Tips for Precepting DO Students and Utilizing OMT: technique types, indications, and contraindications.

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12/2/22

Disclosures

I have no disclosures

Objectives

- At the end of this educational activity, participants will be able to:
  - Articulate the Osteopathic philosophy and understand the history of Osteopathic medicine
  - Identify patients who are good candidates for Osteopathic manipulation
  - Recognize relative and absolute contraindications for OMT
  - Understand the different types of Osteopathic manipulation and when these techniques are appropriate

Osteopathic Medicine

- Undergraduate preparation/degree
- Doctor of Osteopathic Medicine (DO) – 4 years of medical school
  - Years 1 & 2 are in class learning the basic science of medicine
  - Years 3 & 4 are in clinic and hospital settings with direct patient care
  - DO's have an additional 200+ hours of hands-on training in Osteopathic Manipulation during these 4 years of medical school
  - Followed by at least 3 years of post graduate medical training

Andrew Taylor Still, MD, DO (1828-1917)
Founder of Osteopathic Medicine

- Born in Lee County, Virginia August 6, 1828
- Farmer by trade and inventor by nature. His curious mind brought him to the study of medicine.

Andrew Taylor Still, MD, DO (1828-1917)

- A.T. Still mustered into the Kansas Militia as a Sergeant and promoted to Major in the Union Army during the Civil War from September 1, 1861 – October 24, 1864, as a hospital steward, but worked as a surgeon due to his medical skills.
- Shortly after returning home Still became more disillusioned with the current practice of medicine.
- The death of his wife and several of his children had a large impact on his views of medicine.

Andrew Taylor Still (1828-1917)


Museum of Osteopathic Medicine,
Kirksville, MO [1985.1038.05]


Still National Osteopathic Museum [PH 1260]

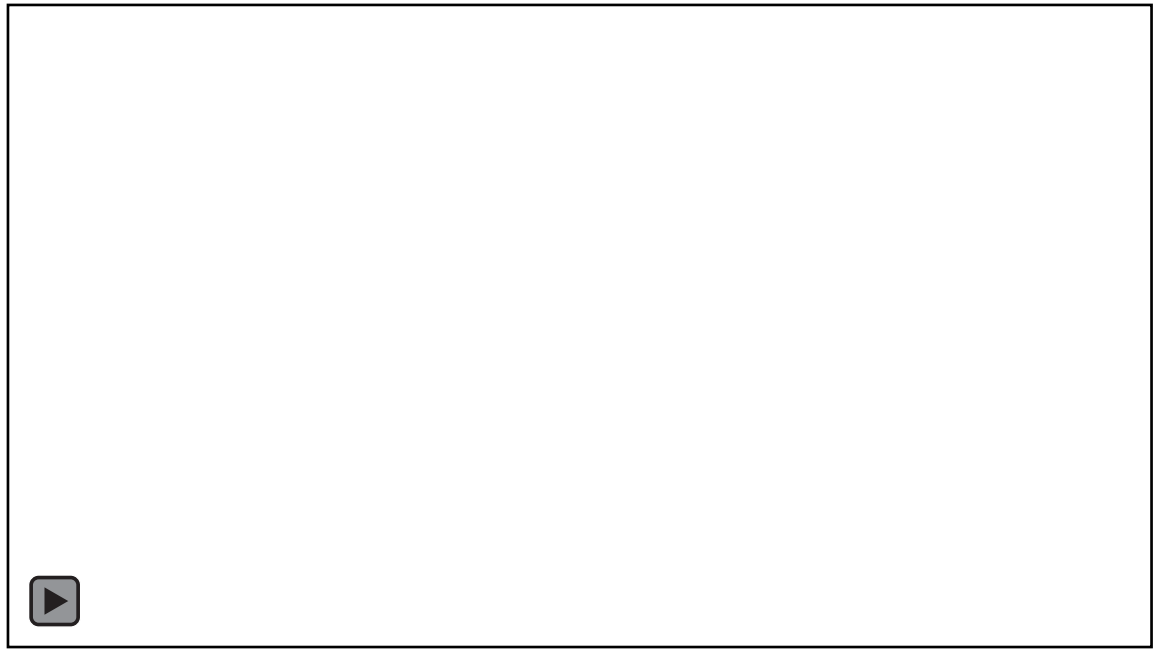
Osteopathic Medicine

- Dr. Still’s philosophy based on:
  - human beings' innate capacity for self healing
  - Belief that if the Osteopath could remove the obstructions in the system, nature would provide the healing.

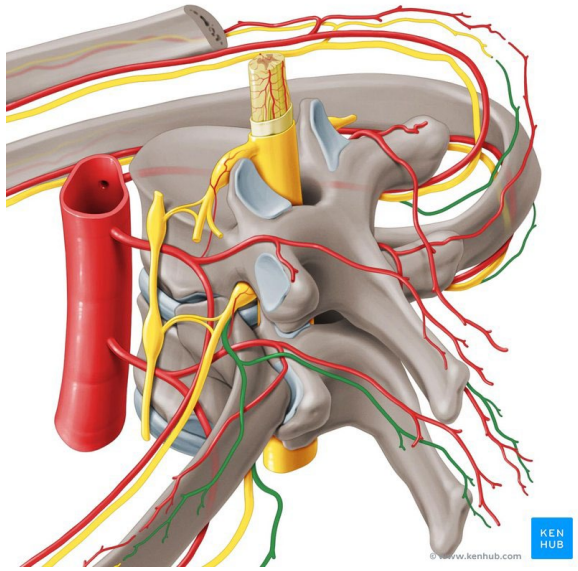
For those who have never seen OMT

- This particular technique is called “Still technique” and was named after Dr. A.T. Still
- This is one of many ways that we can address somatic dysfunction in the spine.

- Note: we can use OMT to treat other areas, too, including the extremities and the cranium



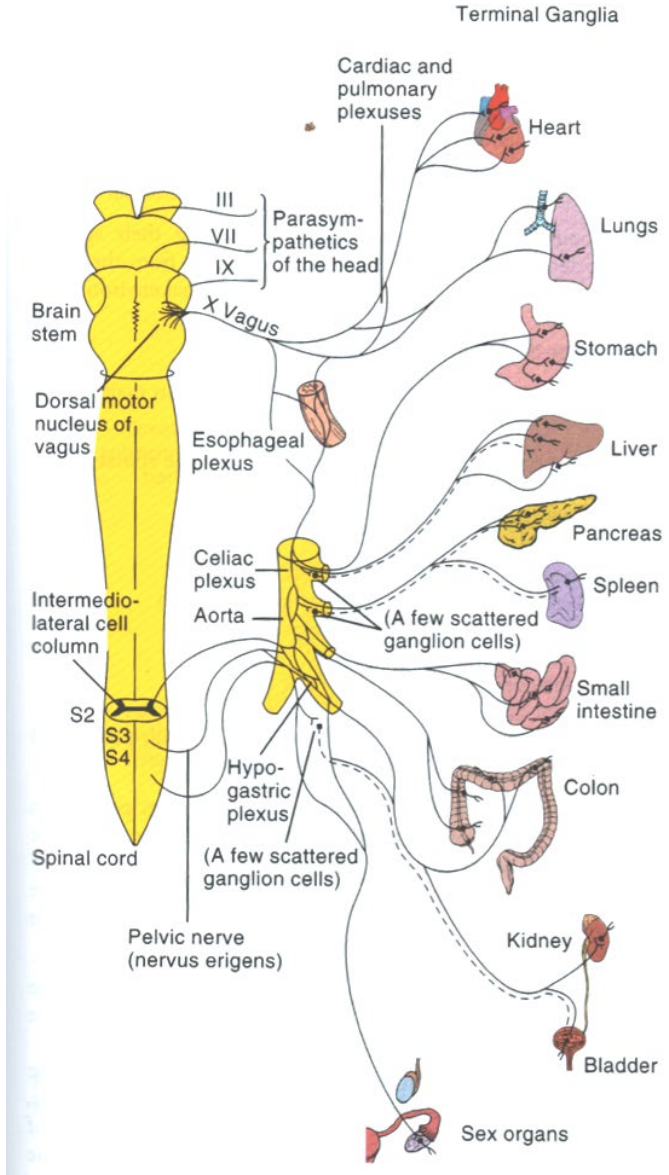
Compression of Thoracic Sympathetic Chain Ganglia



