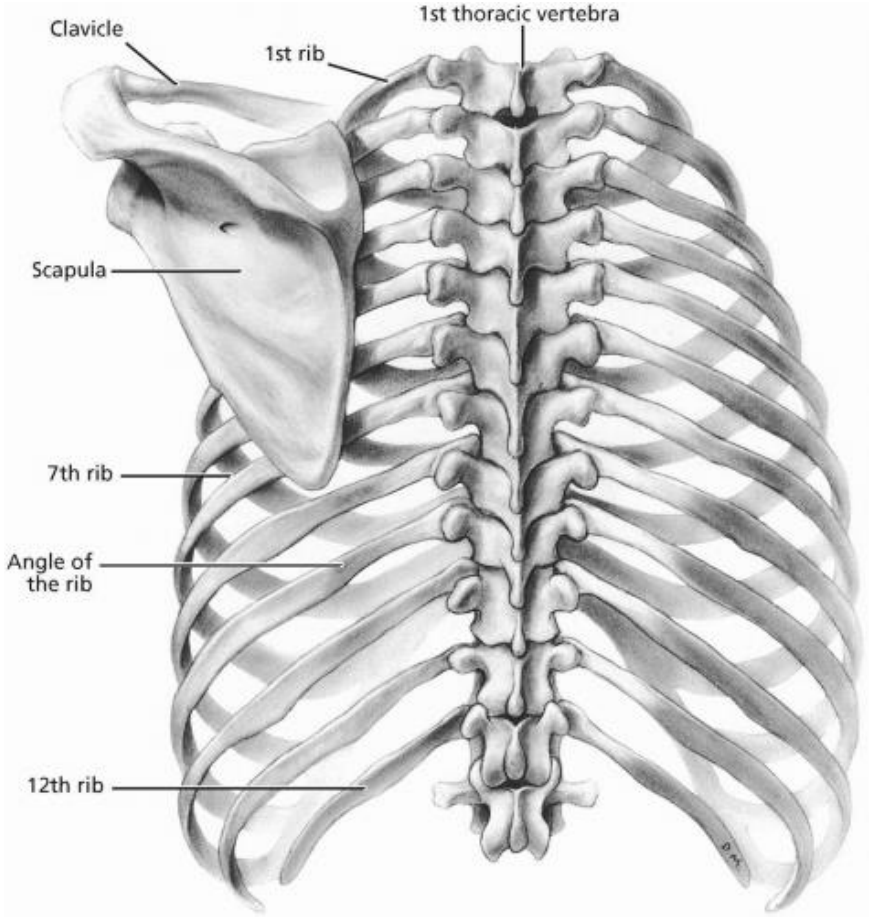
Kinesiology

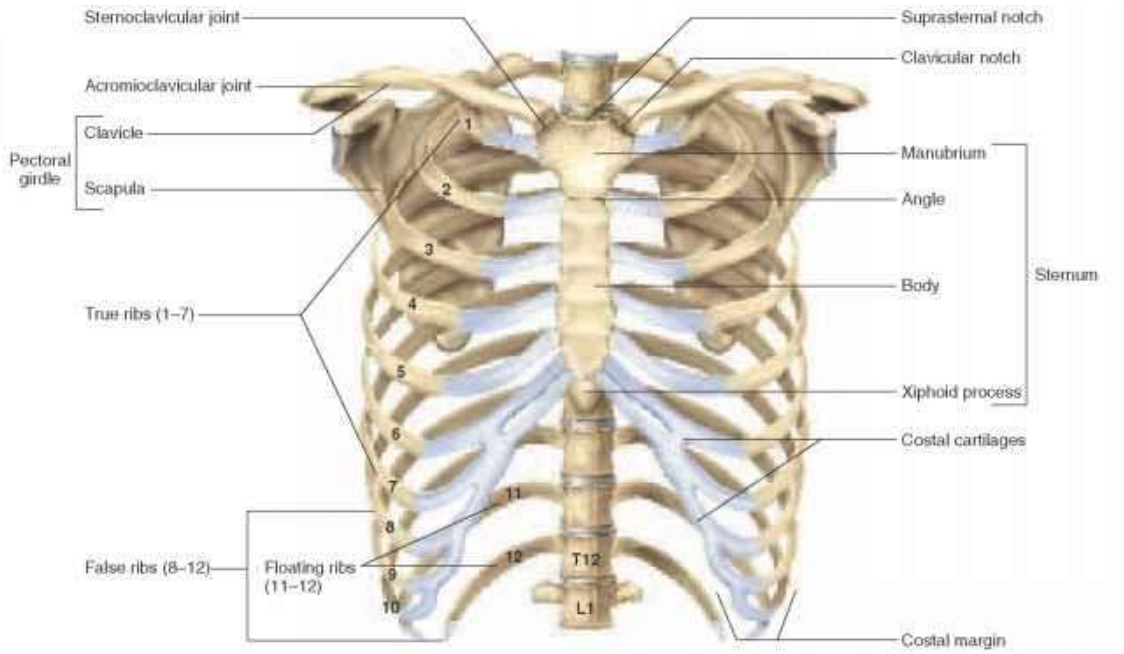
Table 1.0 Normal ranges of movement in the vertebral column and hips

	Cervical (°)	Thoracic (°)	Lumbar (°)	Hips (°) (excluding ab and adduction)
Flexion	0-60	0-50	0-60	0-110
Extension	0-75	0-45	0-25	0-30
Lateral Flexion	0-45	0-40	0-25	n/a
Rotation	0-80	0-30	0-18	Internal = 0-40 External = 0-50

Adapted from ACSM (2006) and Magee (2006).

Anatomy


Clavicle
1st rib
1st thoracic vertebra
Scapula
7th rib
Angle of the rib
12th rib


Sternoclavicular joint
Acromioclavicular joint
Pectoral girdle
Clavicle
Scapula
True ribs (1–7)
False ribs (8–12)
Floating ribs (11–12)
Suprasternal notch
Clavicular notch
Manubrium
Angle
Body
Xiphoid process
Sternum
Costal cartilages
Costal margin
T12
L1

Landmarks

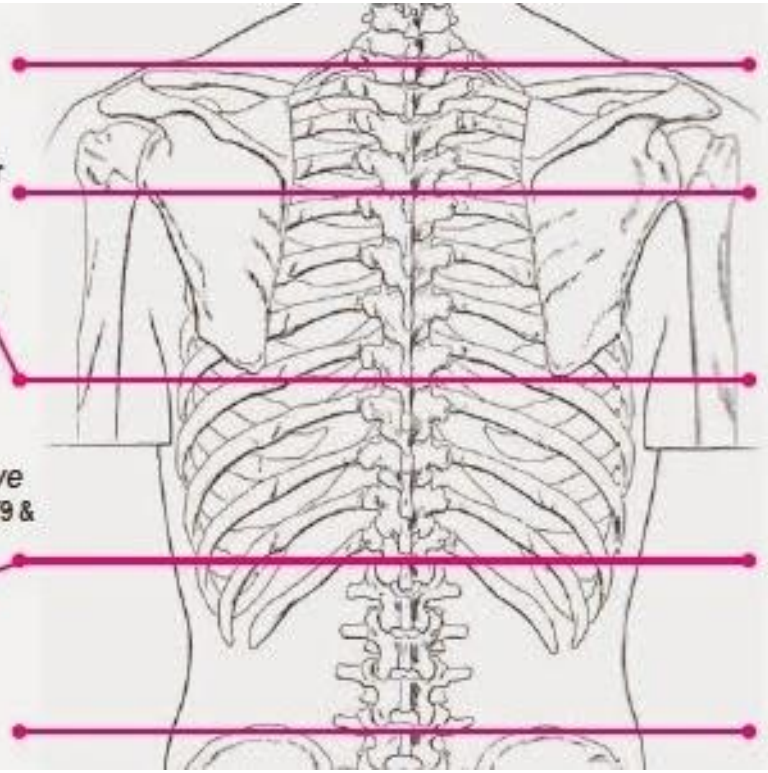
- **C7 or T1** - most prominent SP at base of neck (C7 will usually slide anterior from a palpating finger with cervical extension)
- **T4** - level with the root of the spine of scapula or apex of axillary fold
- **T7-T8** - level with the inferior angle of scapula

Thoracic TP palpation Rule of 3s

- **T1-T3 TPs:** at level of corresponding SP
- **T4-T6 TPs:** ~½ segment *above* SP
- **T7-T9 TPs:** at ~level of SP of vertebrae *above*

T10-T12 have SP's that project from a position similar to T9 & rapidly regress until T12 is like T1

- **T12** - level with the head of the 12th rib
- **L4** - level with the superior border of the iliac crest

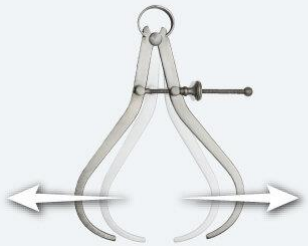
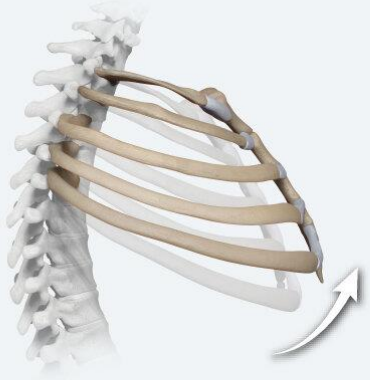
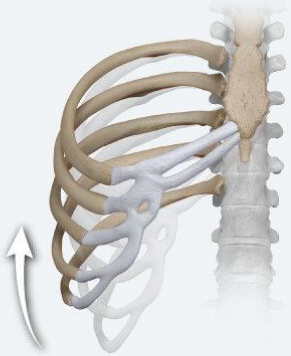


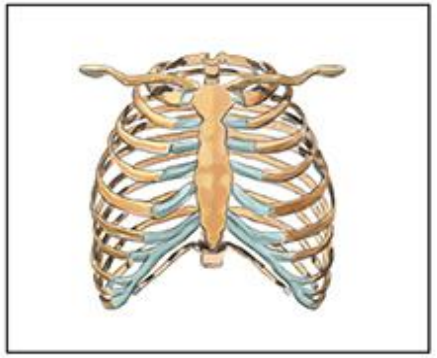
SPINOUS AND TRANSVERSE PROCESS RELATIONSHIP

- Osteopathic Rule of 3's
  - T1-T3
    - SP and TP at same level
  - T4-T6
    - SP ½ level below TP
  - T7-T9
    - SP 1 full level below TP
  - T10 as T7-T9
  - T11 as T4-T6
  - T12 as T1-T3

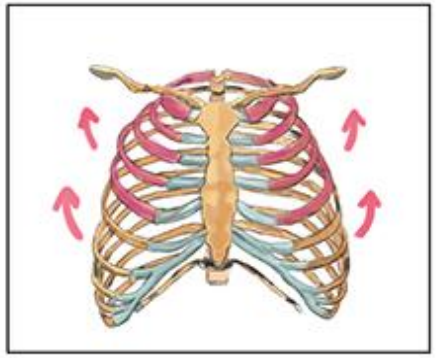
Kinesiology

Rib motion

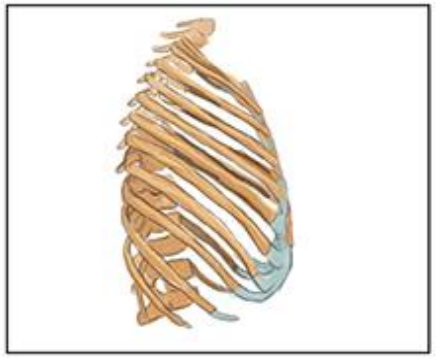
Ribs 1-5	Ribs 6-10	Ribs 11-12
		
"Pump handle" motion	"Bucket handle" motion	"Caliper" motion
		
• Superior/anterior (inhalation) • Inferior/posterior (exhalation)	• Lateral/superior (inhalation) • Medial/inferior (exhalation)	• Lateral (inhalation) • Medial (exhalation)



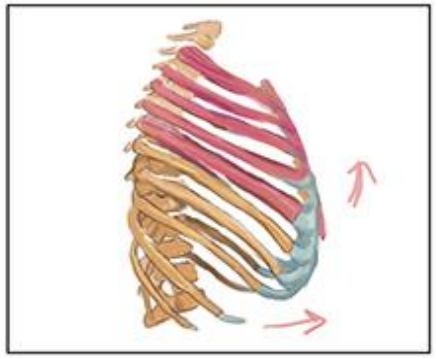
true ribs after exhaling



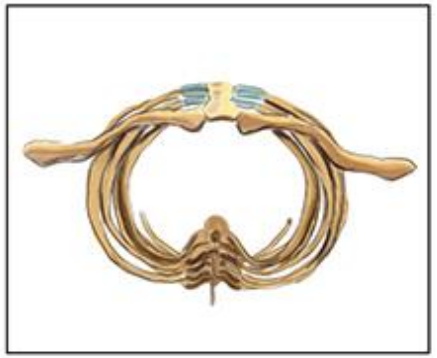
true ribs move superiorly during inhalation



