ATSU | National Center for Osteopathic Principles and Practice Education

Introduction to OMM for MDs and DOs

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

ATSU | A.T. Still University

FIRST IN WHOLE PERSON HEALTHCARE

Muscle Energy Technique: Lumbar Spine

ATSU
National Center for Osteopathic Principles and Practice Education

Richard LaBaere II, DO, MPH, FAODME, FNAOME

Eric Snider, DO

Eric Snider, DO, is an associate professor at A.T. Still University's Kirksville College of Osteopathic Medicine (ATSU-KCOM). He serves as the chairperson for the Osteopathic Manipulative Medicine department and as the program director for the Osteopathic Neuromusculoskeletal Medicine (ONMM) residency. Dr. Snider is board certified in Neuromusculoskeletal Medicine & Osteopathic Manipulative Medicine. He earned his Doctor of Osteopathy from the West Virginia School of Osteopathic Medicine (1999), and he completed his internship and residency at Northeast Regional Medical Center (1999-2002).

Speaker Disclosure Statements

The speaker(s) disclose that s/he has no relevant financial relationships with any organization producing, marketing, reselling, or distributing healthcare goods or services consumed by, or used on, patients relative to the content of this presentation.

Planning Committee Disclosure Statement

- The Continuing Education Steering Committee (CESC), Osteopathic Principles and Practice (OPP) Committee members, and planners/reviewers of this activity disclose that they have no relevant financial relationships with any organization producing, marking, reselling, or distributing health care goods or services consumed by, or used on, patients relative to the content of this presentation.
- The copyrighted materials available in this PowerPoint are for educational use only. Redistribution of copyrighted materials is not permitted.
- No discussion of off-label use and/or investigation used in this presentation.

Accreditation Statement

- Missouri Accreditation of Osteopathic Physicians and Surgeons (MAOPS) is accredited by the American Osteopathic Association to provide osteopathic continuing medical education for physicians.
- MAOPS designates this program for a maximum of 2 AOA Category 1-A CME credits and will report CME and specialty credits commensurate with the extent of the physician's participation.
- MAOPS is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.
- MAOPS designates this live activity for a maximum of 2 *AMA PRA Category 1 Credits™.* Physicians should claim only the credit commensurate with the extent of their participation in the activity.
- This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Missouri Association of Osteopathic Physicians and Surgeons (MAOPS) and Still OPTI. MAOPS is accredited by the ACCME to provide continuing medical education for physicians.

ATSU | National Center for Osteopathic Principles and Practice Education

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 lumbar spine using Muscle Energy Technique OMT.
- Demonstrate efficient physician ergonomics while diagnosing and treating somatic dysfunction of the lumbar spine using Muscle Energy Technique OMT.

Spinal Motion:

Coupled Movements

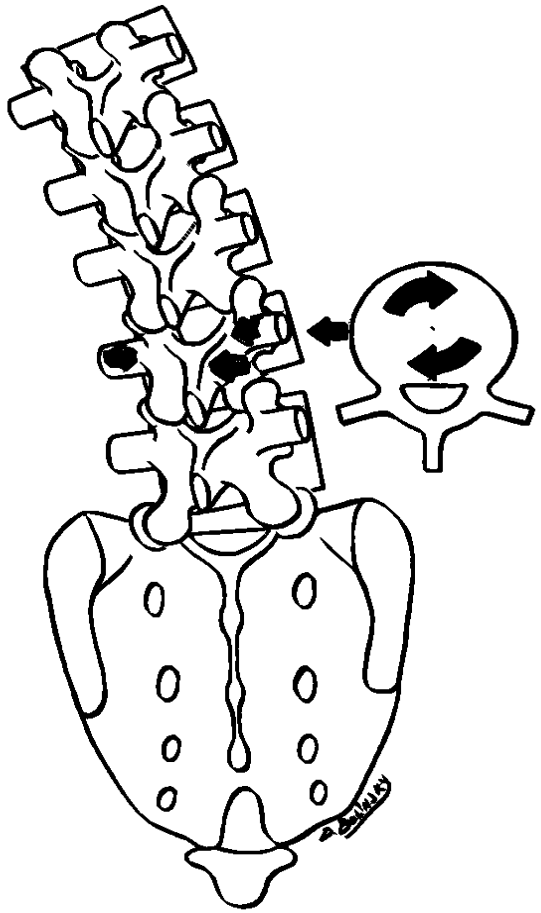
Sidebending and rotation are coupled movements and do not occur individually.

