ATSU | National Center for Osteopathic Principles and Practice Education

Introduction to OMM for MDs and DOs

- May 19–22, 2025, Kirksville, MO
- NCOPPE & KCOM

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Muscle Energy Technique: Cervical Spine

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Session Evaluation

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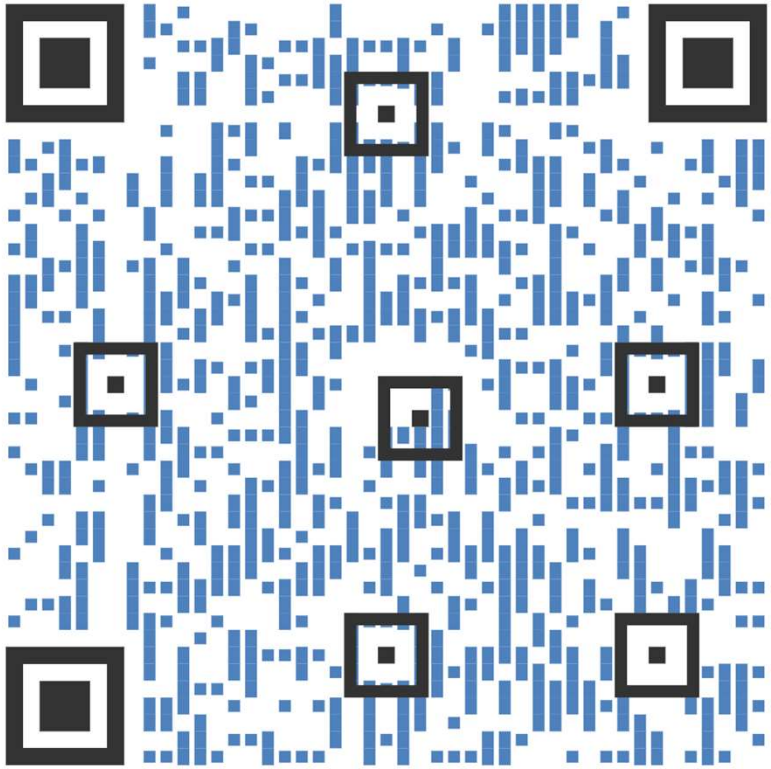

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Objectives

- Identify, describe, and define Muscle Energy Technique OMT.
- Identify, describe, and define Indications and Contraindications for Muscle Energy Technique OMT.
- Demonstrate the ability to position the patient in a manner that is safe, comfortable, and maintains dignity while diagnosing and treating somatic dysfunction of the cervical spine using Muscle Energy Technique OMT.
- Demonstrate efficient physician ergonomics while diagnosing and treating somatic dysfunction of the cervical spine using Muscle Energy Technique OMT.

Courtesy Dr. E. Becker and
Dr. Bobechko, University of Toronto
Toronto, Ontario, Canada

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Direct Methods: Muscle Energy

- A form of osteopathic manipulative diagnosis and treatment in which the patient's muscles are actively used on request, from a precisely controlled position, in a specific direction, and against a distinctly executed physician counterforce
- First described in 1948 by Fred Mitchell, Sr, DO

- Most commonly used as a direct method technique

Muscle Energy Indications & Diagnosis

- Identification of a specific motion restriction is critical
  - Specific joint motion loss
    - Especially with associated muscle hypertonicity
  - Specific muscle hypertonicity

Muscle Contraction

- Contraction: shortening and/or development of tension in muscle
- Concentric contraction: muscle contraction results in approximation of attachments
- Eccentric contraction: lengthening of muscle during contraction

“Three” Common Types of Muscle Contractions Used in Muscle Energy Tech.

- Isometric contraction
  - Change in the tension of a muscle without approximation of muscle origin and insertion.
  - Operator force equal to patient force.
  - Most common
- Isolytic contraction
  - A form of eccentric contraction designed to break adhesions using an operator-induced force to lengthen the muscle.
  - Operator force is greater than the patient force.

“Three” Common Types of Muscle Contractions Used in Muscle Energy Tech.

- Isotonic contraction
  - A form of concentric contraction in which a constant counter-force is applied.
  - Operator force is less than patient force.
- Isokinetic contraction
  - A form of concentric contraction against resistance in which the angular change of joint motion is at the same rate.
  - Operator force is less than patient force.