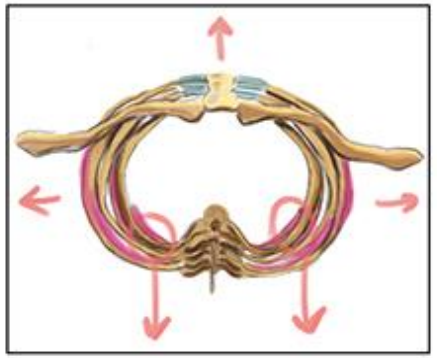
false ribs after exhaling



true ribs move anteriorly during inhalation



false ribs after exhaling



false ribs move laterally during inhalation

Question 3

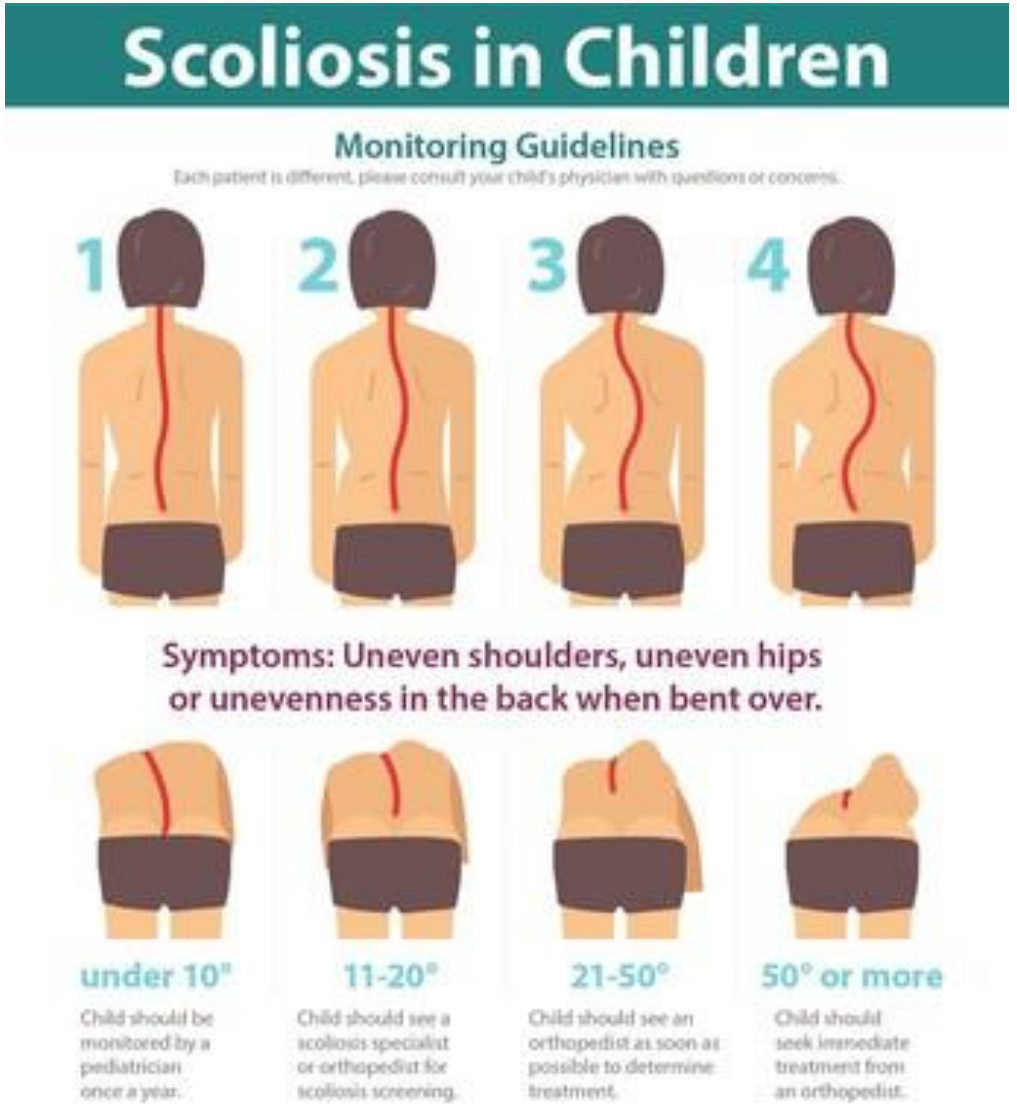
- A physical therapist is palpating the posterior thoracic region of a patient complaining of focal pain upon inspiration. The therapist detects a bony abnormality and tenderness approximately 1 inch lateral to the T8 spinous process that reproduces their pain. What intervention is the **MOST** appropriate?

- 1- thoracolumbar traction
- 2- grade 5 PA manipulation T4-6
- 3- PA mobilization of T9 vertabrae
- 4- PA mobilization of T8 vertabrae

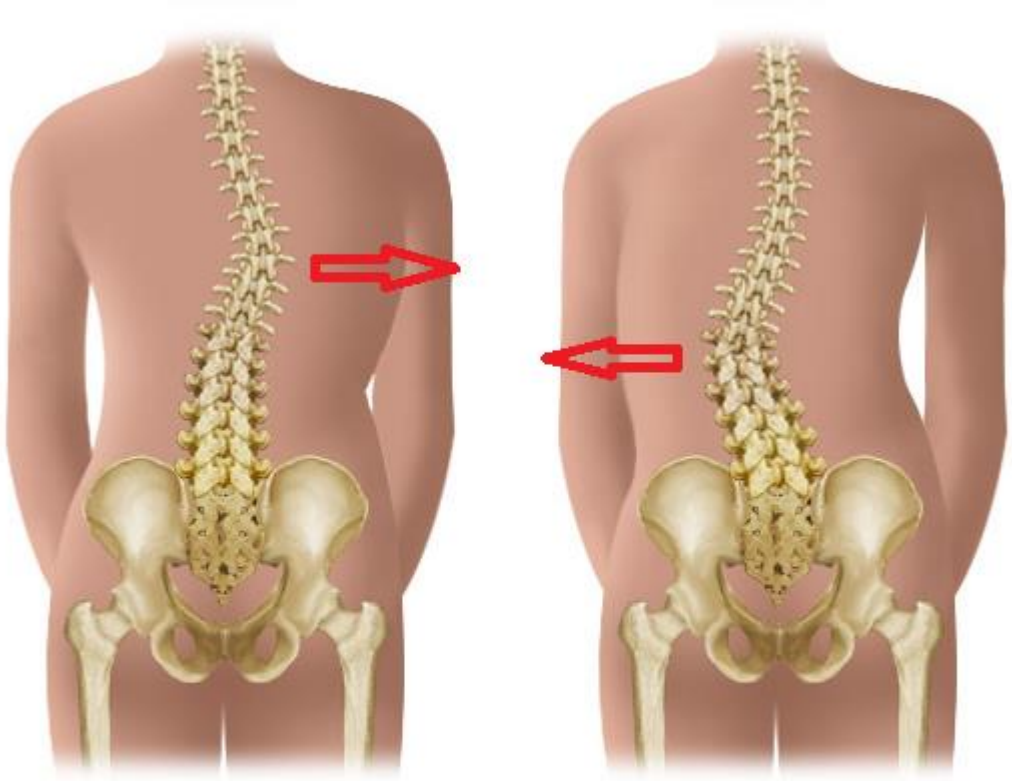
Conditions

- Scoliosis
- Costochondritis
- Slipping rib
- T4 Syndrome
- Thoracic Outlet

Scoliosis

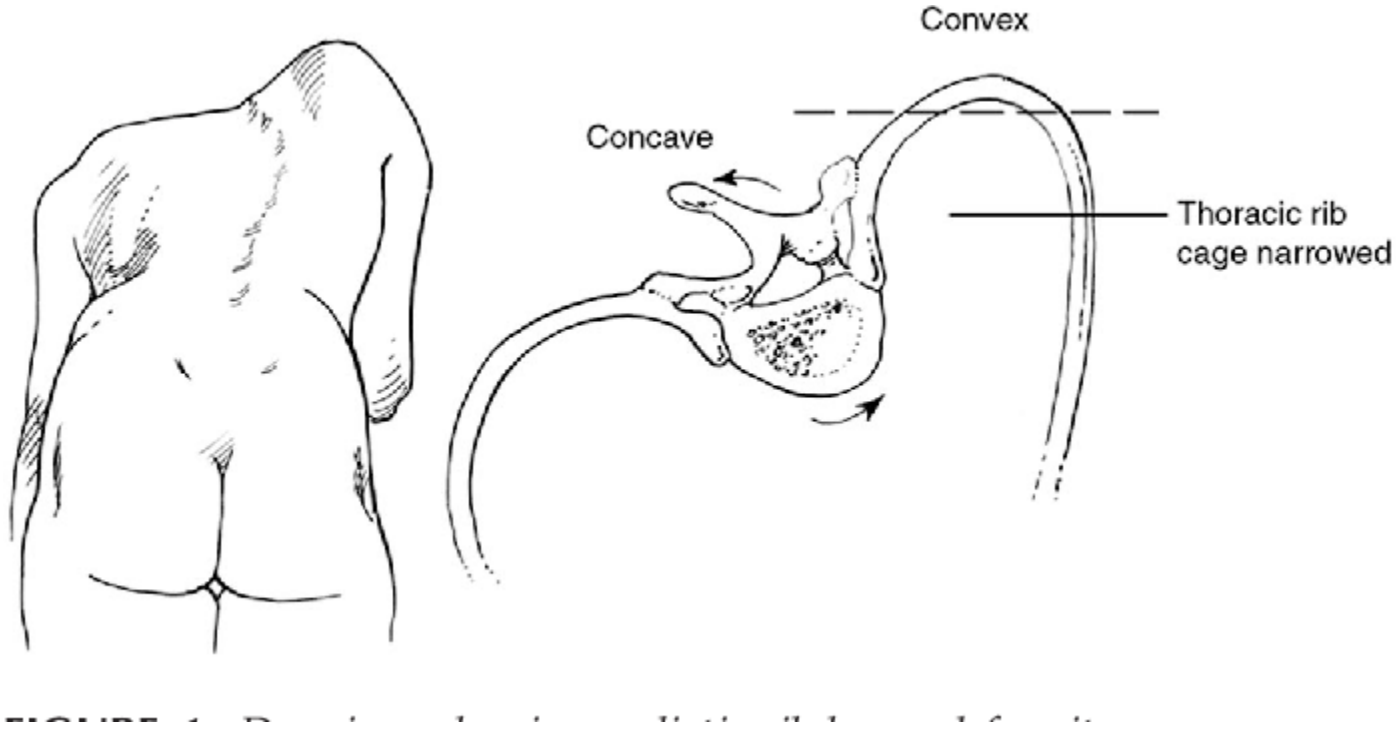

Scoliosis in Children
Monitoring Guidelines
Each patient is different, please consult your child's physician with questions or concerns.
1
2
3
4
Symptoms: Uneven shoulders, uneven hips or unevenness in the back when bent over.
under 10°
Child should be monitored by a pediatrician once a year.
11-20°
Child should see a scoliosis specialist or orthopedist for scoliosis screening.
21-50°
Child should see an orthopedist as soon as possible to determine treatment.
50° or more
Child should seek immediate treatment from an orthopedist.

