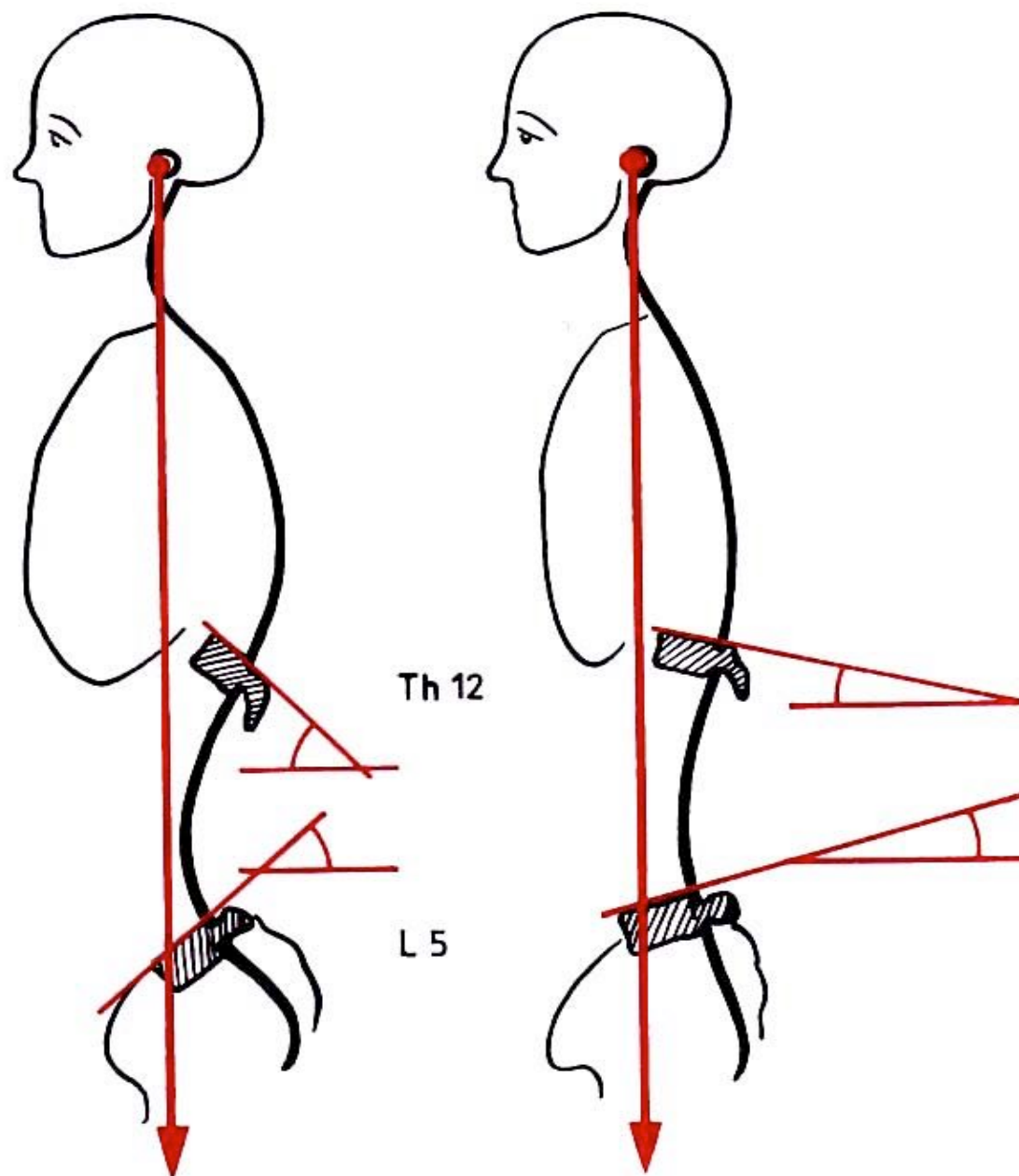




Workshop on thoracic diagnostic procedures

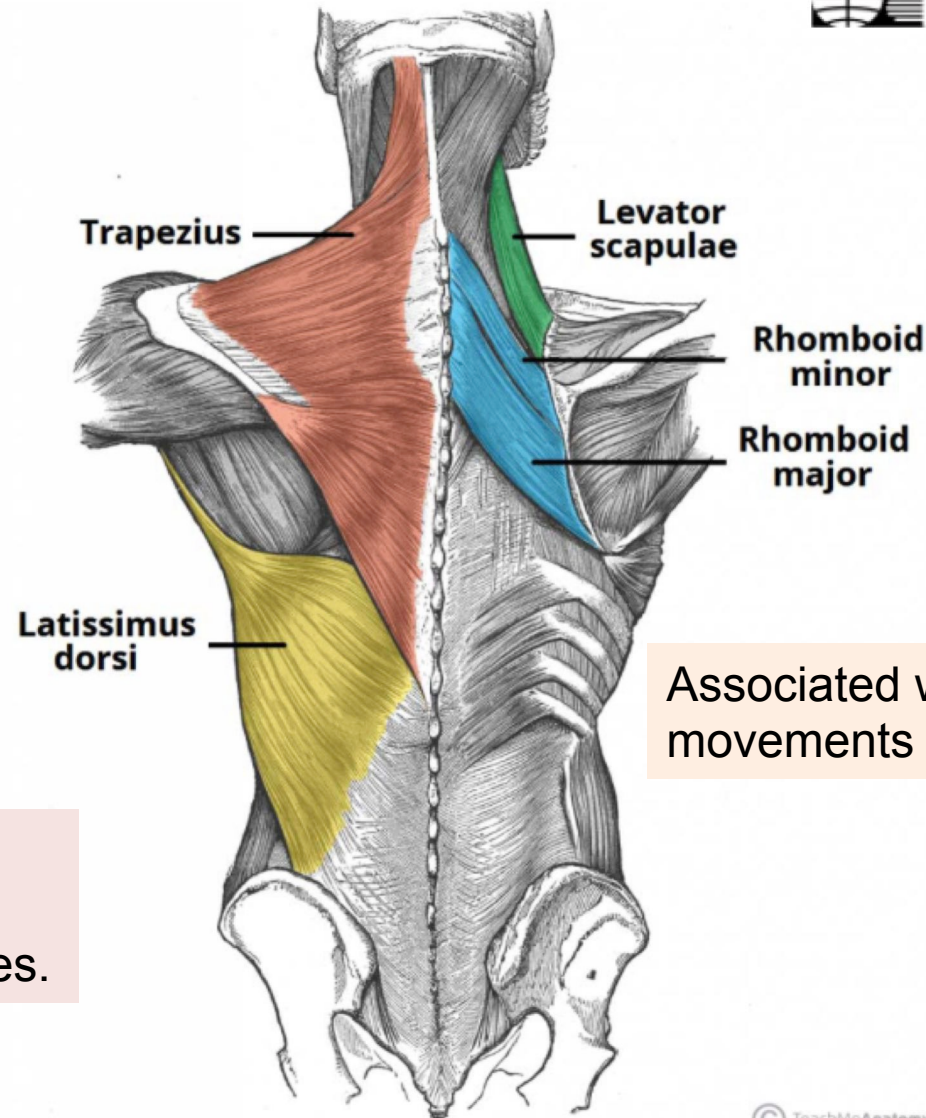


**Kyphosis is in correlation
with lordosis of lumbar
and cervicle spine**

**20°- 40°
(Hefti et al. 1997)**

Extrinsic dorsal muscles superficial layer

- a. M. trapezius
- b. M. levator scapulae
- c. M. Rhomboid minor
- d. M. Rhomboid major
- e. M. latissimus dorsi



Associated with movements of the shoulder.

The superficial and intermediate muscles do not develop in the back, and are classified as **extrinsic** muscles.

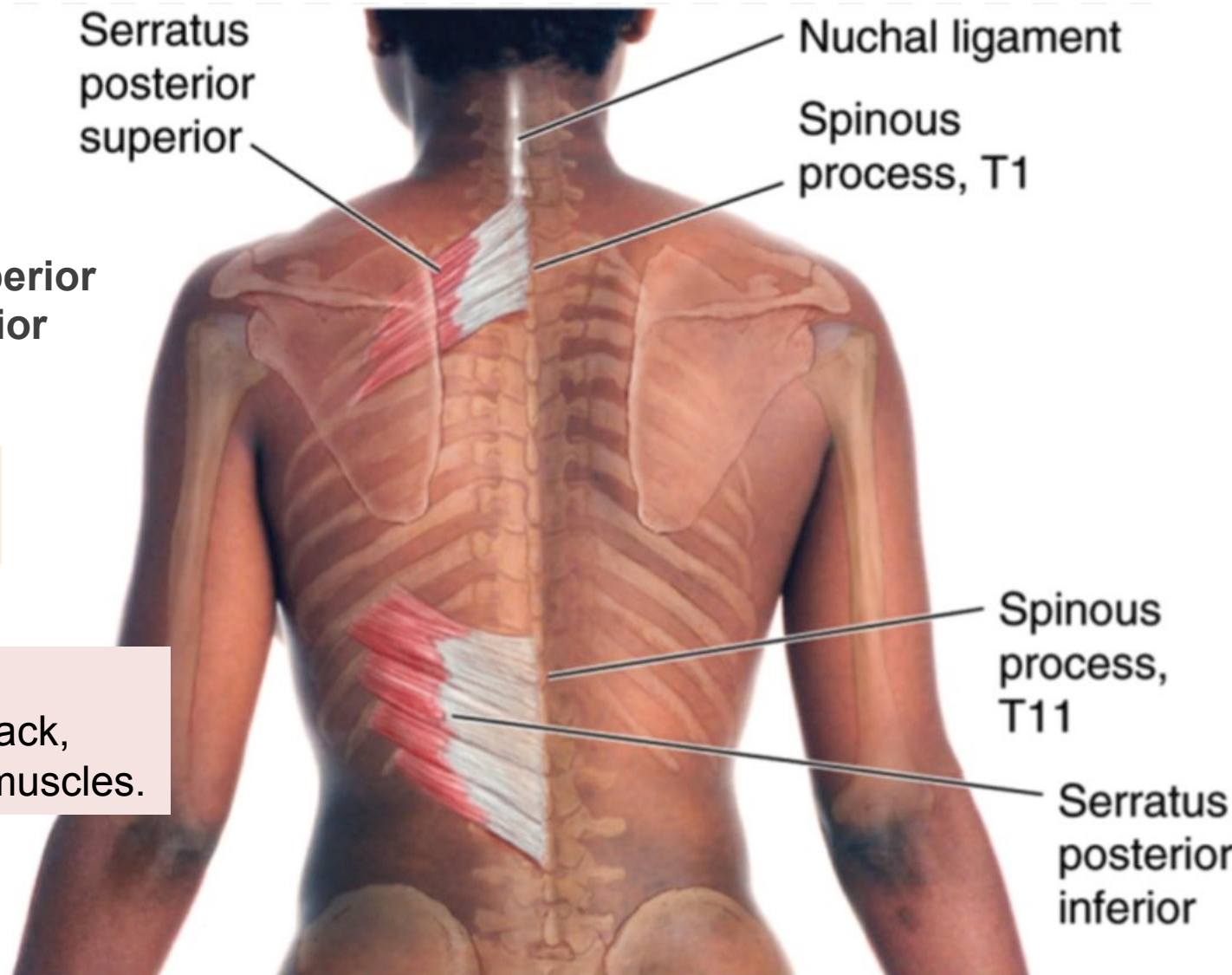
Extrinsic dorsal muscles intermediate layer



- a. M. serratus posterior superior
- b. M. serratus posterior inferior

Associated with movements of the thoracic cage.

The superficial and intermediate muscles do not develop in the back, and are classified as **extrinsic** muscles.



