Osteopathy and Respiratory Pandemics of 1918 and 2020

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Disclaimer

- Eva Shay, DO, is an employee of William Carey University College of Osteopathic Medicine, in Hattiesburg, Mississippi.

- This presentation represents the author’s collection of information, but is not officially endorsed by the University.

Objectives

- Identify the historical impact of Osteopathy on the 1918 influenza pandemic
- Identify indications for OMT with respiratory infections
- Describe the regions that may benefit from OMT during respiratory infections
- BRIEF review of associated anatomy and the Autonomic Nervous System
- Demonstrate OMT techniques for both outpatients and inpatients
  - The predominant treatments included here are variations of the ones possibly utilized by DOs during the 1918 Spanish Flu (with a few additional)

Seattle, Washington Policemen Wearing Masks Made by the Red Cross, Dec 1918

https://www.archives.gov/exhibits/influenza-epidemic/records-list.html

COVID-19 Update Resources

- **CDC: Coronavirus Disease 2019 (COVID-19) Situation Summary – updated as information becomes available**
- https://www.cdc.gov/coronavirus/2019-nCoV/summary.html

- **WHO: Updates on Coronavirus disease (COVID-19) outbreak**
- https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Historical Facts from 1918

- The 1918 influenza pandemic was the most severe pandemic in recent history
- Caused by an H1N1 virus with genes of avian origin
- Exact origin was disputed; often attributed to beginning in Spain, thus the name the "Spanish Flu"
- Spread worldwide during 1918-1919
- In the United States, it was first identified in military personnel in spring 1918

https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.html

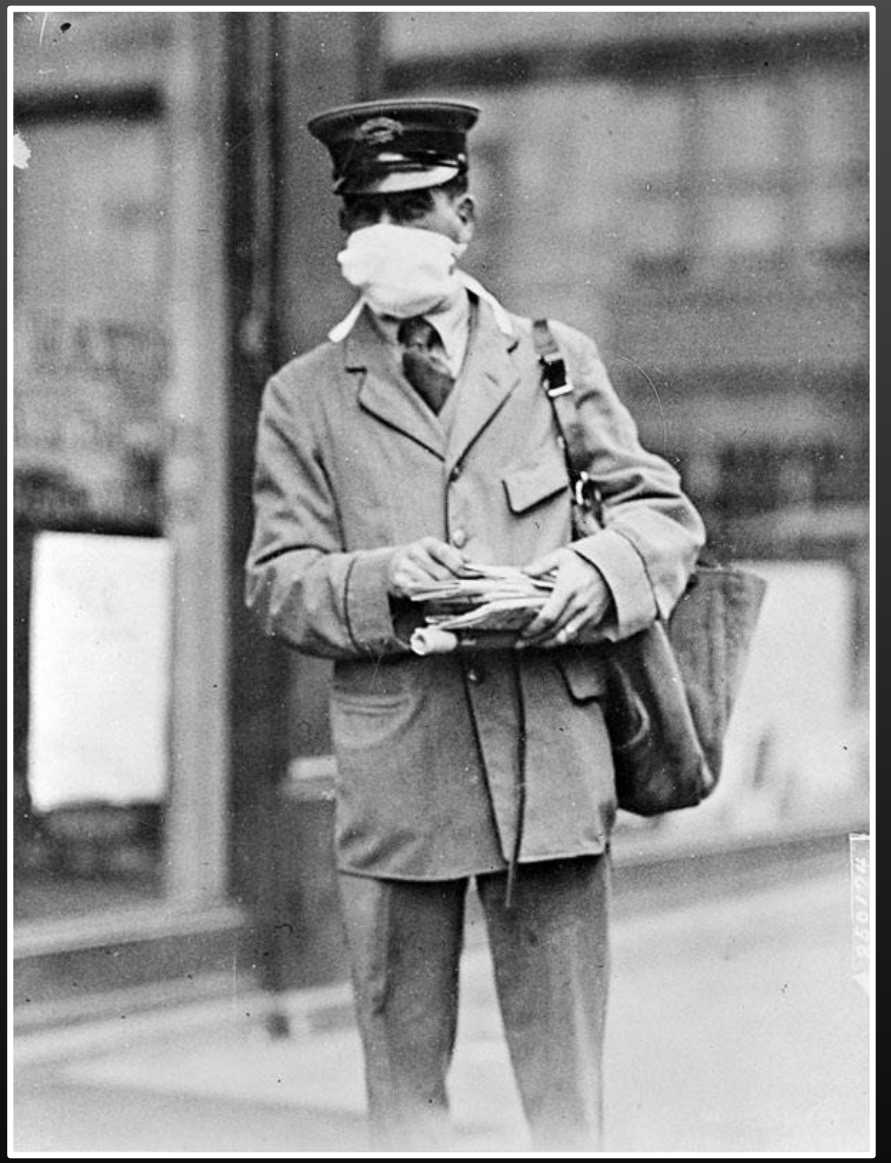


Image: Mailman in NYC 16 Oct 1918
https://www.archives.gov/exhibits/influenza-epidemic/records-list.html

Historical Facts from 1918

- Mortality was high in specific age groups:
  - younger than 5 years old
  - 20-40 years old
  - 65 years and older

- Unique feature: high mortality in healthy people, including those in the 20-40 year age group – exact reason unknown

https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.html

Historical Facts from 1918

- Worldwide control efforts limited to non-pharmaceutical interventions due to no influenza vaccines and no antibiotics to treat secondary bacterial infections
  - Conventional interventions were applied unevenly: Isolation, quarantine, good personal hygiene, use of disinfectants, and limitations of public gatherings

https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.html

- The cities that enacted non-pharmaceutical interventions early and kept them in place throughout the pandemic saw death rates approximately 50% lower than those cities that did not enact such measures.

1918 vs. 2020 Population

	Estimated World Population	* Morbidity * Worldwide Estimated Infected	* Mortality * Worldwide Estimated Deaths	* Mortality * USA Estimated Deaths
1918	1,500,000,000	500 million	50 million	675,000
2020 (as of 11 March)	~ 7,770,000,000	TBD	TBD	TBD

https://www.ncbi.nlm.nih.gov/pubmed/17620133

https://www.worldometers.info/world-population/

DOs Made the Difference
1918 H1N1 Virus Influenza Pandemic

The known data regarding the success of DOs treating influenza were gathered from the 1918 Spanish influenza pandemic and was first presented by R. Kendric Smith, MD, in a paper in which he described the "osteopathic conquest of disease in which medicine has failed".

	H1N1 Influenza Cases	% Mortality	Secondary Pneumonia Cases	% Mortality
Records collected from 2445 DOs	110,120 patients	0.25%	6258 patients	10%
Standard Medical Care		5-6%		~33% overall (as high as 68-78% in some large cities)

Hruby RJ, Hoffman KN. *Avian Influenza: an Osteopathic Component to Treatment.* Osteopath. Med. Prim. Care. 2007. https://www.ncbi.nlm.nih.gov/pubmed/17620133

OMT Employed in the 1918 Pandemic

- There were no universally employed OMT treatments during the 1918 pandemic
- A review of the literature reveals a commonality of approaches
- OMT was applied to:
  1. Paraspinal muscles of the cervical, thoracic and lumbar spine (Sympathetic Nerve “Springing”)
  2. Thoracic inlet, including the scalene muscles, upper ribs and clavicle
  3. Rib cage
  4. (Note: Lymphatic pump techniques did not develop for another 10 years, but were employed in the treatment of yearly flu as early as 1928. Mention is made of vibrating the chest wall with the fingertips, however, which may have served a similar purpose.)

Teitelbaum D. Osteopathy for Bird Flu Pandemics: 1917 and Soon. AAO Convocation. March 2008

OMT Employed in the 1918 Pandemic

- Treatments were provided with the patient in bed to avoid overexertion
- The patient was treated in sitting or lying position
- As much as possible, the patient would be kept covered with clothing and blankets during treatment to avoid chilling
- Treatment duration was 10 minutes or less, so as not to exhaust the patient
- Treatment would be vigorous and thorough at the onset of symptoms, but afterwards would be applied much more gently
- Treatments would be provided up to three times a day on day one, and two times a day thereafter

Teitelbaum D., Osteopathy for Bird Flu Pandemics: 1917 and Soon. AAO Convocation. March 2008

Statistical Integrity

- In a letter to the editor of the JAOA in July, 2008, MarkAlain Déry, DO, MPH argued that Dr. Smith's statistics were invalid because the data was collected in a non-controlled observational study that "lacked today's rigorous scientific standards."

  One Hundred Thousand Cases of Influenza With a Death Rate of One-Fortieth of That Officially Reported Under Conventional Medical Treatment https://jaoa.org/article.aspx?articleid=2093631

- In retrospect, much of the research we depend upon today was performed in an era of different scientific standards, just as much of how medicine is practiced today is based upon tradition and dogma. Just because we now have more stringent standards, we should not throw out what we have learned.

- Much can be gleaned from these statistics, including their incentive to spur on more research and encourage the use of Osteopathic Manipulation to potentially save lives.