Exception: C1-C2 (atlantoaxial) rotation without sidebending.

Designated as Type I, Type II, and Type III.

(Specifically for the thoracic and lumbar spine).

Type I Mechanics - Neutral Mechanics



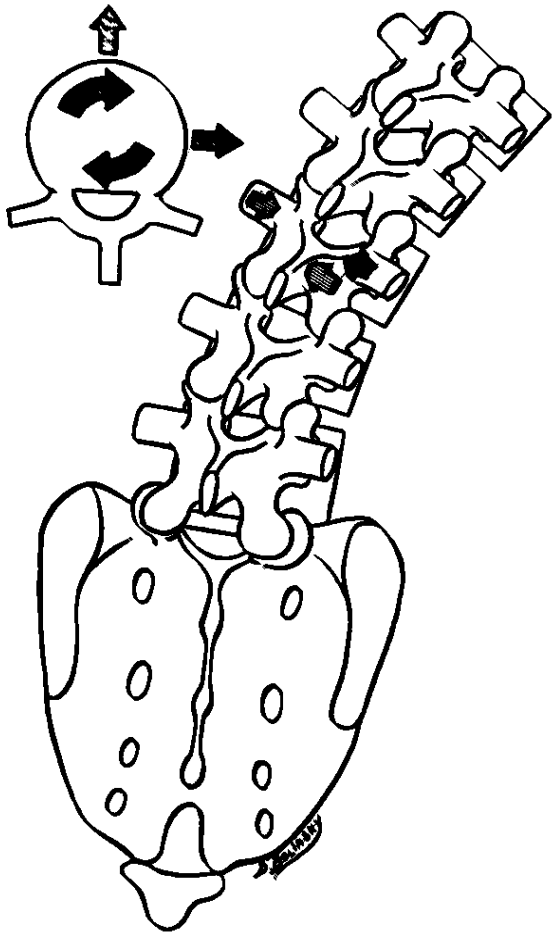
Sidebending and rotation are coupled movements occurring to opposite sides.

Typically occurs in the presence of free and easy articular and soft tissue motion. (e.g. when standing with normal AP curves).

Thoracic and lumbar spine.

C0-C1 (occipitoatlantal). ("Type-I-like")

Type II Mechanics - NonNeutral Mechanics



Sidebending and rotation are coupled movements to the same side.

Occurs in flexion or extension in the thoracic and lumbar spine.

C2-C7 (typical cervical spine). ("Type-II-like")

Type III Movement

Principle regarding motion available to a vertebral unit

When motion is introduced within the vertebral column in one direction, motion in all other directions is reduced.

Somatic Dysfunction

ATSU
A.T. STILL UNIVERSITY

Neutral (Type I)

Occur in thoracic and lumbar spine

Sidebending is accompanied by rotation to the opposite side

Typically involves 3 or more segments.

NS_LR_R and NS_RR_L

Somatic Dysfunction

ATSU
A.T. STILL UNIVERSITY

NonNeutral (Type II)

Occur in thoracic and lumbar spine

In flexion and extension sidebending is accompanied by rotation to the same side

Usually involves one segment.

FRS_L, FRS_R, ERS_L, and ERS_L

Neutral Testing

Motion is passive – induced by examiner.

Check for motion preference and barrier end-feel.

Segmental somatic dysfunction named for motion preference.

Rotation – pt. prone, thumbs posterior to transverse processe /spring anteriorly

Neutral Testing

ATSU
A.T. STILL UNIVERSITY

Sidebending – pt. prone, thumbs just lateral to inferior facets of articular columns, alternately push/spring side to side

(left translation = right sidebending.

Neutral Testing

Flexion/Extension

pt. lateral recumbent

finger pads on or in between spinous processes

physician pulls patient's knees to chest and then into hyperextension

checking for ease of separation and approximation of spinous processes.