Intrinsic dorsal muscles intermediate layer

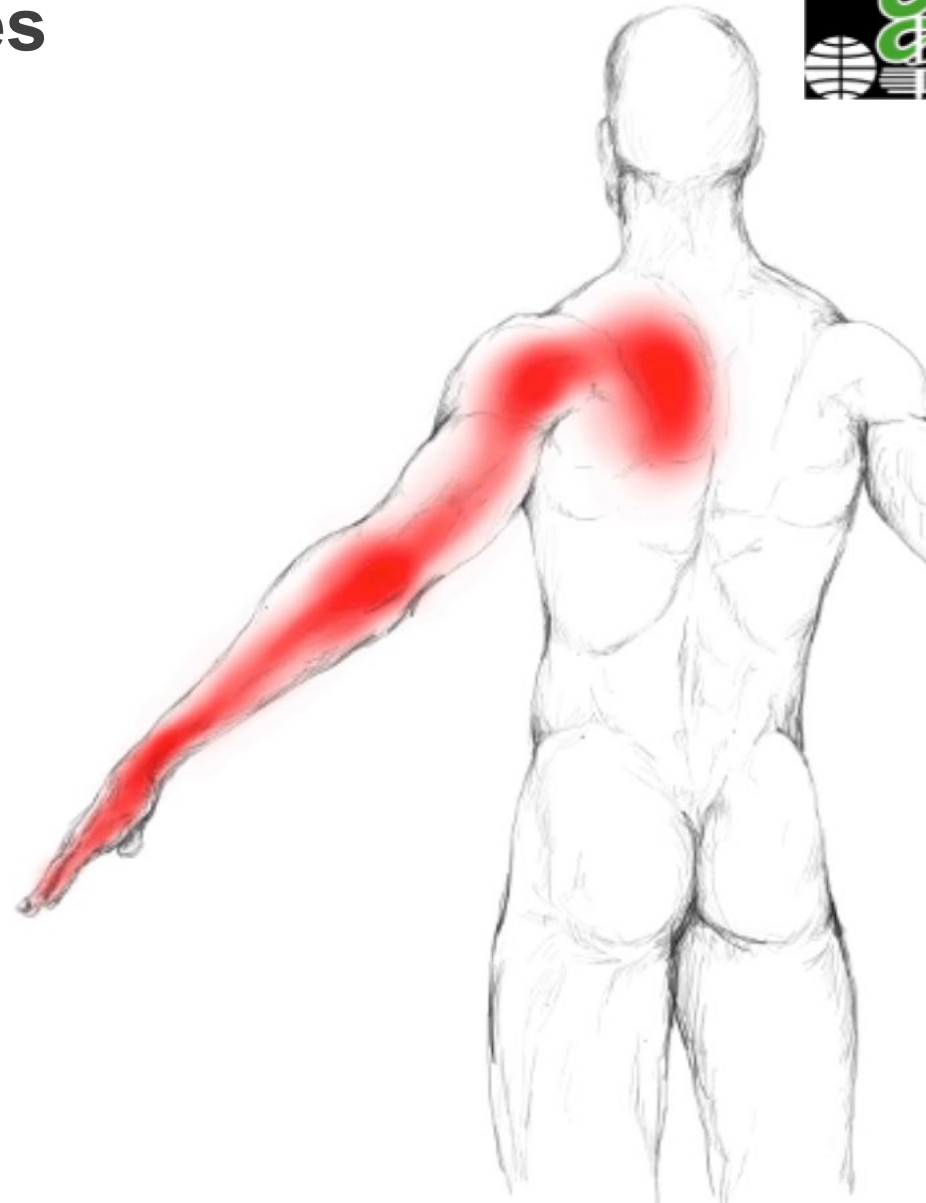
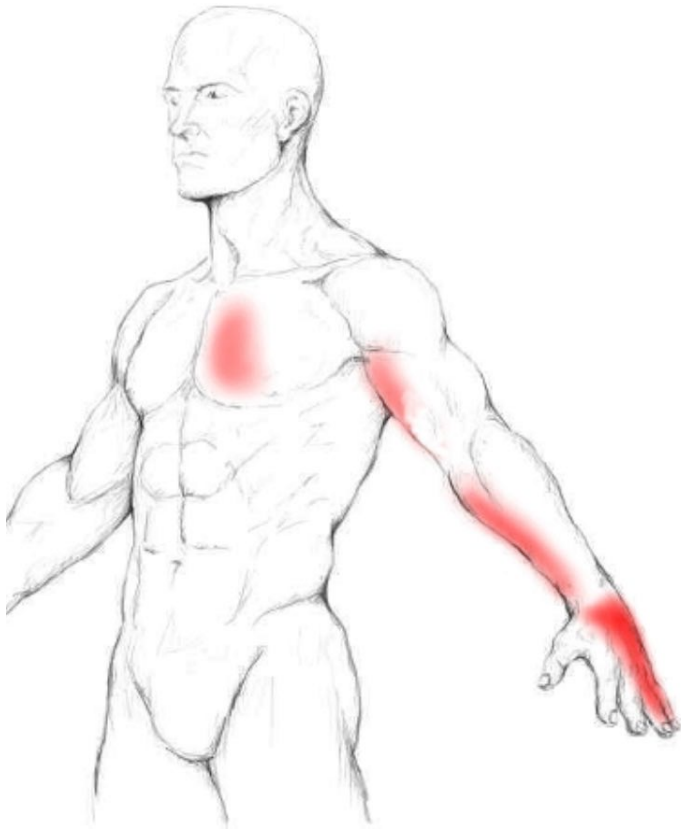
- a. M. serratus posterior superior
- b. M. serratus posterior inferior



Intrinsic dorsal muscles intermediate layer



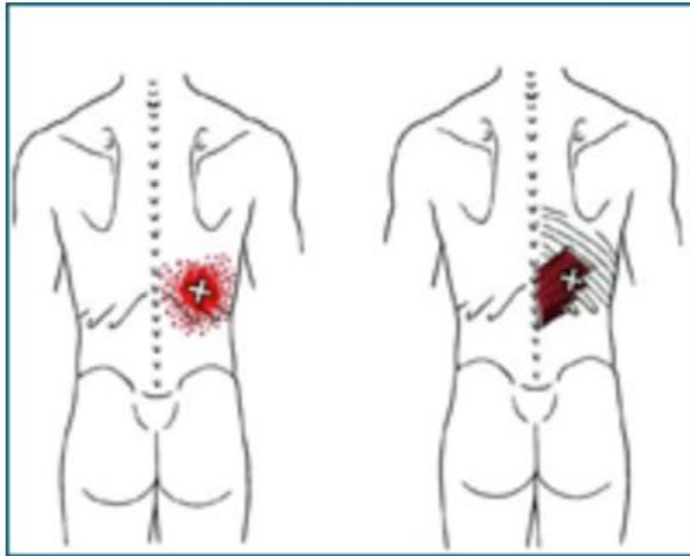
a. M. serratus posterior superior



Intrinsic dorsal muscles intermediate layer



b. M. serratus posterior inferior



Intrinsic dorsal muscles intermediate layer

- a. M. spinalis
- b. M. longissimus
- c. M. iliocostalis

Together these muscles form a column, known as the **M. erector spinae**.

The muscles themselves are covered by **deep fascia**, which plays a key role in their organisation.

The deep muscles develop embryologically in the back, and are thus described as **intrinsic** muscles.

Spinalis
(thoracic only)

Longissimus

Iliocostalis

They are associated with the movements of the vertebral column, and the control of posture.



Intrinsic dorsal muscles deep layer

- a. M. spinalis
- b. M. longissimus
- c. M. iliocostalis

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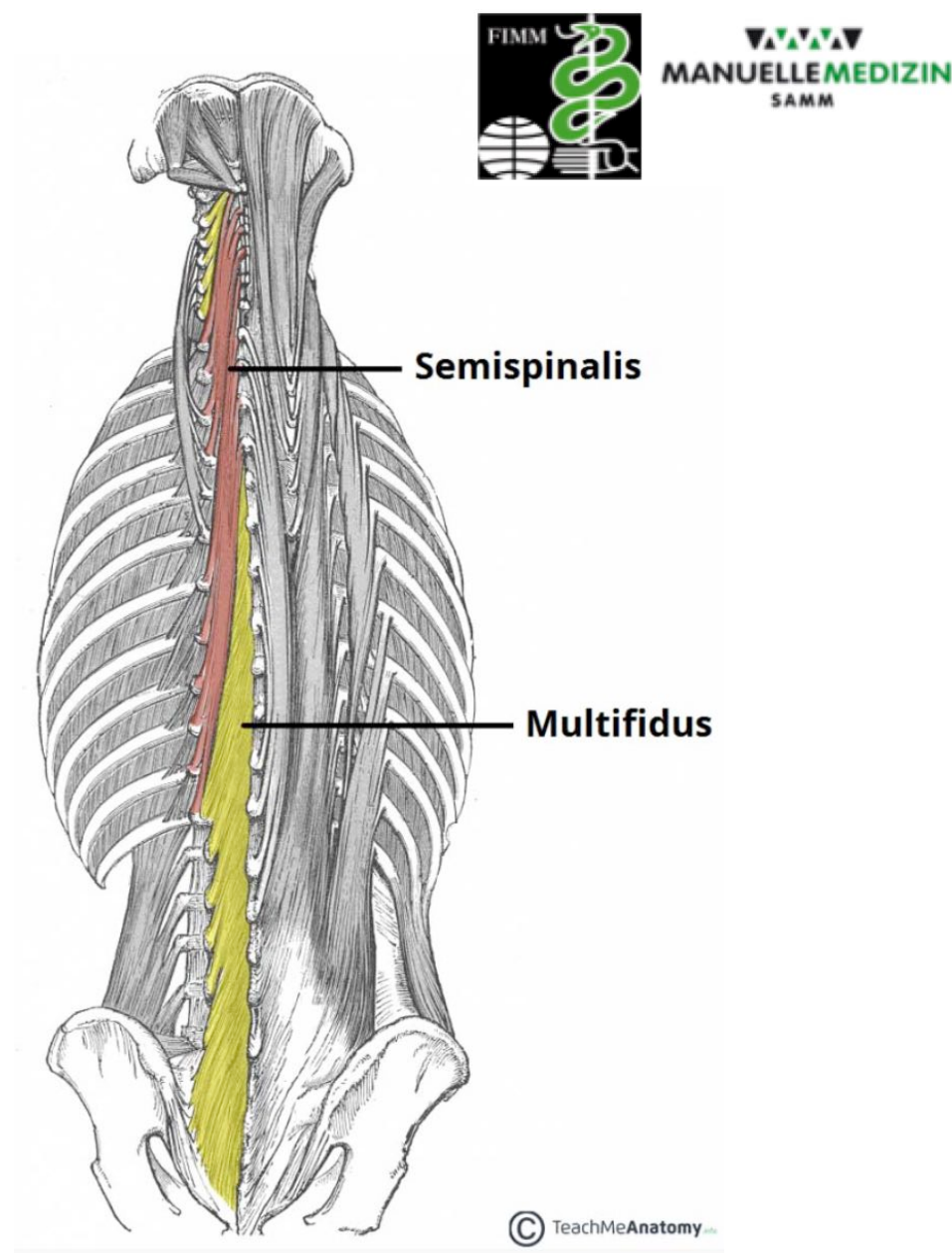


Intrinsic dorsal muscles deep layer

- a. M. semispinalis
- b. M. multifidus
- c. Mm. rotatores
- d. Mm. interspinales
- e. Mm. intertransversarii
- f. Mm. levators costarum

They are associated with the movements of the vertebral column, and the control of posture.