Isometric Contraction Muscle Energy

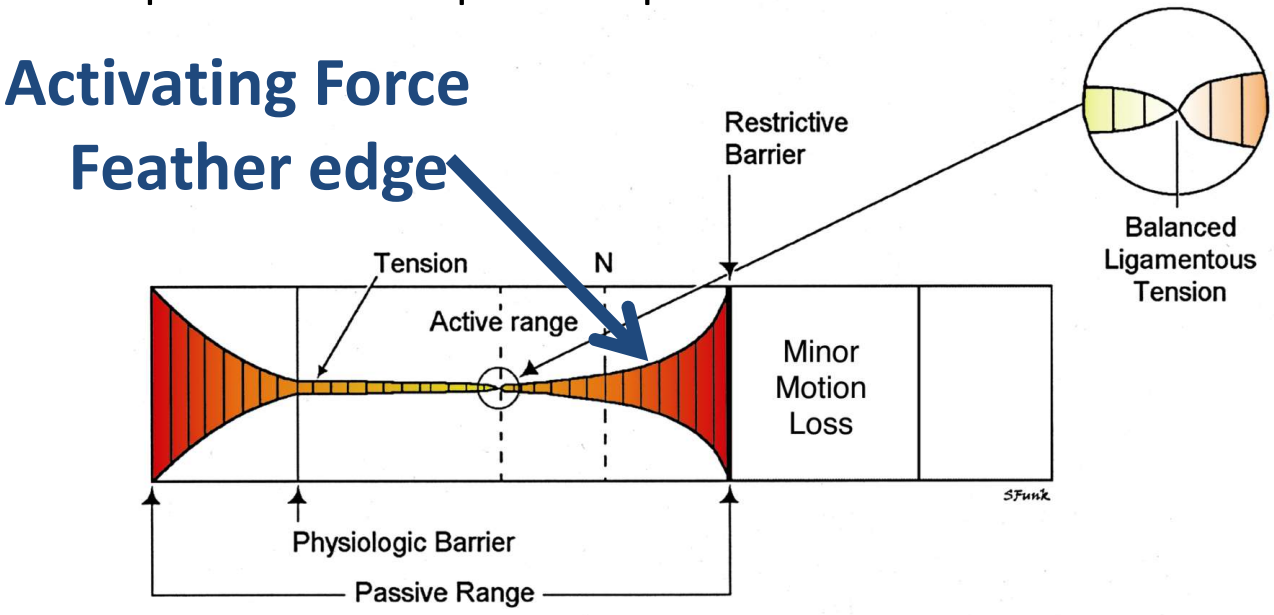
- Increase in muscle tension without change in muscle length
  - Physician force equal to patient force
  - **Force of Contraction:** Sustained gentle pressure (10-20 pounds)
- The origin and insertion of the muscle are maintained in a stationary position while the muscle is contracted against resistance
- Patient contraction generally in a direction away from the restrictive barrier
- Several seconds after the muscle contraction, the physician guides the muscle/joint to the new restrictive barrier
- Most common type of Muscle Energy Technique

Physiological Basis of Isometric Muscle Energy Technique

- Shortened muscles may reflexively contract when stretched
- Refractory relaxation period occurs after a muscle is contracted
- Technique gently stretches affected structures during the refractory relaxation period to avoid the reflexive contraction

Isometric Muscle Energy

1. Pt contracts hamstring away from restrictive barrier
2. After muscle relaxes physician lengthens muscle to new restrictive barrier
3. Repeat until adequate response



MULTIPLE PLANE (TRIAXIAL)

C2-C7, ROTATED AND SIDEBENT TO THE SAME SIDE

Note: The typical cervical spine is subdivided into two regions:

- C2-C3 where **rotation** predominates and
- C4-C7 where **sidebending** predominates.

Diagnostic Findings: (C2-C3 R_L S_L)

C2-C3, ROTATED AND SIDEBENT TO THE SAME SIDE

- Tissue texture changes over the articular column and in paraspinal musculature
- Left articular pillar is prominent posteriorly
- Right articular pillar is prominent laterally
- Spinous Process shifted to the right
- Left rotation and sidebending is present
- Right rotation and sidebending is restricted
- Flexion or extension may be restricted
- Tenderness to palpation is over the articular capsules and paraspinal muscles

Supine – Direct – MET for C2 or C3 *(p.79C, iKM 128)*

Diagnosis: C3 rotated left, sidebent left

Finger Translation (Pull) method

1. Sidebend the dysfunctional segment by contacting it's right articular pillar with the pad of your index finger & translate it left to the RB
2. Flex or Extend to the restrictive barrier (RB)
3. Use your other hand on the head to apply a lever or "counterforce"
4. Instruct patient to "Push your head toward the left." Maintain an isometric counterforce.
5. Upon relaxation, wait 1-2 seconds and then localize to the new barrier
6. Repeat steps 4 & 5 until restrictive barrier is resolved *(usually 3-5 times)*
7. Re-Check!

Supine – Direct – MET for C2 or C3 *(p.79C, iKM 128)*

Diagnosis: C3 rotated left, sidebent left

Thumb Translation (Push) method

1. Sidebend the dysfunctional segment by contacting it's right articular pillar with the pad of your thumb & translate it left to the RB
2. Flex or Extend to the restrictive barrier
3. Use your other hand on the head to apply a lever or "counterforce"
4. Instruct patient to "Push your head toward the left." Maintain an isometric counterforce.
5. Upon relaxation, wait 1-2 seconds and then localize to the new barrier
6. Repeat steps 4 & 5 until restrictive barrier is resolved *(usually 3-5 times)*
7. Re-Check!