Examples of Benefits of OMT in Research Studies

Authors	Region /Technique	Outcomes	Notes
Whiting; Lane; Castilio & Ferris-Swift	Liver & Splenic Pumps	↑ WBC ↓ RBC	Alternating compressions, 1.5-5 minutes, 21 compressions/min
Measel; Measel & Kafity	Lymphatic Pumps	↑ B-cell & T-cell components	
Mesina et. al.; Hampton et. al.	Lymphatic Pumps – Pectoral Traction & Splenic Pump	"Significant basophilia"	"may play a significant role in initial immune response"
Sleszynski & Kelso	Thoracic Pump post cholecystectomy	Earlier recovery and quicker return to preoperative FVC	Atelectasis occurred in both groups. Control: Incentive spirometry

Hruby RJ, Hoffman KN. *Avian Influenza: an Osteopathic Component to Treatment.* Osteopath. Med. Prim. Care. 2007 https://www.ncbi.nlm.nih.gov/pubmed/17620133

OMT – Adjunctive Treatment for Pneumonia

Osteopathic Manipulative Treatment (OMT) is a cost-effective adjunctive treatment of pneumonia that has been shown to reduce patients' length of hospital stay, duration of intravenous antibiotics, and incidence of respiratory failure or death when compared to subjects who received conventional care alone. The use of manual manipulation techniques for pneumonia was first recorded as early as the Spanish influenza pandemic of 1918, when patients treated with standard medical care had an estimated mortality rate of 33%, compared to a 10% mortality rate in patients treated by osteopathic physicians. When applied to the management of pneumonia, manual manipulation techniques bolster lymphatic flow, respiratory function, and immunological defense by targeting anatomical structures involved in the these systems.

Yao, S., Hassani, J., Gagne, M., George, G., Gilliar, W. Osteopathic Manipulative Treatment as a Useful Adjunctive Tool for Pneumonia. *J. Vis. Exp.* (87), e50687, doi:10.3791/50687 (2014).
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4173698/

- ***Breathing:*** *the movement of air in and out of the lungs for the purpose of exchanging carbon dioxide for oxygen within the blood.*

- ***Respiration:*** *The exchange of carbon dioxide for oxygen at the cellular level.*

Kuchera M & Kuchera W, *Osteopathic Considerations in Systemic Dysfunction*, Revised 2nd ed. Columbus, OH: Original Works; 1994:33

- *… any treatment that augments the local oxygen supply or helps to avoid hypoperfusion of the wound will tend to increase the rate of healing and decrease the susceptibility to infection.*

Niinikoski J, Cellular and nutritional interactions in healing wounds, Med Biol. 1980 Dec;58(6):303-9. Review. PMID: **7015032**

Osteopathic manipulative treatment affects the pulmonary environment through somatosomatic and somatovisceral reflexes. It also affects the musculoskeletal mechanics involved in breathing, respiration and lymph flow.

Kuchera M & Kuchera W, *Osteopathic Considerations in Systemic Dysfunction*, Revised 2nd ed. Columbus, OH: Original Works; 1994:34.

Symptom Comparison of Infectious Respiratory Diseases	COVID-19	Avian Flu [H5N1] 2003	Seasonal Flu	Upper Resp. Infection	Common Cold
Elevated temp	Yes	+++/++++	++	++	+/-
Chills		++++	++++	++++	-
Cough	Yes	+++	+++	+++	+++
Short of breath	Yes	++++	+/-	+/-	-
Chest discomfort		+++	++	++	+/-
Sore throat		+/-	+++	+++	++
Vomiting/nausea		++	+	+	-
Diarrhea		++	+	+/-	-
CNS		++	-	-	-
Malaise/fatigue		+++	+++	+	+/-
Runny nose		+/-	+	++	+++
Headache/myalgia		+++	+++	++	+/-
Young healthy at serious risk		+++	+/-	+/-	-
Elderly & underlying conditions at serious risk	Yes				

Teitelbaum D., Osteopathy for Bird Flu Pandemics: 1917 and Soon. AAO Convocation. March 2008
https://www.cdc.gov/coronavirus/2019-ncov/about/symptoms.html

Prevention Measures in a Pandemic

- Social distancing measures decrease contact between infected and non-infected individuals
  - Isolation, quarantine
  - Travel advisories and restrictions
  - School closures
  - Cancellation of mass gatherings

- Infection control practices decrease the likelihood of disease transmission between infected and non-infected individuals
  - Cough/sneeze etiquette (sneeze zone = 6-10ft)
  - Hand hygiene
  - Personal protective equipment
  - Infection control protocols

Treatment Considerations

- Begin with three treatments on Day 1
- Subsequent days – twice daily
- Limit treatments of the seriously ill to less than ten minutes

- Remember, during a pandemic, there will be insufficient DOs in the country to treat all who are ill; thus, this information needs to be shared extensively.
  - Consider teaching these OMT techniques to all physicians and any other medical personnel who are willing to learn and utilize them when treating the ill
  - Consider teaching these OMT techniques to family members of those who are ill so that they may be continued at home
  - Home treatments allow more patients to be treated more frequently and limit “breaking” isolation

Opportunities for Treatment

Four Tenets of Osteopathic Medicine

- The body is a unit: body, mind and spirit
- The body possesses self-regulatory mechanisms that are self-healing in nature
- Structure and function are reciprocally interrelated
- Rational treatment is based on an understanding of body unity, self-regulatory mechanisms, and the inter-relationship of structure and function

Areas for OMT Consideration

- Upper thoracic vertebrae, ribs, sternum
- T1-5 – sympathetic innervation to the lungs
- OA joint & the course of the vagus n. – parasympathetic innervation of the lungs
- Accessory muscles of respiration (such as: scalene & sternocleidomastoid muscles)
- Anterior cervical fascia
- Thoracic diaphragm (C3-5 - phrenic n. comes from the cervical plexus/sympathetic. Mobility of the diaphragm influenced by the lower 6 ribs, L1-3(4) and the sternum – don't forget the transversus thoracis muscle.)
- Chapman reflexes for the lungs, sinuses & adrenal glands
  - be sure to check these to see if they are involved
- The craniosacral mechanism

Chila AG, Executive Editor, *Foundations for Osteopathic Medicine,* 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2011:885.

OMT

- Varies with individual needs and areas of Somatic Dysfunction (SD)

  Stiles, EG. Osteo .Med. 1976;1(3),21-23

- Ensure good cervical, thoracic, and diaphragmatic motion

  Larson, NJ. Osteo .Med. 1977;2(1),41-9

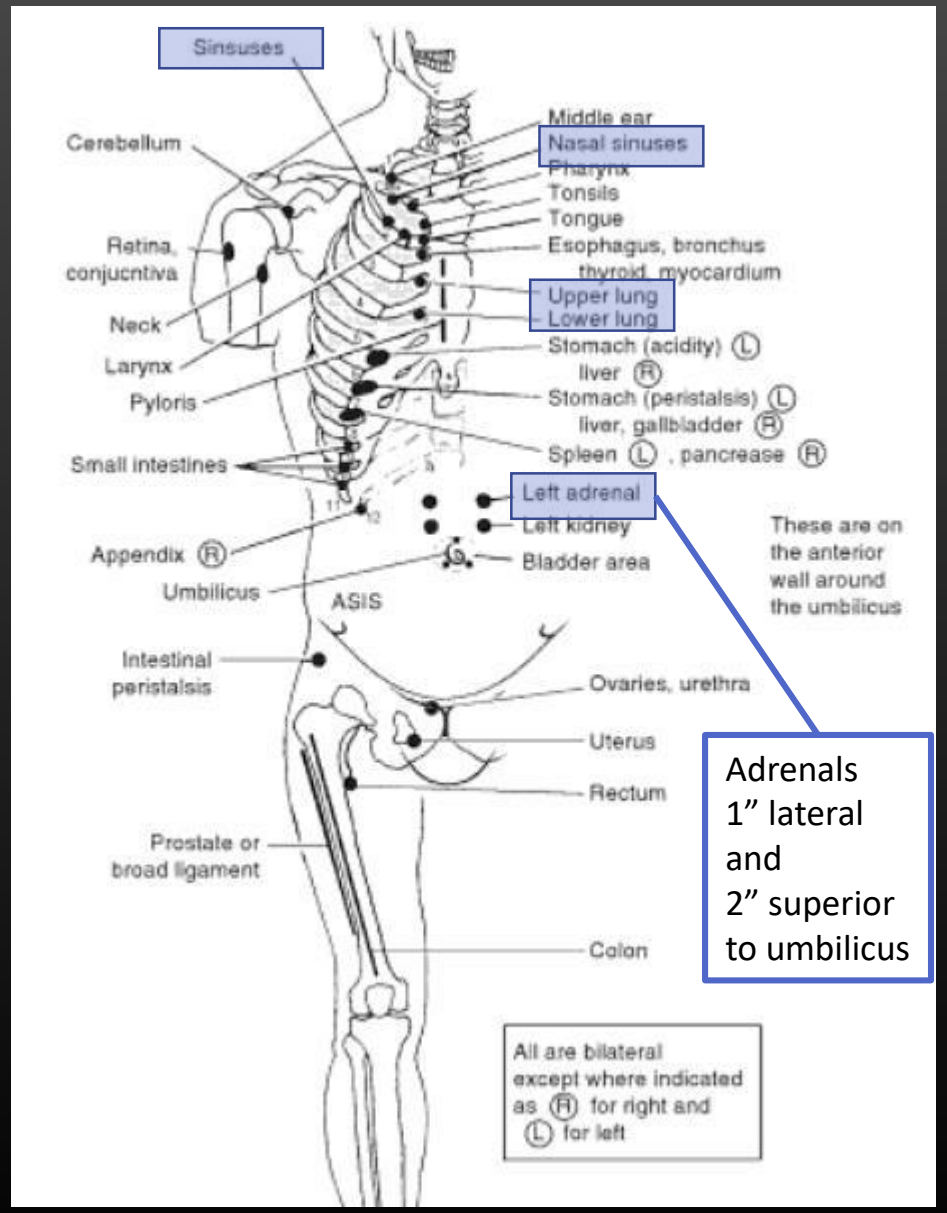
- OMT for mid-cervical SD decreases postoperative pulmonary and other complications and discomfort. Sleszynski and Kelso. JAOA,1993,834-45