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 Energy Relative Contraindications

1. Infection, hematoma, or tear in involved muscle.
2. Fracture or dislocation of involved joint.
3. Rheumatologic conditions causing instability of the cervical spine.
4. Undiagnosed joint swelling of involved joint.
5. Positioning that compromises vasculature.
6. Uncooperative or unresponsive patient

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.
- Isotonic & Isokinetic are similar

Isometric Contraction Muscle Energy

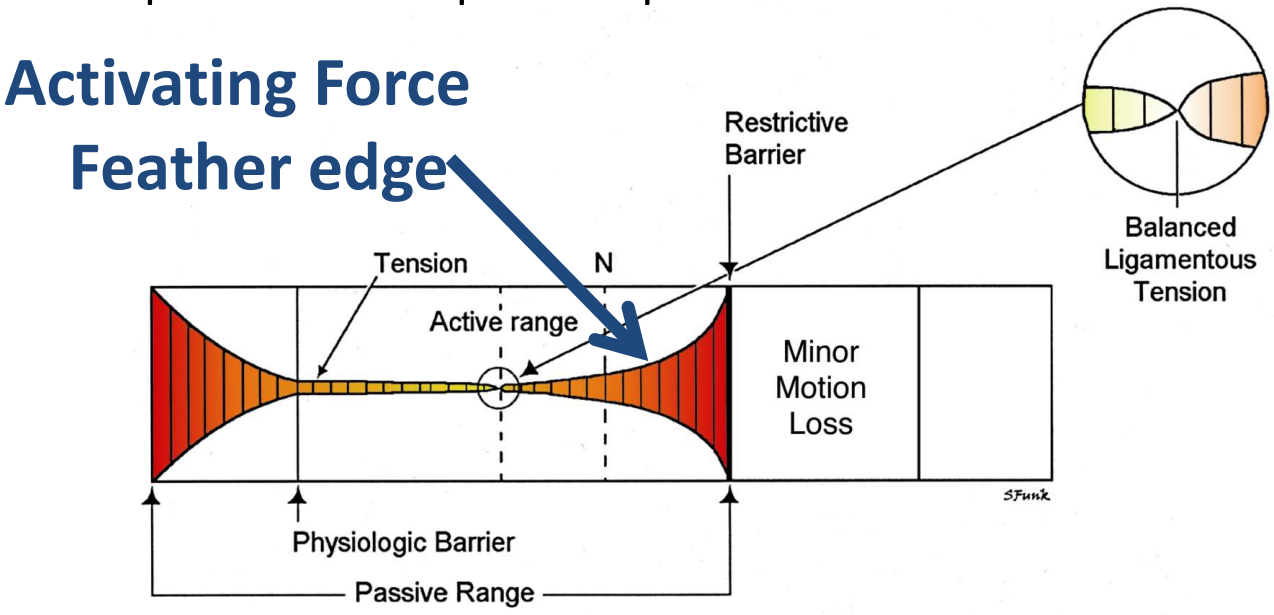
- Increase in muscle tension without change in muscle length
  - Physician force equal to patient force
  - **Force of Contraction:** Sustained gentle pressure (10-20 pounds)
- The origin and insertion of the muscle are maintained in a stationary position while the muscle is contracted against resistance
- 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



Direct Treatment Positioning Summary

Somatic Dysfunction	Restrictive Barrier Direction of Bind
Named for preferred motion	Direct Technique Positioning
ER_LS_L	**FR_RS_R**
ER_RS_R	**FR_LS_L**
FR_LS_L	**ER_RS_R**
FR_RS_R	**ER_LS_L**
NS_LR_R	**NS_RR_L (variable F or E)**
NS_RR_L	**NS_LR_R (variable F or E)**

Seated – Direct Method – MET: T4-12

Dx: **T8 ES_LR_L**

Tx position: T8 FS_RR_R

Patient Position: seated w/physician standing behind & to side

1. Monitor with thumb at posterior TP or facet
2. Use hand & armpit to position patient against restrictive barrier
3. Perform contract, relax & reposition 3-5 times
4. *Retest*

KM, 103(a), iKM, 163

Isolytic Contraction Muscle Energy

- Isolytic contraction: Contraction of a muscle against resistance while forcing the muscle to lengthen
  - Physician force greater than patient force
- Most commonly used for the treatment of fibrotic or chronically shortened myofascial tissues; also used to gap a joint
- Patient contraction is away from the restrictive barrier

Isokinetic Contraction Muscle Energy

- Isokinetic contraction: a concentric contraction against resistance in which the angular change of the joint motion is at the same rate.
  - Physician force less than patient force
  - **Force of Contraction:** Gentle (10-20 lbs)
- Reciprocal Inhibition: when a gentle contraction is initiated in the agonist muscle, there is a reflex relaxation of that muscle's antagonistic group. (Sherrington's Law)
- Used to lengthen a muscle shortened by <u>cramp or acute spasm</u>

Key steps for successful direct (isometric) muscle energy techniques:

1. Accurate specific diagnosis of somatic dysfunction.
2. Position the patient at the point of initial resistance ("feather's edge") of the barrier.
3. Patient instructed in direction, intensity, and duration of muscle contraction.
4. Physician counterforce – equal (for isometric) and opposite to patient muscle contraction.
5. Patient and physician maintain forces for 3-5 seconds.
6. Patient and physician simultaneously cease contraction.
7. A pause of 1-2 seconds is necessary for neuromuscular adaptation (post-relaxation phase). Physician senses tissue relaxation.
8. Physician "takes up the slack" by repositioning the patient at the new restrictive barrier.
9. Repeat steps 2-8 until no further change is obtained.
10. Reassess for appropriate change. (gives you insight into efficacy and prognosis)

Performing Technique

- Localization
  - Palpate and monitor tissue at area of dysfunction
  - Move trunk in each plane of motion until you first feel the tissue tighten (feather's edge)
- Activating Force
  - Coach patient to lightly contract against your resistance

Neutral Testing

Motion is passive – induced by examiner.

Check for motion preference and barrier end-feel.

Segmental somatic dysfunction named for motion preference.

Rotation – pt. prone, thumbs posterior to transverse processes, alternately push/spring anteriorly.

Neutral Testing

Sidebending – pt. prone, thumbs just lateral to inferior facets of articular columns, alternately push/spring side to side

(left translation = right sidebending.

Neutral Testing

Flexion/Extension

pt. lateral recumbent

finger pads on or in between spinous processes

physician pulls patient's knees to chest and then into hyperextension

checking for ease of separation and approximation of spinous processes.

Supine--direct method—ME (isometric)

Diagnosis: Lumbar extension

1. Patient is supine with the lower extremities flexed and the knees over the abdomen. The physician stands at the side of the table and rests his/her chest on the patient's legs
2. Physician reaches his/her arms around the sides of the patient to place his/her fingers on the transverse processes of the dysfunctional segment
3. Flexion is increased by chest pressure on the patient's lower extremities until the force is localized at the dysfunctional segment
4. Patient is instructed, "Gently push your knees against my chest and toward the end of the table"
5. Physician has the patient maintain the force long enough to sense that the patient's contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
6. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
7. Physician waits for the tissues to relax completely (about 2 seconds) and then increases flexion to the new restrictive barrier
8. Steps 4-7 are repeated until the best motion is obtained (average is 3 times)
9. Recheck

Seated--direct method—ME (isometric)

Diagnosis: Lumbar, extension

1. Patient sits on a stool with his/her knees apart and bends forward allowing his/her hands to fall toward the floor. The physician stands at the side of the patient
2. Physician's caudad hand contacts the lumbar spine (or sacrum) one segment below the dysfunctional segment
3. Physician uses the other hand to tap the patient's back over the spine of the dysfunctional segment and instructs the patient, "This is the spot that I will be asking you to move"
4. The fingers are then used to contact the patient's spine at the dysfunctional segment while the palm rests on the spine above the somatic dysfunction
5. Patient is instructed, "Arch your back like a cat at the spot I showed you" while the physician provides isometric counterforce. The physician should feel that the patient's effort is focused between his/her hands
6. Physician has the patient maintain the force long enough to sense that the patient's contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
7. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
8. Physician waits for the tissues to relax completely (about 2 seconds) and then increases flexion to the new restrictive barrier
9. Steps 5-8 are repeated until the best motion is obtained (average is 3 times)
10. Recheck

Seated--direct method—ME (isometric)

Diagnosis: Lumbar neutral, sidebending left, rotation right

1. Patient sits on a stool or straddles the end of the table and the physician stands to the left and behind the patient
2. Patient's right-hand is placed on his/her left shoulder
3. Physician reaches across the patient's chest with his/her left hand, grasps the patient's right shoulder or arm, and leans against the patient's left shoulder
4. Physician places the pad of his/her right thumb on the transverse process of the dysfunctional segment to monitor motion and provide a fulcrum
5. Physician induces varying increments of left rotation, right sidebending, and flexion or extension until there is full engagement of the restrictive barrier. Keep the patient upright and balanced by keeping the shoulders over his/her hips as much as possible
6. Patient is instructed, "Bend to the left against me" or "Turn your body to the right against my thumb" while the physician offers isometric counterforce
7. Physician has the patient maintain the force long enough to sense that the patient's contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
8. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
9. Physician waits for the tissues to relax completely (about 2 seconds) and then repositions all planes to the new restrictive barrier
10. Steps 6-9 are repeated until the best motion is obtained (average is 3 times)
11. Recheck