Supine – Direct - ME (isometric) - p.79C (iKM 128)

Diagnosis: C3 rotation left, sidebending left

1. Patient is supine
2. Physician sits at the head of the table
3. **Sidebending** is introduced at the dysfunctional segment using one of the following:
4. Flexes or extends the neck as needed to localize
5. Physician's other hand grasps the head for counterforce
6. **"Push your head toward the left"** while the physician offers isometric counterforce
7. Maintain the force (typically 3-5 seconds)
8. "Gently relax" & physician also ceases counterforce
9. Waits for the tissues to relax completely (about 2 seconds)
10. Sidebend to the new restrictive barrier
11. Repeat until the best motion is obtained (avg is 3 times)
12. Recheck

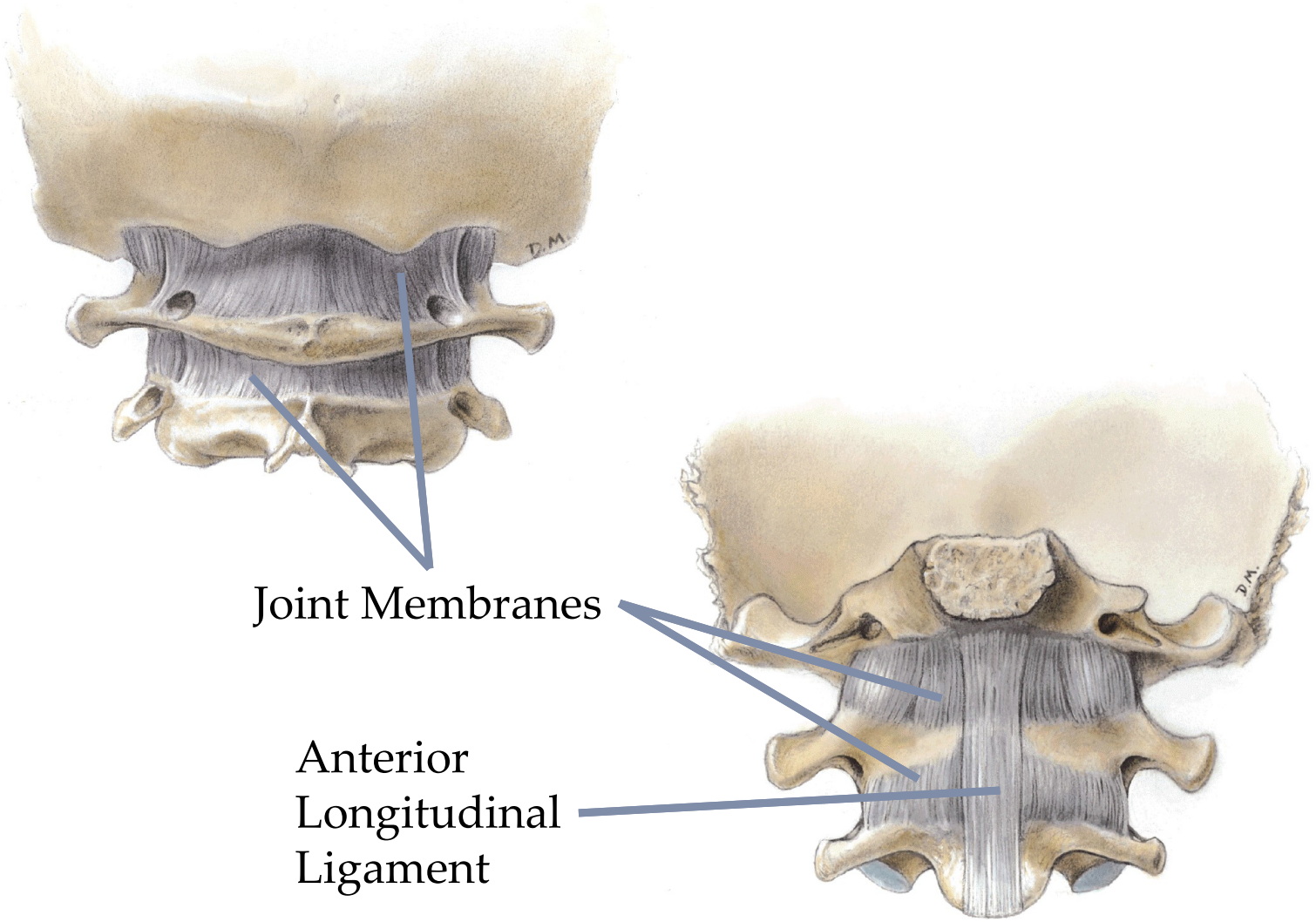
Reaches under the cervical spine .
Contacts the right side of the articular.
Pulls the cervical spine toward the left

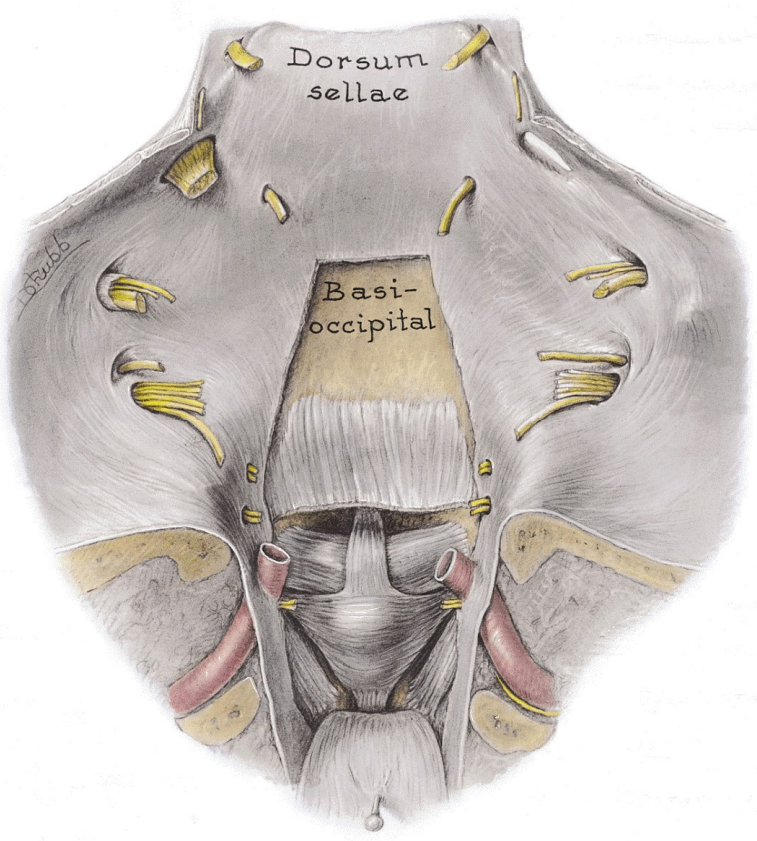
Thumb on the lateral margin of the right articular pillar. **Pushes** the articular column to the left