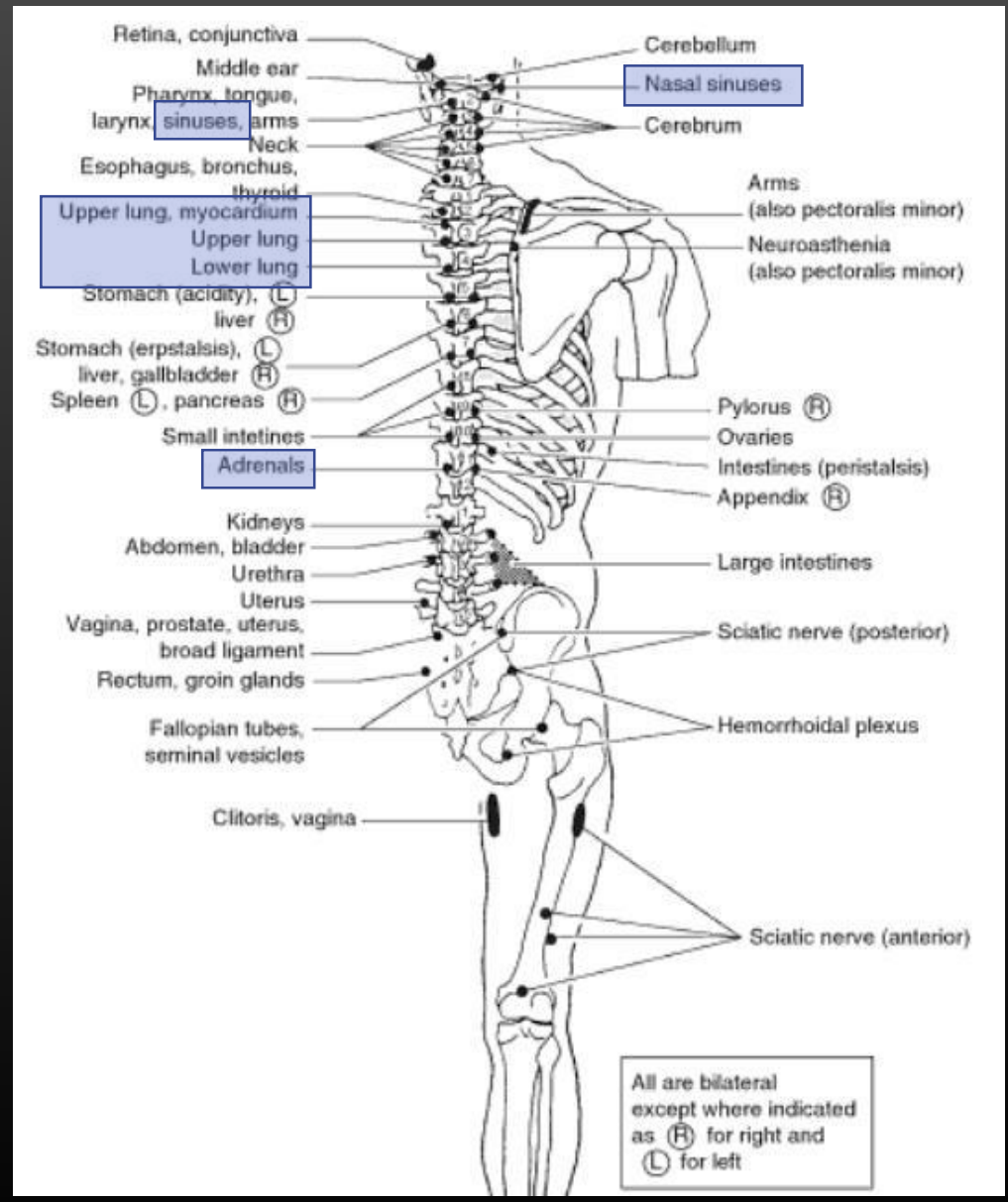
- Osteopathic evaluation can assist in diagnosis via viscerosomatic changes & Chapman reflexes

Chapman Reflex Points

- Segmentally predictable
- Dermatomal and myotomal in location
- Responses to inflammatory visceral pathology
- Location related to involved organs
- The intensity of the tissue texture abnormalities (TTA) indicates the degree of inflammation

Chapman Reflex Points

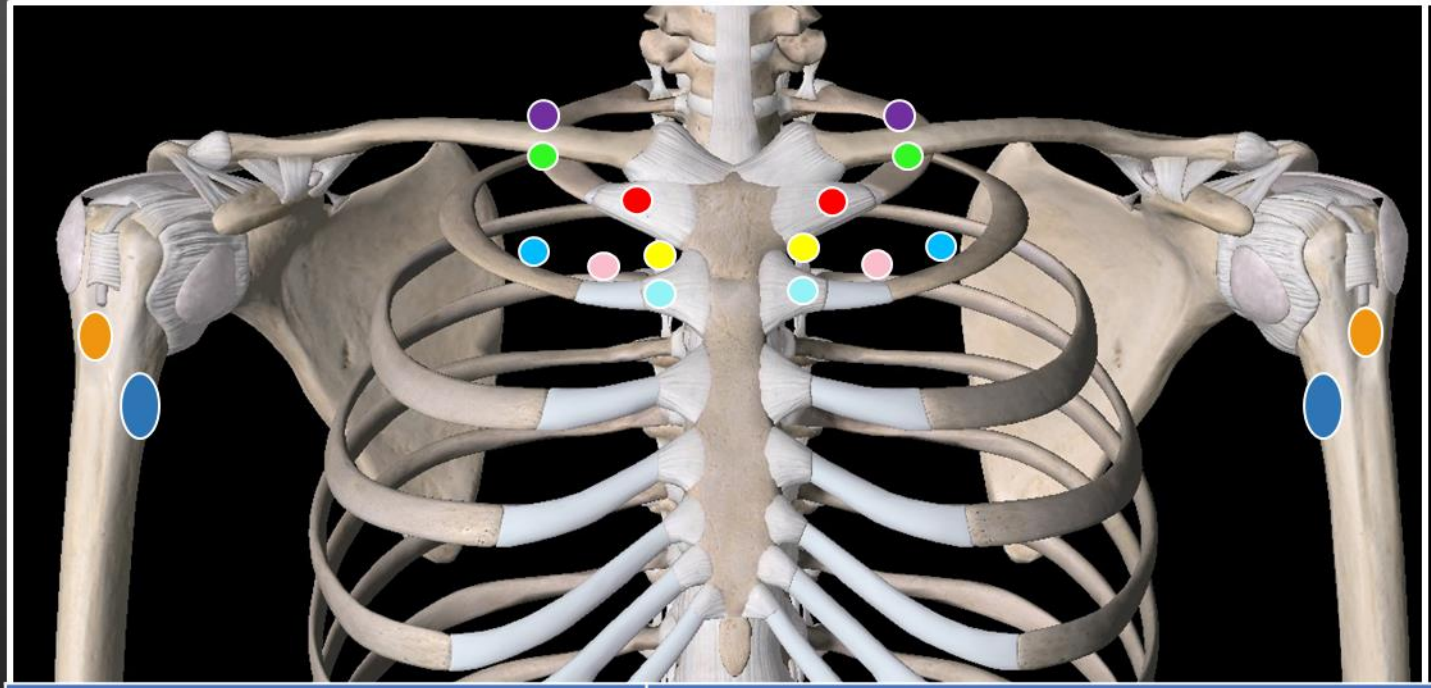


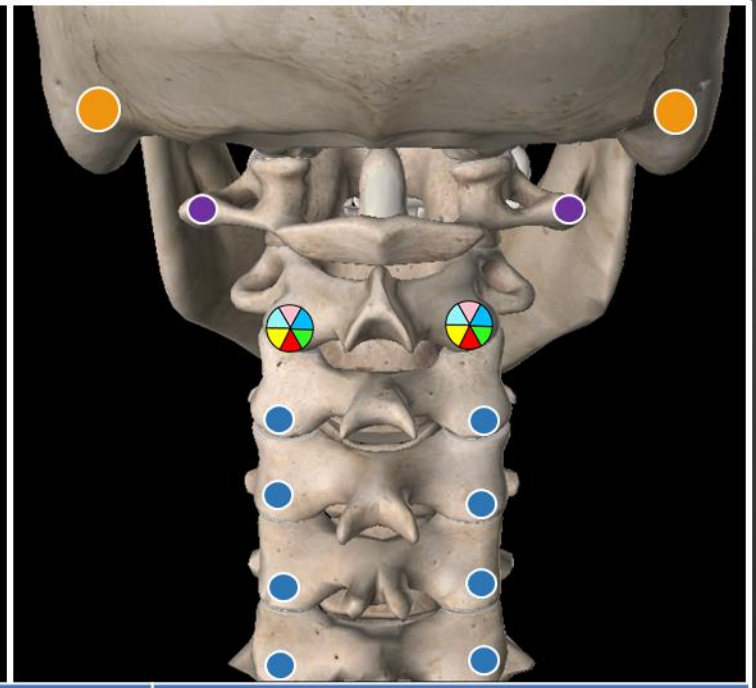


Ward RC, Executive Editor, Foundations for Osteopathic Medicine. 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2003