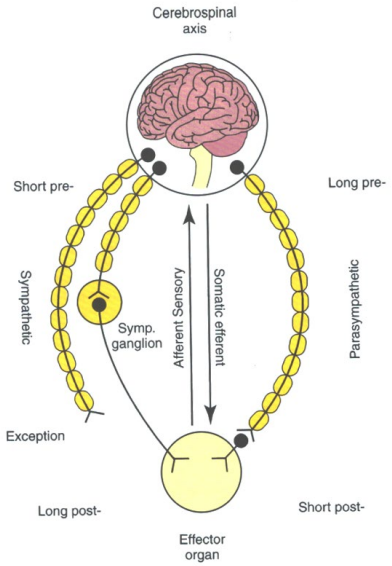
- Note that the sympathetic trunk lies anterior to the body of the vertebra and anterior to the costo-vertebral articulation
- This means that somatic dysfunction of the vertebra and of the rib can affect the adjacent sympathetic ganglion

Parasympathetic: Two Divisions

- The parasympathetic nervous system has 2 divisions:
  - Cranial
  - Sacral
- The vagus innervates the thoracic organs and the gastrointestinal tract up to the mid-transverse colon
- The pelvic splanchnic nerves (coming out from the sacrum) innervate the gastrointestinal tract from the mid-transverse colon to the rectum (includes left side of transverse colon, descending colon, sigmoid colon, and rectum



Where Parasympathetic Nerves are Vulnerable to Compression or Traction

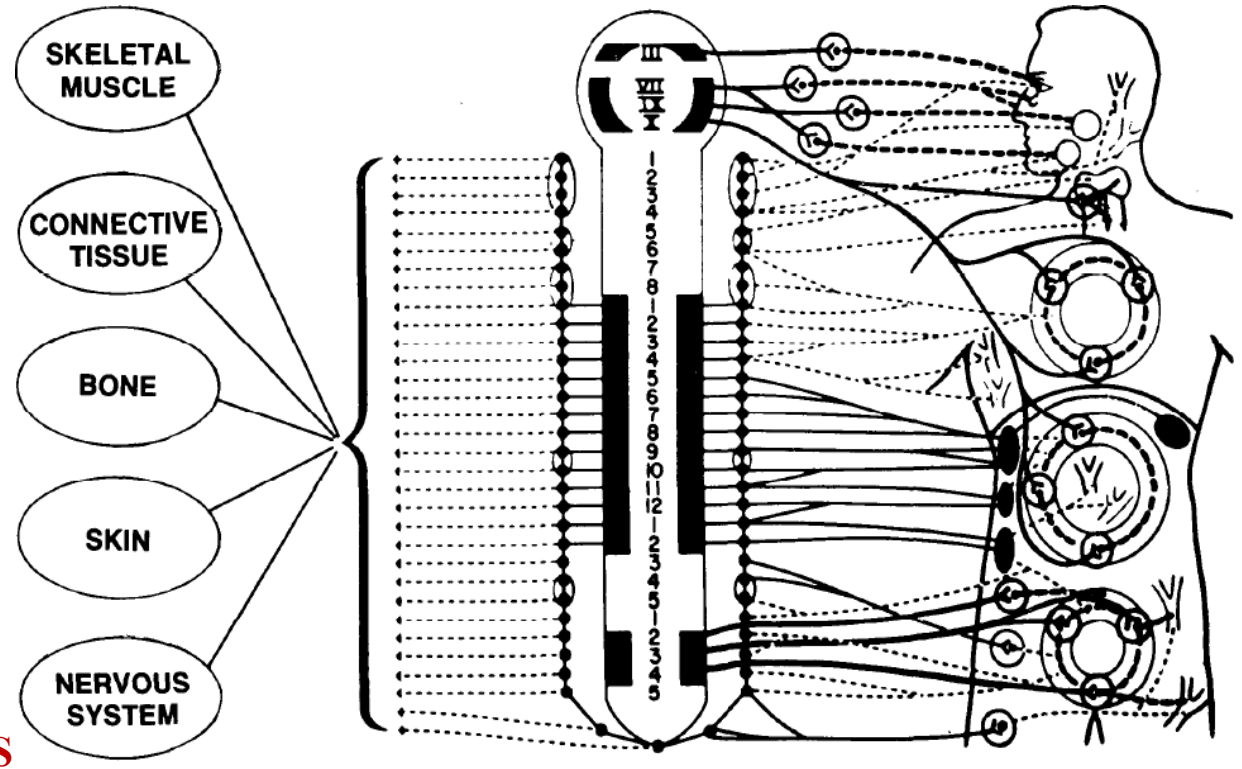


- Nerves in general have 2 situations where they are particularly vulnerable to compression and traction:
- Where they exit the spinal column
- Where they traverse ganglia (which have a relatively tight capsule covering)
- Sympathetic nerves have relatively short pre-synaptic neurons, so their ganglia are near the spine and vertebral and rib dysfunctions are important
- Parasympathetic nerves have long pre-synaptic neurons and so we are mostly concerned with where they exit the central nervous system

PRIMARY MACHINERY OF LIFE (KORR)