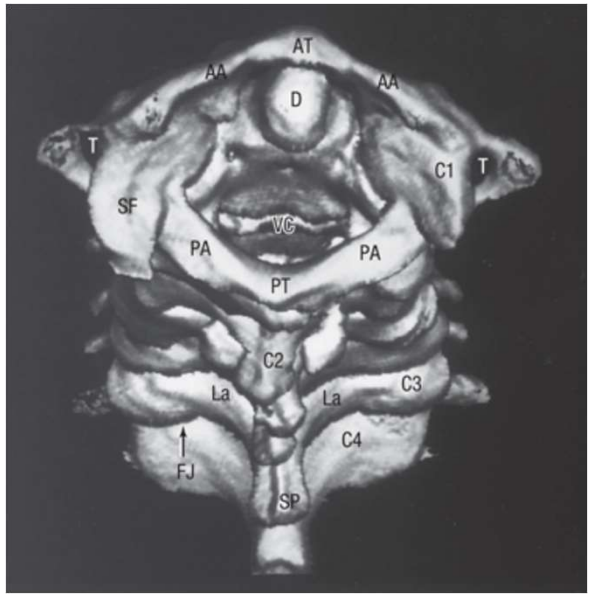
Supine - Direct – MET for C4-C7 *(p.82B, iKM 133)*

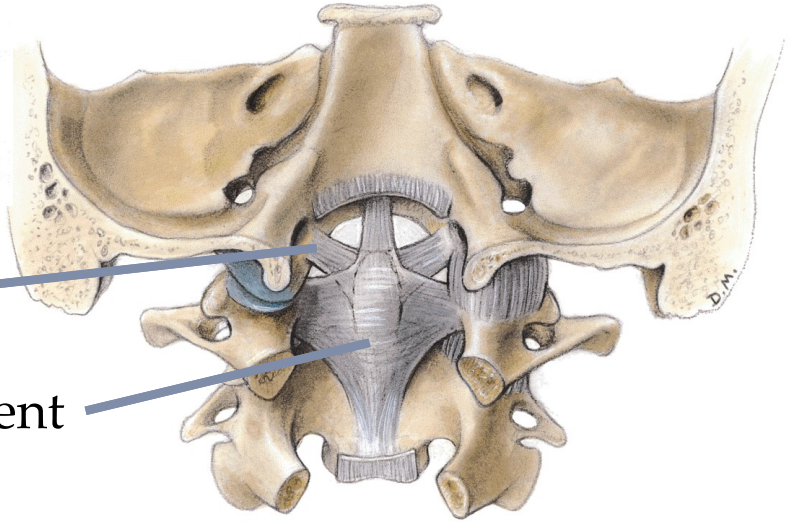
Diagnosis: C4-C7 rotated left, sidebent left

1. Sidebend the dysfunctional segment by contacting it's right articular pillar with the pad of your thumb & translate it left to the RB
2. Flex or Extend to localize to the restrictive barrier
3. Use your other hand on the head to apply a lever or "counterforce"
4. Instruct patient to "Push your head toward the left." Maintain an isometric counterforce.
5. Upon relaxation, wait 1-2 seconds and then localize to the new barrier
6. Repeat steps 4 & 5 until restrictive barrier is resolved *(usually 3-5 times)*
7. Re-Check!