Naming



Dextroscoliosis

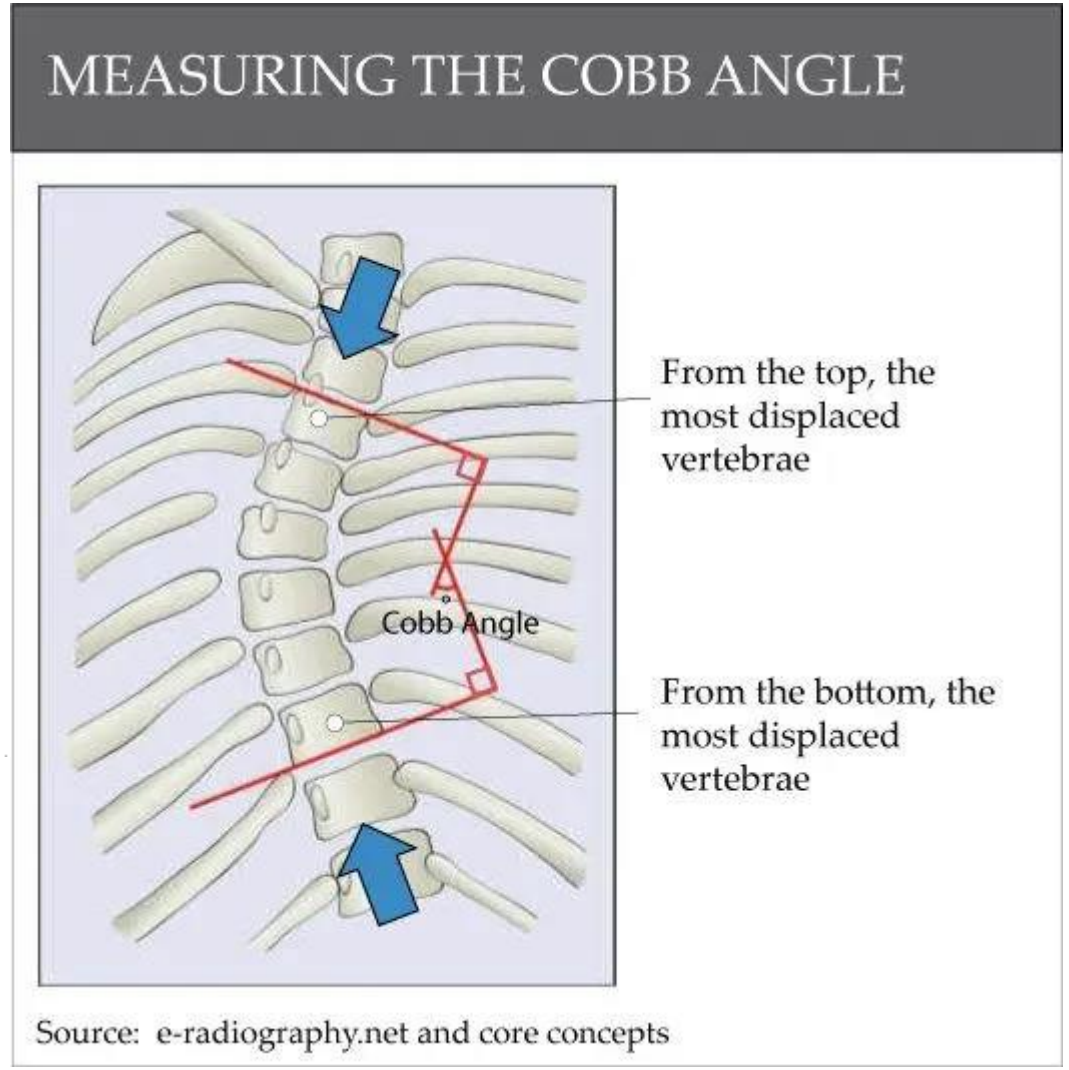
Levoscoliosis



Grading

ABLE 4: THE CLASSIFICATION OF SCOLIOSIS

Degree of Cobb Angle (°)	Classification
<10°	Normal
10° < *x* < 25°	Mild
25° < x < 45°	Moderate
>45°	Severe