Seated--direct method—ME (isometric)

Diagnosis: Lumbar neutral, sidebending left, rotation right

1. Patient sits straddling the end of the table, and the physician sits behind the patient
2. Physician contacts the transverse process of the dysfunctional segment with the pad of his/her right thumb
3. Physician places his/her other arm under the patient's left shoulder, the forearm passes anterior to the patient's left shoulder and the palm rests on the back of the patient's neck
4. Patient is guided into right sidebending, left rotation and flexion or extension, as needed, to engage the restrictive barrier in all three planes. Translation to the left to induce some of the right sidebending helps to keep the patient balanced
5. Patient is instructed, "Bend to the left against me" or "Turn your body to the right against my thumb" while the physician offers isometric counterforce
6. Physician has the patient maintain the force long enough to sense that the patient's contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
7. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
8. Physician waits for the tissues to relax completely (about 2 seconds) and then repositions all planes to the new restrictive barrier
9. Steps 5-8 are repeated until the best motion is obtained (average is 3 times)
10. Recheck

Supine--direct method—ME (isometric)

Diagnosis: Lumbar, neutral, sidebending left, rotation right

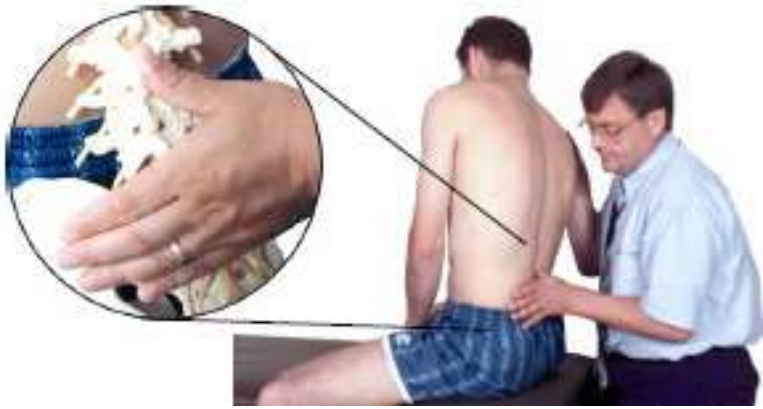
1. Patient is supine and the physician sits or stands at patient's right side
2. The patient is instructed to flex the knees and hips and place the feet flat on table or bed thus creating lumbar flexion
3. Physician grasps the spinous processes of the dysfunctional segment with his/her left hand and pulls the segment into left rotation to the restrictive barrier
4. Physician uses his/her other hand to pull the patient's feet toward him/her carrying the lumbar spine into right sidebending to the restrictive barrier
5. Patient is instructed, "Pull your feet back to the middle of the table" while the physician offers isometric counterforce
6. Physician has the patient maintain the force long enough to sense that the patient's contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
7. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
8. Physician waits for the tissues to relax completely (about 2 seconds) and then repositions all three planes to the new restrictive barrier
9. Steps 5-8 are repeated until the best motion is obtained (average is 3 times)
10. Recheck

Note: Occasionally, the physician will need to move the feet beyond the edge of the table and support them on his/her thighs to obtain adequate right sidebending.

Seated--direct method—ME (isometric)

Diagnosis: Lumbar non-neutral, flexion, rotation left, sidebending left

1. Patient sits straddling the table and the physician sits or stands behind the patient
2. Physician's left thumb pad contacts the right side of the spinous process of the dysfunctional segment to induce right rotation
3. Physician's right hand grasps the patient's right shoulder and guides the patient's lumbar spine into right sidebending, right rotation and flexion or extension, as needed, until all three planes are localized at the restrictive barrier
4. Patient is instructed, "Turn your body to the left against my thumb" or "Bend your body to the left" while the physician offers isometric counterforce
5. Physician has the patient maintain the force long enough to sense that the patient's contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
6. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
7. Physician waits for the tissues to relax completely (about 2 seconds) and sidebends and rotates to the new restrictive barrier
8. Steps 4-7 are repeated until the best motion is obtained
9. Recheck



Note: Keep the patient's shoulders above his/her hips as much as possible to maintain balance.