Joint Membranes
Anterior
Longitudinal
Ligament

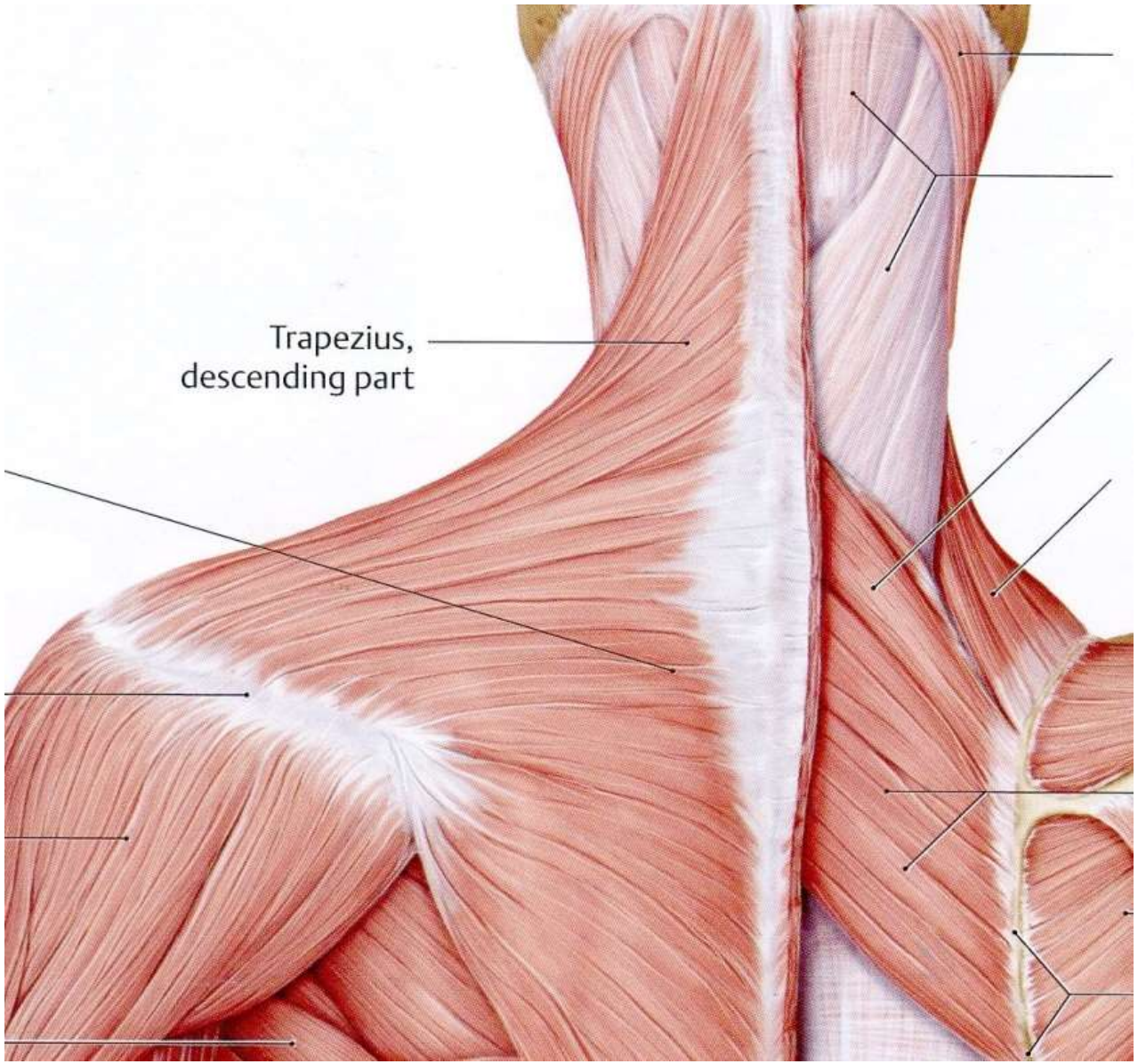


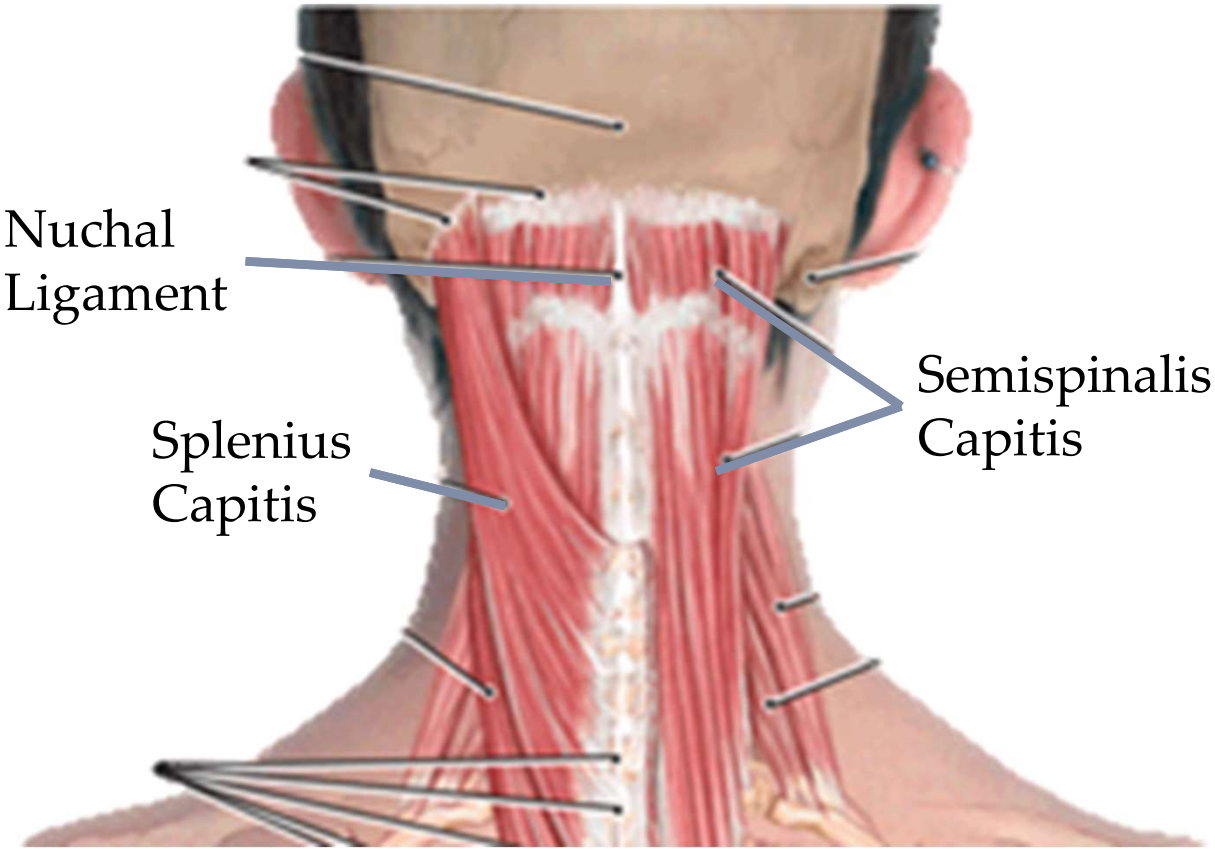


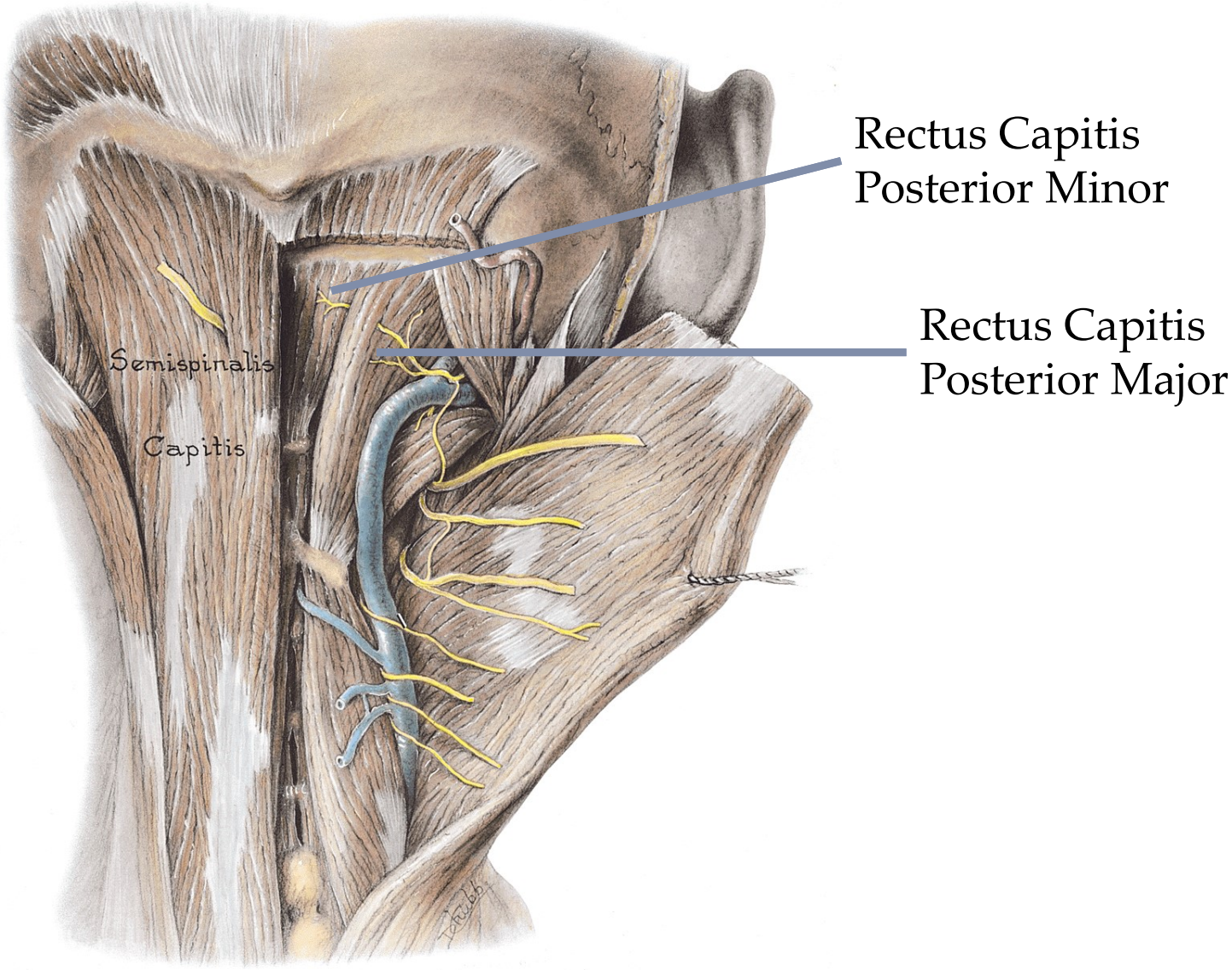


Alar Ligament

Cruciform ligament


Trapezius,
descending part


Nuchal
Ligament
Splenius
Capitis
Semispinalis
Capitis


Rectus Capitis
Posterior Minor
Rectus Capitis
Posterior Major
Semispinalis
Capitis

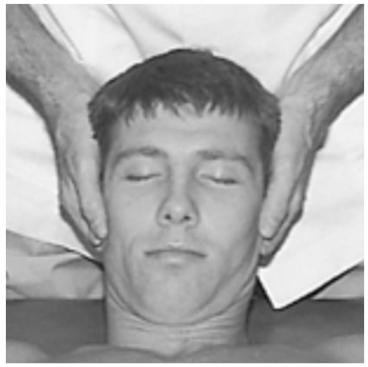
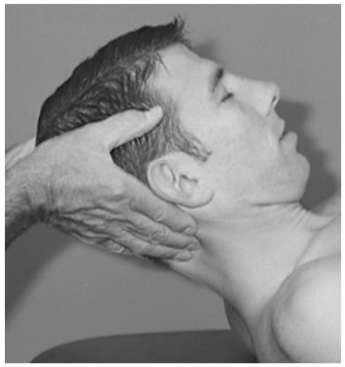
AA DIAGNOSIS