SYSTEM TO ENABLE ACTIVITIES OF DAILY LIVING

2/3 OF THE TOTAL BODY MASS

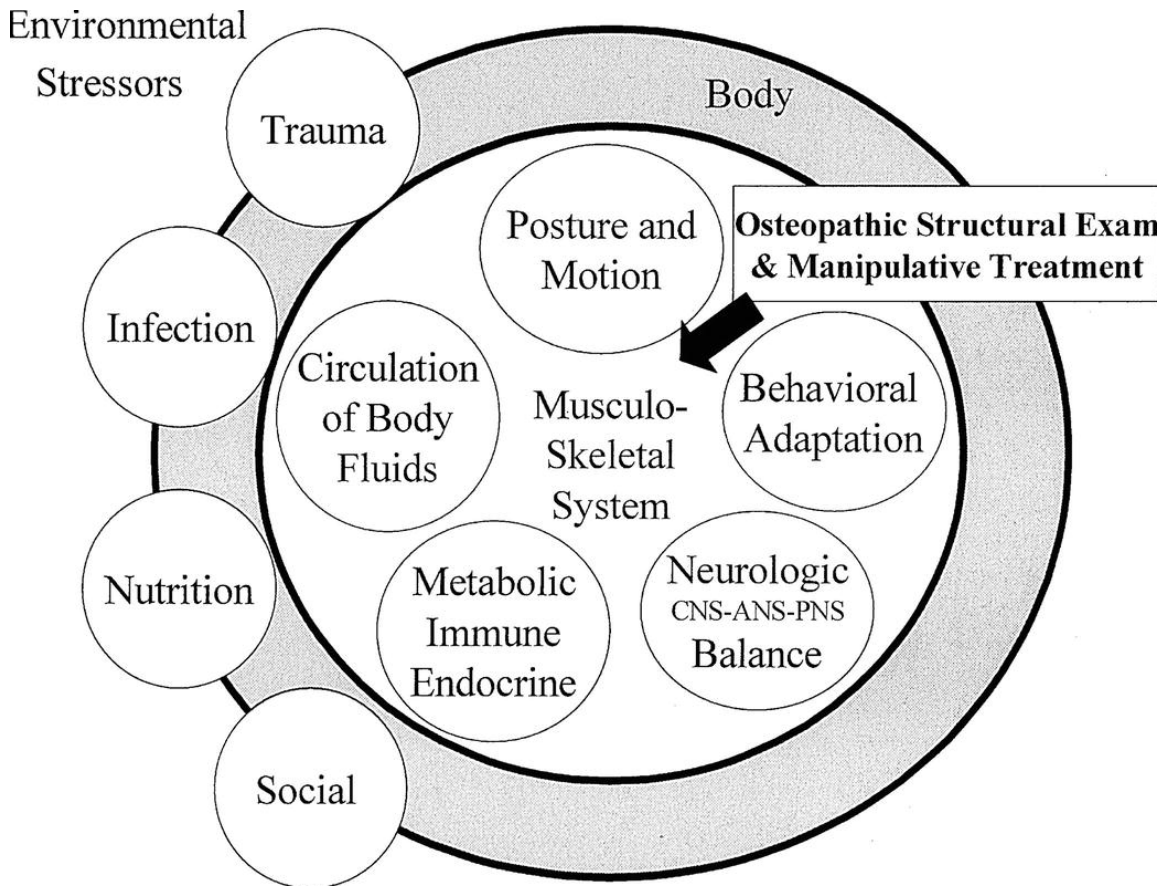


SECONDARY MACHINERY

ROLE:
TO MEET THE METABOLIC DEMANDS OF THE PRIMARY MACHINERY

SOMATO ⇄ VISCERAL

The spinal cord can be viewed as a neurological lens for a variety of stressors that initiate somatic and/or visceral symptoms



The Four Tenets of Osteopathic Medicine

1. The body is a unit; the person is a unit of body, mind, and spirit.

2. The body is capable of self regulation, self healing, and health maintenance.

3. Structure and function are reciprocally interrelated.

4. Rational treatment is based on an understanding of these principles of body unit, self regulation, and the interrelationship of structure and function.

Osteopathic Manipulative Treatment Modalities

- Direct
  - A manipulative treatment in which the restrictive barrier is engaged and the dysfunctional body part is moved towards from the restrictive barrier.
- Indirect
  - A manipulative treatment in which the restrictive barrier is disengaged and the dysfunctional body part is moved away from the restrictive barrier.
  - Considered to be the more gentle of the two types of techniques though direct techniques can be very gentle, too.

Two questions to ask students:

What did you find with your Osteopathic structural exam?

How could you utilize OMT with this patient?

These two questions achieve several goals:

The patient receives Osteopathic consideration in their care.

You also learn about Osteopathic principles.

Reinforces Osteopathic principles and concepts even if OMT is not utilized.

General Relative and Absolute Contraindications OMT

Relative

- Fractures
- Open wounds
- Soft tissue or bony infections
- Abscesses
- DVT or threat of DVT
- Anticoagulation, disseminated or focal neoplasm
- Recent postoperative conditions over the site of proposed treatment (ex: wound dehiscence)
- Muscle tear
- Joint dislocation
- Severe Osteoporosis
- Hypermobility and joint instability
- Aortic aneurysm

Absolute

- Patient refusal or inability to consent
- Manifestation of neurological symptoms brought on by treatment positioning
- Exacerbation of potentially life-threatening symptomatology by treatment positioning (ex: EKG changes, oxygen desaturation in a monitored patient)
- Unstable fractures

A sample case to help illustrate the use of the two questions

Family Medicine/Internal Medicine

What did you find on your structural exam?

- Should report to you general exam findings such as patient appearance, heart and lung sounds
- Should also note tissue texture changes in the upper thoracic spine and any joint restrictions in the upper thoracic spine as well as the rib cage

How could you utilize OMT with this patient?

- Improve venous and lymphatic return
- Improve arterial circulation to carry immune system products to the lungs
- To ease removal of accumulated bronchial secretions and phlegm
- To decrease workload of breathing

What the note might look like:

- S
  - 25-year-old w/f presents with productive cough x 3 days. She reports chills but has not checked her temperature at home. She notes possible COVID exposure last week. DayQuil helps symptoms. Activity makes cough worse. Cough tends to be worse in the morning and evening hours.
- O
  - Vitals HR 90 RR 18 temp 100.2 O2 sat 98%
  - Gen: alert female in no acute distress
  - Heart: RRR; no m/r/g
  - Lung: wheezing and rhonchi
  - Osteopathic structural exam: boggy, edematous paraspinal tissues in the upper thoracic spine. General decreased excursion of the rib cage with inspiration.
- A
- P

Signs	Manifestations
Pain	
Acute	Severe, cutting, or sharp
Chronic	Dull, achy with paresthesias
Skin Changes	
Acute	Warm, moist, red, inflamed
Chronic	Cool, pale
Vasculature	
Acute	Vessel injury with resultant release of endogenous peptides, chemical vasodilation, inflammation, and edema
Chronic	Vessels constricted due to increased sympathetic tone
Sympathetic Activity	
Acute	Systemically increased sympathetic activity, but the local effect of this increased activity is overpowered by bradykinins released, so there is local vasodilation due to chemical effect
Chronic	Local vasoconstriction due to hypersympathetic tone; systemic tone has returned toward normal
Musculature	
Acute	Locally increased muscle tonus, muscle contraction, and spasm mediated via the muscle spindle. Minimal somatosomatic reflex effects
Chronic	Diminished muscle tone, ropiness, flaccidity, mushy feeling. Limited range of motion likely due to fascial contracture. Common somatosomatic reflex effects (9)
Mobility	
Acute	Range of motion is often normal, but the quality is sluggish
Chronic	Range of motion is diminished, but quality of remaining motion is normal
Soft Tissues	
Acute	Boggy edema, acute congestion, fluids from vascular leakage, and chemical reactions in the tissues
Chronic	Congestion, doughy, stringy, fibrotic, thickened, exhibits increased resistance to penetration, contracted, contractured
Adnexa	
Acute	Moist skin, no trophic changes
Chronic	Scaly, dry skin, pimples, folliculitis altered pigmentation (trophic changes)
Visceral	
Acute	Minimal somatovisceral reflex effects
Chronic	Common somatovisceral reflex effects (10)

PNEUMONIA

- Goals of treatment:
  - Improve venous and lymphatic return
  - Improve arterial circulation to carry immune system products to the lungs
  - To ease removal of accumulated bronchial secretions and phlegm
  - To decrease workload of breathing