Interventions- Braces

Milwaukee

Boston

Chêneau

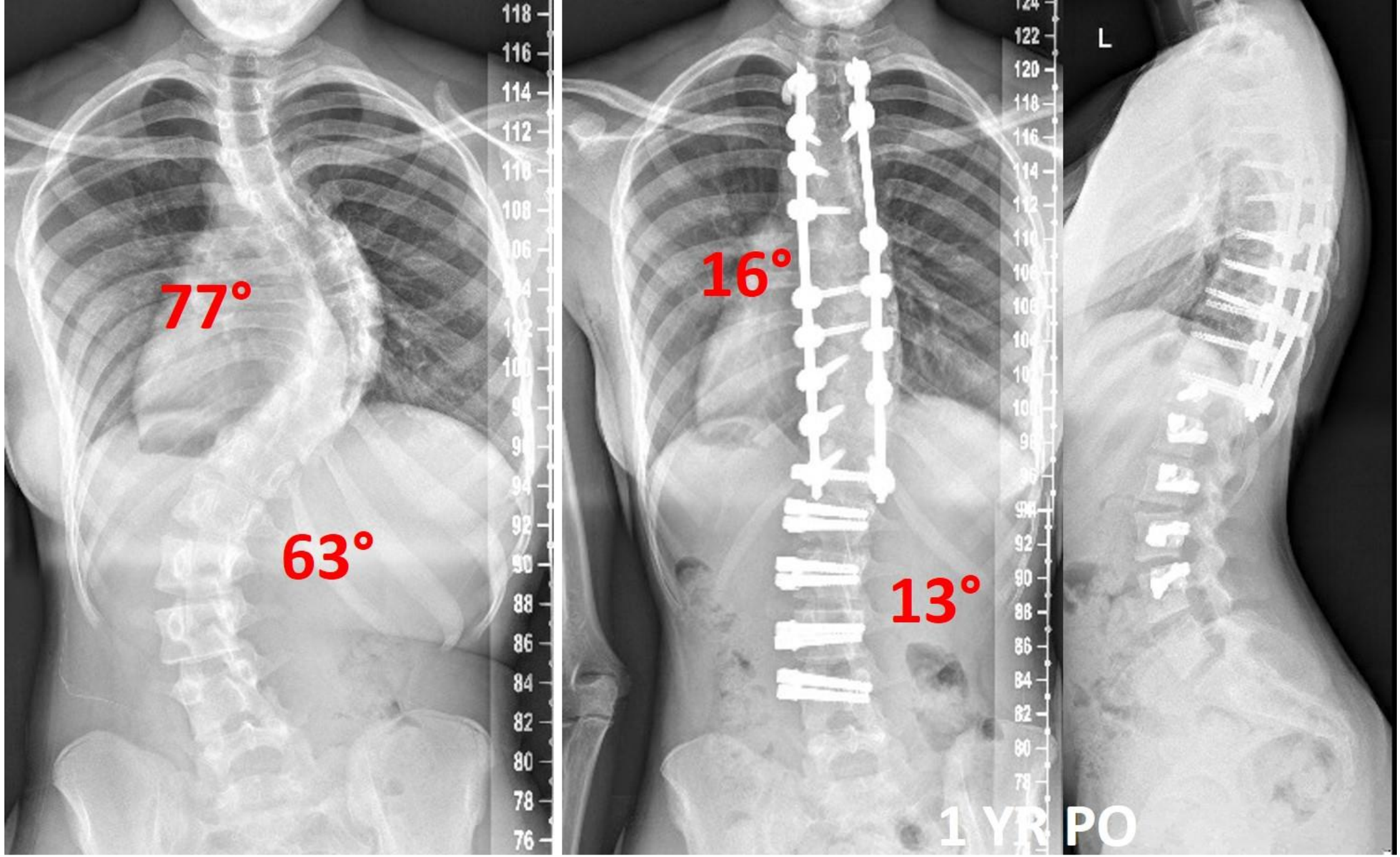
Lyon

TriaC

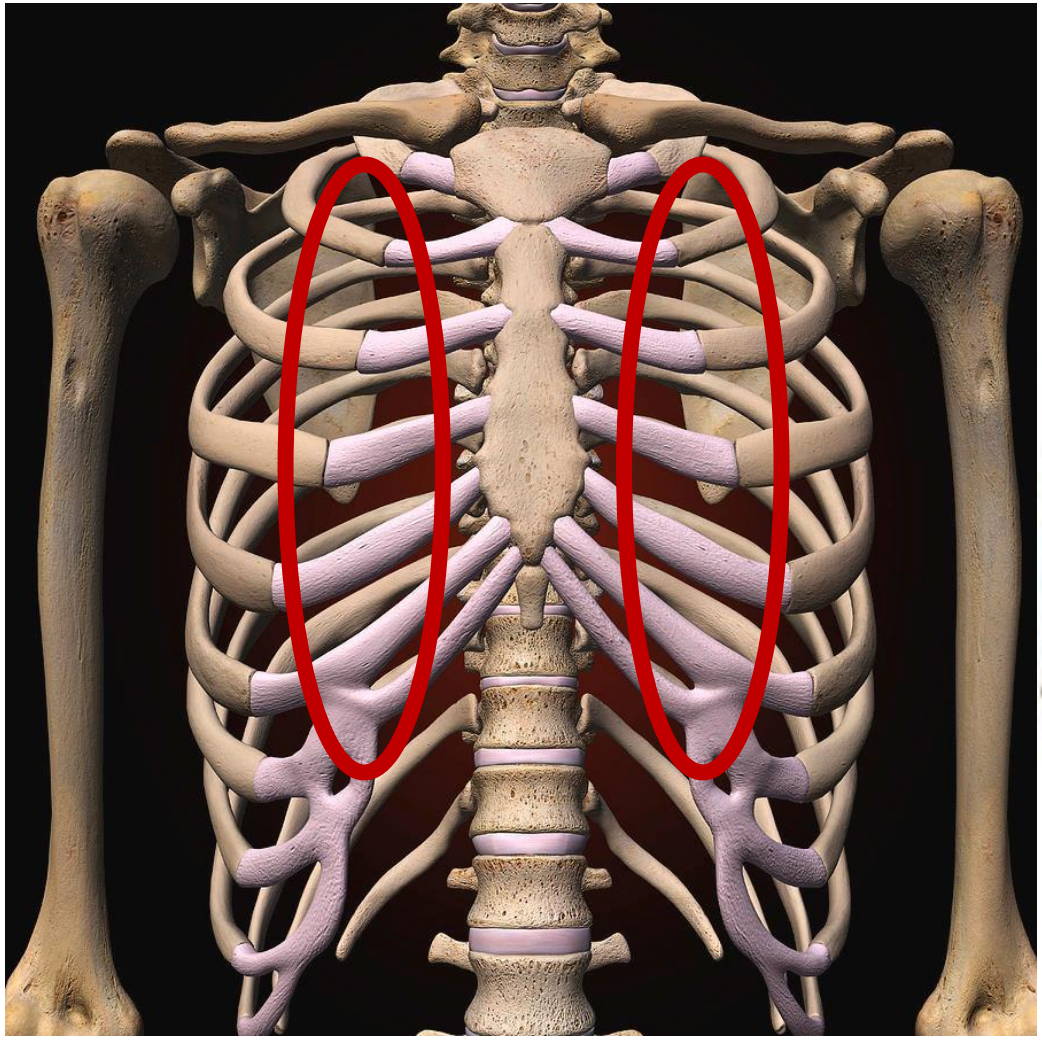
SpineCor

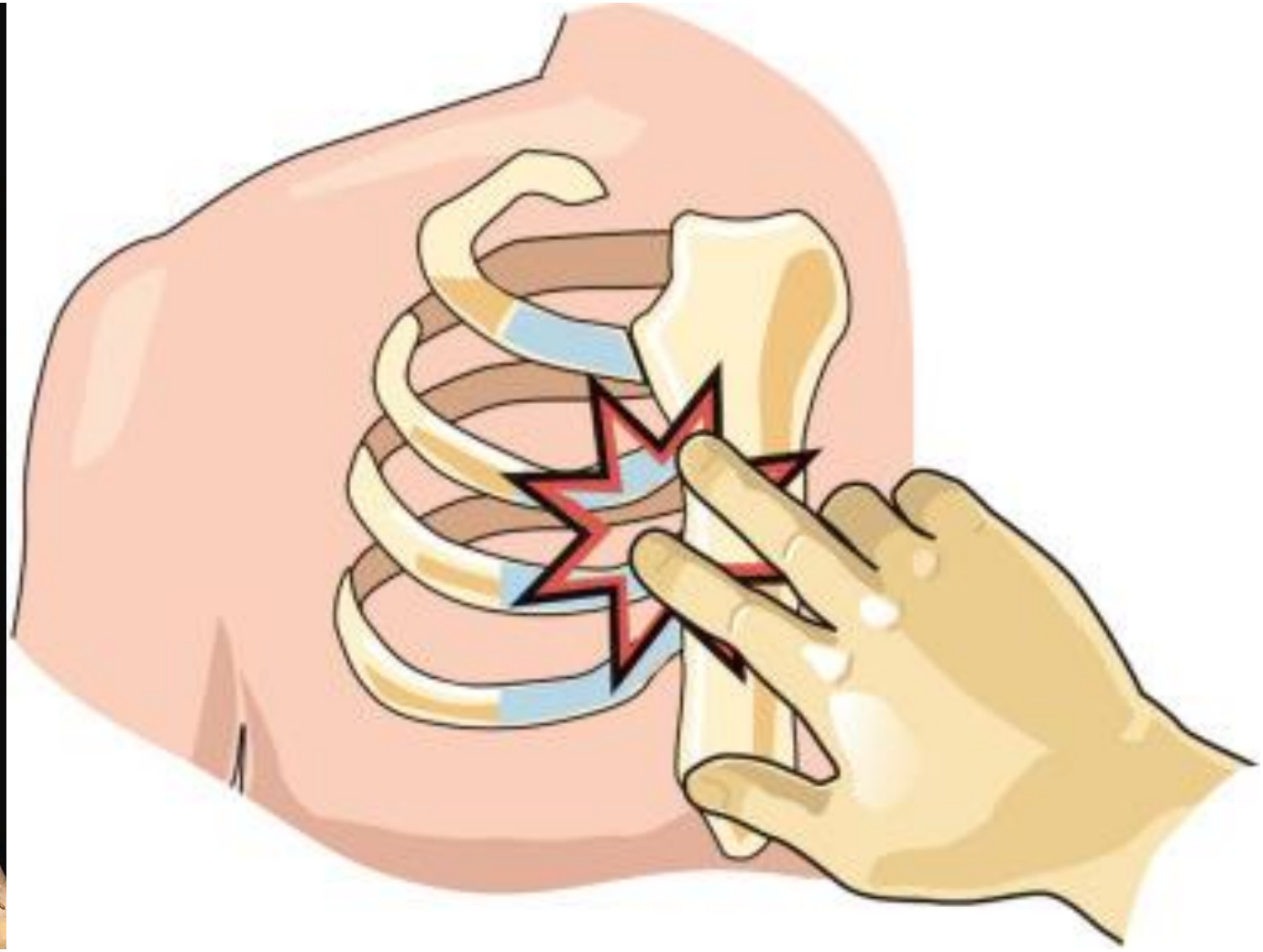
ScoliSMART

Flexpine

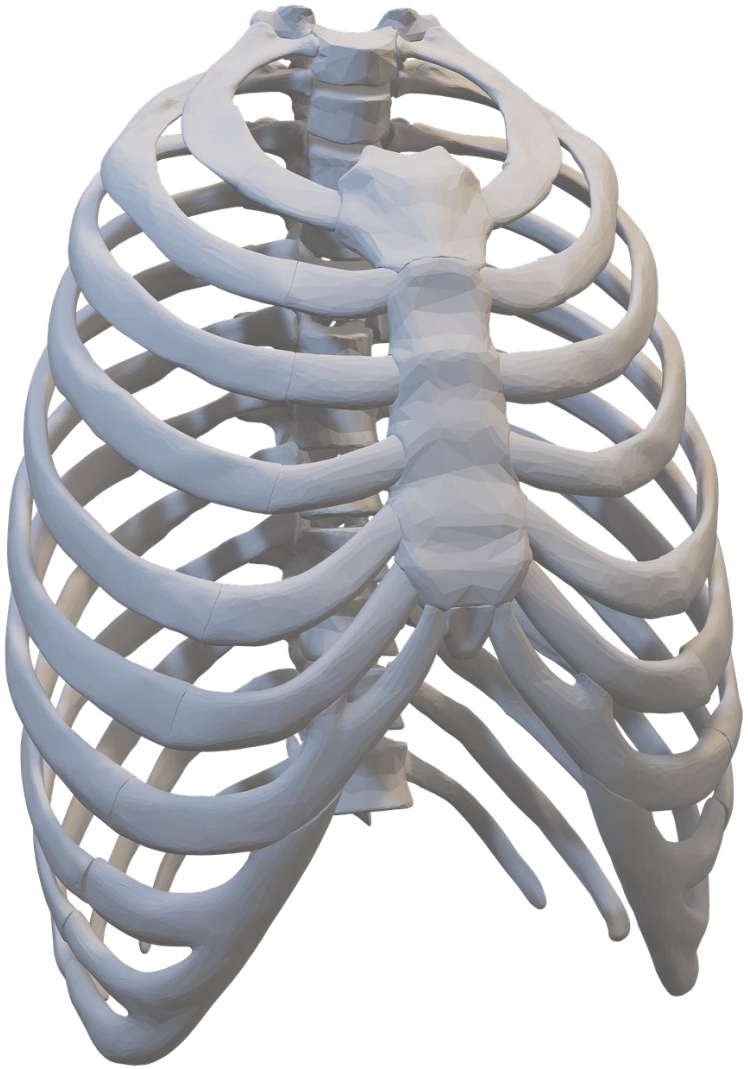

77°
63°
16°
13°
L
1 YR PO

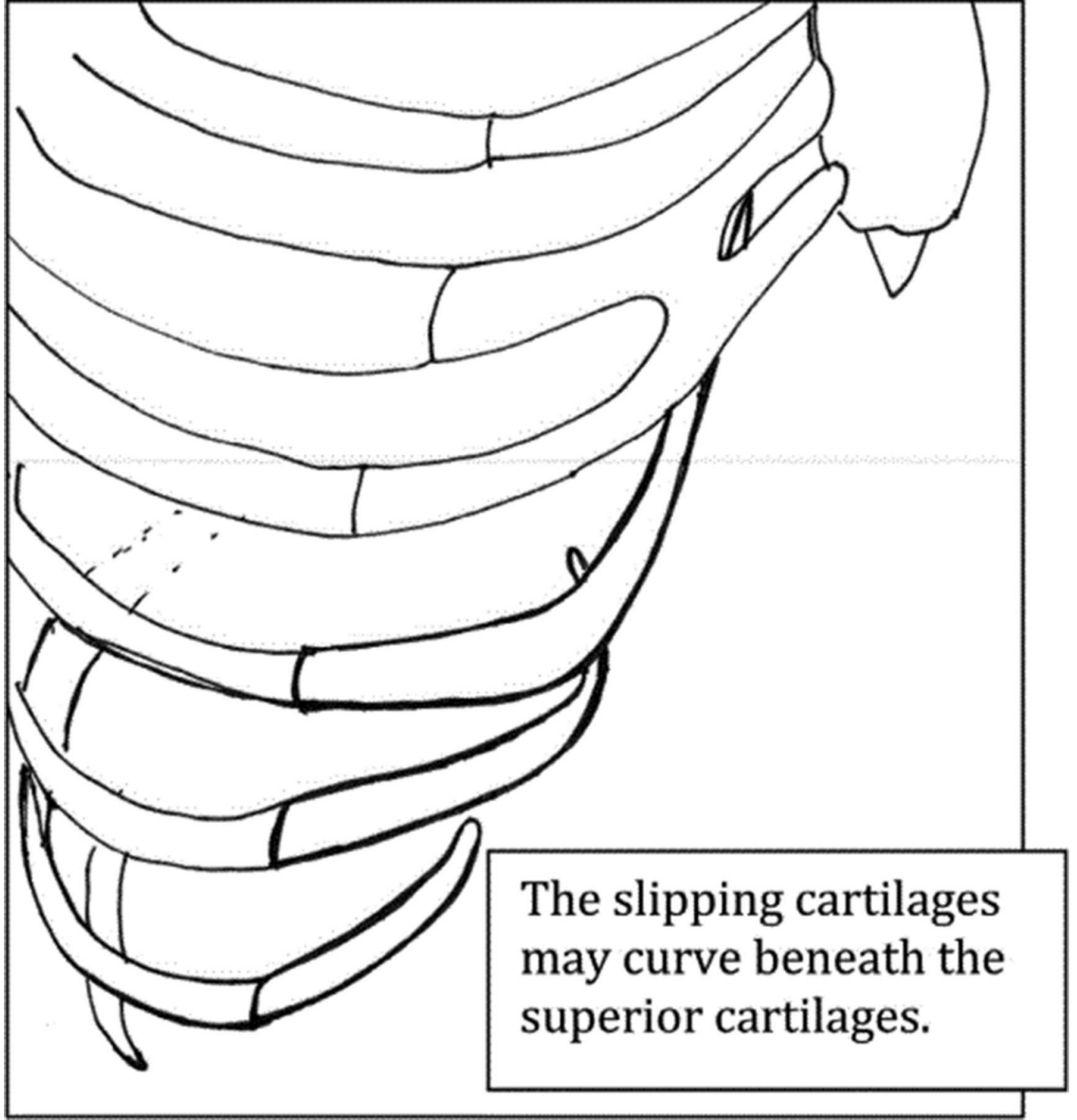
Costochondritis vs Tietze Syndrome





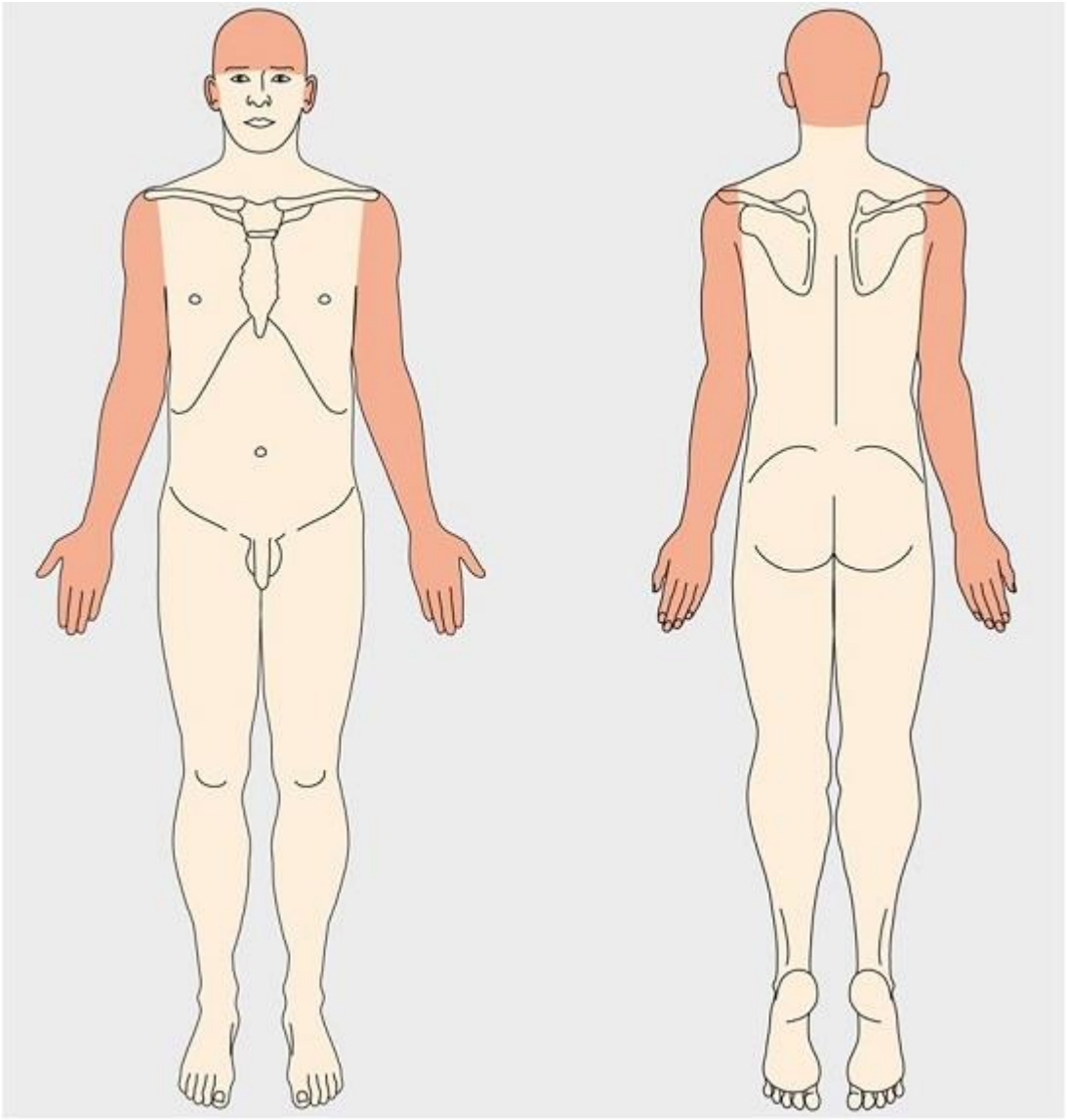
Slipping Rib



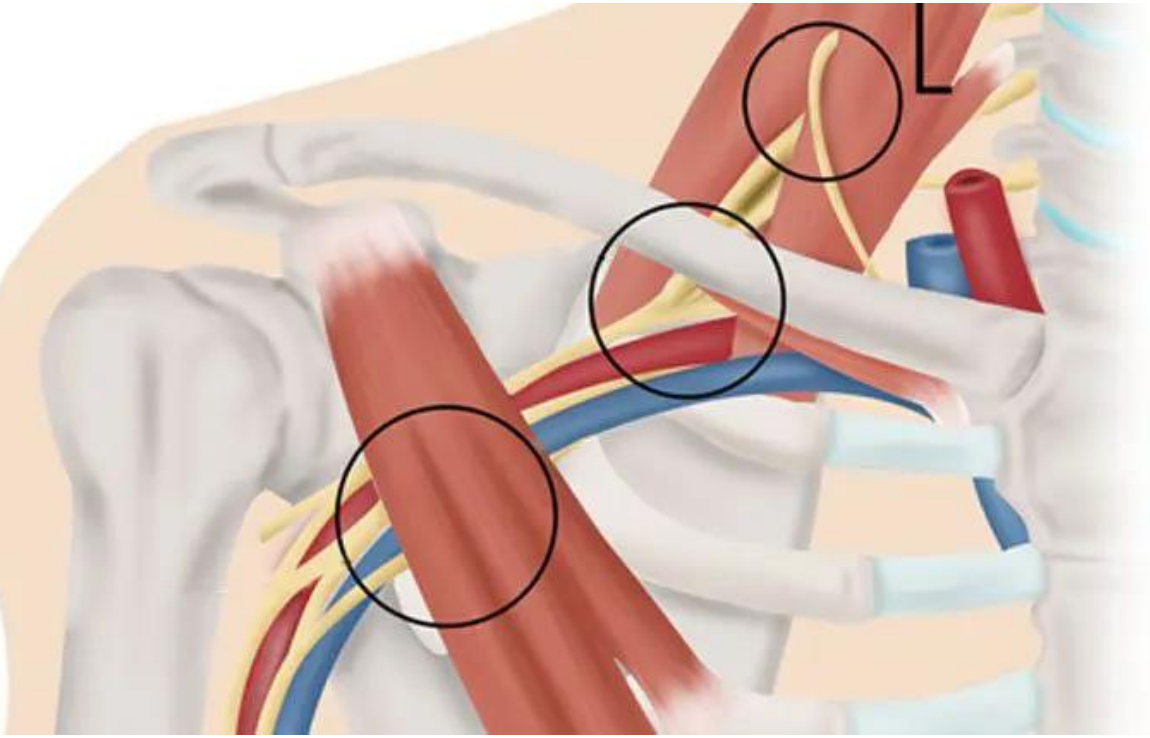


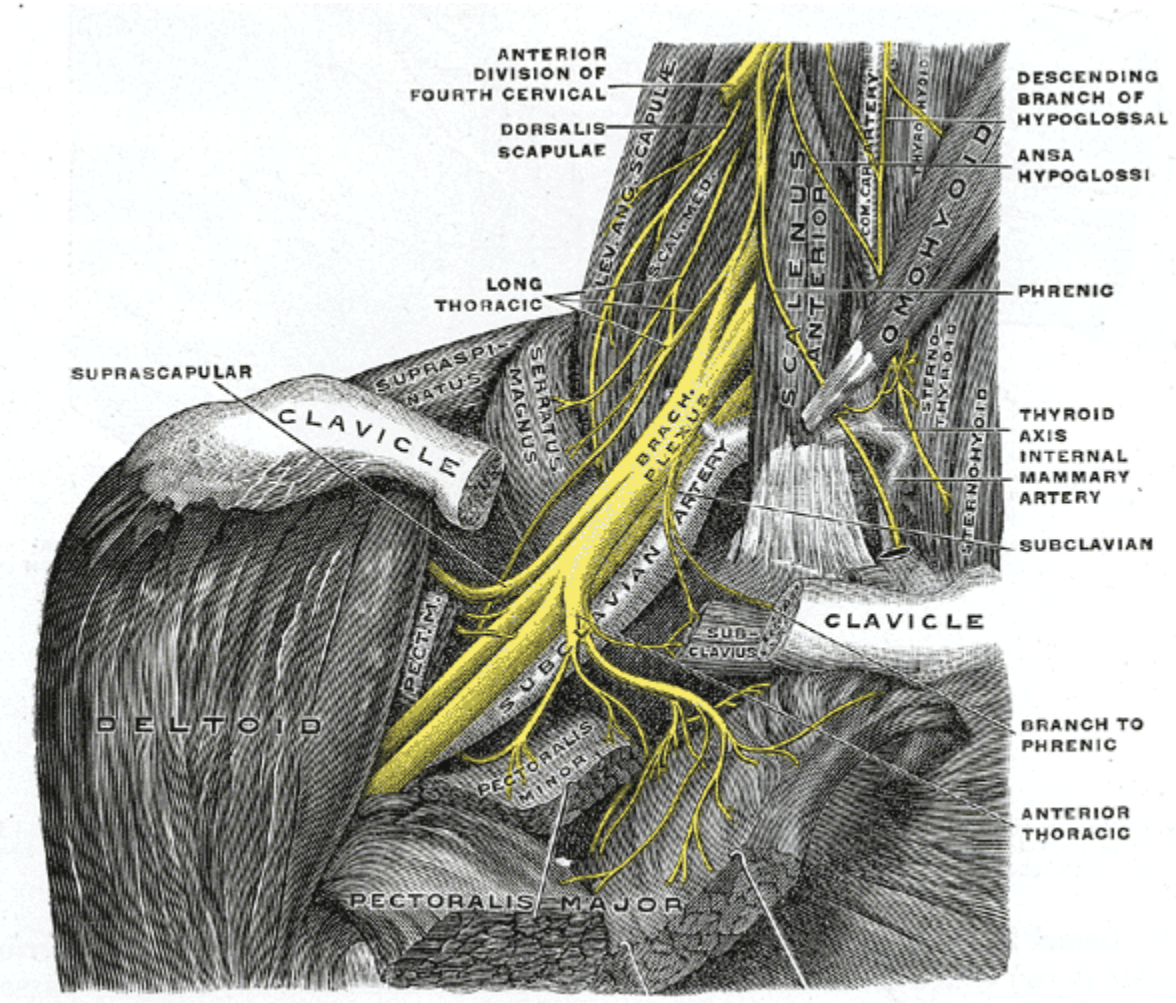
Hooking

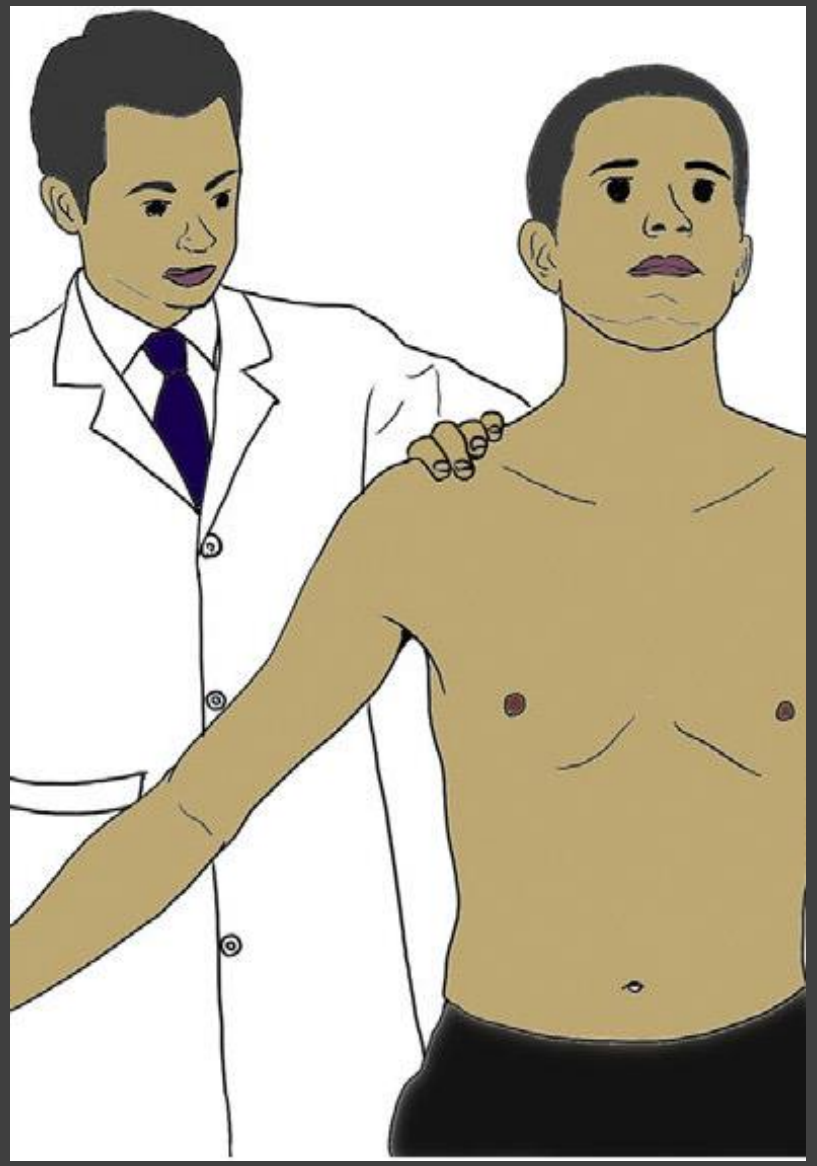
T4 Syndrome

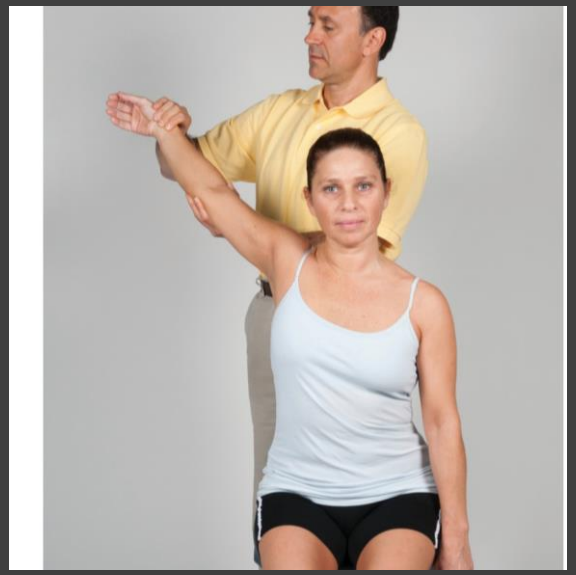


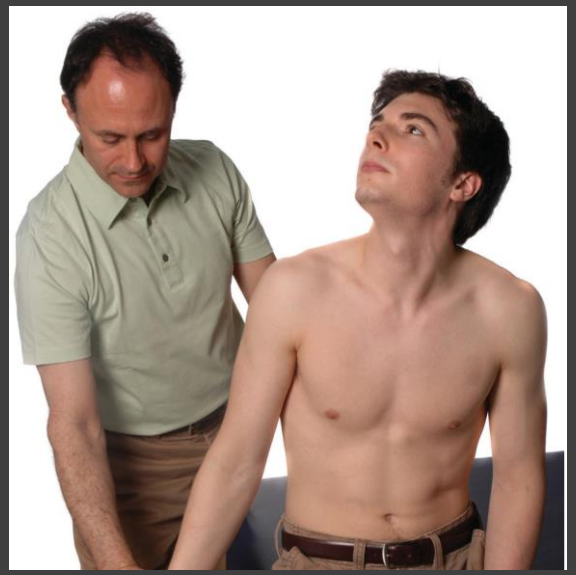
Thoracic Outlet











Tests

Question 4

- When evaluating a patient with a known scoliosis you determine that they have a Cobb angle of 50 degrees causing a right scoliosis. Based on this information, what is the **MOST** appropriate intervention for the therapist to perform?

- 1- Refer to an orthotist
- 2- Stretch out the left paraspinals
- 3- Refer to an orthopedic surgeon
- 4- Stretch out the right paraspinals

Question 5

- While evaluating a patient with lumbothoracic junctional scoliosis, the patient complains that their corrective bracing solution irritates their back and is very bulky. Which bracing solution would be the **MOST** appropriate given this information?
- 1- Milwaukee
- 2- Cruciform
- 3- Boston
- 4- Halo

Question 6

A patient presents with a complaint of left shoulder pain (7/10 with overhead activities) secondary to suspected sub-acromial pain syndrome. While examining the patient you identify bilateral areas of tenderness along the anterior ribs. They report the pain as being a 2/10 and that it does not affect function. The patient denies any shortness of breath and recently was examined by their cardiologist and no issues were detected. What is the **MOST** appropriate action for the physical therapist to take?

- 1- Refer back to the cardiologist
- 2- perform thoracic spine mobilizations
- 3- Focus on reducing shoulder pain
- 4- Focus on rib mobilization

Question 7

- A patient presents with a bilateral headache that does not worsen with cervical movements. In addition, the patient reports numbness and tingling in their left thumb. Testing reveals weakness of elbow flexion and wrist extension as well as diminished DTR of the brachioradialis. Based on this information, what is the **MOST** appropriate intervention?