Dx: rotation only

- Flex head to 90 deg. to lock out lower cervicals & rotate L & R & name for the way it likes to go

OR…

- Use "V" hold to **stabilize C2** & rotate head left & right & name for way it likes to go



B&W Pics from Greenman's Principles of Manual Medicine, 4e, 2010 LWW online accessed 2/1/15

AA Muscle Energy (direct)

Dx: AA rotated left

1. Place palms on sides of pt. head, contact both **lateral masses of atlas** w/lateral margin of index or middle fingers
2. **Extend head over fingers & rotate AA joint to restrictive barrier**
3. Have pt. turn head left against resistance (hold 3-5 sec)
4. Have pt. relax (wait for 2 sec), then move head further to new barrier
5. Repeat until best motion obtained (avg. 3x)
6. Recheck

KM page 74 – 4231.11B

OA DIAGNOSIS

- **Shelf method for screening—** pull base of skull superiorly on each side with alternating motion
- **Dx 3 planes:** F or E; rotation & sidebending in opposite directions
  - *Use "V" hold to **stabilize C1** & sidebend, rotate and flex or extend the head & name for way all directions like to go*

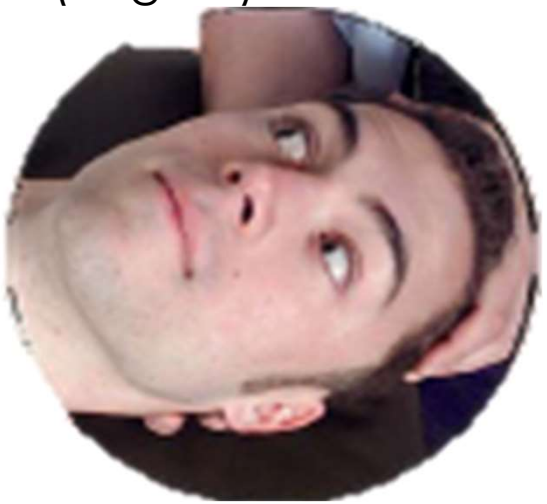
Oculocephalogyric Reflex

- **Goal:** to affect reflex muscle contractions using eye motion
- **Physiologic basis:** Functional muscle groups are contracted in response to voluntary eye motion on the part of the patient. These eye movements reflexively affect the cervical and truncal musculature as the body attempts to follow the lead provided by eye motion. It can be used to produce very gentle postisometric relaxation or reciprocal inhibition.
- **Force of Contraction:** exceptionally gentle
- **Contraindications:** Fracture, dislocation, or moderate to severe segmental instability in the cervical spine. Evocation of neurologic symptoms or signs on rotation of the neck.

OA Muscle Energy

Dx: OA flexed, sidebent left, rotated right

1. Support **posterior arch & lateral masses w/"V" hold** using thumb & index finger
2. Grasp head, adjust **extend, sidebend** occiput right and **rotate** left **to engage restrictive barrier**
3. Have pt. turn head right against resistance or look right ***(oculocephalogyric reflex)*** and hold 3-5 sec
4. Have pt. relax (wait for 2 sec), then move head further to new barrier
5. Repeat until best motion obtained (avg. 3x)
6. Recheck



Patient Seated Isometric Muscle Energy Technique

- Time permitting
- Demonstrate & Practice OA-C7 seated MET.

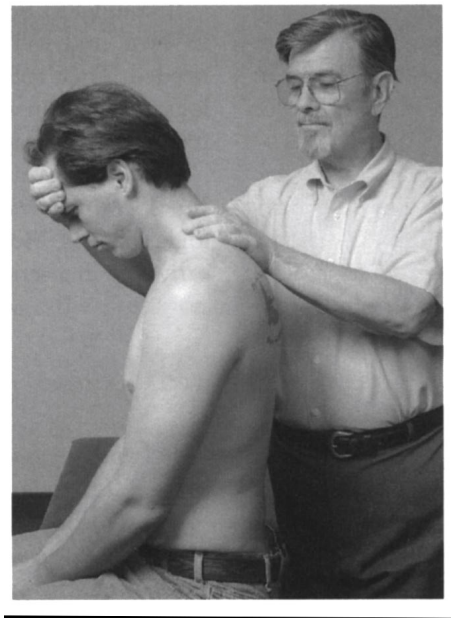
Concentric Isotonic Muscle Energy Technique

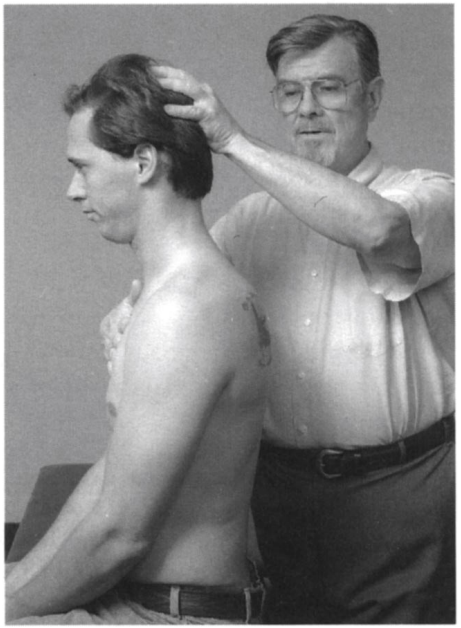
- Isotonic contraction
  - A form of concentric contraction in which a constant counter-force is applied.
  - Operator force is slightly less than patient force.
  - Based on inhibition effect that strong isotonic contraction has on the antagonist muscles
- Sherrington's Law
  - When a muscle receives a nerve impulse to contract, its antagonist receives a simultaneous impulse to relax.