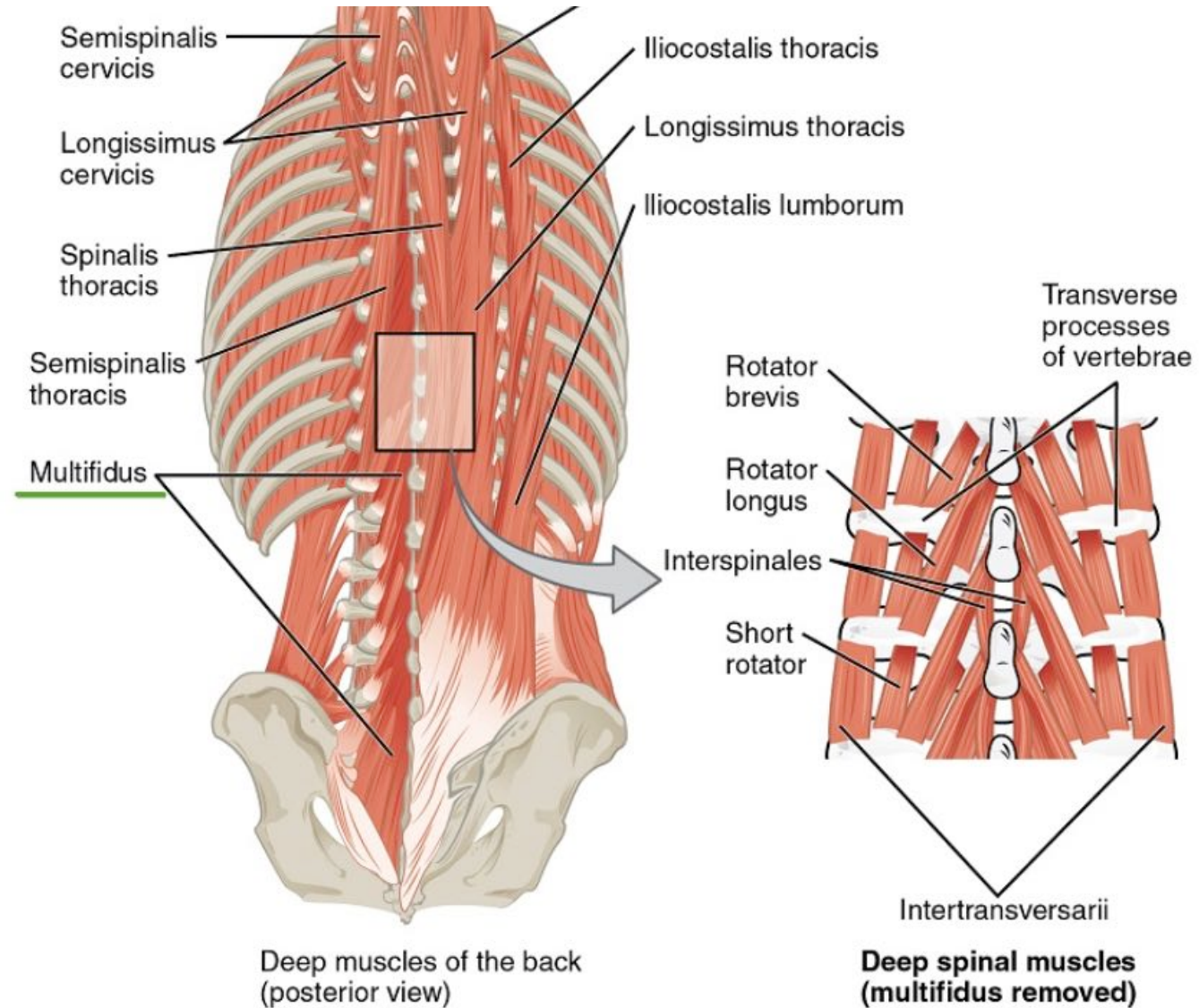
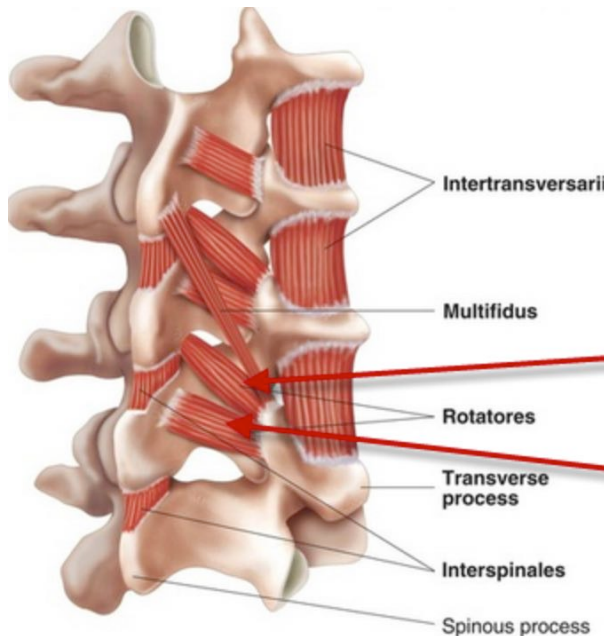
The deep muscles develop embryologically in the back, and are thus described as **intrinsic** muscles.



Intrinsic dorsal muscles deep layer

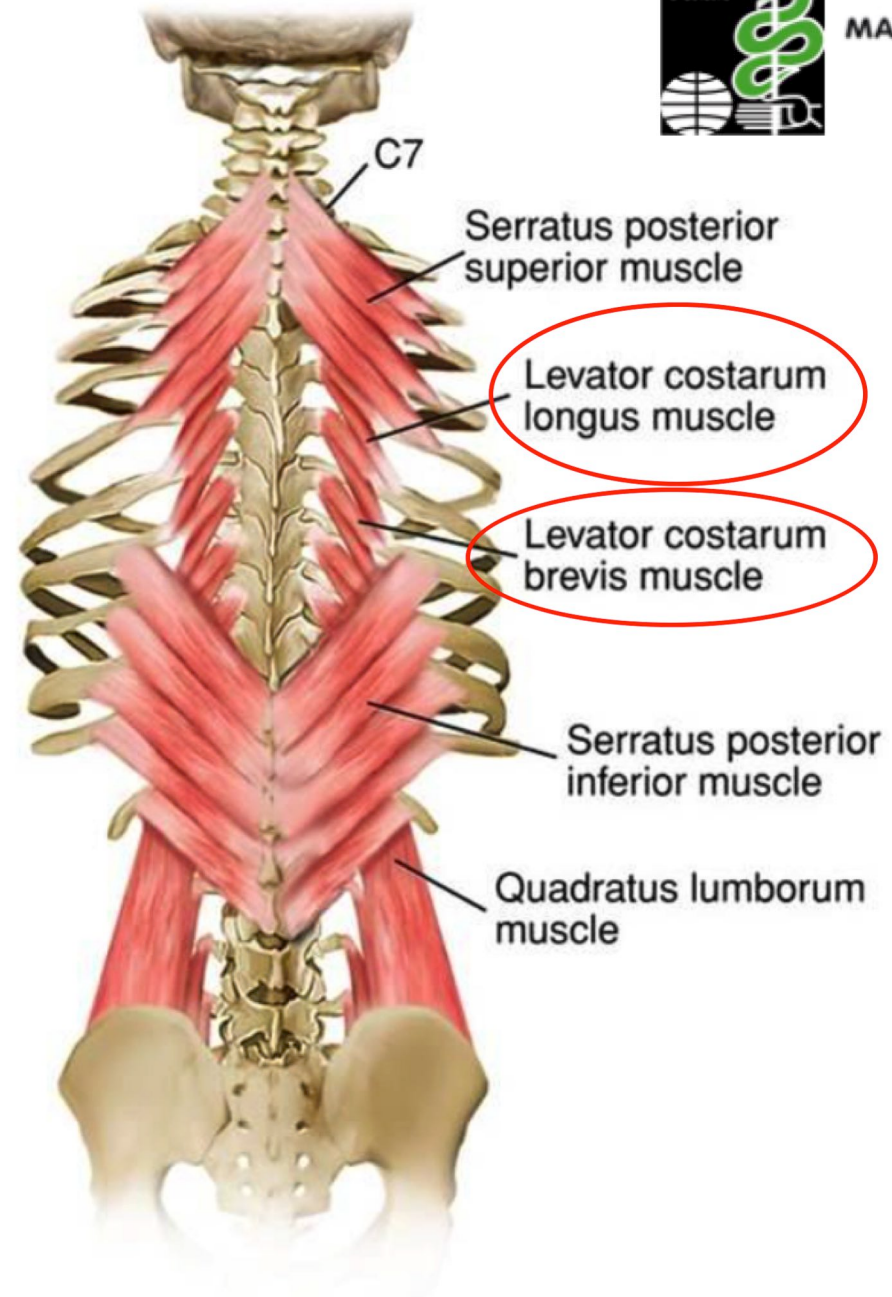
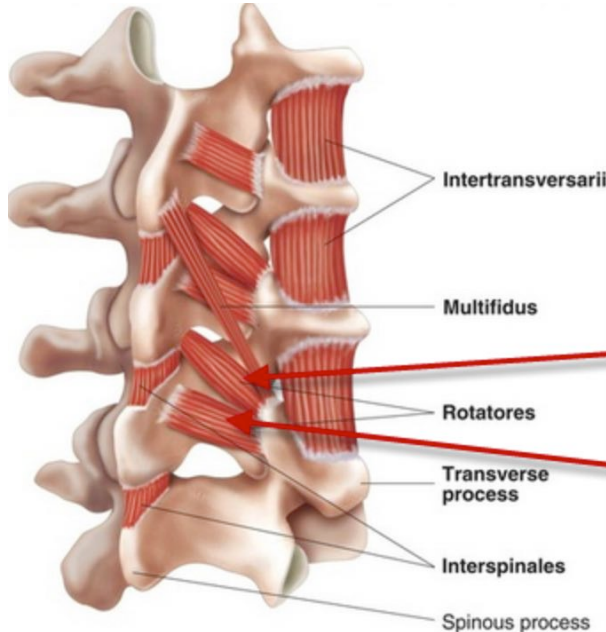


- a. **M. semispinalis**
- b. **M. multifidus**
- c. **Mm. rotatores**
- d. **Mm. interspinales**
- e. **Mm. intertransversarii**
- f. **Mm. levators costarum**



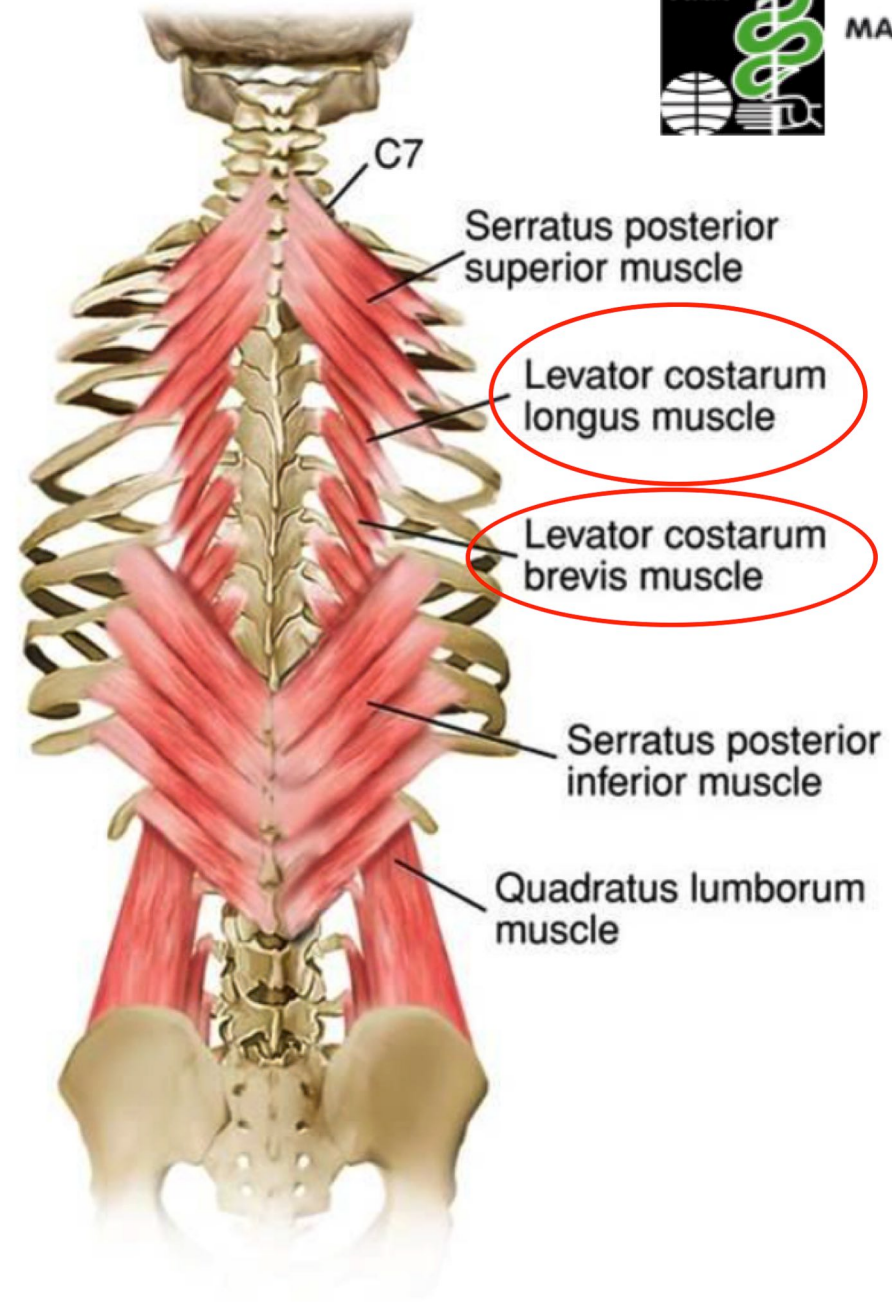
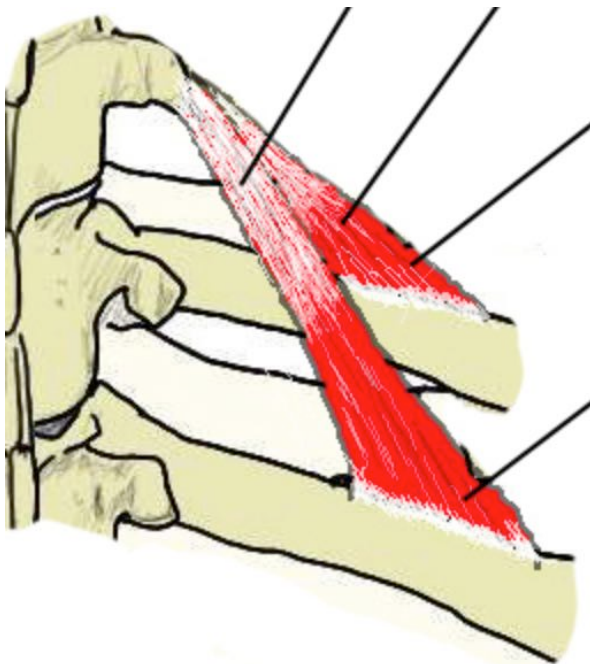
Intrinsic dorsal muscles deep layer