- 1- Intermittent traction
- 2- c1-c2 SNAGs
- 3- Thoracic manipulation
- 4- Refer for imaging

Question 8

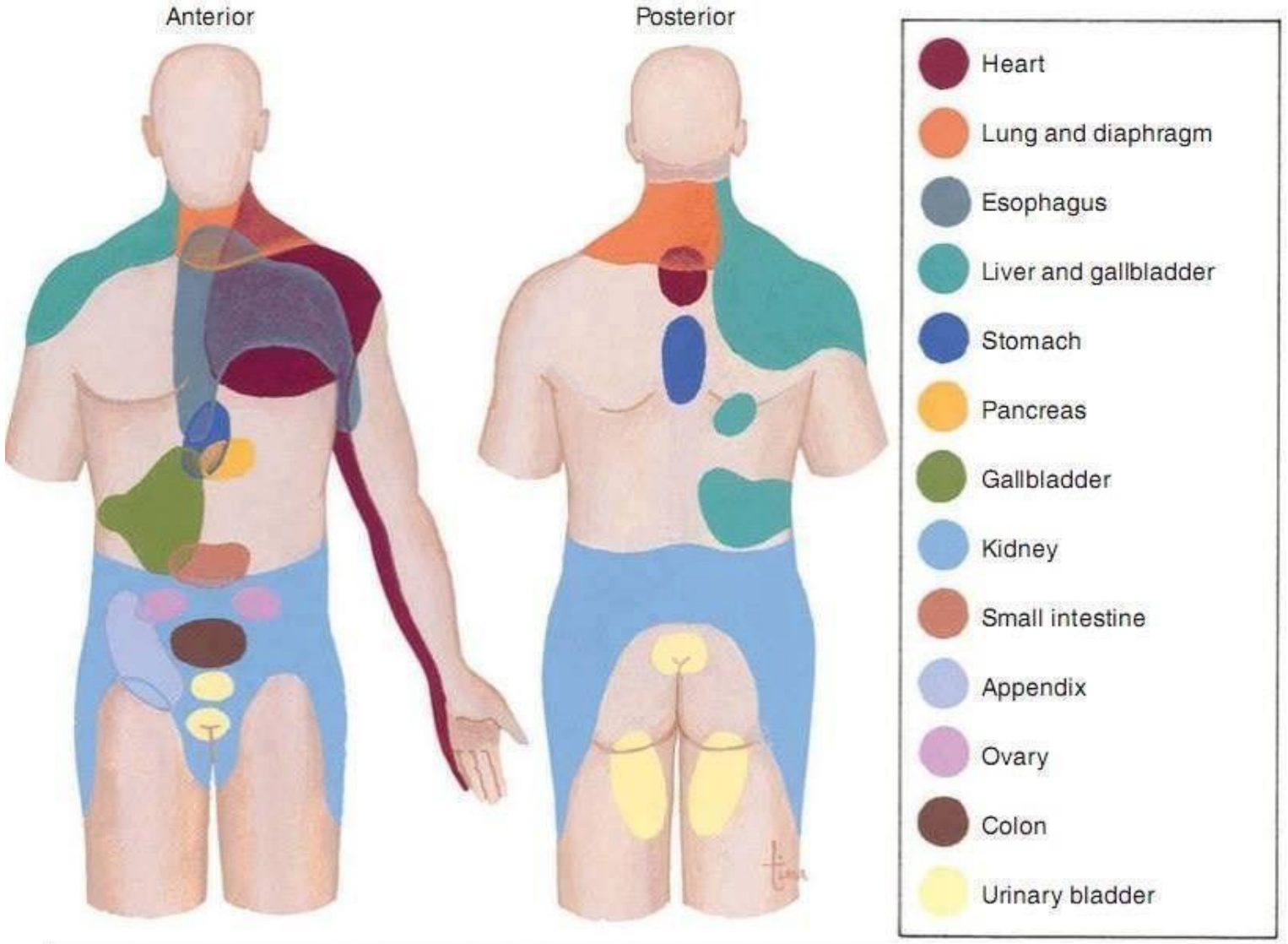
- The physical therapist has determined that the patient most likely has thoracic outlet syndrome. The perform the Wright's test and Eden's test and find negative results. When performing the Adson's test they find a diminished pulse in the upper extremity. What area of entrapment is **MOST** likely based on these results?

- 1- pectoralis minor
- 2- inferior to first rib
- 3- interscalene triangle
- 4- costoclavicular space

Differential Diagnosis

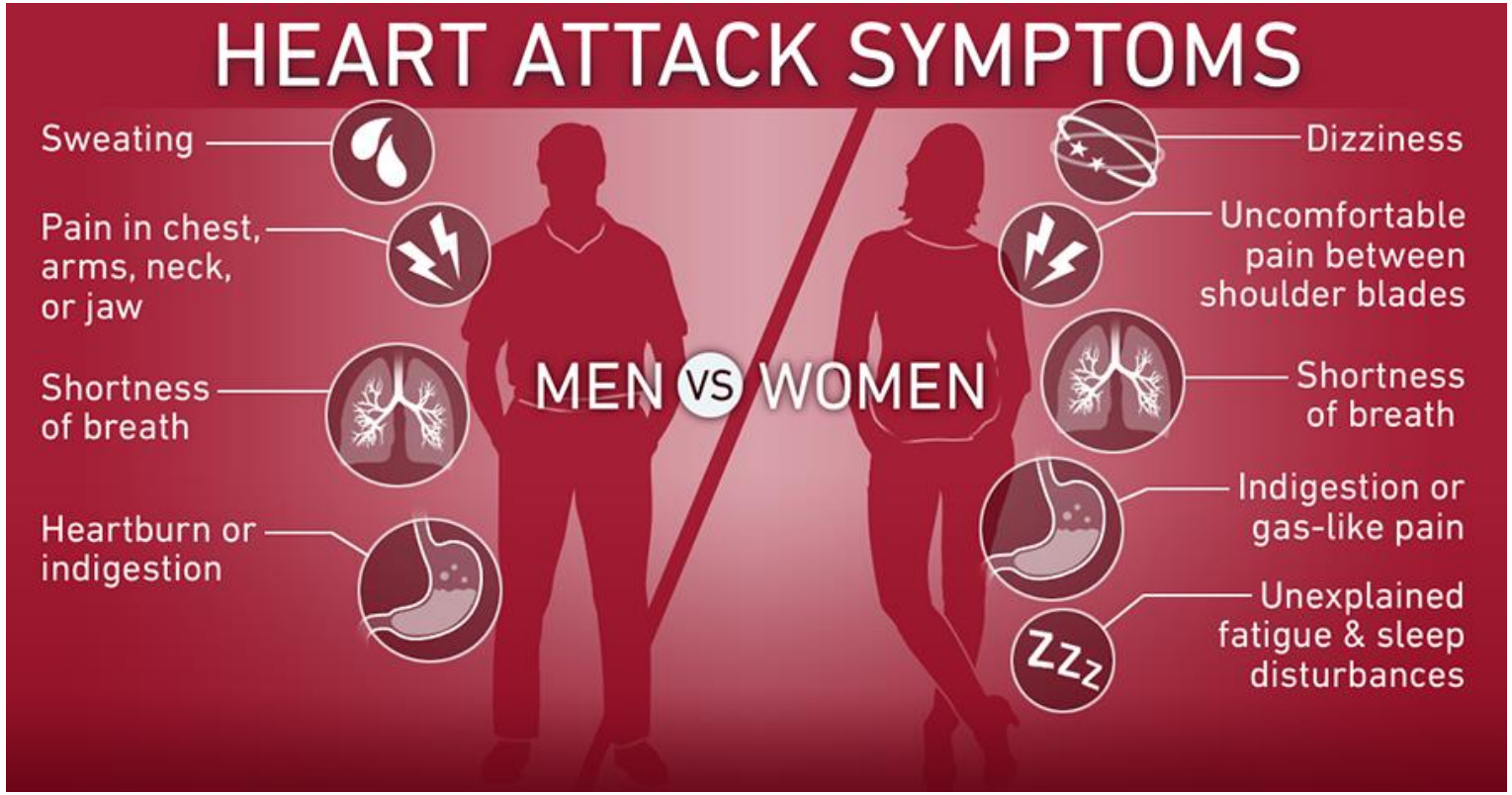
- Visceral referral
- Transverse myelitis
- VCF
- Pancoast tumor
- Paget-Schroetter Syndrome

Visceral

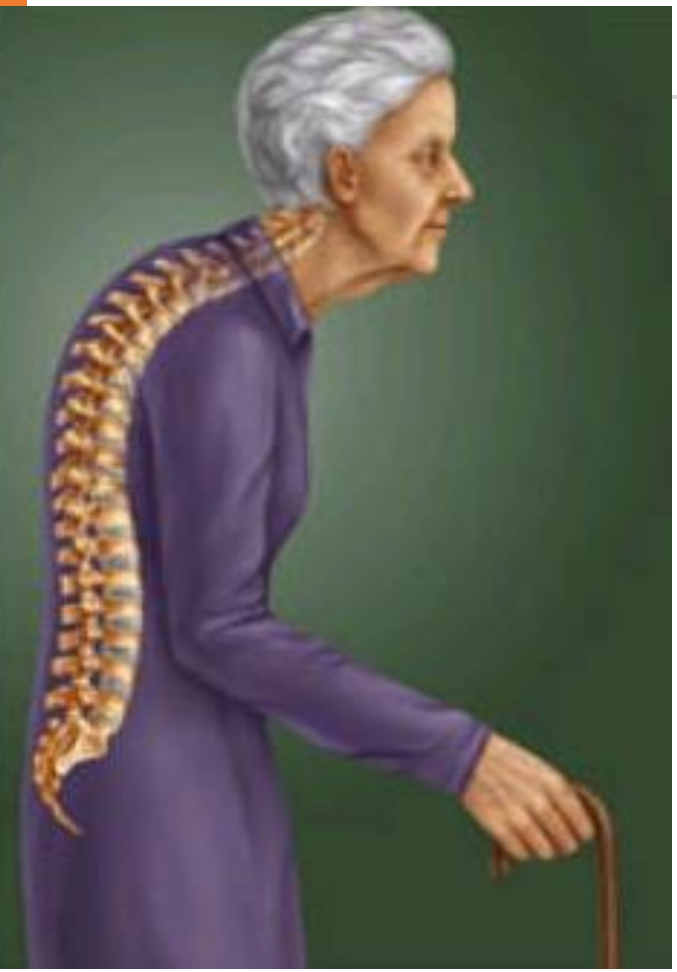


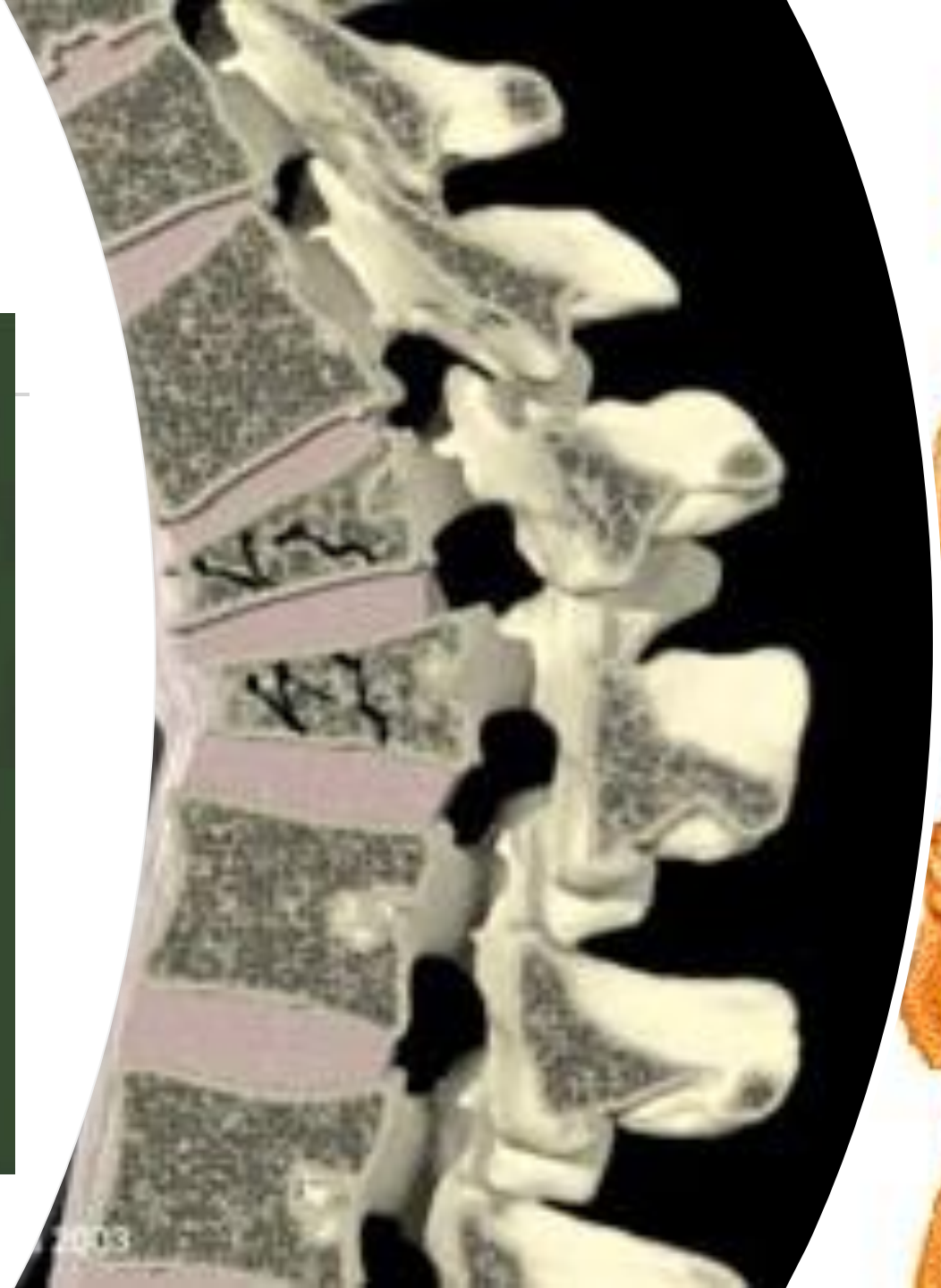
Referred pain. The sites for referred pain from various organs are shown.