HEENT

- Conjunctivitis
- Otitis
- Pharyngitis
- Laryngitis
- Tonsillitis
- Hay fever
- Sinusitis



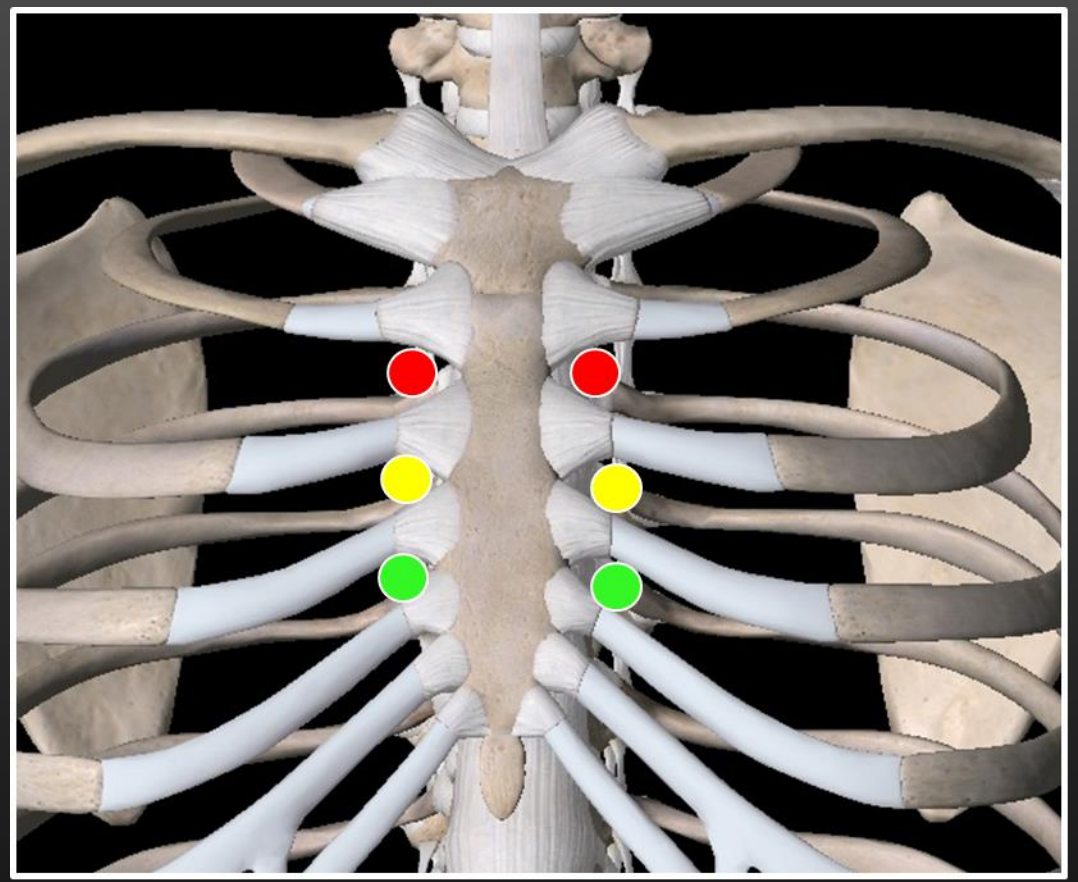


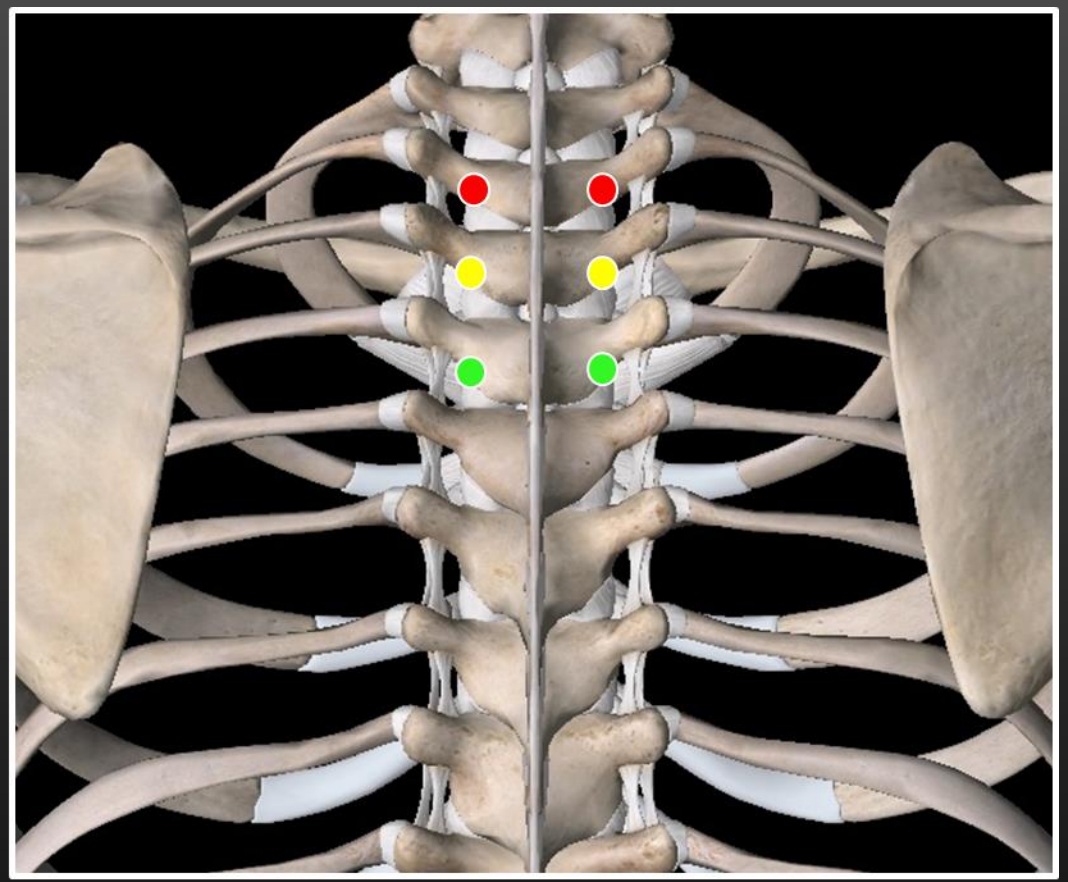
Organ	Anterior	Posterior
Middle ear (Otitis media) (purple)	Superior to mid-clavicles (X with 1st rib)	C1 posterior rami
Nasal sinuses (green)	Inferior to mid-clavicles (X with 1st rib)	C2 articular pillars
Sinuses (turquoise)	Superior to mid-2nd ribs	C2 articular pillars
Pharynx (red)	Inferior to sternoclavicular joints	C2 articular pillars
Tonsils (yellow)	Medial 1st intercostal spaces	C2 articular pillars
Tongue (light blue)	Medial 2nd ribs	C2 articular pillars
Larynx (pink)	Superior to medial 2nd ribs	C2 articular pillars
Eye (retina & conjunctiva) (orange)	Lateral aspect of humerus on the middle aspect of surgical humeral neck	Occipital bone, behind mastoid processes
Neck (dark blue)	Medial aspect of surgical humeral neck	C3-7 articular pillars

Lauren Davis, DO & Craig Wells, DO, designers of the original Chapman Reflexes handout

Respiratory

- Asthma
- Bronchitis
- Influenza
- Pneumonia





Organ	Anterior	Posterior
Bronchi (red)	Medial 2nd intercostal spaces	T2
Upper Lung (yellow)	Medial 3rd intercostal spaces	T3
Lower Lung (green)	Medial 4th intercostal spaces	T4

Lauren Davis, DO & Craig Wells, DO, designers of the original Chapman Reflexes handout

Tissue Texture Abnormalities (TTA)
Allopathic Translation

- Readily palpable in paravertebral soft tissues of spinal level that innervates the structure causing the reflex
- General visceral afferent neurons return to the spinal cord in the same nerves that carry efferent autonomic fibers
- Reflexes lateralize to paravertebral tissues on the same side as the visceral organ
- Patients often report pain at spinal levels where tissue findings occur
- Tissue texture abnormalities (TTA) and tissue texture pathology (TTP) from the reflex is the manifestation of visceral pathology, NOT a primary somatic dysfunction

Autonomic Innervation for the Lungs (Allopathic Info.)