- a. **M. semispinalis**
- b. **M. multifidus**
- c. **Mm. rotatores**
- d. **Mm. interspinales**
- e. **Mm. intertransversarii**
- f. **Mm. levatores costarum**



Intrinsic dorsal muscles deep layer

- a. **M. semispinalis**
- b. **M. multifidus**
- c. **Mm. rotatores**
- d. **Mm. interspinales**
- e. **Mm. intertransversarii**
- f. **Mm. levators costarum**

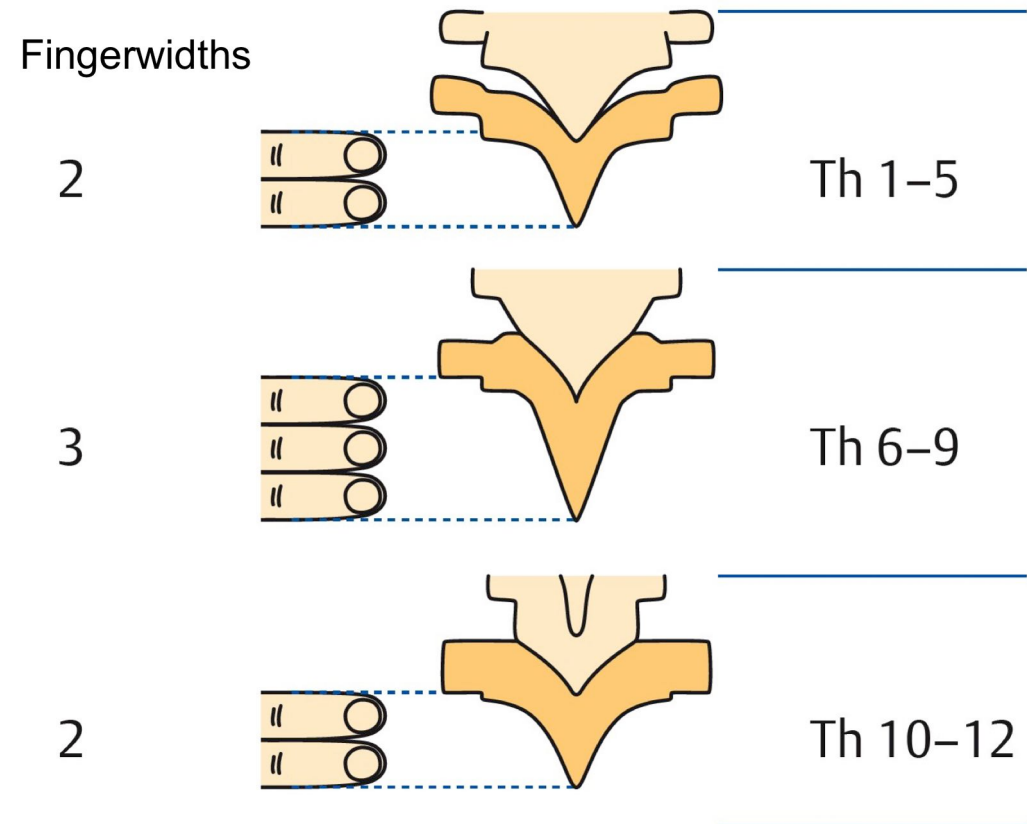


Segmental Correlation of Spinous process – fingerwidths



Horizontal line from
spina scapulae:
spinous spinosus **Th 3**

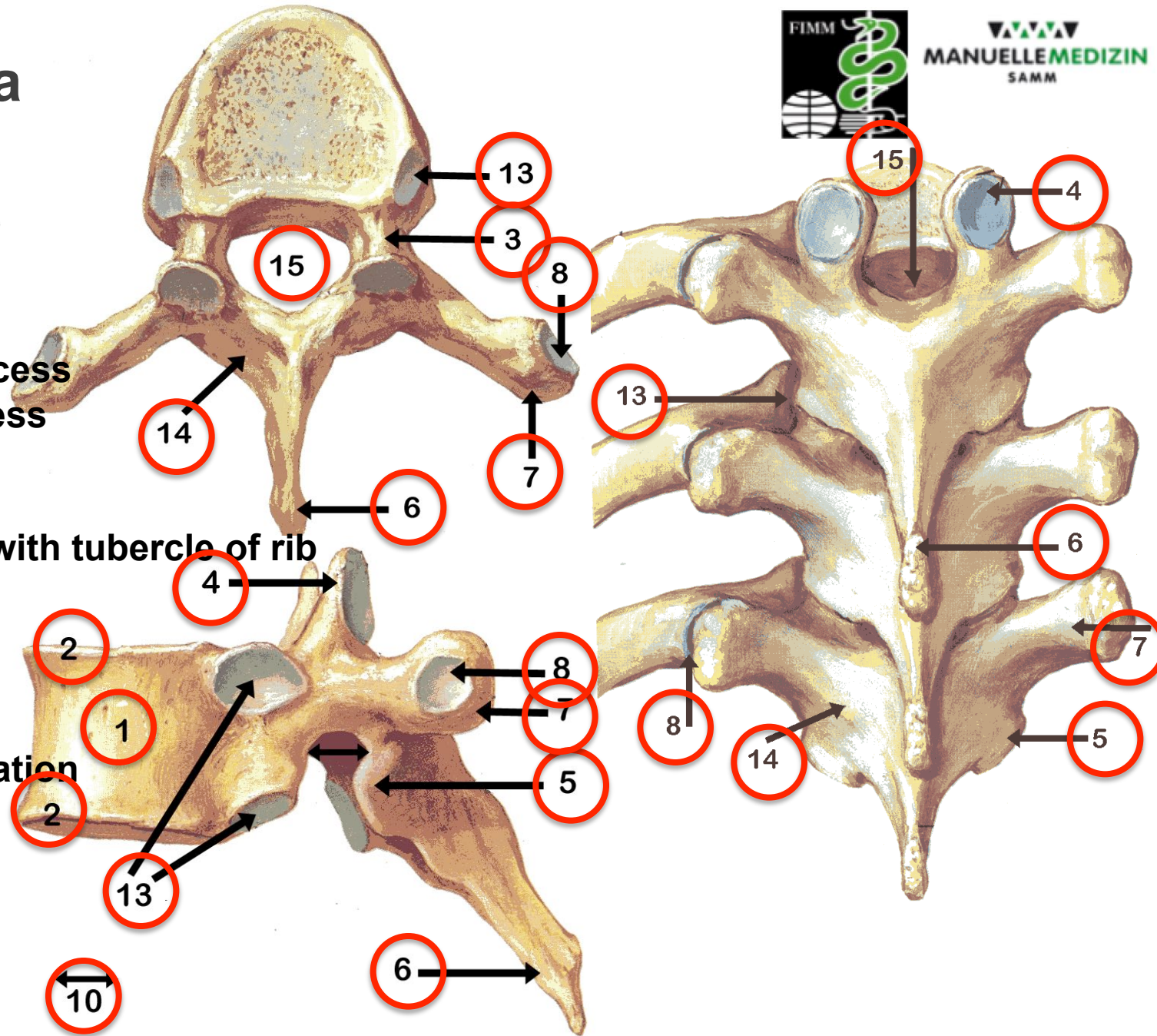
Horizontal line from
angulus costae scapulae:
spinous spinosous **Th 7**



Thoracic vertebra

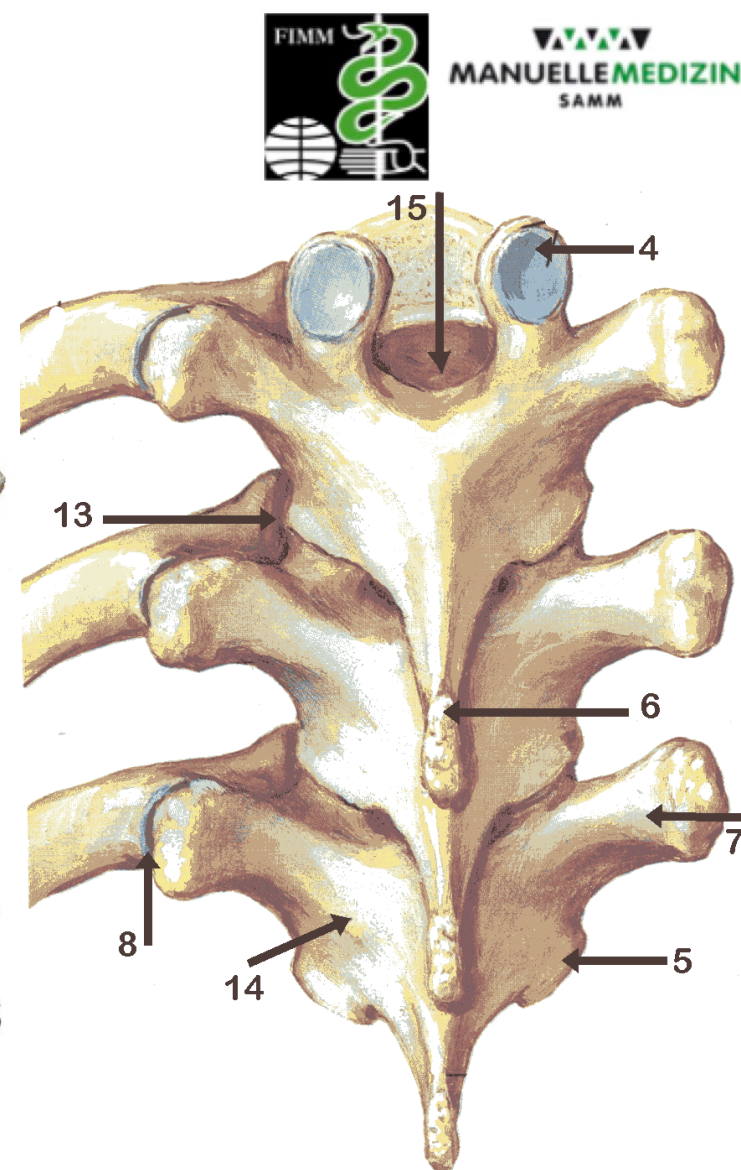
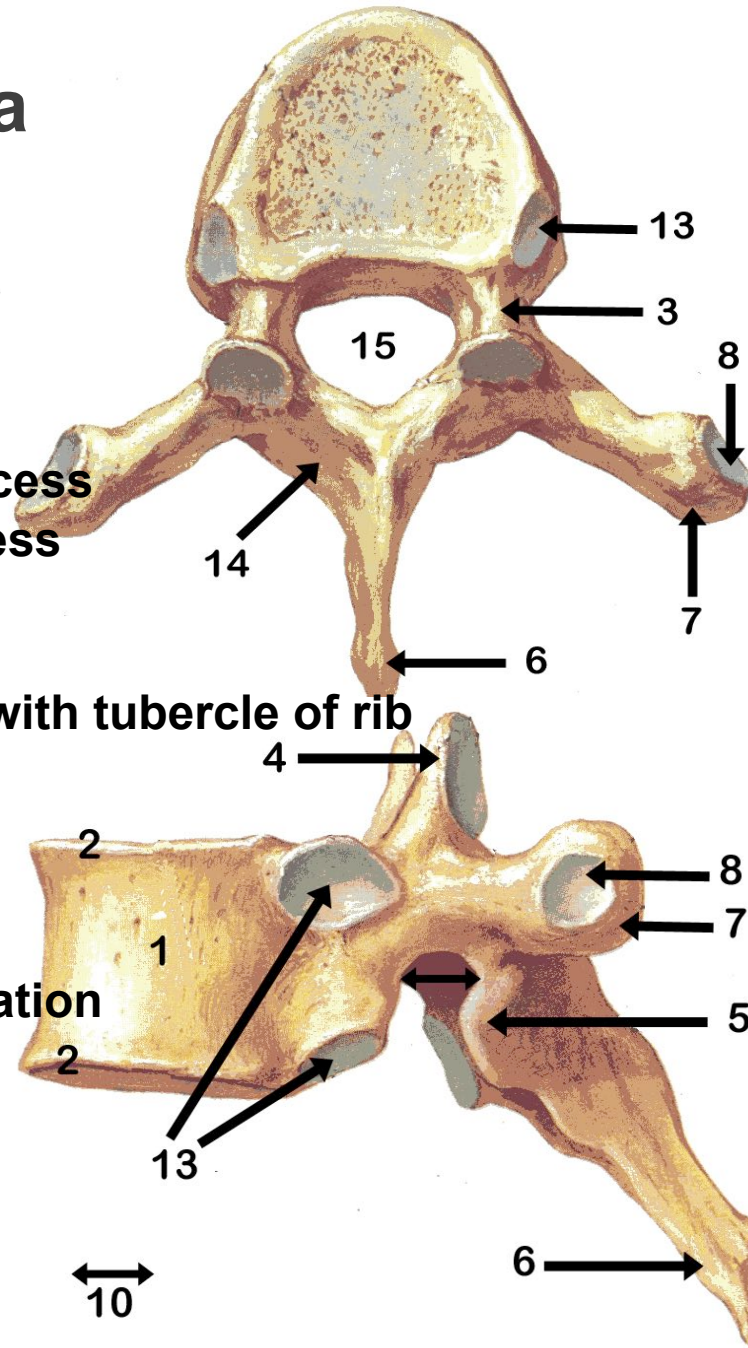