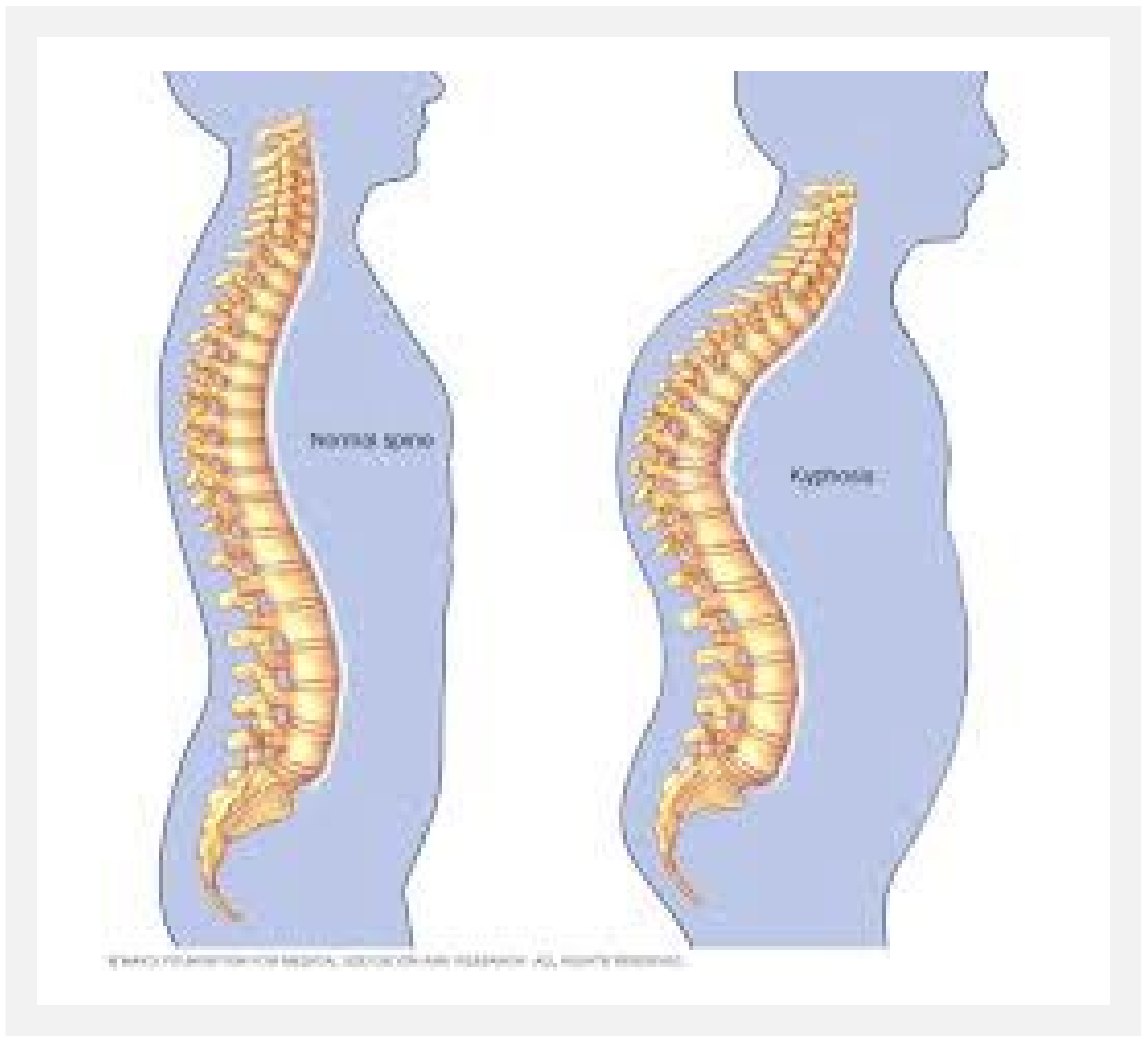
  - Rib raising may be used to free bronchial secretions so they may be easier to cough up
  - Rib raising may also help to normalize sympathetic tone

AUTONOMICS TO THE LUNGS

- Parasympathetic Vagus nerve (CN X)
  - Bronchiolar smooth muscle
    - contracts
  - Respiratory epithelium
    - Decreases # of goblet cells to enhance thin secretions
- Sympathetic T2-T7
  - Bronchiolar smooth muscle
    - Relaxes
  - Respiratory epithelium
    - Increases # of goblet cells to produce thick secretions

OTHER FACTORS

- We also want to consider the ability of the spine to straighten during inhalation and curve with exhalation



EFFICACY OF OSTEOPATHIC MANIPULATION AS AN ADJUNCTIVE TREATMENT FOR HOSPITALIZED PATIENTS WITH PNEUMONIA: A RANDOMIZED CONTROLLED TRIAL

Abstract

Background: The Multicenter Osteopathic Pneumonia Study in the Elderly (MOPSE) is a registered, double-blinded, randomized, controlled trial designed to assess the efficacy of osteopathic manipulative treatment (OMT) as an adjunctive treatment in elderly patients with pneumonia.

Methods: 406 subjects aged >/= 50 years hospitalized with pneumonia at 7 community hospitals were randomized using concealed allocation to conventional care only (CCO), light-touch treatment (LT), or OMT groups. All subjects received conventional treatment for pneumonia. OMT and LT groups received group-specific protocols for 15 minutes, twice daily until discharge, cessation of antibiotics, respiratory failure, death, or withdrawal from the study. The primary outcomes were hospital length of stay (LOS), time to clinical stability, and a symptomatic and functional recovery score.

Results: Intention-to-treat (ITT) analysis (n = 387) found no significant differences between groups. Per-protocol (PP) analysis (n = 318) found a significant difference between groups (P = 0.01) in LOS. Multiple comparisons indicated a reduction in median LOS (95% confidence interval) for the OMT group (3.5 [3.2-4.0] days) versus the CCO group (4.5 [3.9-4.9] days), but not versus the LT group (3.9 [3.5-4.8] days). Secondary outcomes of duration of intravenous antibiotics and treatment endpoint were also significantly different between groups (P = 0.05 and 0.006, respectively). Duration of intravenous antibiotics and death or respiratory failure were lower for the OMT group versus the CCO group, but not versus the LT group.

Conclusions: ITT analysis found no differences between groups. PP analysis found significant reductions in LOS, duration of intravenous antibiotics, and respiratory failure or death when OMT was compared to CCO. Given the prevalence of pneumonia, adjunctive OMT merits further study.

CLINICAL AND RESEARCH PROTOCOL FOR OSTEOPATHIC MANIPULATIVE TREATMENT OF ELDERLY PATIENTS WITH PNEUMONIA

- The OMT protocol used in MOPSE has its origins in the osteopathic medical literature of the early 1900s. The protocol incorporates eight standardized OMT techniques yet allows for non-standardized treatment to address somatic dysfunction unique to each patient. While familiar to osteopathic physicians, the techniques are not well known to the larger biomedical community.

- Dysfunctions of the thoracic spine, particularly from T1 to T10, and the associated ribs routinely corresponded with lower respiratory tract infections.[6,7] Correlation was noted between somatic dysfunction from C7 to T3 and congestion of the upper lobes of the lungs.[6,7] Dysfunction from T5 to T8 correlated with overall congestion of the lungs.[6-9] Associations between pneumonia and somatic dysfunction were also noted in the cervical region and the cervicothoracic junction (thoracic inlet), which included the first ribs and clavicles.[6-9]

SOMATIC DYSFUNCTION AND ITS HYPOTHESIZED IMPACT ON PNEUMONIA

Somatic dysfunction was hypothesized to impede the body's ability to recover from influenza and pneumonia through any of the following three interdependent processes:

- Mechanically impairing rib cage and diaphragmatic motion
- Distorting the transmission of neurologic impulses through autonomically regulated reflexes
- Impairing circulation, particularly at the venous and lymphatic levels