Structure

- Bronchial smooth muscle
- Resp. epithelium

Parasympathetic

Contracts

↓ # goblet cells
w/ thin secretions

Sympathetic

Relaxes *(deep breathing)*

↑ # goblet cells
w/ thick secretions

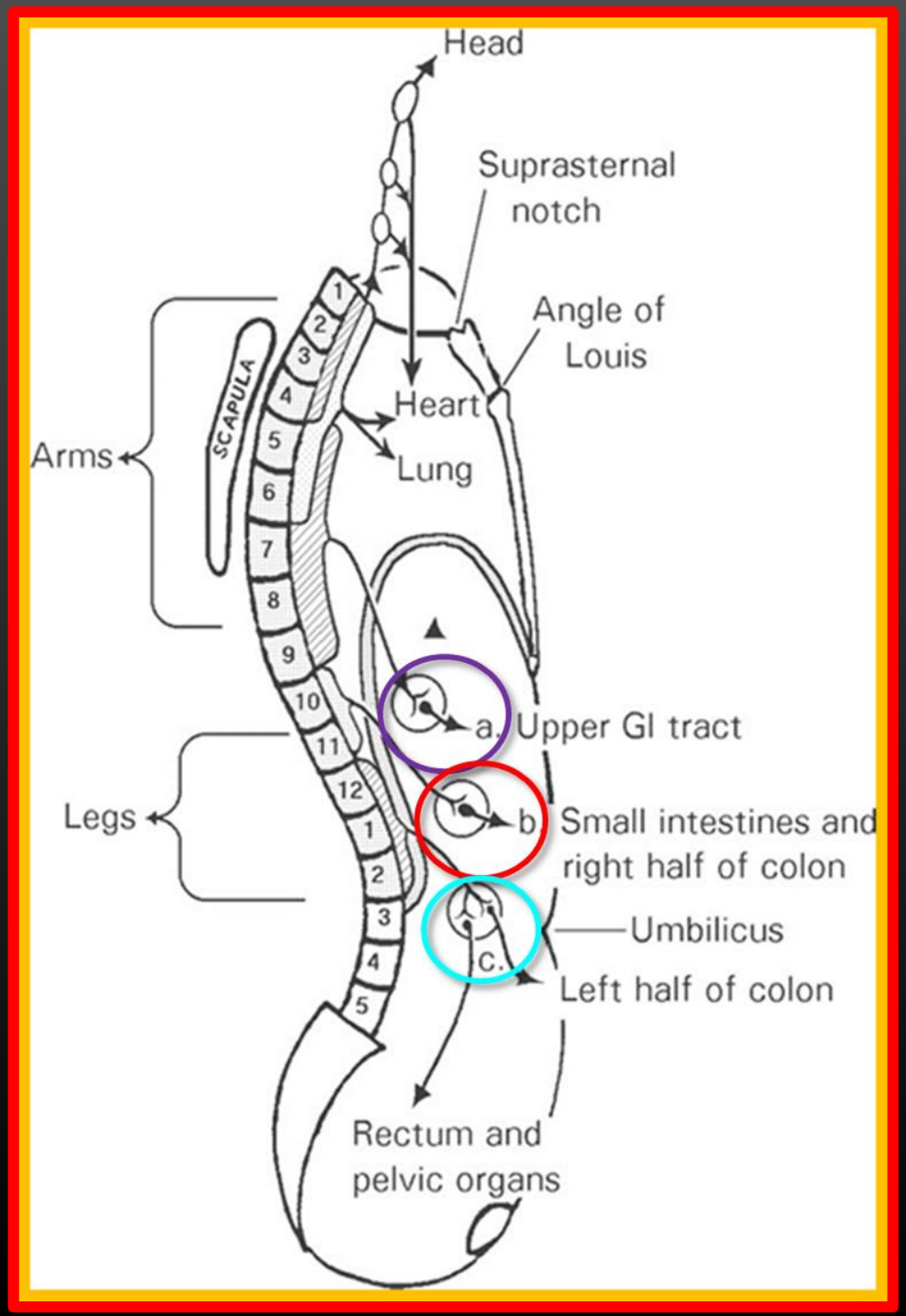
Treatment

Autonomic Nervous System Balancing

- Suboccipital release /upper cervical soft tissue work (vagus neural input)
  - Vagus nerve
    - 90% afferent
    - 10% efferent
- Anterior Longitudinal Ligament Release (sympathetic neural input)
- Rib Raising

Sympathetic Nervous System

- T1 – T4: Head and neck
- T1 – T6: Heart
- T1 – T5: Respiratory/Lung
- T7 – T11: Body Wall
- T2 – T8: Upper Extremities
- T12 – L2: Lower Extremities
- T5 – T9: (Foregut → Celiac Ganglion)
  - Distal esophagus
  - Stomach – left
  - Proximal Duodenum – right
  - Liver – right
  - Gall bladder - right
  - Spleen – left
  - Portions of Pancreas – left



- T10 – T11 (Midgut → Superior Mesenteric Ganglion)
  - Distal Duodenum, Jejunum & Ileum
  - Head of pancreas
  - Ascending colon
  - Proximal 2/3 of transverse colon
  - (not part of midgut)
    - Ovaries
    - Testes
    - Adrenal glands
    - Kidneys
- T12 – L2 (Hindgut → Inferior Mesenteric Ganglion)
  - Distal 1/3 of transverse colon
  - Descending colon
  - Sigmoid colon
  - Rectum
  - Anus
  - (not part of hindgut)
    - Prostate
    - Uterus
    - Bladder

Parasympathetic Nervous System

- Cranial Nerves *
  - CN III (Oculomotor nerve)
    - Pupillary Constriction
  - CN VII (Facial nerve)
    - Lacrimal/Salivary Secretion
  - CN IX (Glossopharyngeal nerve)
    - Carotid body/sinus
      - Regulates blood pressure
      - Regulates blood concentrations of O_2 and CO_2

* Remember "1973": CN X, IX, VII, III

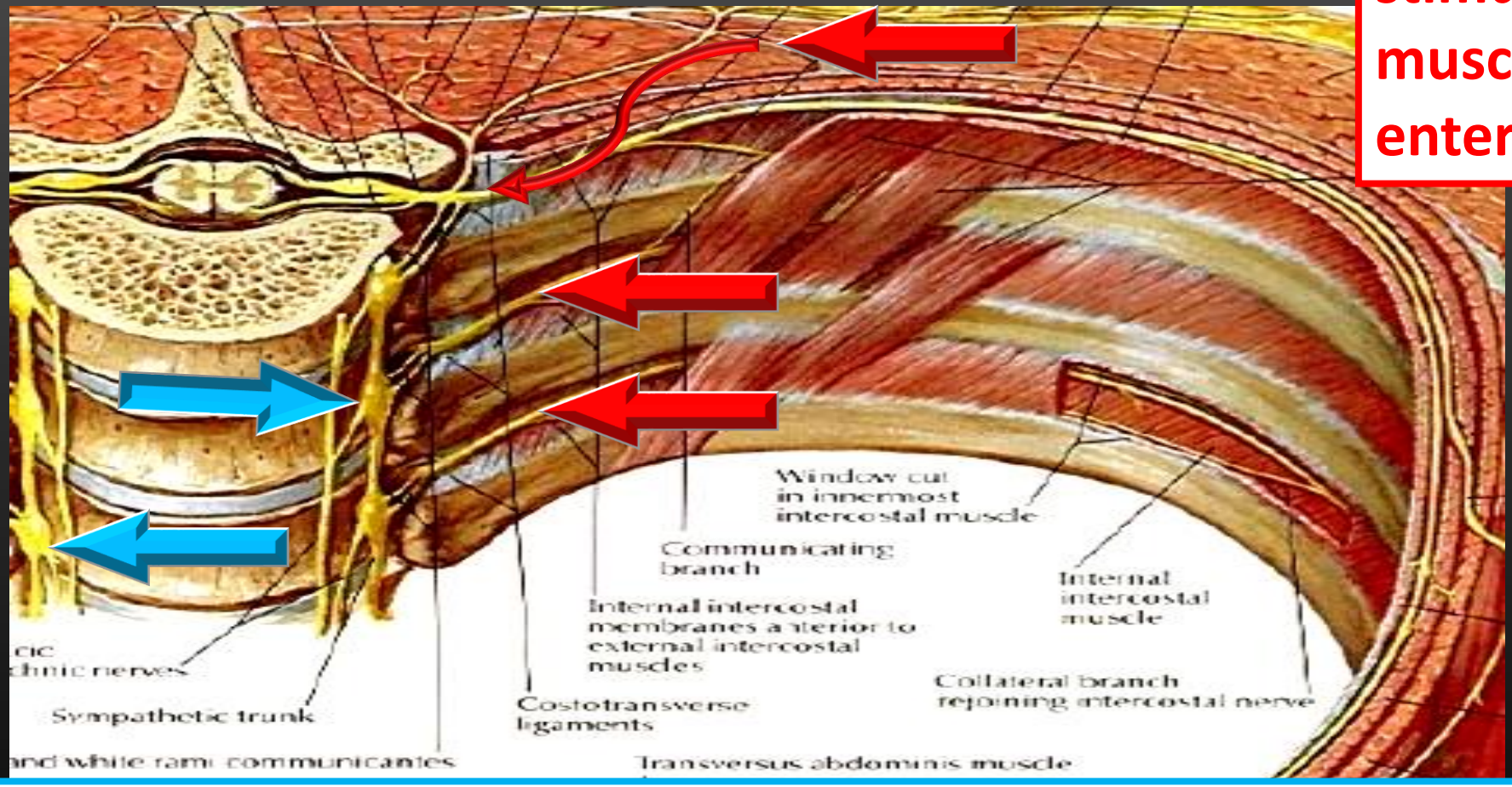
- CN X (Vagus nerve)
  - Left Division
    - Innervation to AV node and
    - Terminates at the duodenum
  - Right Division
    - Innervation to the SA node
    - Terminates at the transverse colon
- Pelvic Splanchnics (S2-4)
  - Descending Colon
  - Sigmoid Colon
  - Pelvis