1. Vertebral body
2. Coverplates
3. Pedicle
4. Superior articular process
5. Inferior articular process
6. Spinous process
7. Transverse process
8. Facet for articulation with tubercle of rib
9. Missing
10. Unknown
11. Missing
12. Missing
13. Demifacets for articulation with head of ribs
14. Lamina
15. Vertebral foramen



Thoracic vertebra

1. Vertebral body
2. Coverplates
3. Pedicle
4. Superior articular process
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15. Vertebral foramen

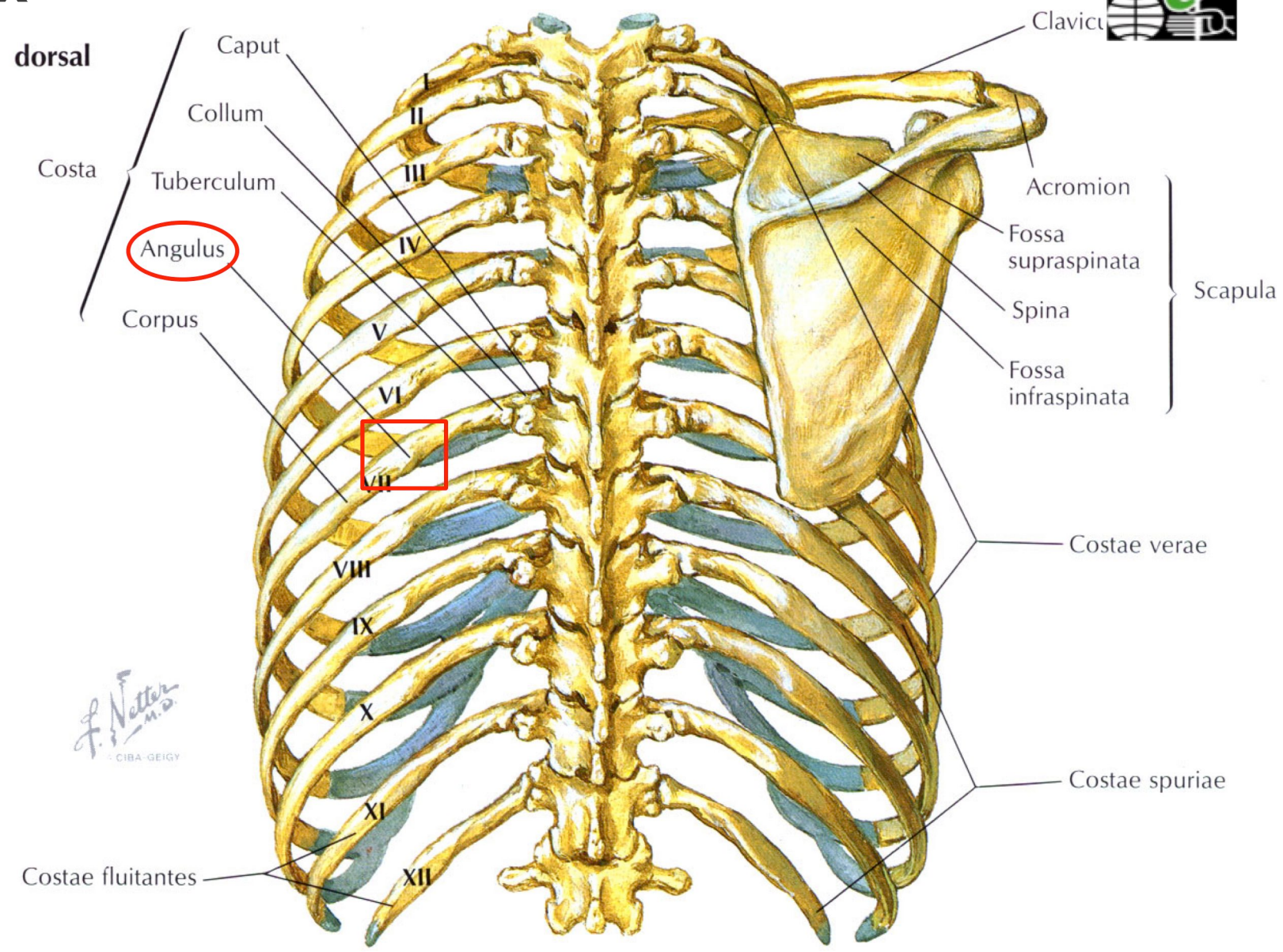


Range of motion thoracic spine (limited by the ribs)

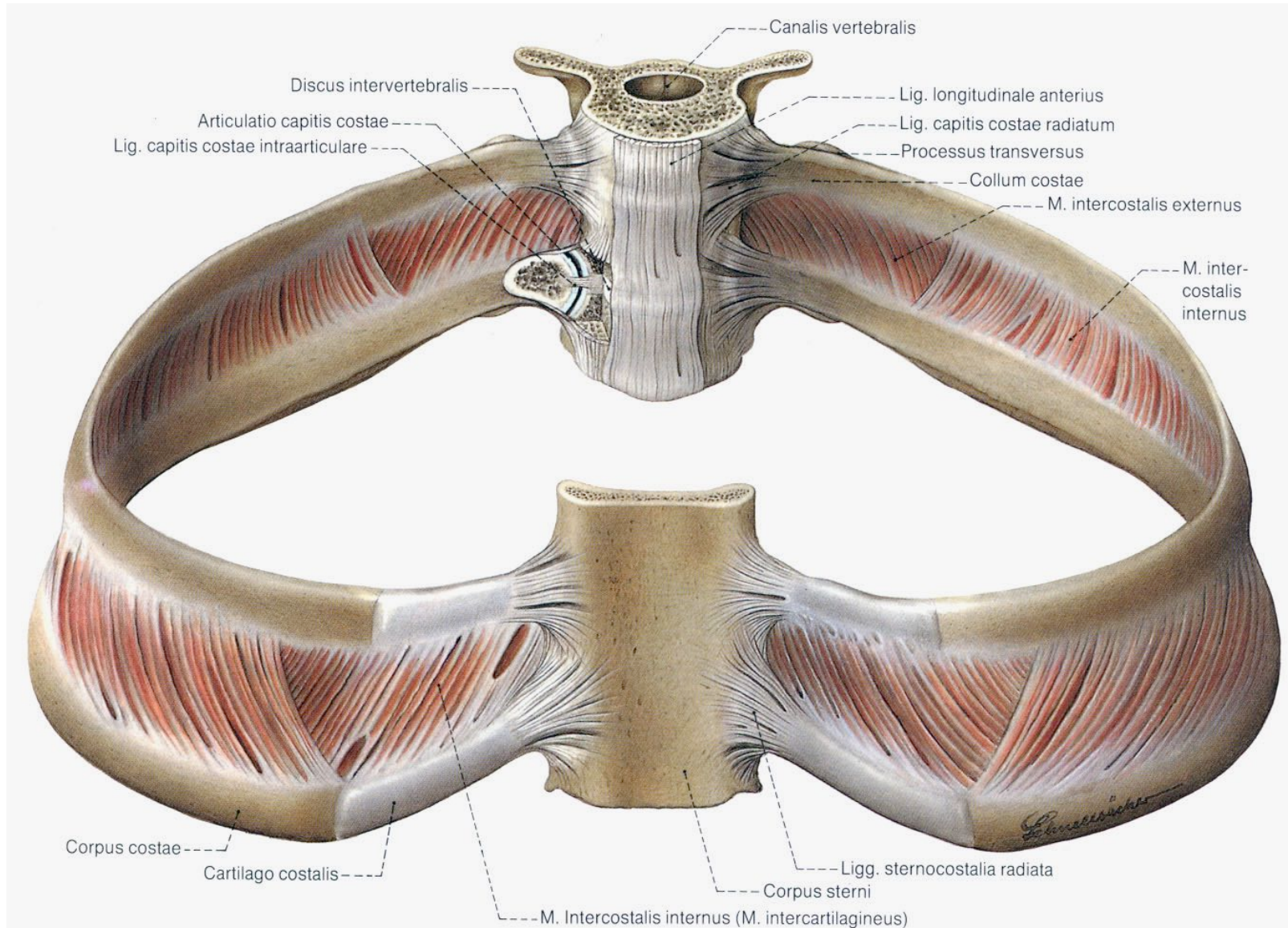
Segment	F / E	Latflex	Rotation
Th 1/2	4°	5°	14°
Th 2 – Th 7	4°	6°	8°
Th 9/10	6°	6°	4°
Th 11/12	12°	9°	2°