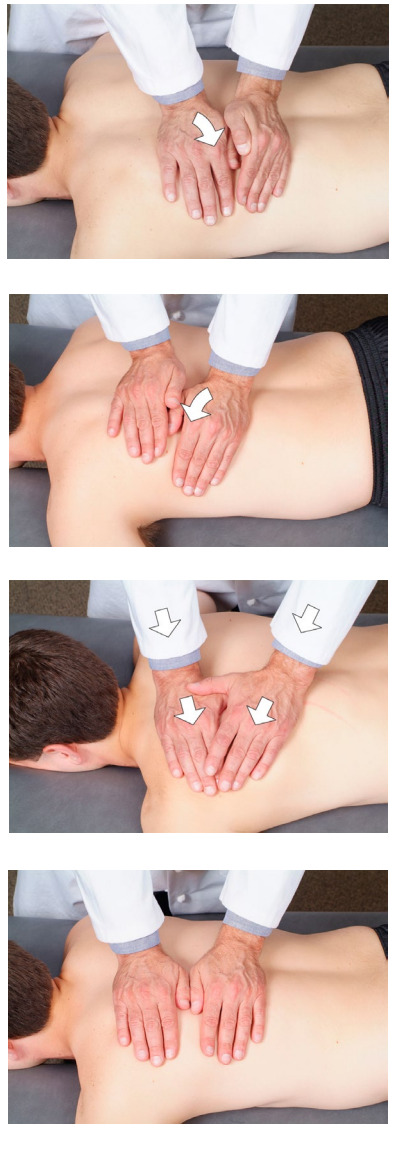
STANDARDIZED OMT PROTOCOL FOR MOPSE TRIAL

1. Thoracolumbar Soft Tissue
2. Rib Raising
3. Doming of Diaphragm
4. Cervical Soft Tissue
5. Suboccipital Decompression
6. Thoracic Inlet Myofascial Release
7. Thoracic Lymphatic Pump
8. Pedal Lymphatic Pump

THORACOLUMBAR SOFT TISSUE

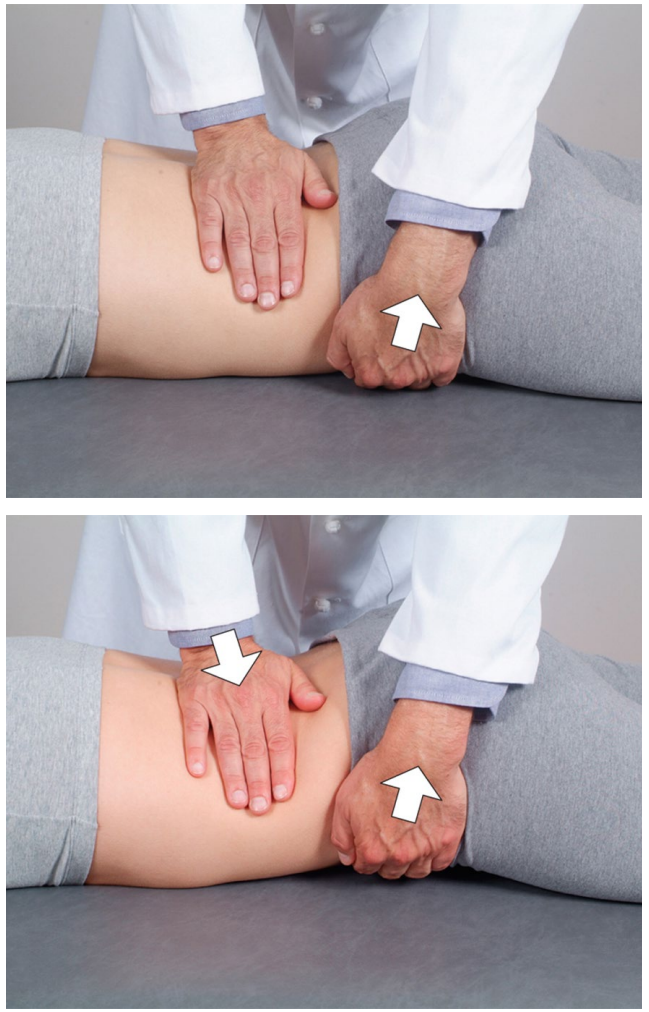
1. The physician places one hand on the patient's back with the thumb and thenar eminence in the trough area between the spinous and transverse processes, over the erector spinae mass.

2. The physician's other hand is used to apply force through this "listening" hands to stretch and compress the tissue in a gentile rhythmic fashion. This may be applied to the entire length of the thoracic and lumbar paraspinal muscles.



LUMBAR SOFT TISSUE

- The physician stands on the opposite side to be treated, grasps the anterior portion of the pelvis firmly with one hand and places the other hand posteriorly over soft tissues and the 11th and 12th ribs.
- The pelvis is rolled toward the physician and, on the down roll, the physician's other hand applies pressure over the 11th and 12th ribs with an alternating rhythmic "make or break" tension release maneuver.
- Gentle kneading and stretching to the lumbar area may be performed from the 11th rib to the 5th lumbar, using the hand on the anterior portion of the pelvis as the counter force.
- After the tension of the soft tissues has been released, the physician can apply pressure over the 11th and 12th ribs in an antero-lateral direction while stretching with the other hand. A deep breath and cough from the patient may assist in mobilizing those ribs
- Reading the tissues will signal the completion of treatment and not the articulation of ribs. The quadratus lumborum should start to feel softer and more pliable, thus signaling the end of the treatment. The treatment may be applied bilaterally.



RIB RAISING

1. The patient is supine on the treatment table or hospital bed, and the physician is seated on the side to be treated.

2. The physician’s hands (palms up) reach under the patient’s thoracic spine with the pads of the fingers on the patient’s thoracic paravertebral musculature between the spinous and the transverse processes on the side closest to the physician.

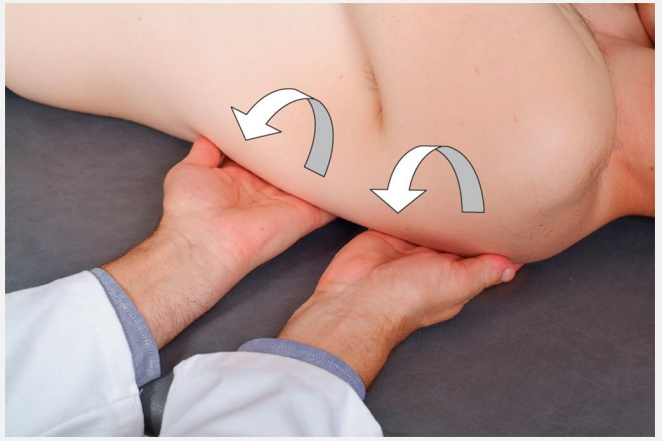
3. The physician exerts a gentle force anteriorly to contact the thoracic paravertebral musculature.

4. The fingers are simultaneously drawn toward the physician, producing a lateral stretch perpendicular to the thoracic paravertebral musculature

5. This stretch is held for several seconds and is slowly released.

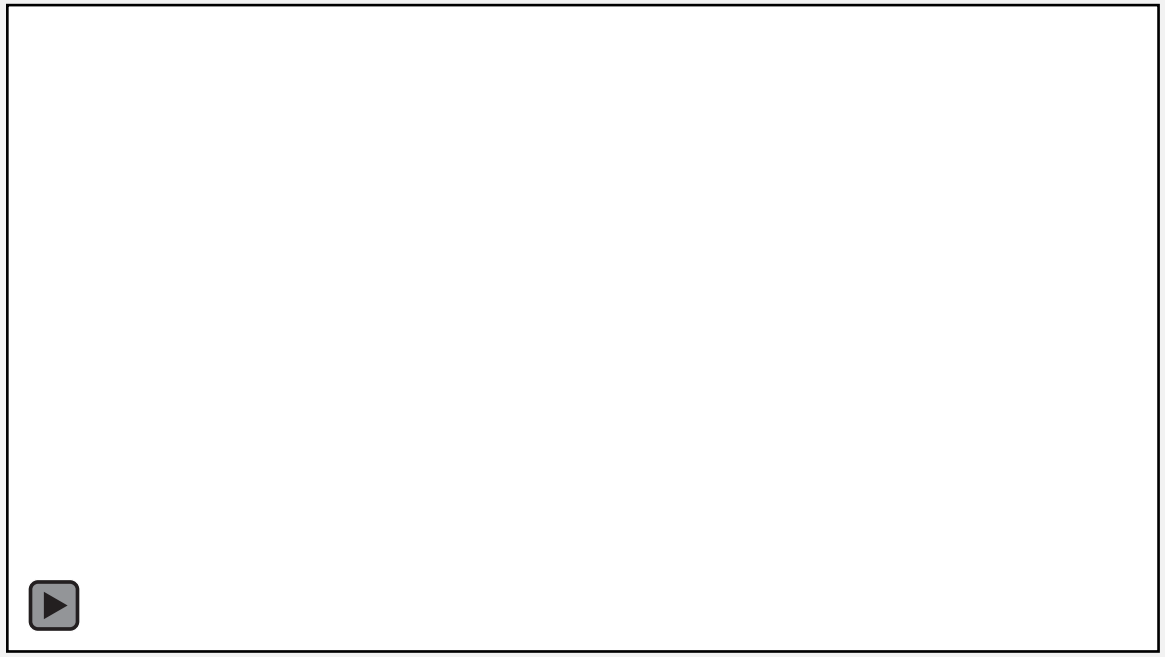
6. Steps 3 – 5 are repeated several times in a gentle, rhythmic, and kneading fashion.