Basic Autonomic Response - Review

Organ	Parasympathetic Feed, Breed & Rest	Sympathetic Fight or Flight
Eyes	Pupillary constriction	Pupillary dilation
Salivary Glands	Secretory	Vasoconstriction
Lungs	Bronchoconstriction	Bronchodilation
Heart	Bradycardia	Tachycardia
Liver	Gluconeogenesis Stimulates Gallbladder	Glycogenolysis
GI	Stimulate digestion with increased peristalsis & secretion	Inhibit digestions with decreased peristalsis & secretion
Sweat Glands	Vasoconstriction	Secretory
Urinary Bladder	Constriction	Relaxation
Uterine Body/Cervix	Relaxation/Constriction	Constriction/Relaxation

Sympathetic Chain Ganglia (Allopathic Info. Cont.)

Afferent stimulation from muscles and skin enter spinal cord



Efferent information feed back to the sympathetic chain ganglia, located just anterior to rib heads, posterior to the pleura

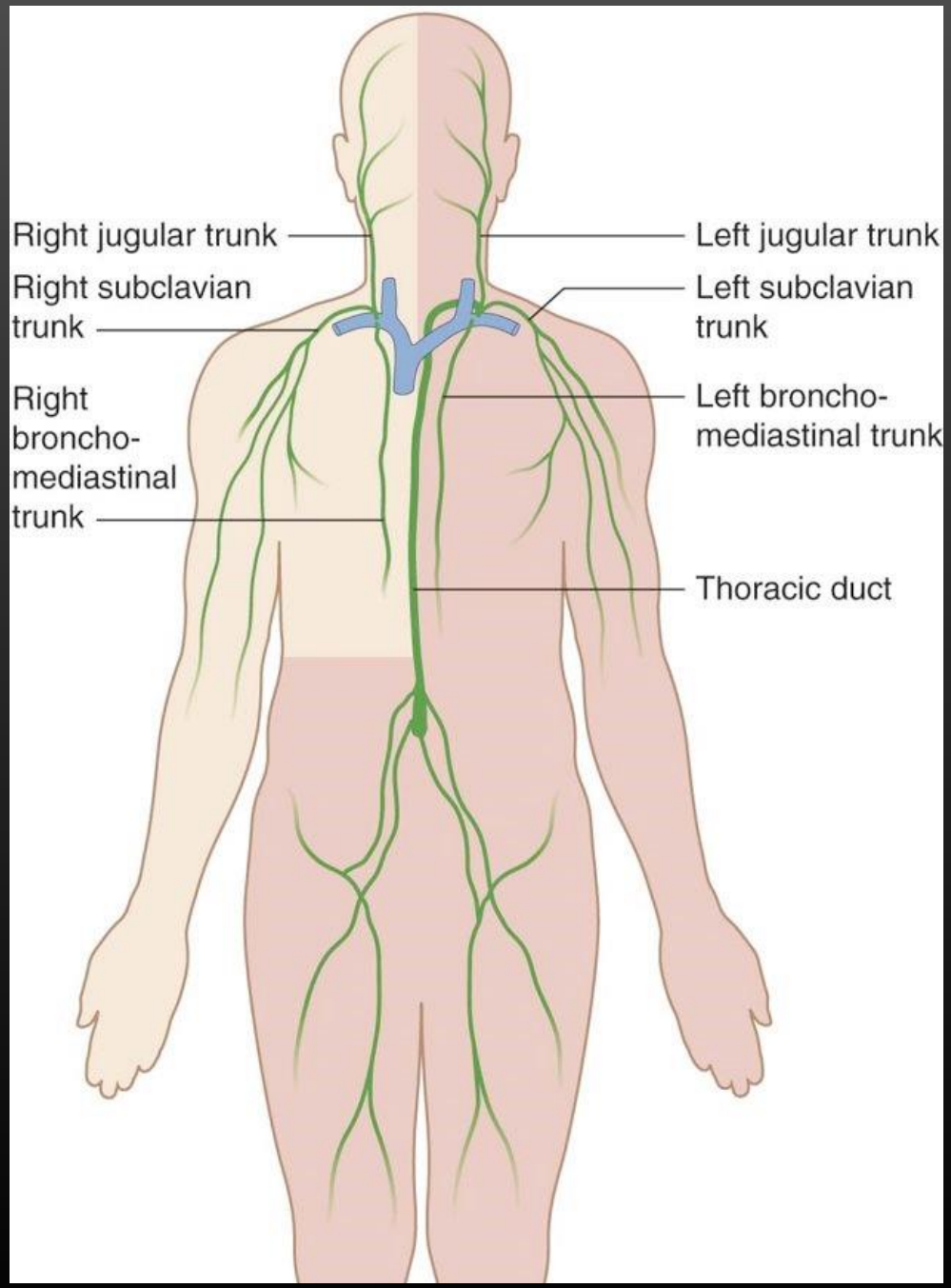
Image source unknown

Innervate viscera as well as skin, muscles, sweat glands, blood and lymphatic vessels

Osteopathic Treatment

A Treatment Protocol for Respiratory Infections and Optimizing Respiratory Function

- Thoracic Inlet Releases (lymphatics)
- Rib Raising (sympathetic and relax ribs)
- Autonomic Nervous System Balancing
  - Anterior Longitudinal Ligament Release (sympathetic)
  - Suboccipital Release (parasympathetic)
- Thoracic Diaphragm Releases (lymphatics)
- Lymphatic Pumps (lymphatics)
- “Liver Quiver” and “Splenic Pump” (immune system)



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Lymphatic Drainage Techniques

Keys points to remember:

- The thoracic ducts should be opened first, so as to allow the newly mobilized lymph a drainage outlet.
- The right thoracic duct drains the right upper thoracic region, right broncho-mediastinal trunk, right upper extremity and the right side of the head.
- The left side drains the remainder of the body.
- Ideally lymphatic work begins at the thoracic duct, moves through the core, then proximally to distally through the limbs and then back and back proximally to the core.

"Open the valves,

clean out the pipes,

flush the fluid through the pipes"

– Eva Shay, DO

Diagnosing the Thoracic Inlet Fascia for treatment with Supine Thoracic Inlet Release (Arm As A Lever)

- Palpate the supraclavicular fascia for TART criteria of somatic dysfunction
  - Tissue texture abnormalities
  - Asymmetry
  - Restriction in motion
  - Tenderness
- Instruct the patient to inhale and exhale
  - Evaluate the motion of Sibson’s fascia during both phases of the respiratory cycle
- Diagnose inhalation or exhalation somatic dysfunction
  - Is there ease/bind of the tissues during inhalation/exhalation

Supine Thoracic Inlet Release (Arm As A Lever)

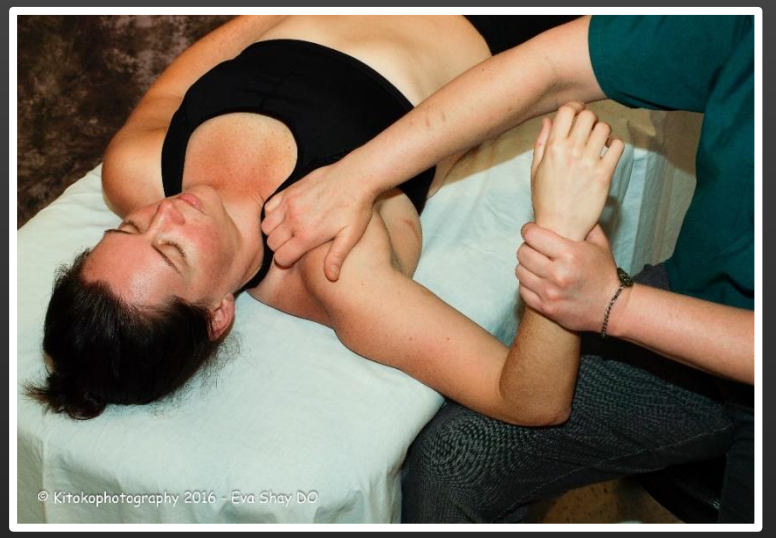
Caution The supraclavicular fossa region /thoracic inlet, is frequently very tight and pressure can be painful. Use a firm touch, but always observing your patient's pain tolerance.