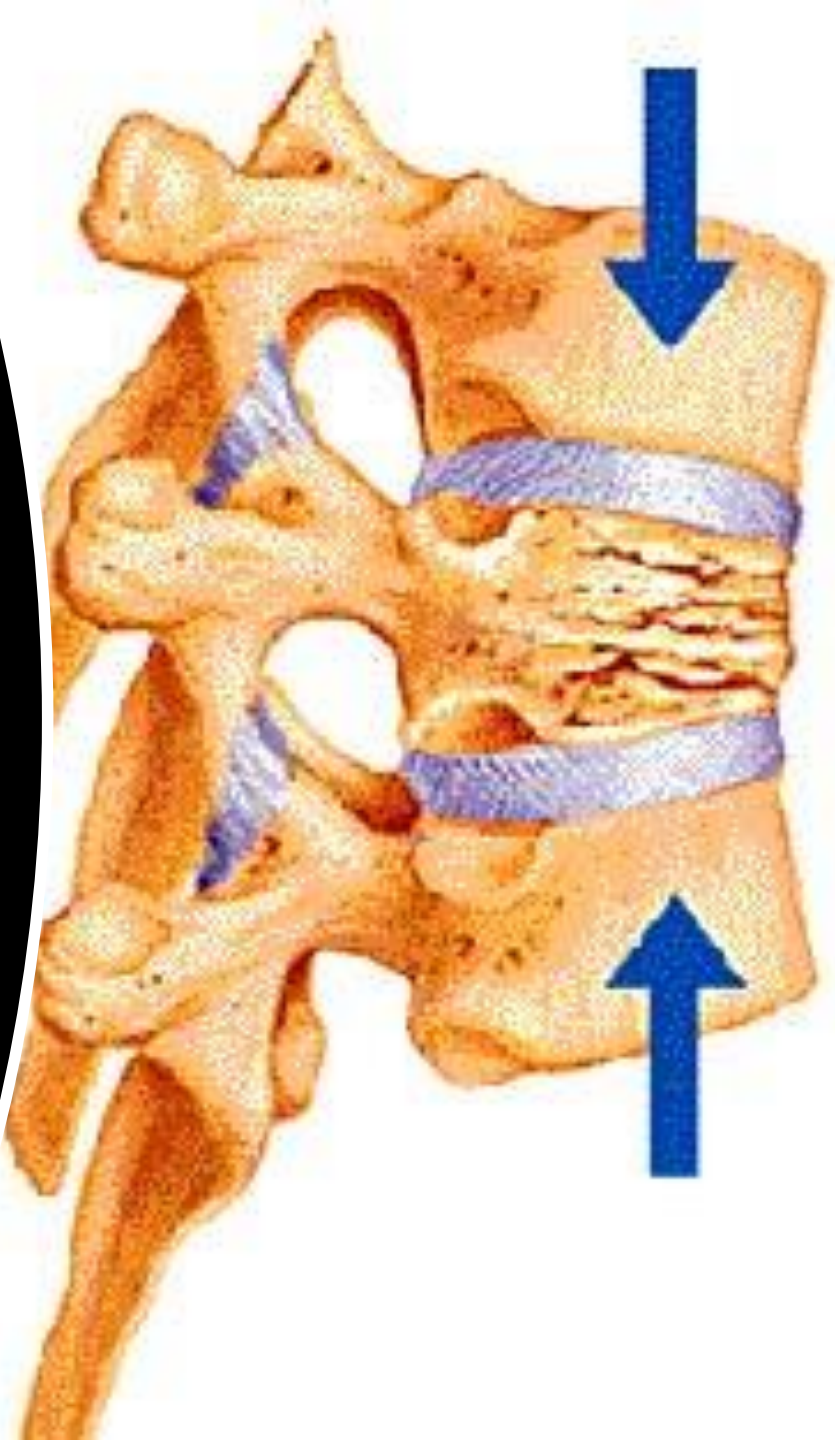
Men vs Women

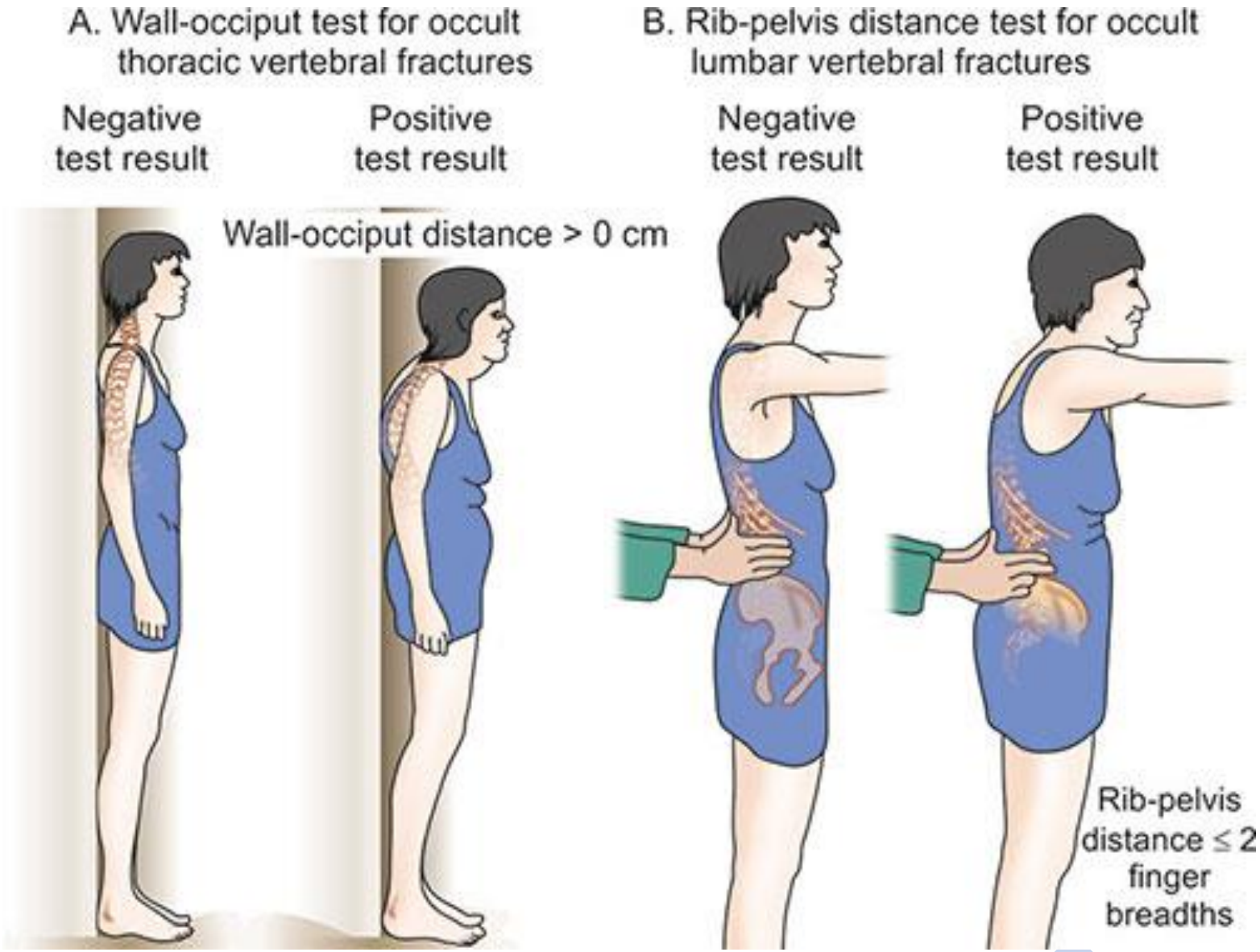

HEART ATTACK SYMPTOMS
Sweating
Pain in chest, arms, neck, or jaw
Shortness of breath
Heartburn or indigestion
MEN VS WOMEN
Dizziness
Uncomfortable pain between shoulder blades
Shortness of breath
Indigestion or gas-like pain
Unexplained fatigue & sleep disturbances
Zzz