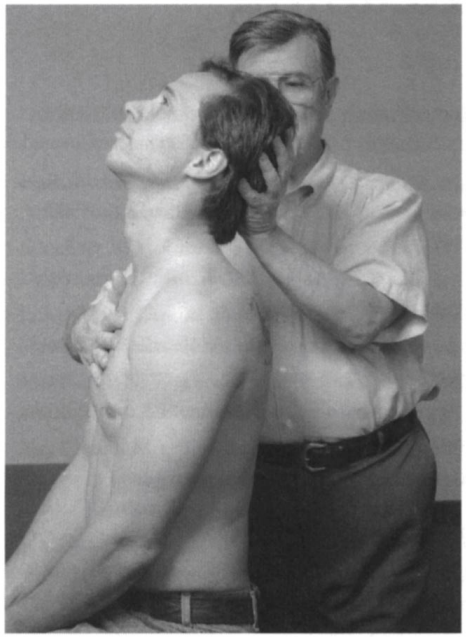
Concentric Isotonic Contraction

- Useful for torticollis
- Addresses global c-spine ROM
- Patient starts in a comfortable location in their ROM and gradually pushes toward the restrictive barrier as the physician resists but "lets the patient slowly win"
- Start with most comfortable ROM first
- Typically
  - 1st – extension, flexion
  - 2nd – left & right rotation
  - 3rd – left & right sidebending

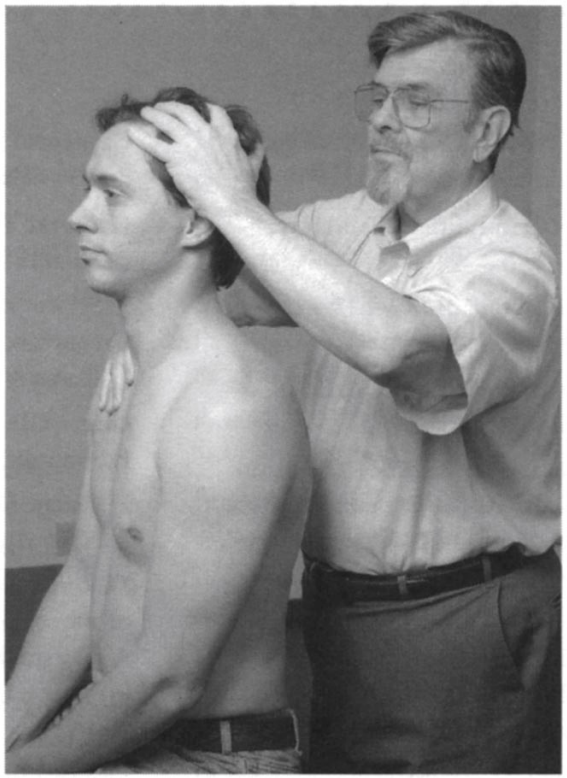
Concentric Isotonic Contraction

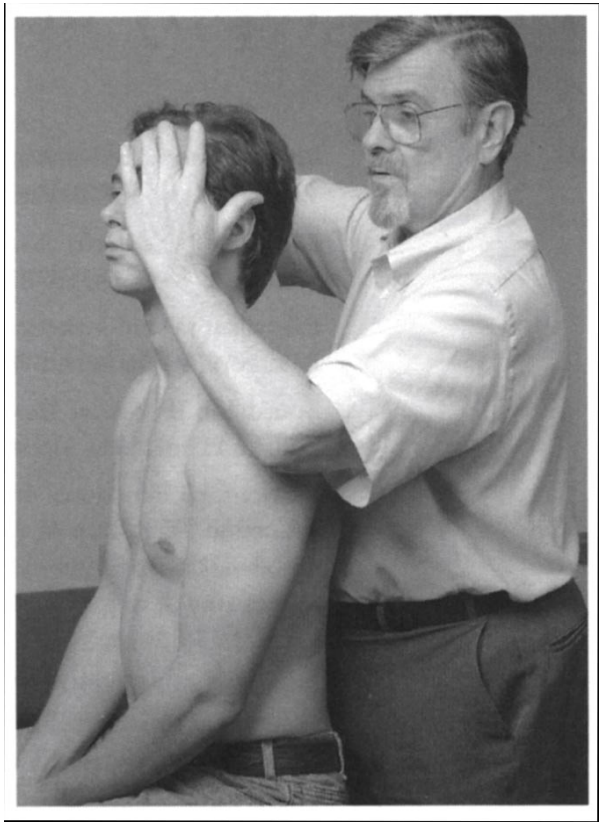






Concentric Isotonic Contraction





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