7. The physician’s hands are repositioned to contact the different levels of the thoracic spine, and the technique is repeated to stretch various portions of the thoracic paravertebral musculature.



RIB RAISING

RIB RAISING VIDEO



DOMING THE DIAPHRAGM

1. The patient lies supine with the hips and knees flexed and feet flat on the table.

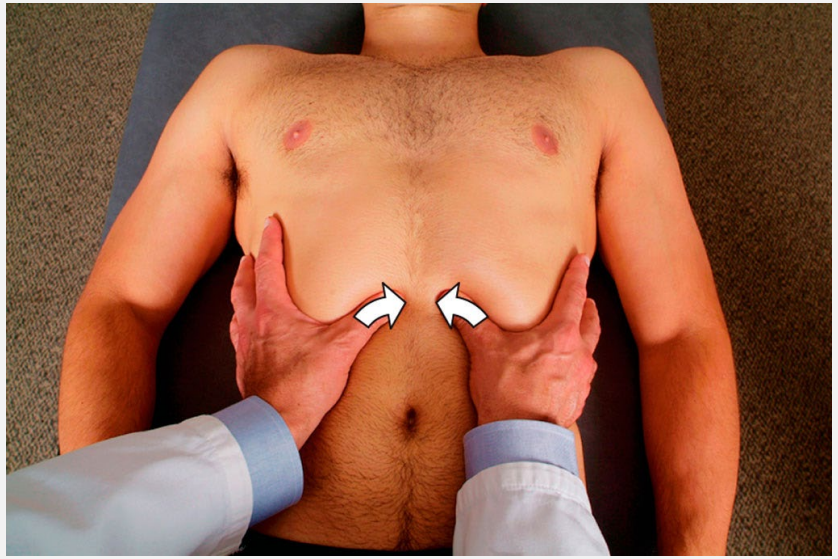
2. The physician stands to one side at the level of the pelvis, facing cephalad.

3. The physician places the thumbs and thenar eminence just inferior to the patient's lower costal margin and xiphoid process with the thumbs pointing cephalad.

4. The patient is instructed to take a deep breath and exhale. On exhalation, the physician's thumbs follow the diaphragm which causes the thumbs to move posteriorly.

5. The patient is instructed to inhale, and the physician gently resists this motion.

6. These motions are repeated for 3-5 breath cycles.



MUSCLES OF RESPIRATION

Inspiration

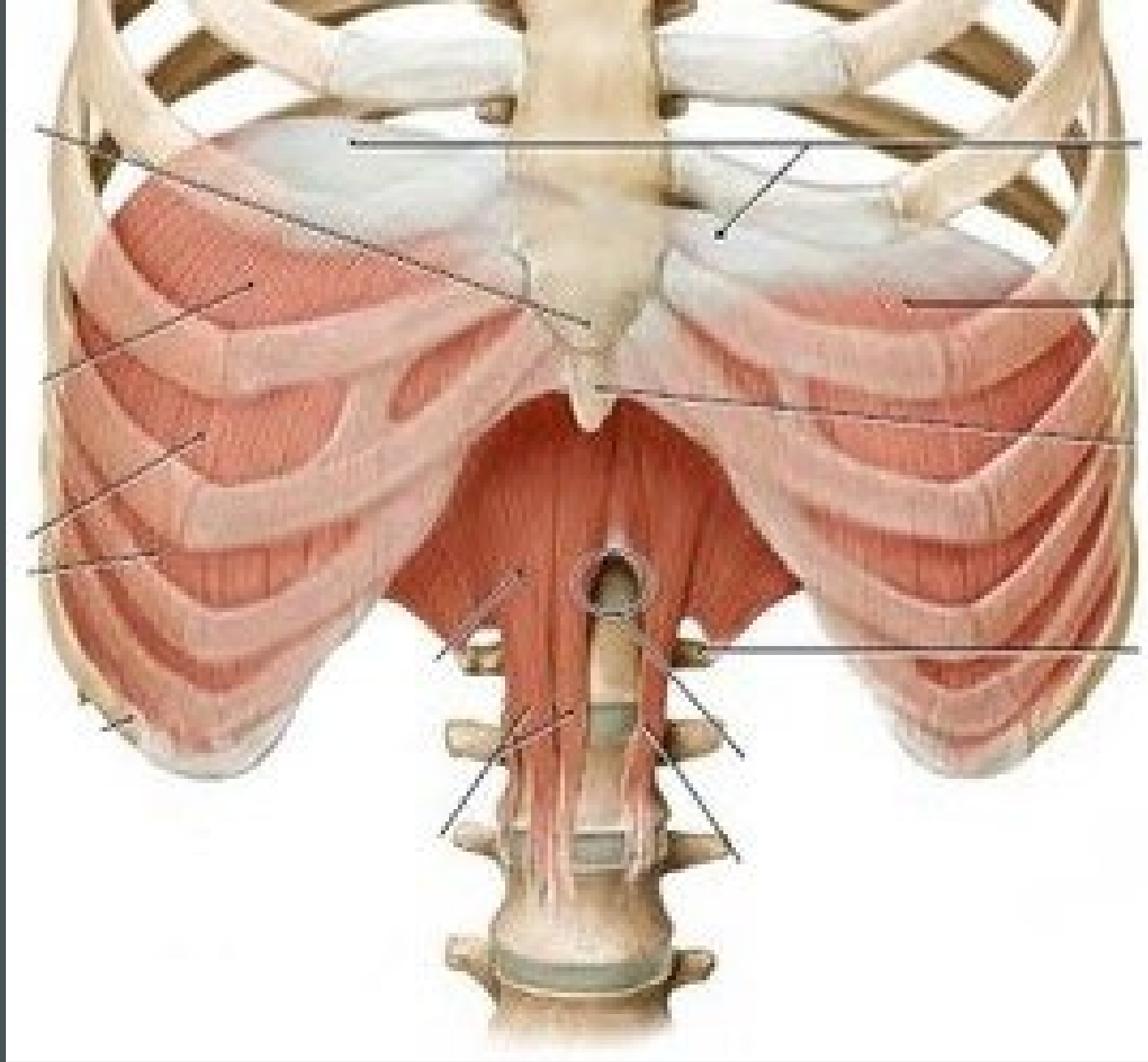
- Diaphragm
  - Most important muscle of inspiration
  - Thin, dome-shaped (important to its function), and inserted into the lower ribs
  - Supplied by phrenic nerves from C3,4, &5
  - When contracts:
    - Abdominal contents are forced downward and forward
    - Vertical dimension of chest cavity increases
    - Rib margins are lifted and moved out
      - Which increases the transverse diameter of the thorax
  - In normal tidal breathing, the level of the diaphragm moves about 1cm
  - On forced inspiration and expiration, a total excursion of up to 10 cm may occur