VCF

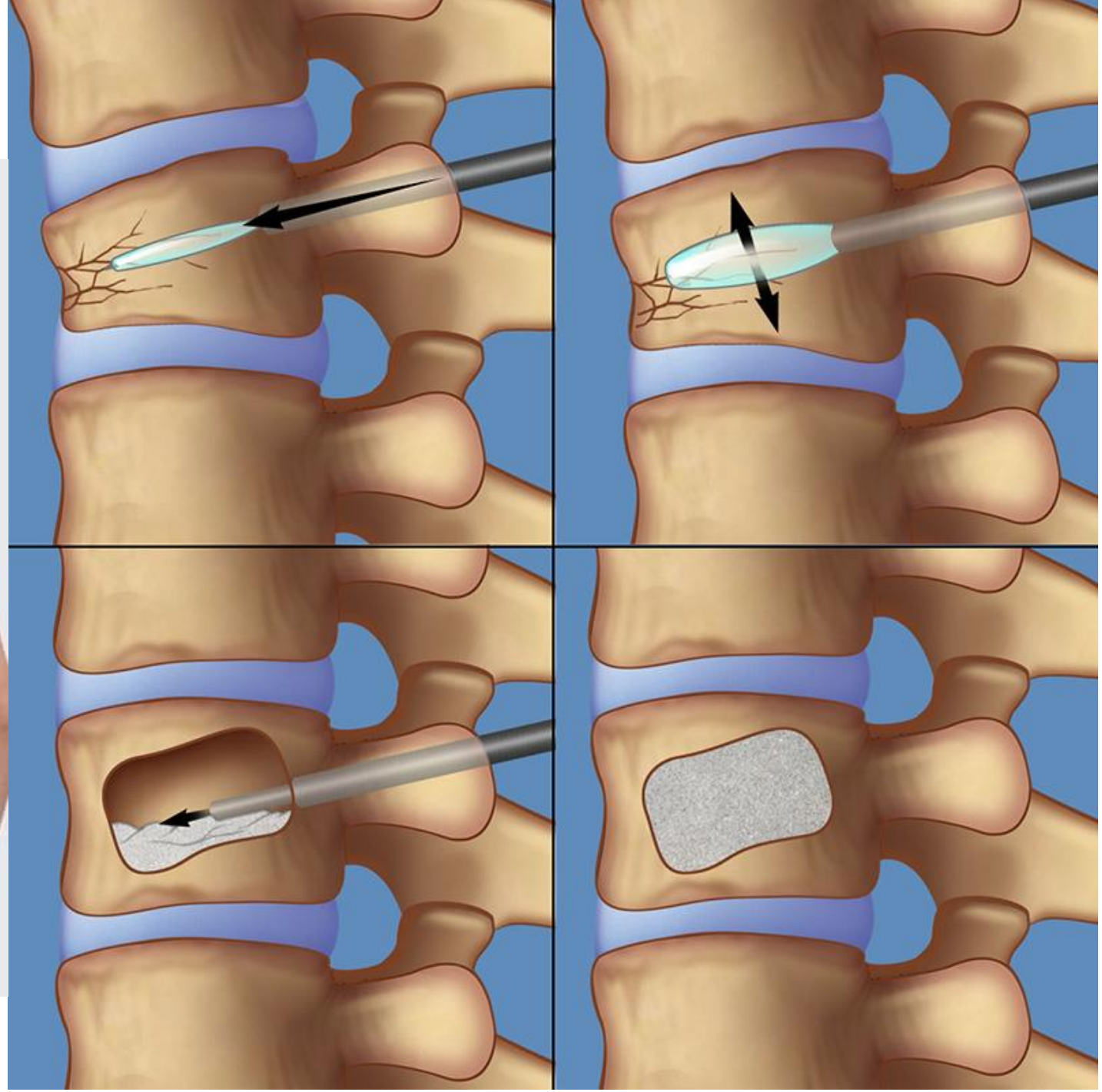




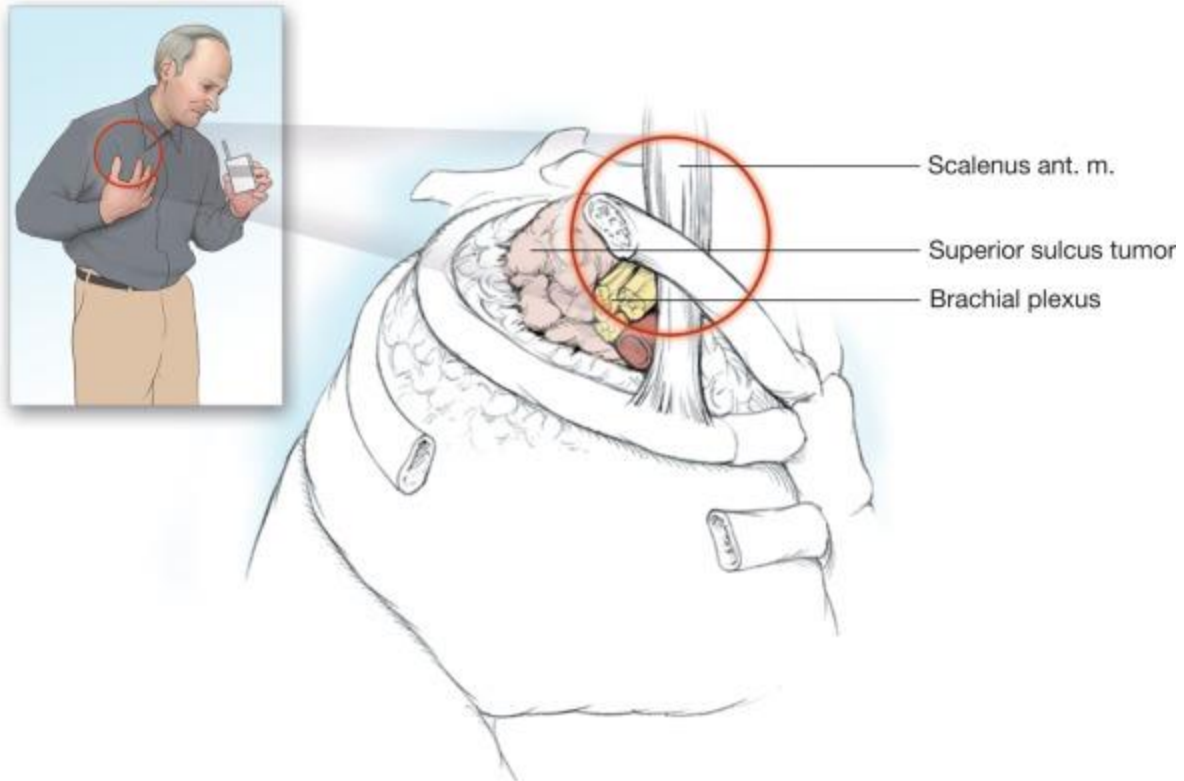


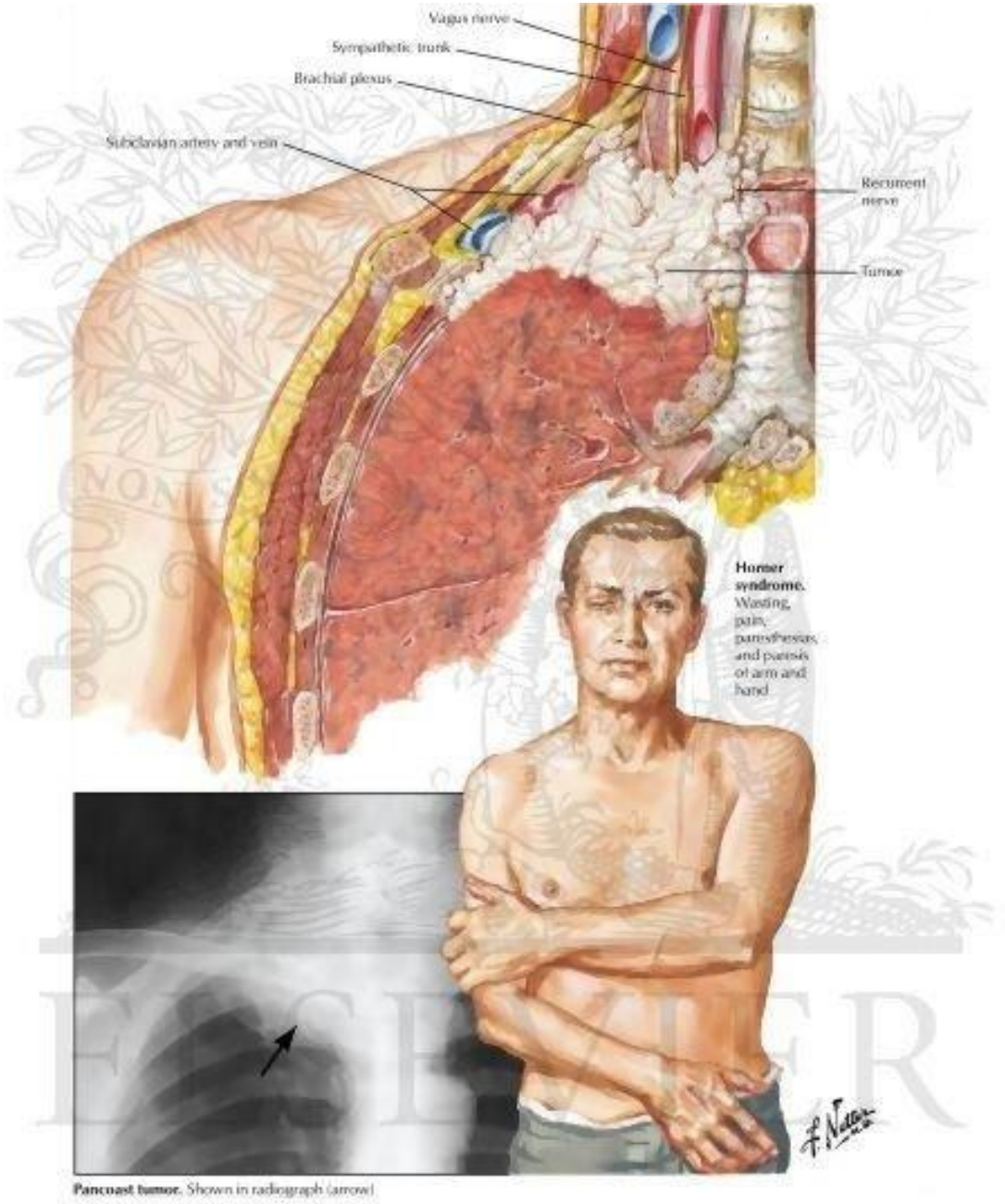

A. Wall-occiput test for occult thoracic vertebral fractures
Negative test result
Positive test result
Wall-occiput distance > 0 cm
B. Rib-pelvis distance test for occult lumbar vertebral fractures
Negative test result
Positive test result
Rib-pelvis distance ≤ 2 finger breadths


medi

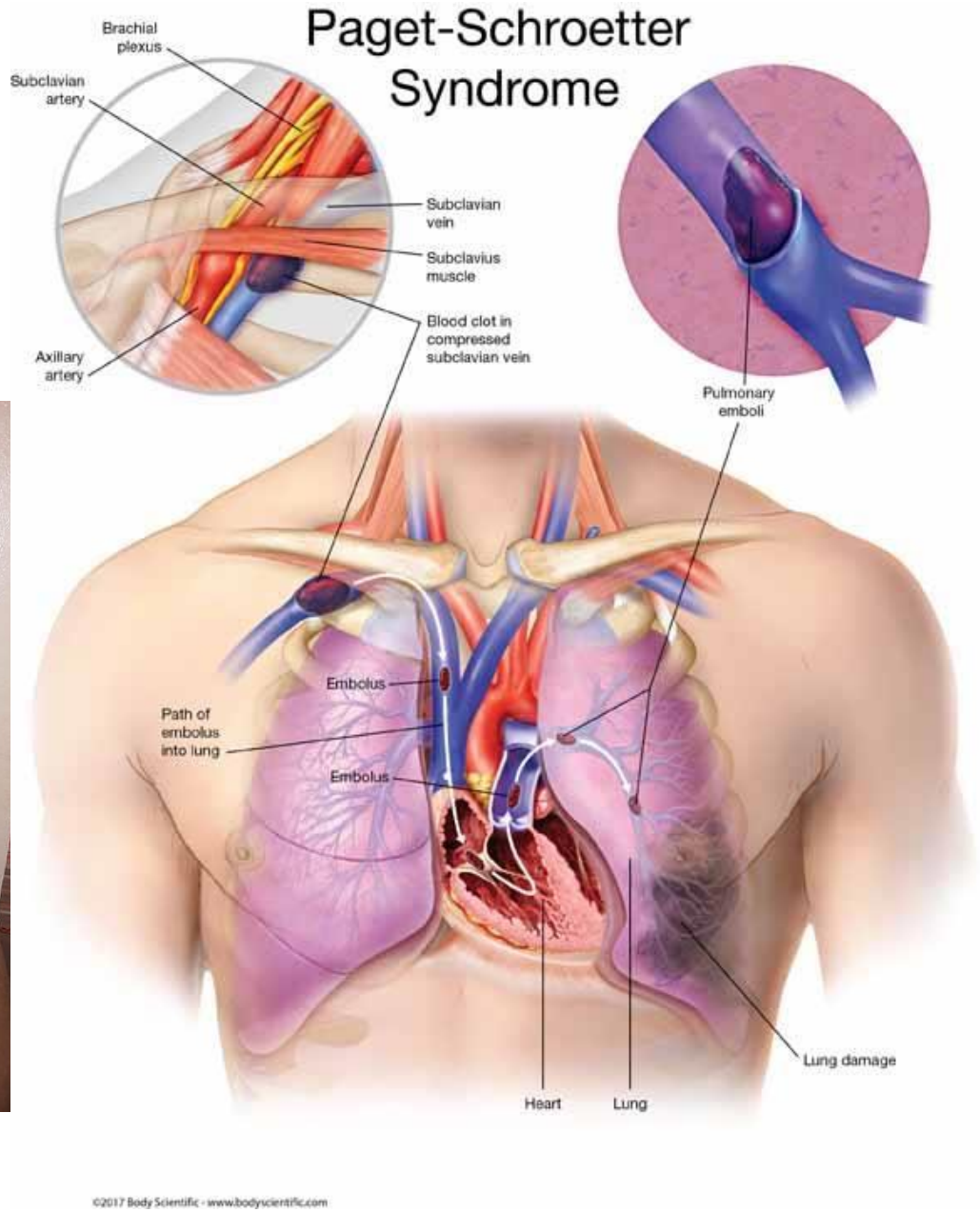


Pancoast





Paget-Schroetter Syndrome



Question 9

- During an examination of patient with left shoulder pain, you identify constriction of the pupil and eyelid drop on the left side? The patient denies any difficulty breathing, presence of a cough, or weight loss. Based on this presentation, what is the **MOST** appropriate decision?

- 1- Continue treating the shoulder
- 2- Assess sympathetic chain neural tension
- 3- refer back to the medical doctor
- 4- Assess thoracic spine mobility

Question 10

- A physical therapist performs the rib-pelvic distance test and finds a distance of <2 finger breadths. The patient reports no complaints of pain but does report fatigue with maintaining their spine in neutral. They report they have had this posture for years and have had multiple x-rays by their orthopedist. What intervention would be the **MOST** beneficial to this patient?

- 1- refer to an orthotist
- 2- perform thoracic extension exercises
- 3- stretch the hip flexors
- 4- refer for imaging

Feedback? Let Us Know!

We would love to get your general feedback on today's session and ideas for subject matter for future Spotlight Sessions!

SPOTLIGHT *Series*

Good Luck and Thanks for Tuning In!

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