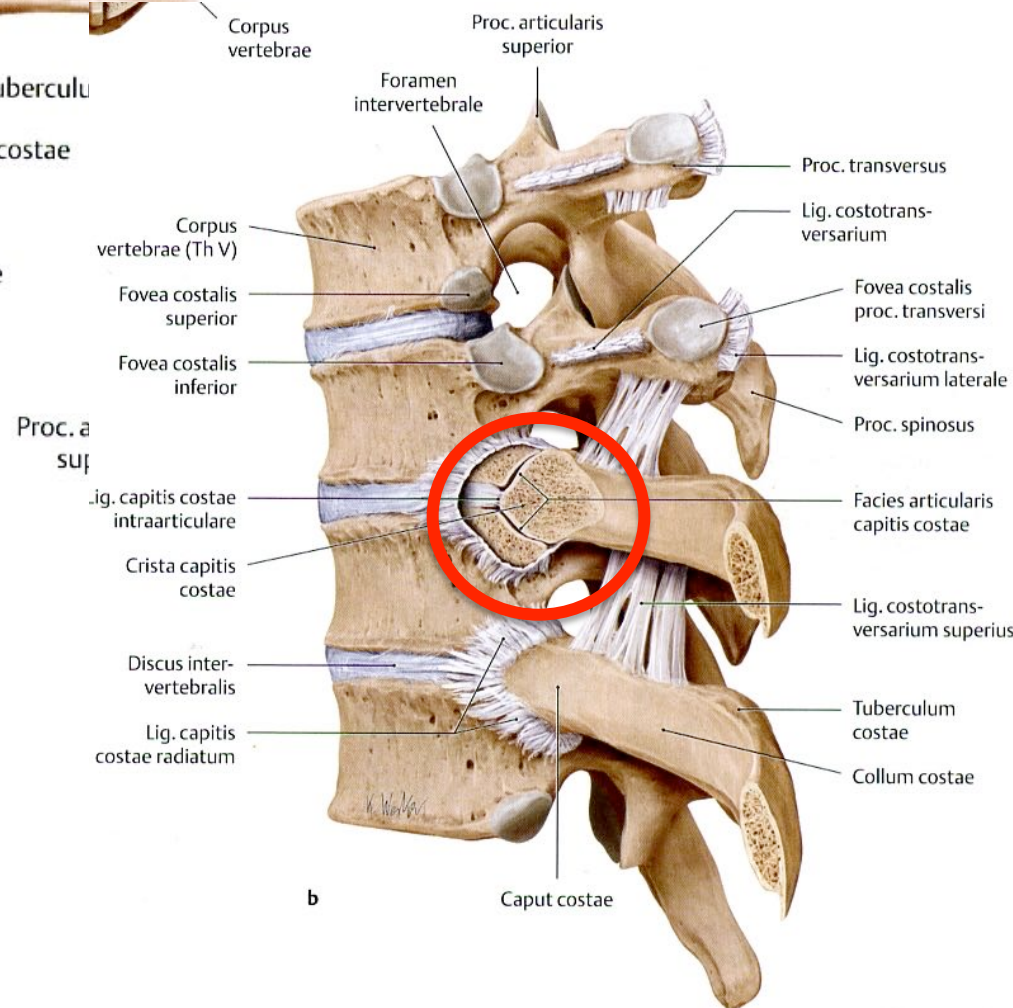
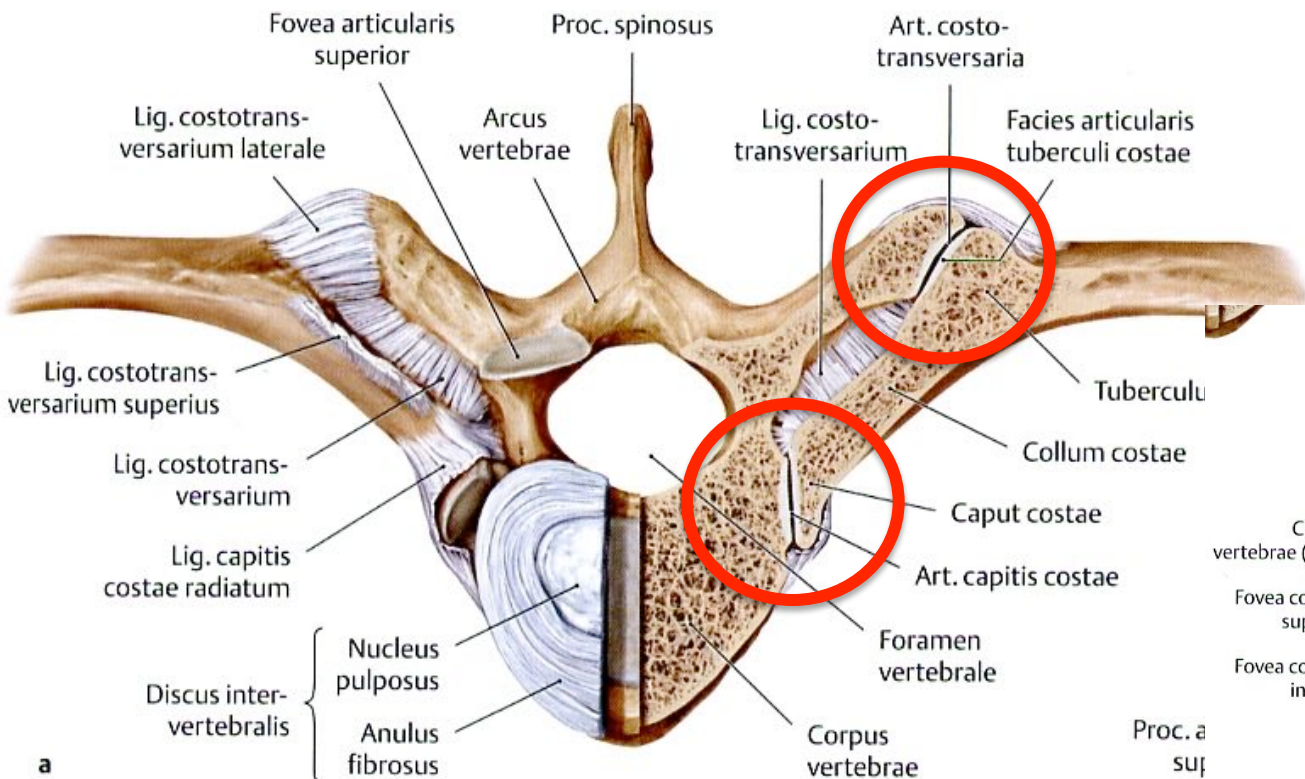
(Mittelwerte nach Penning und Dvorak)

Thorax



Segment of thorax



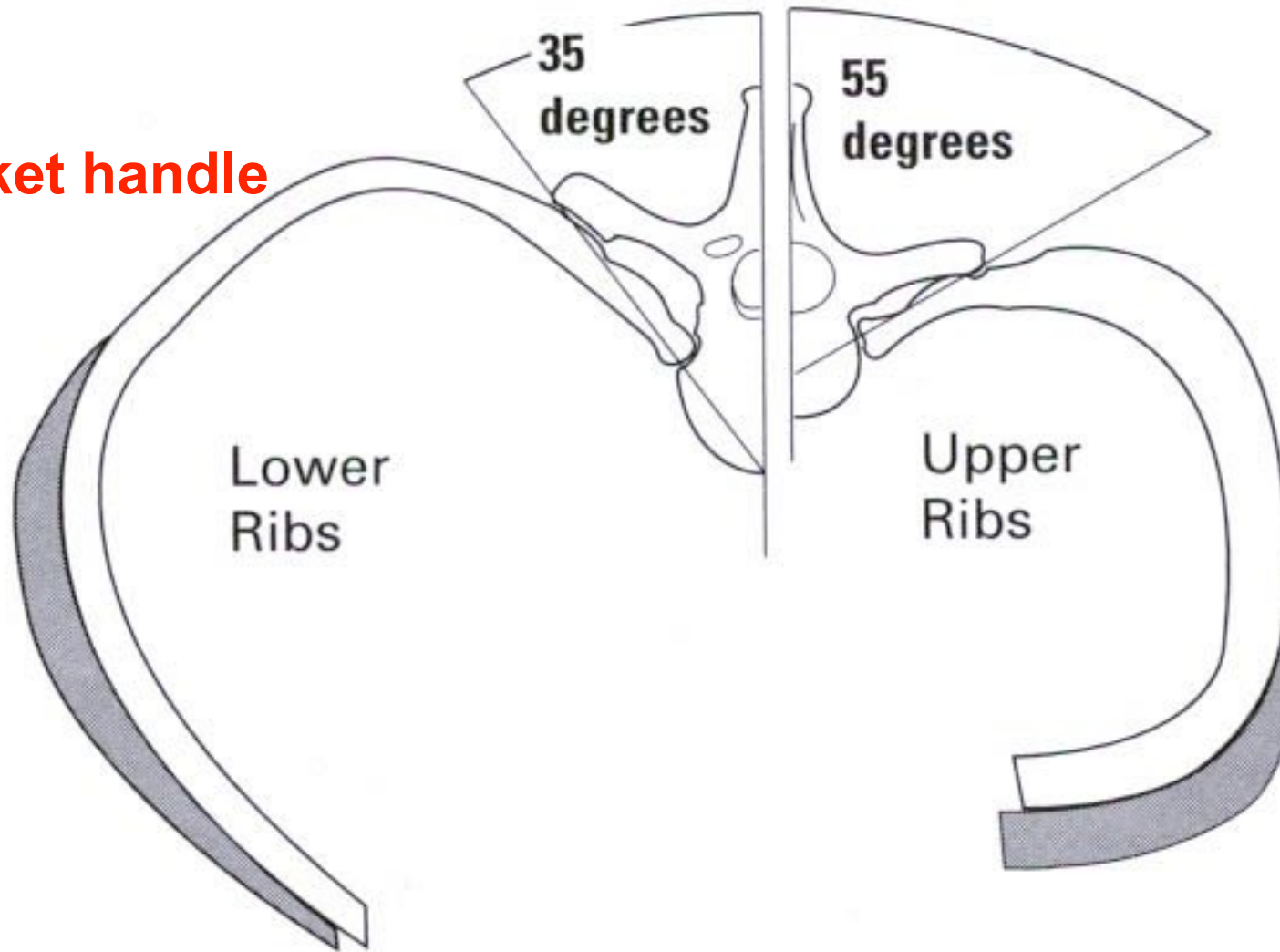


ribs articulate with 2 vertebrae
(except for the 1. and the 12. rib)