GIF

Supine Thoracic Inlet Release (Arm As A Lever)

- Sit next to the supine patient, facing the top of the table
- Position the patient's arm so it is flexed at the elbow and abducted to 90°
  - Support the patient's elbow with your thigh and support the patient's wrist and hand with your hand that is furthest from the patient
- With your hand closest to the table, place your finger pads into the supraclavicular fossa, (fingers slipping caudad immediately behind the clavicle)
- Begin with the patient's upper extremity in internal rotation
- Maintain tension with your finger pads on the fascia of the supraclavicular fossa (respecting tissue tensions and patient comfort) as tension develops while you rotate the patient's arm into external rotation
- Hold this position for several seconds until some relaxation of the tissues are noted
- Slowly move the patient's upper extremity into internal rotation
- Gently advance your finger pads into the fascia of the supraclavicular fossa as the tissues relax
- Repeat this several times
- Reassess for greater supraclavicular space and decreased tissue tension, and then treat the other side

Supine Thoracic Inlet Release (Arm As A Lever)

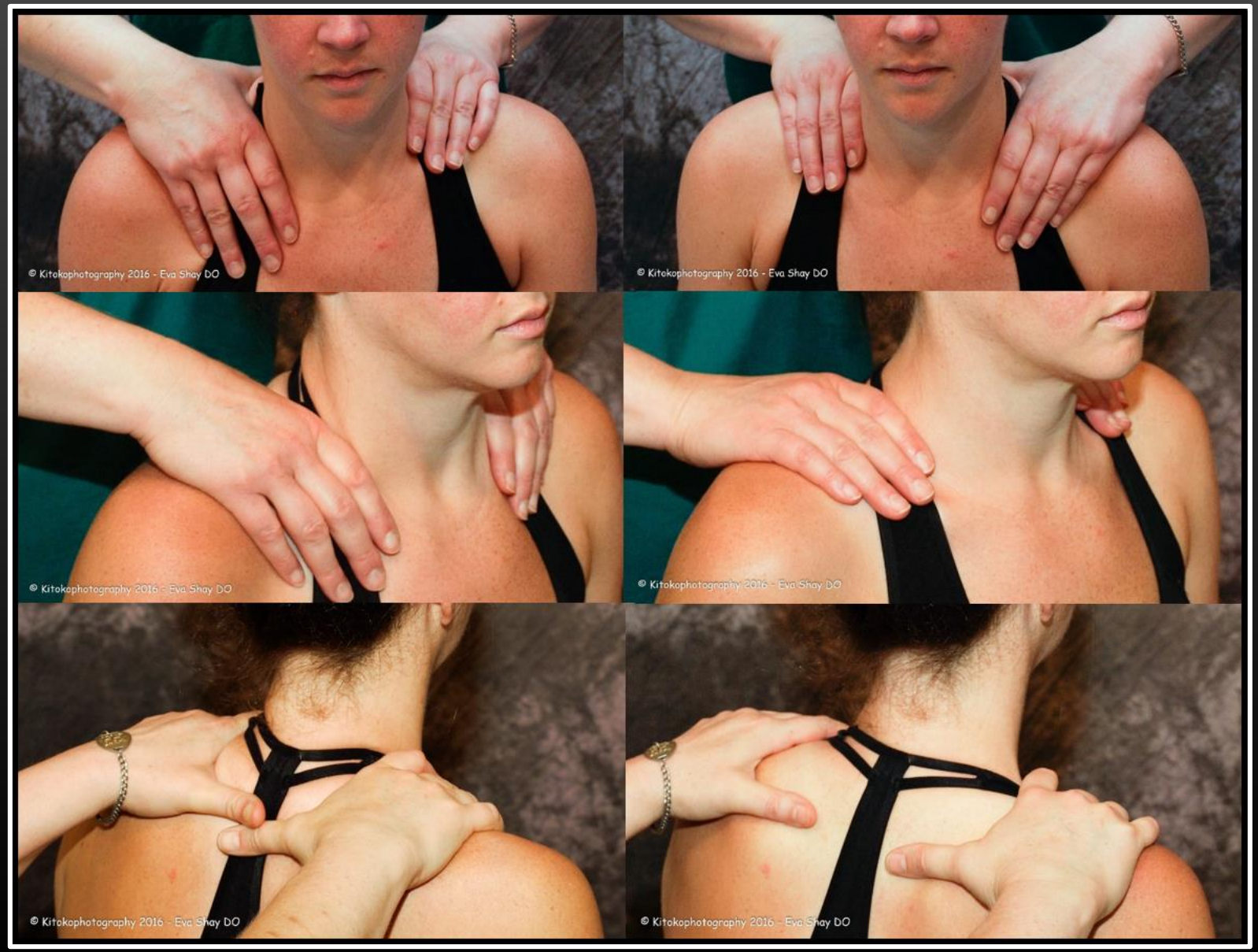


Hand Placement for Thoracic Inlet Myofascial Release Diagnosis, Seated and Supine Treatment