DIAPHRAGM – STRUCTURE

- Muscle fibers of the diaphragm arise radially, from the margins of the inferior thoracic aperture, and converge into a large central tendon

- Crura of diaphragm attach to lumbar vertebrae (L 1-L2 on left, L1-L3 on right). Diaphragm attaches to inner surface of Ribs 7 – 12 and xiphoid

- Diaphragm "balloons" superiorly, on both the right and left sides, to form domes. The right dome is higher than the left, reaching as far as rib 5

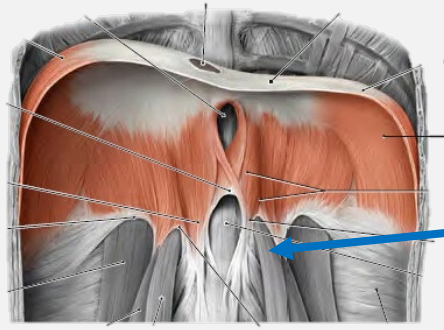


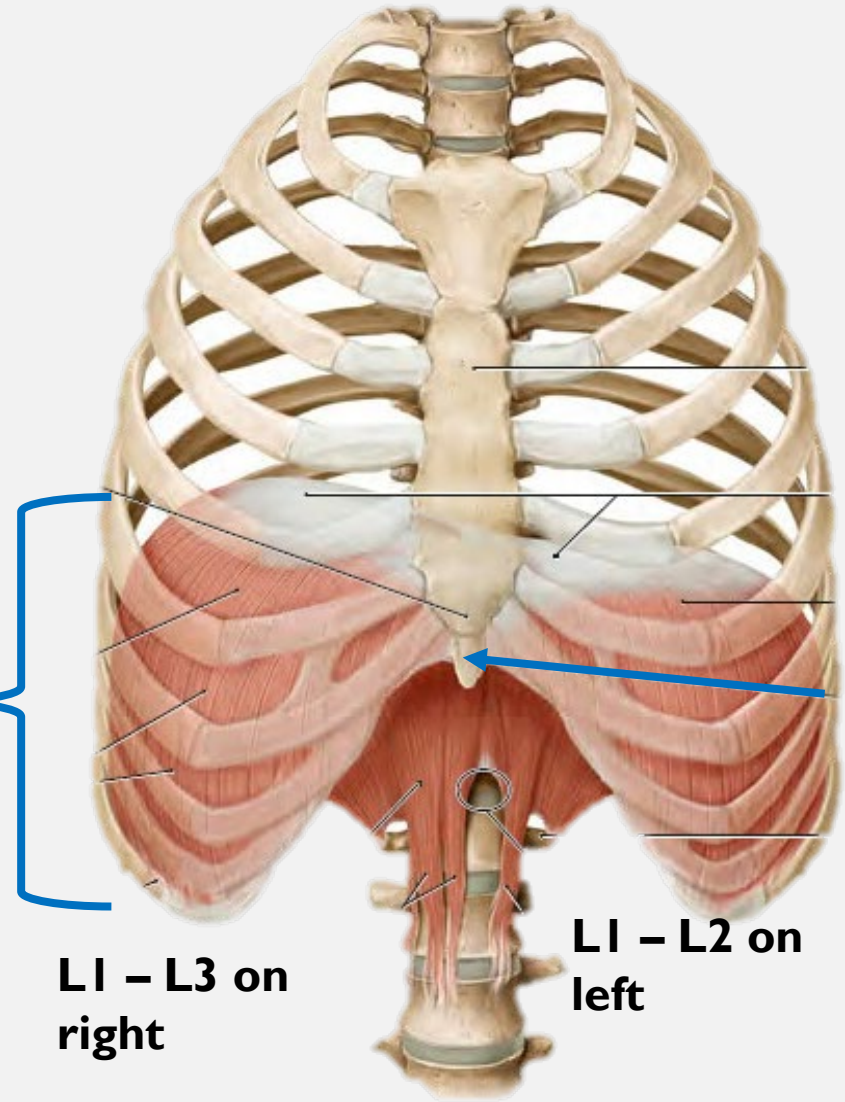
DIAPHRAGM IS A DOME

- The thoracic diaphragm must be properly domed to allow for maximal excursion
  - An increase in the workload of the diaphragm may strain the attachments on the ribs and the thoracolumbar junction
    - From the tension, lumbar lordosis is increased and the diaphragm is flattened as well as spastic
      - This prevents optimal exchange of gases

DIAPHRAGM – ATTACHMENTS & CONTINUITIES

- Diaphragm is floor of thorax
- Xiphoid Process
- Inner surface of inferior 6 ribs
- L1 – L2 on left
- L1 – L3 on right
- Fibers from central tendon are continuous with Psoas and Quadratus Lumborum
- Continuous with Endothoracic Fascia





SOFT TISSUE TREATMENT TO CERVICAL SPINE

1. The patient lies supine.

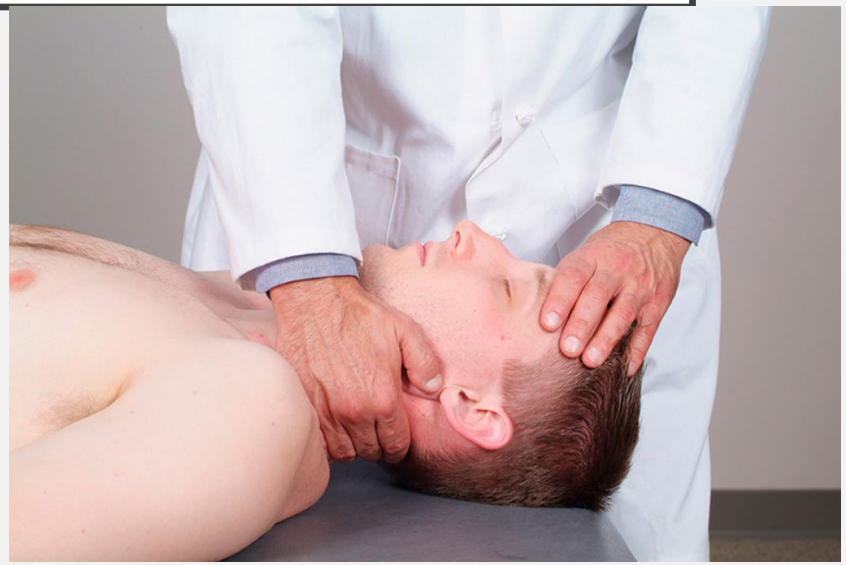
2. The physician stands at the contralateral side to be treated.

3. The physician’s caudad hand reaches over and around the neck to touch with the pads of the fingers the patient’s cervical paravertebral musculature on the side opposite the physician.

4. The physician’s cephalad hand holds the patient’s forehead to stabilize the head.

5. Keeping the caudad arm straight, the physician gently draws the paravertebral muscles anteriorly and slightly laterally, producing minimal extension of the cervical spine.