rib joints → hinge movement
of the rib

Biomechanics of the ribs

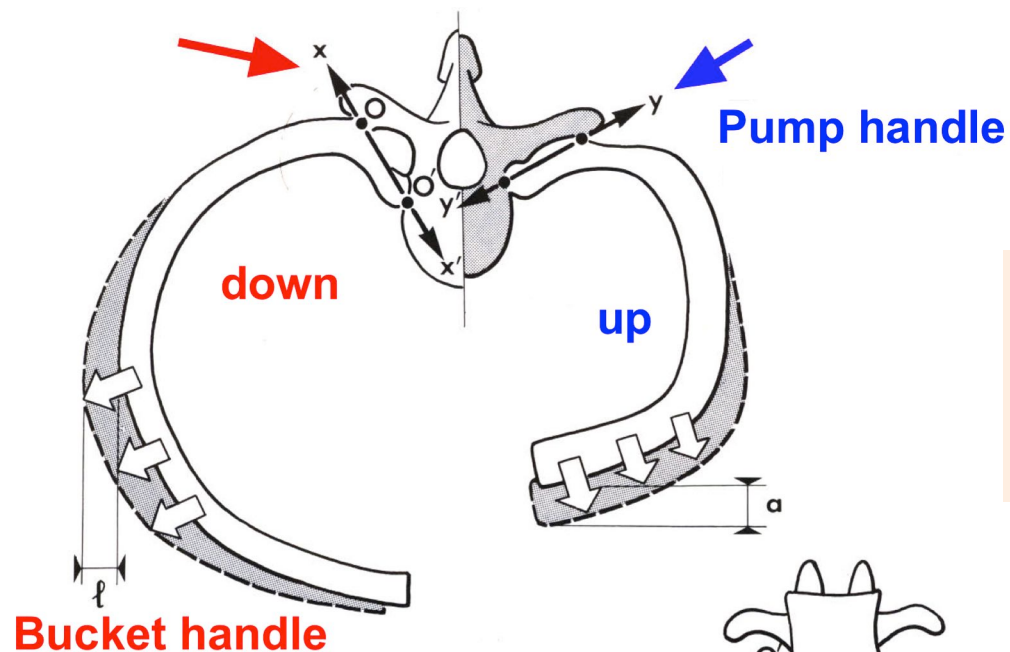
Bucket handle



Pump handle

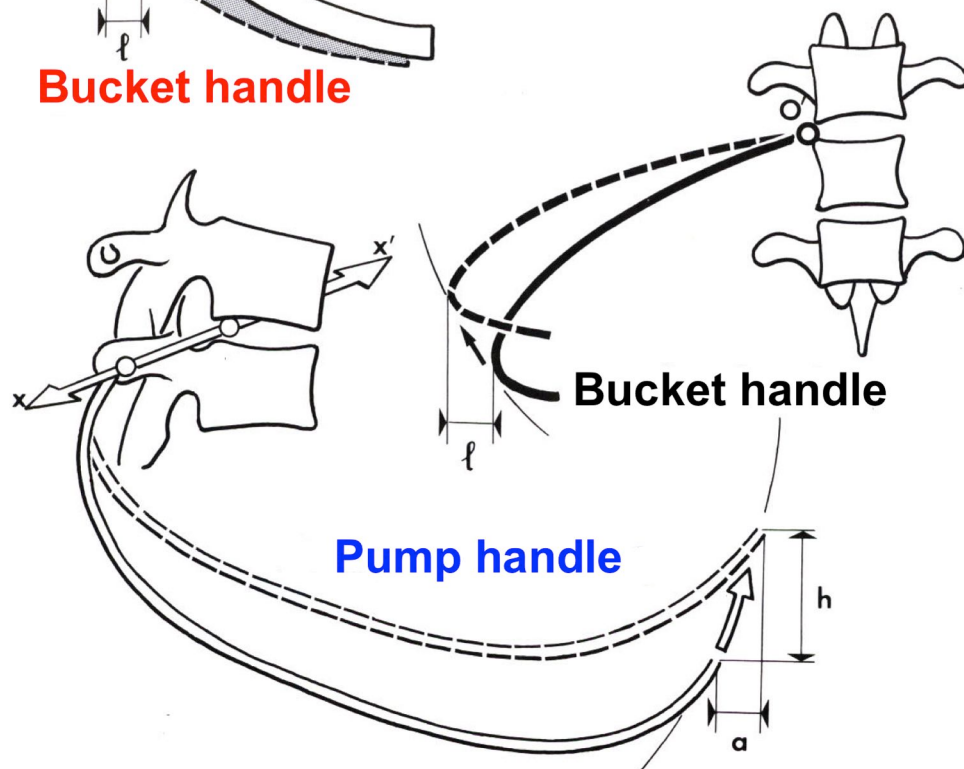
Pumpe handle





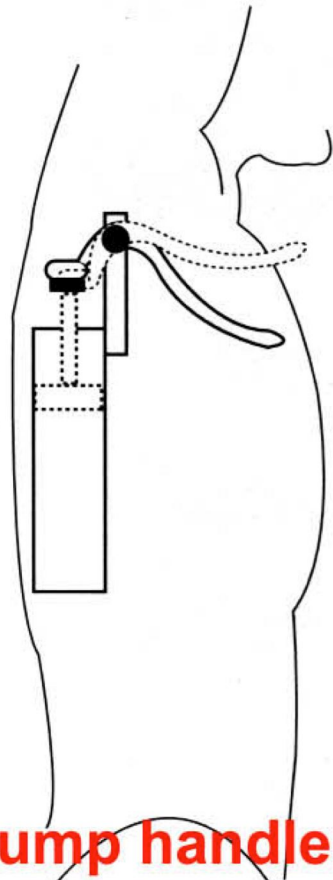
Rip 1:
pump handle,
rib movement leads to
expansion in the sagittal plane.

Rips 2 - 10: mixed,
rib movement leads to
expansion in the sagittal
and transversal plane.

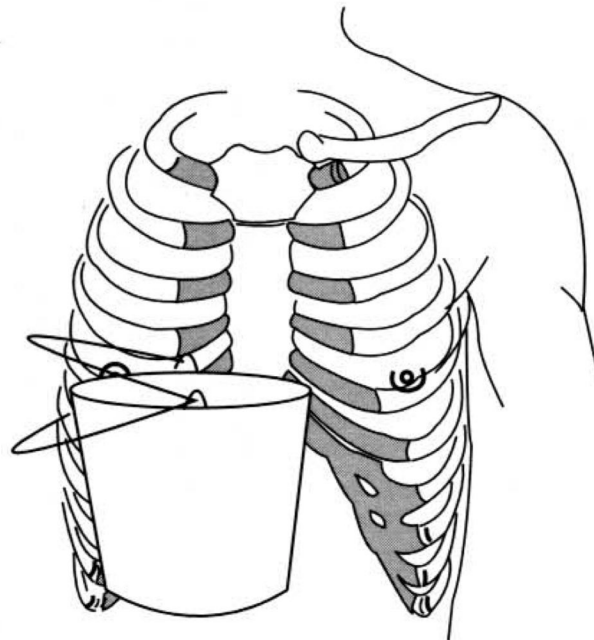


Rips 11 - 12:
bucket handle,
rib movement leads to
expansion in the transversal plane.