Lumbar Muscle Energy-Lateral Recumbent

Diagnosis: Lumbar, neutral, sidebending right, rotation left, Type 1

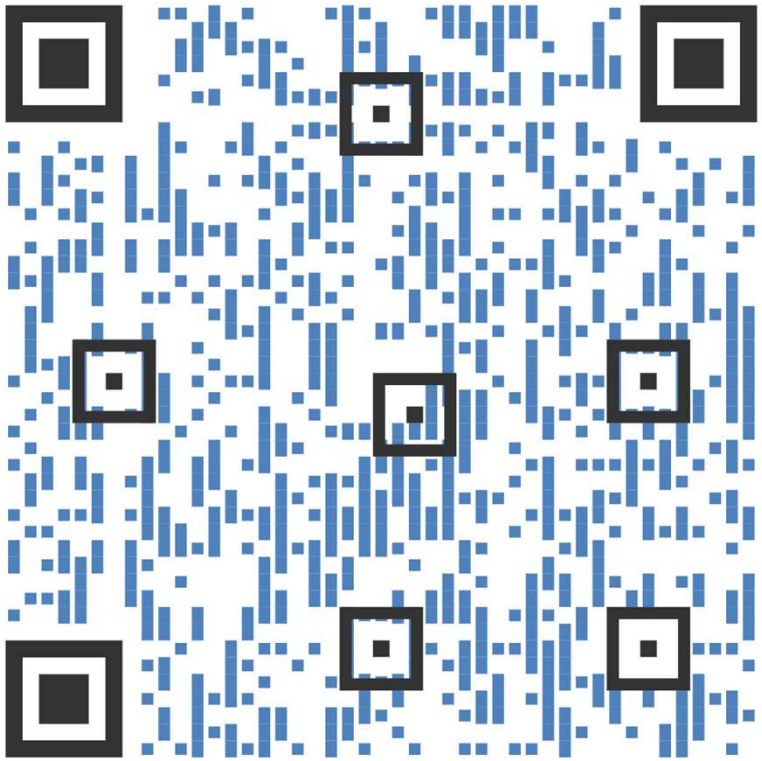
1. Place patient with side of rotation on table
2. Flex, extend to bring to neutral to engage barrier while sensing with opposite hand. Lock right foot at popliteal fossa.
3. Rotate to right upper body to involved segment, engaging barrier
4. Patient is instructed, “Gently, push your hip/buttocks backwards into my forearm”
5. Physician has the patient maintain the force long enough to sense that the patient’s contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
6. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
7. Physician waits for the tissues to relax completely (about 2 seconds) and then repositions all three planes to the new restrictive barrier
8. Steps 4-7 are repeated until the best motion is obtained (average is 3 times)
9. Recheck

Lumbar Muscle Energy-Lateral Recumbent

Diagnosis: Lumbar, flexed, sidebending left, rotation left, Type 2

1. Place patient with side of rotation on table
2. Extend to engage barrier while sensing with opposite hand, lock right foot at popliteal fossa
3. Place pillow under his left arm under head to provide right side bending,
4. Rotate to right upper body to involved segment, engaging barrier
5. Patient is instructed, “Gently, push your hip/buttocks backwards into my forearm”
6. Physician has the patient maintain the force long enough to sense that the patient’s contractile force is localized at the dysfunctional segment (typically 3-5 seconds)
7. Patient is instructed to gently cease the directive force and the physician simultaneously ceases his/her counterforce
8. Physician waits for the tissues to relax completely (about 2 seconds) and then repositions all three planes to the new restrictive barrier
9. Steps 5-8 are repeated until the best motion is obtained (average is 3 times)
10. Recheck

Session Evaluation



Grievance Policy

All grievances should be in writing and should specify the nature of the grievance. Initially, all grievances should be directed to MAOPS Executive Director, who will then forward said grievance to the Education & Convention Committee. All grievances will receive an initial response in writing within 30 days of receipt. If the participant does not receive a satisfactory response, then they can submit a complaint in writing to the Bureau of Osteopathic Education of the AOA at 142 East Ontario Street, Chicago, IL 60611.

References:

- Chila, A.G. (ed.): Foundations for Osteopathic Medicine 3rd Edition, Lippincott Williams & Wilkins, Baltimore, MD, 2011.
- Kimberly, P.; Outline of Osteopathic Manipulative Procedures: Kimberly Manual, 2006 Edition (updated 2008)
- Mitchell Jr., Fred L., The Muscle Energy Manual, Volume Two, MET Press, East Lansing, Michigan, 1995.
- Netter, Frank H.: Atlas of Human Anatomy 7th edition, Hoechstetter Printing Company Inc., New York, New York, 2018