6. This technique is continued in a gentle, rhythmic, and kneading fashion.

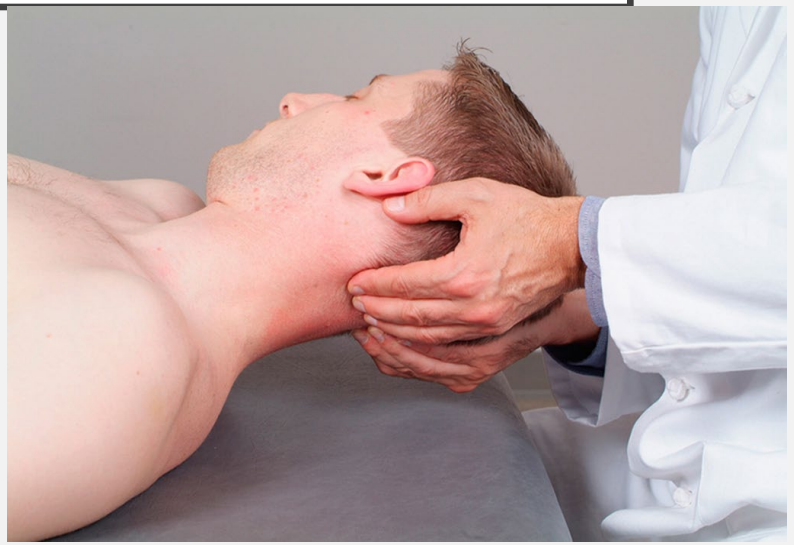


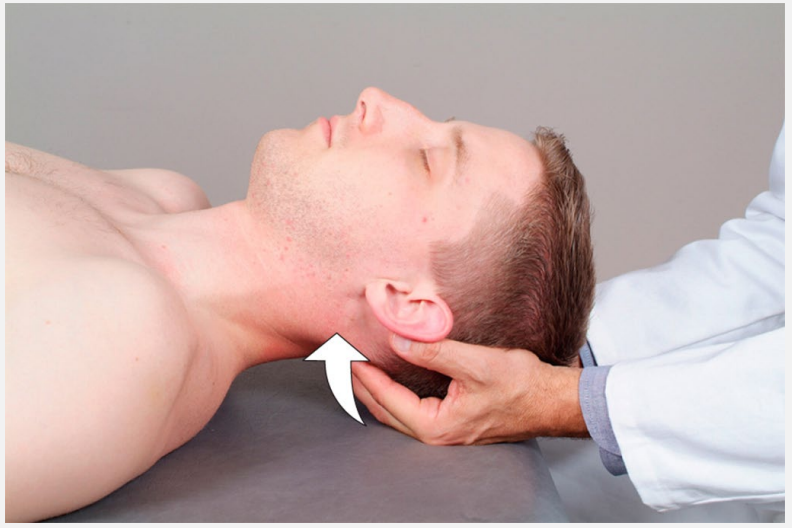
SUBOCCIPITAL DECOMPRESSION

1. With the patient supine and the physician seated at the head of the table, the physician places his fingertips together under the sub-occipital area along the inferior nuchal line.

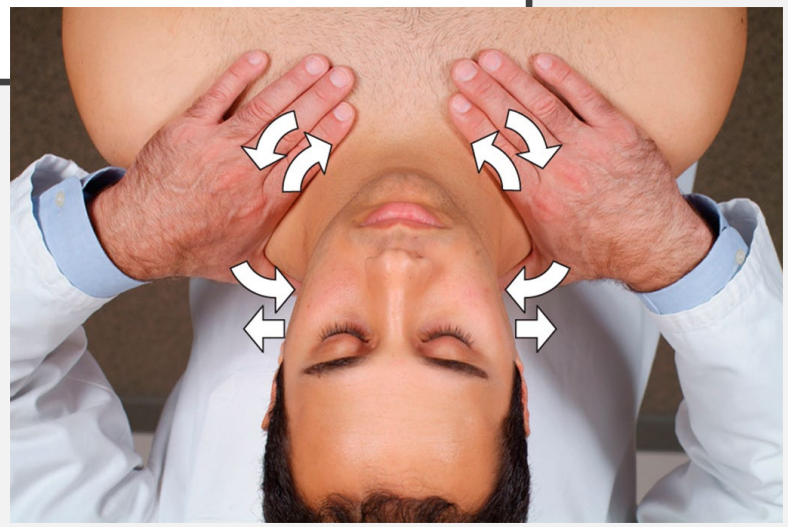
2. With fingertips, the physician supports a portion of the weight of the head, the remainder of the weight is on the thenar eminences. Try not to place traction or distracting forces into the tissue (as this is a different technique) rather, let the weight of the head do the work.

3. Treatment is continued until the tissues release and, at this point, the hands are gently removed.





MFR FOR THORACIC INLET



1. The patient is seated. The physician stands behind the patient.
2. The physician places their hands over the shoulders on top of the cervicothoracic junction.
3. The physician places their thumbs over the posterior aspect of rib 1. Their index fingers are superior to the clavicle and the rest of their fingers rest on the area inferior to the clavicle.
4. The physician monitors inferior and superior (shoulder up and down), circumferential rotation (steering wheel), and torsional motion (twisting of shoulder).
5. The physician finds the ease in all three of these axes (vertical, A/P, and transverse).
6. Stacking the motions into the ease, the physician holds the patient's underlying fascia in this position until relaxation of the tissues is achieved.

THORACIC LYMPHAT

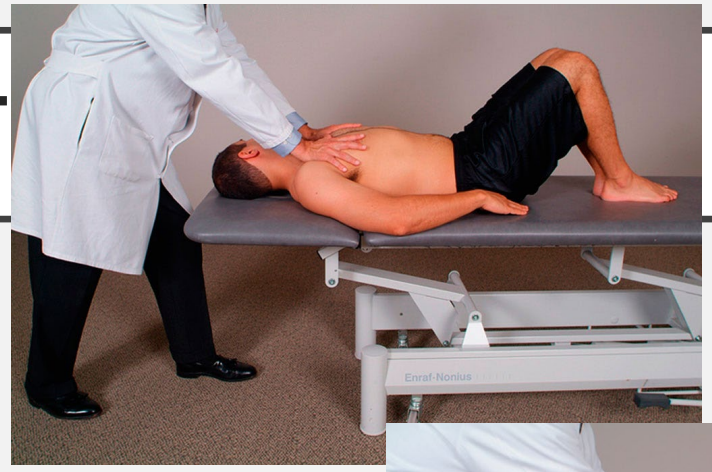
1. Physician places hands on anterior thoracic wall with thenar eminence over the pectoralis muscles just below the clavicles.

2. Rapidly alternate pressure on chest wall during patient exhalation.

3. Maintain pressure at the end of exhalation.

4. Repeat 2-3 times.

5. Briskly remove hands on 3rd or 4th patient inhalation.



PEDAL PUMP (DALRYMPLE)

If possible, proper diaphragmatic respiration should be established first.

1. The patient is supine.
2. The physician places hands on the plantar surfaces of the patient's feet and takes up the slack of the ankles towards dorsiflexion. Then rhythmically dorsi flex the feet, causing motion of the whole patient including abdominal viscera.
3. The feet should be flexed 120 times per minute for approximately two minutes in order to gain the full therapeutic potential.

Considerations for billing

- You need to be present for the procedure (in this case OMT) and you need to confirm all exam findings reported to you by the student.

What the note might look like:

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  - Somatic dysfunction of the thoracic region
- P
  - Abx, rest, hydration
  - OMT x 1-2 regions
  - RTC if symptoms worsen or do not improve

Sources

- Foundation of Osteopathic Medicine 4th edition
- Nicholas and Nicholas Atlas
- An Osteopathic Approach to Diagnosis and Treatment- DiGiovanna
- Merck Manual
- Comlex OMM Review- Crow
- OMT review- Savarese
- Gray's Anatomy
- Respiratory Physiology- the Essentials- John B. West
- Knoxville 2020-2021 OPP scholars' awesome MOPSE slides