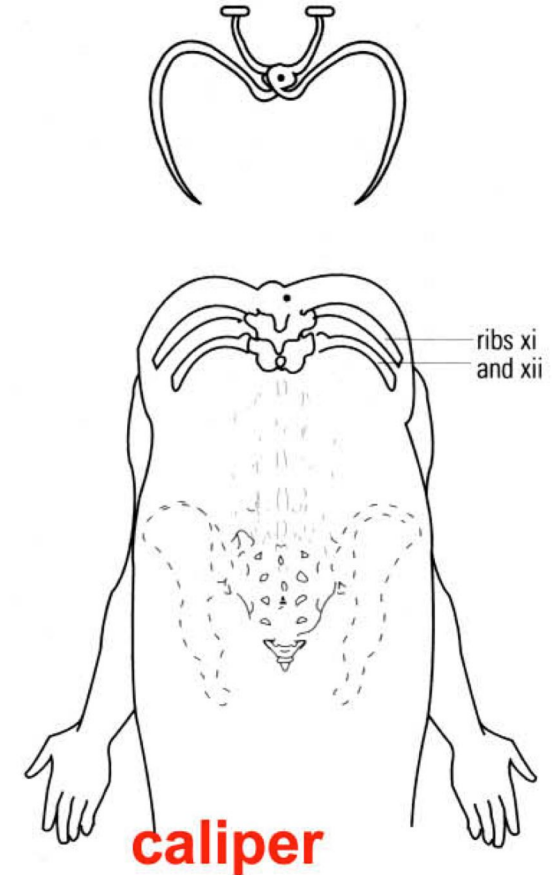
Biomechanics of the ribs



pump handle



bucket handle

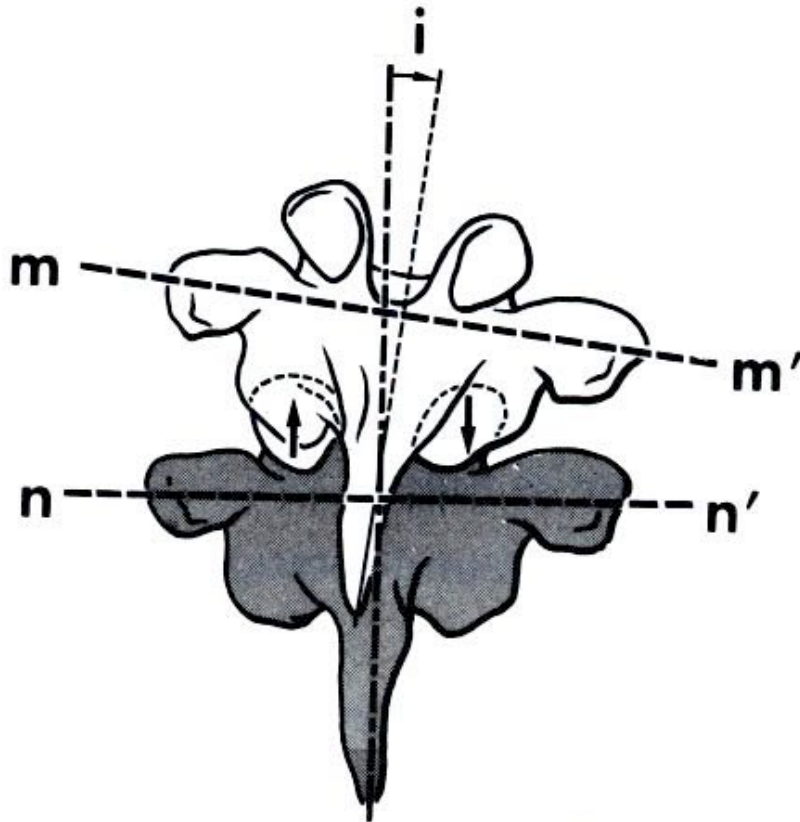


caliper

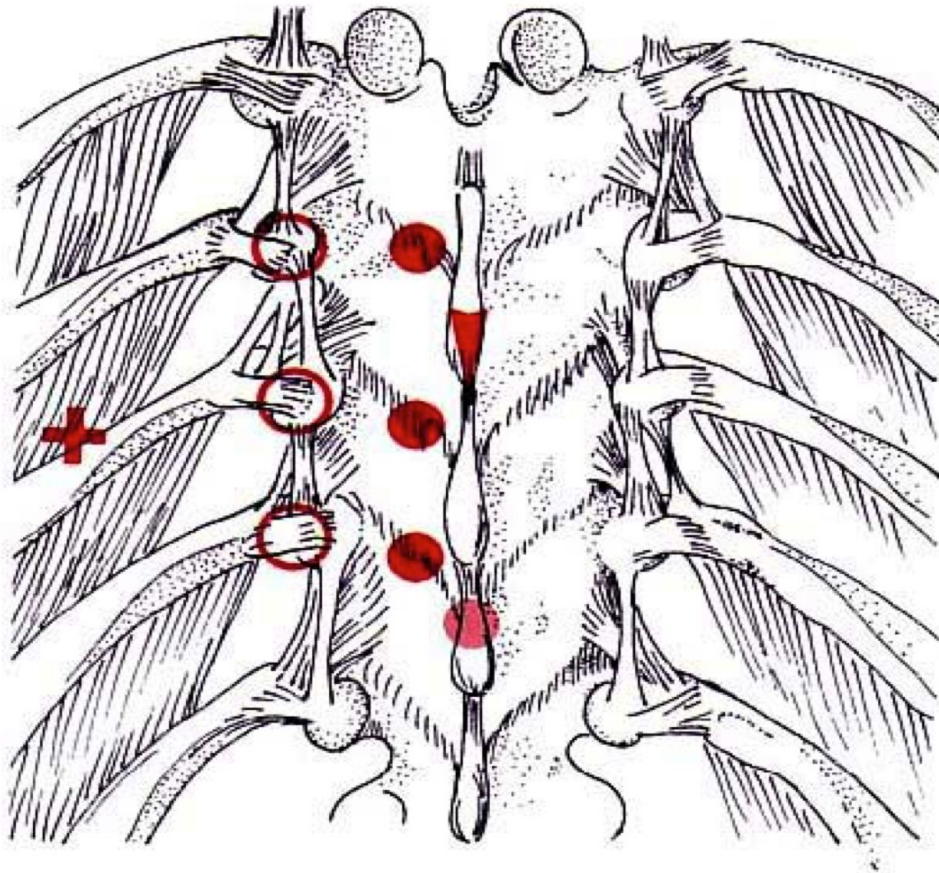
Lateral flexion of the thoracic spine



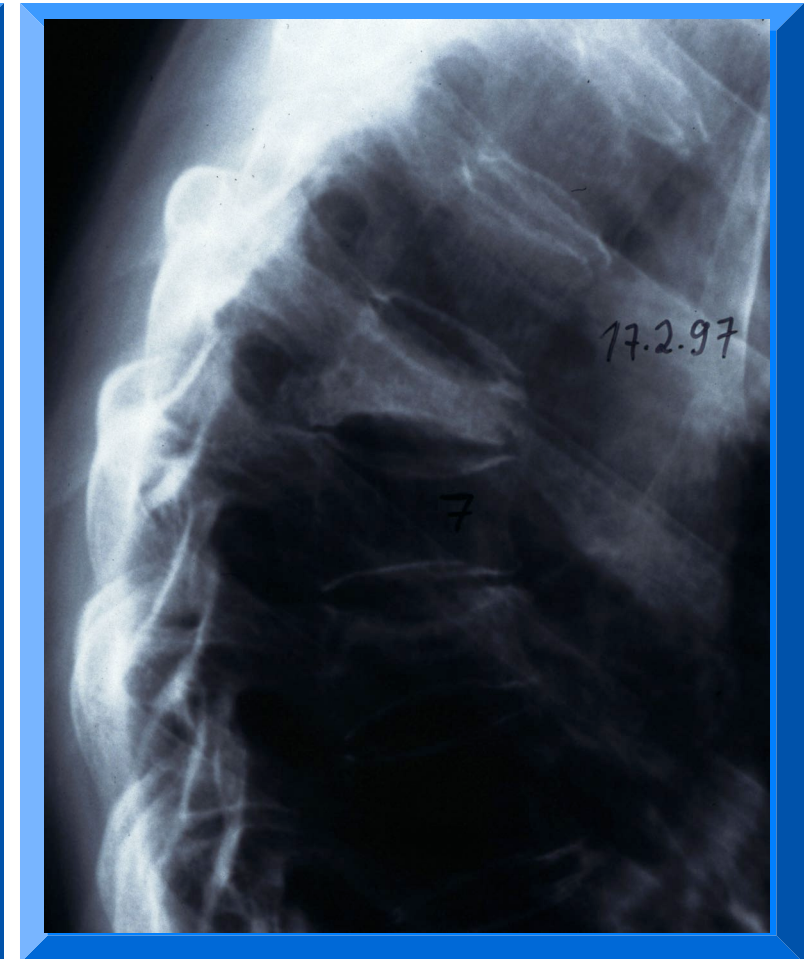
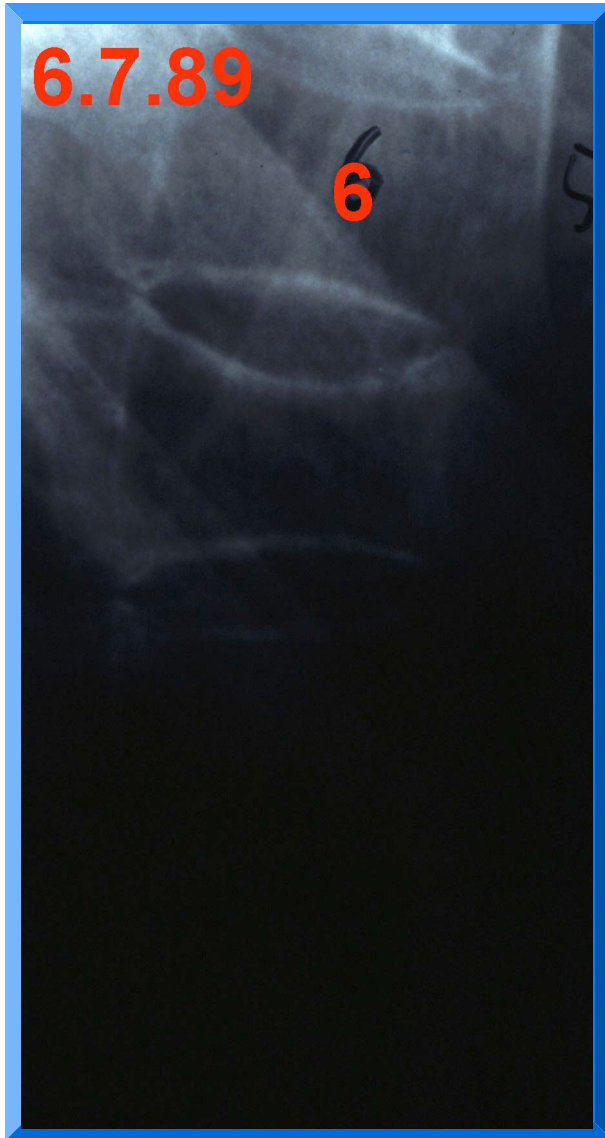
limited range of motion because of the ribs



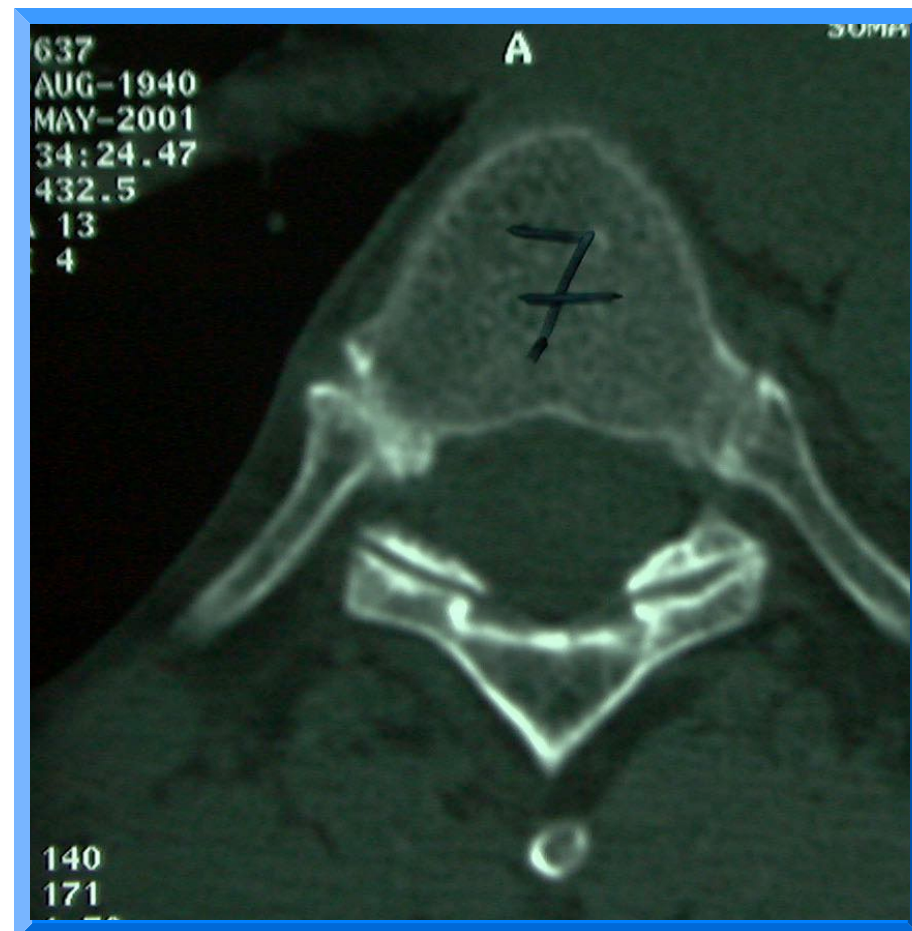
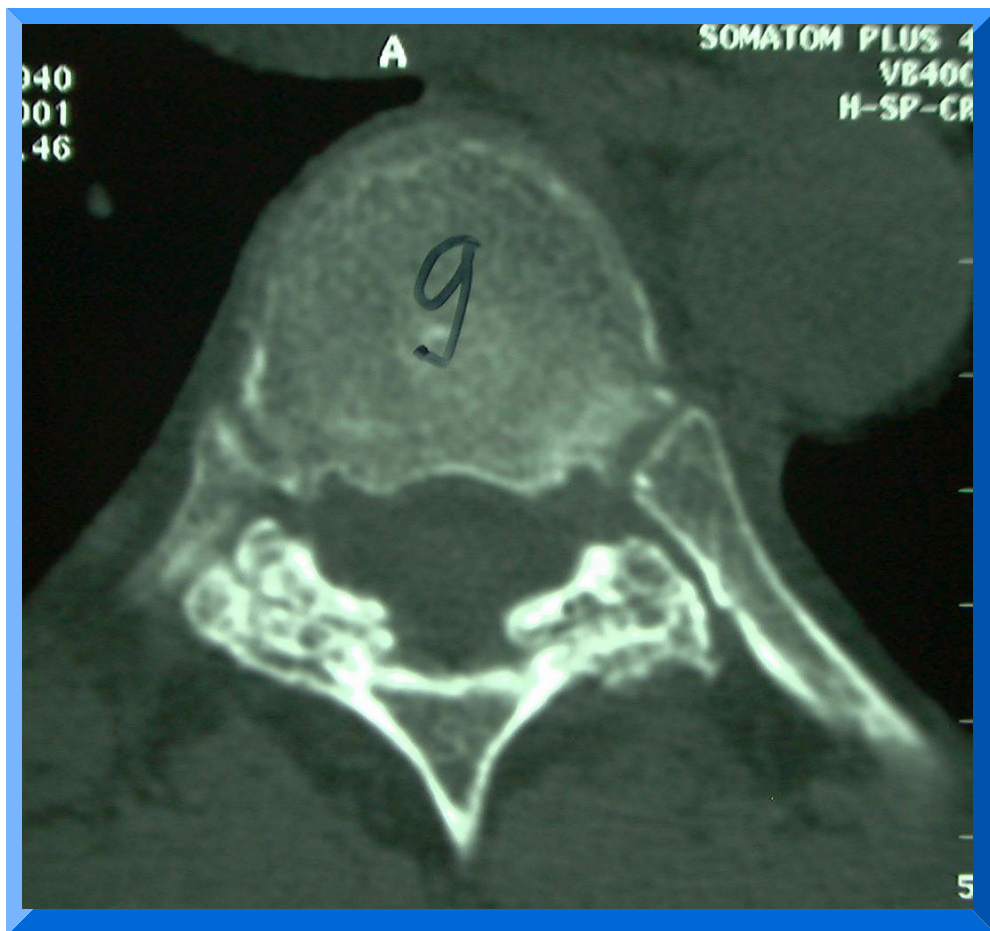
Points of irritation

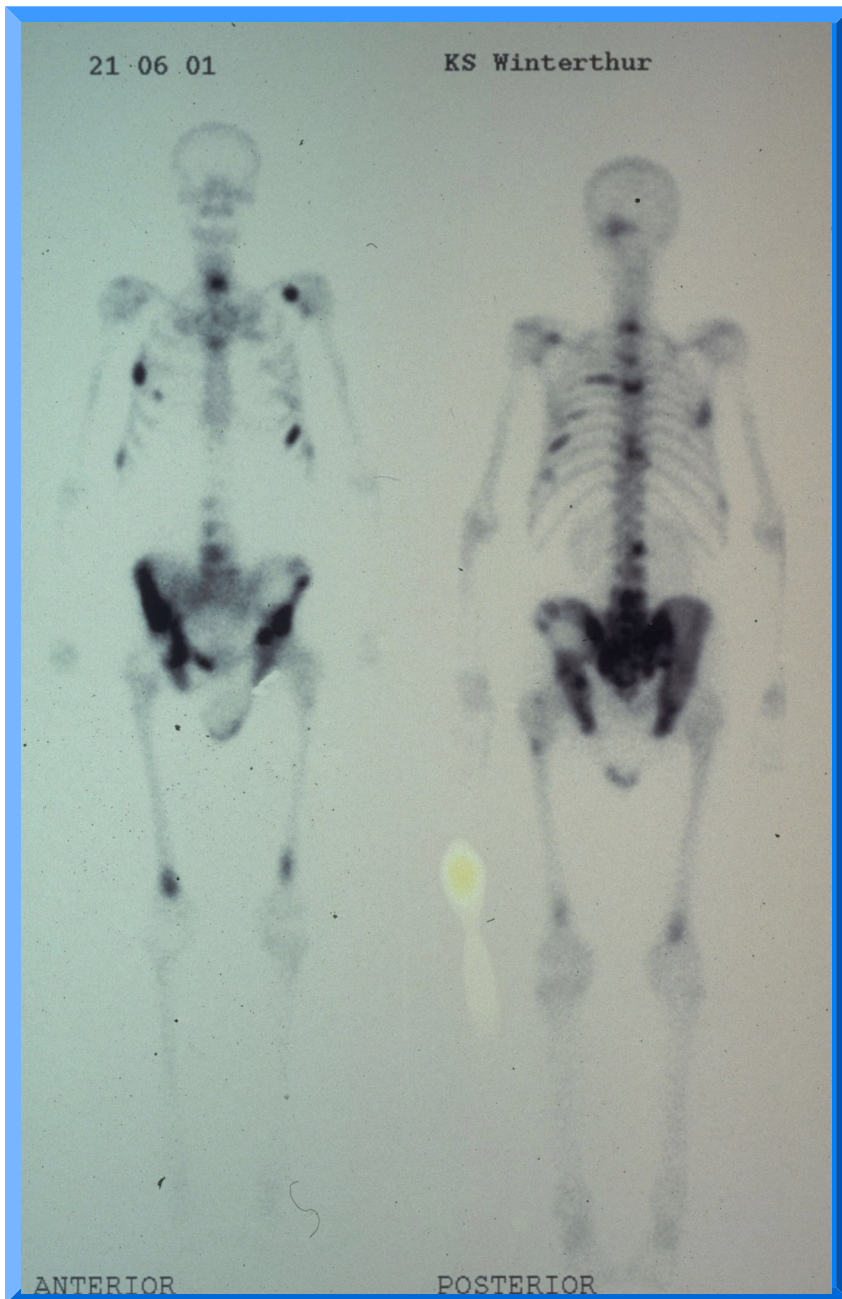


Osteoporosis



Intervertebral- / Costo-vertebral Osteoarthritis





Tumor

Carcinoma of the prostate



Scheuermann's disease

Practice creates masters