Rotation

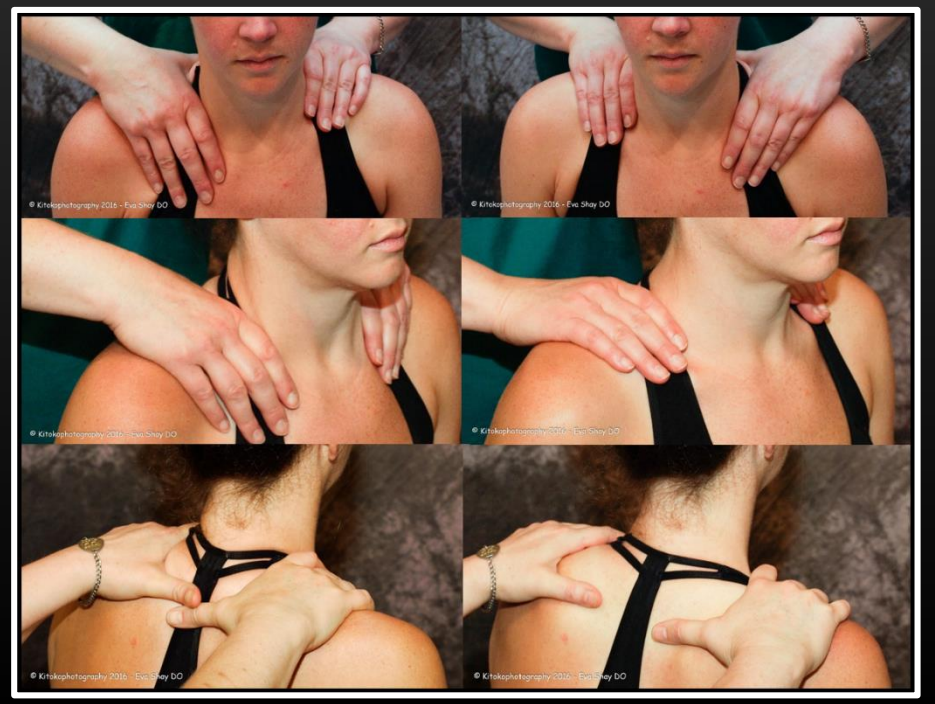
Anterior/Posterior

Translation

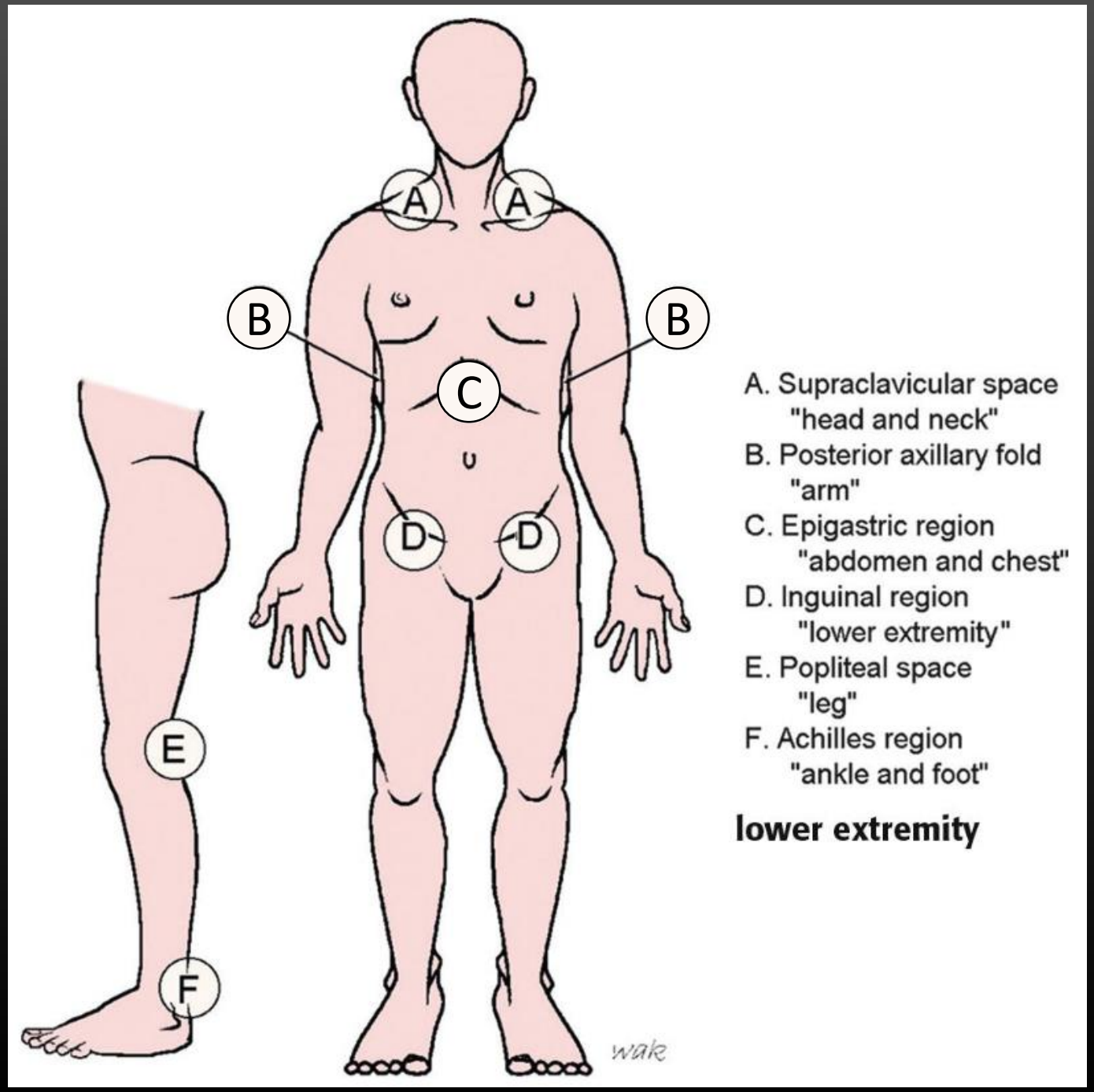


Seated or Supine Thoracic Inlet Myofascial Release

- Sit/stand at the head of the table behind the patient and place your hands on the patient's shoulders so that:
  - Fingertips are touching clavicles, fingers on scalenes, Sibson's fascia (anterior cervical fascia)
  - Thumbs are touching at midline at T1 level
  - Palms of hands are over trapezius, levator scapulae muscles
- Palpate fascial layers
- Assess for ease/bind by motion testing with both hands in:
  - Rotation around a vertical axis
  - Anterior/posterior
    - Hands moving anterior and posterior
  - Translation
    - This acts as compression/traction like force
- Hold tissues in positions of ease/bind
- Have patient go through a respiratory cycle as you palpate these tissues
- Determine which breath cycle the tissues exhibit less/more tension
- Instruct the patient to hold breath in the cycle determined above until air hunger
  - More than one cycle may be needed
- Follow the tissues further into the direction of ease/bind as necessary for complete release
- Reassess TART criteria as well as motion of the fascia in all planes

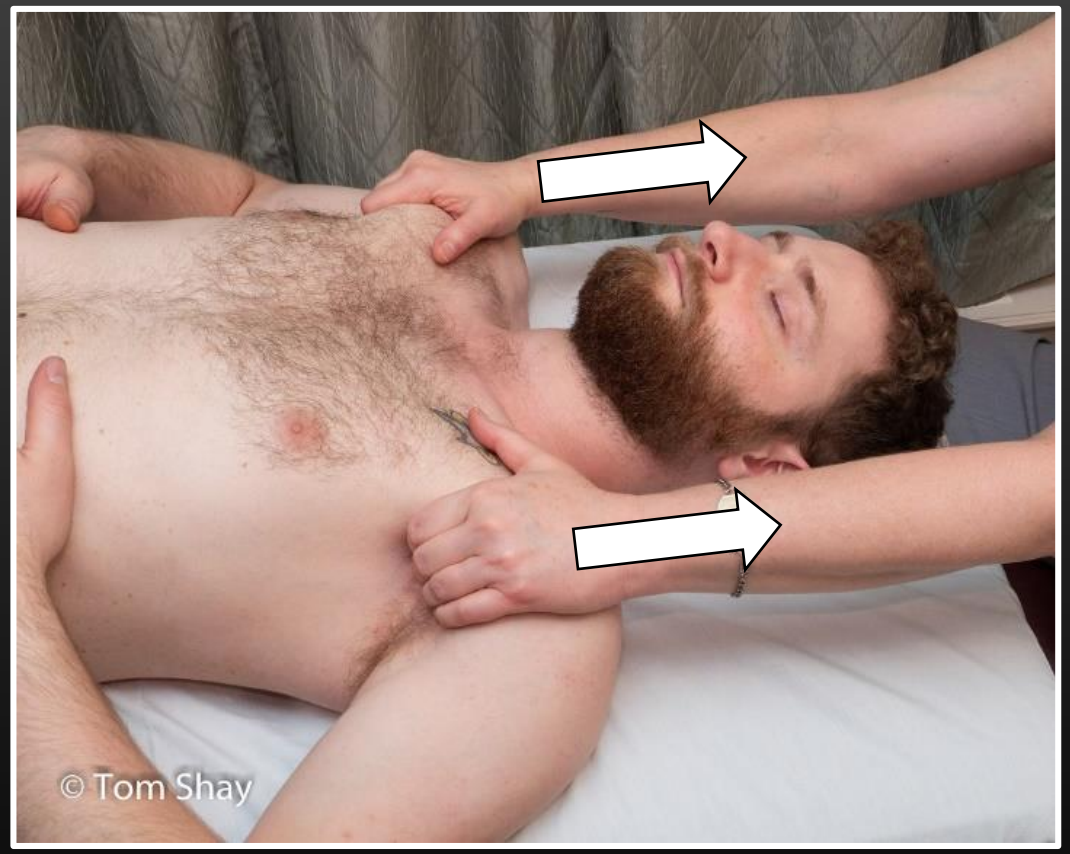


Lymphatic Drainage Sites



FOM4, Figure 39.6.
Palpation sites for terminal lymphatic drainage dysfunction from body regions.

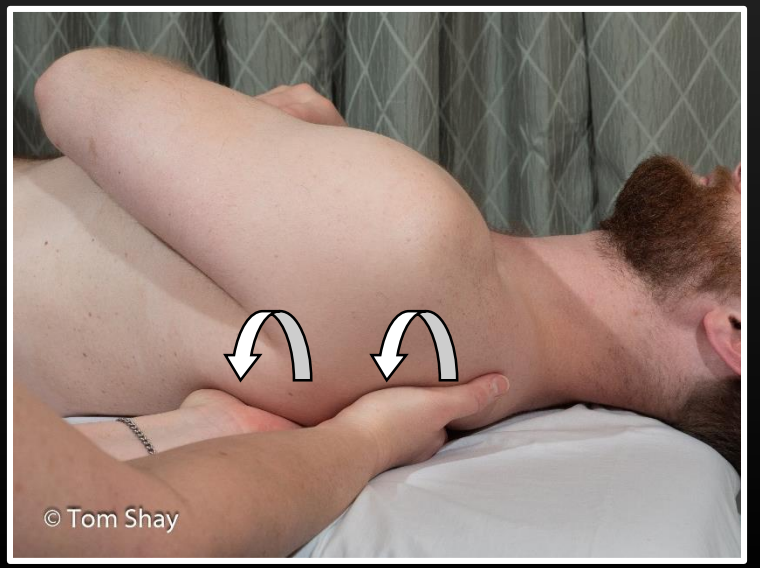
Pectoral Traction



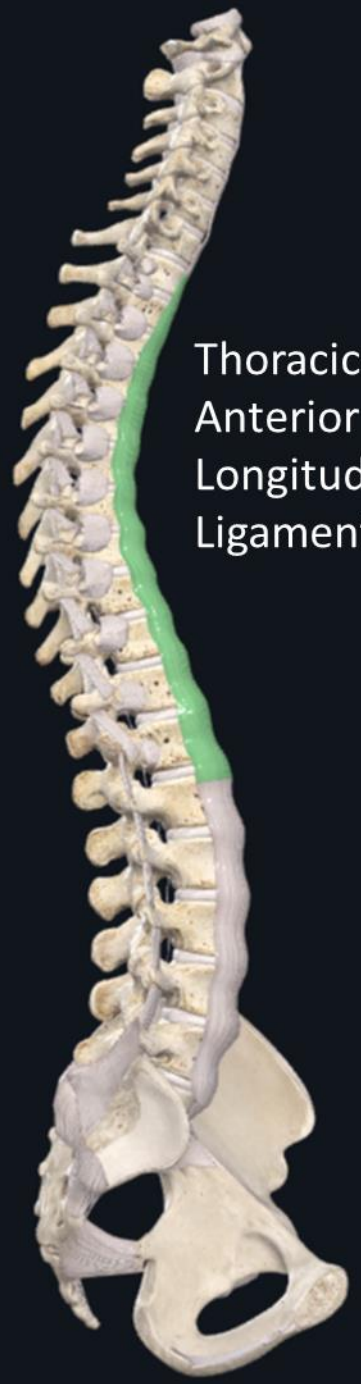
- Sit or stand at the head of the table
- Have the supine patient abduct their arms to allow greater access to the pectoral girdle
- Grasp the anterior axillary fold (deep under the pectoralis major and minor muscles) using the finger pads of the index, middle, and ring fingers of each hand
- Use a sensitive approach so that it is less painful
- Apply traction in an antero-superiolateral direction, by leaning your body backwards, as the patient inhales deeply, to stretch the muscles and deep underlying fascia in the axilla
- Maintain this traction and resist the inferior pull of the tissues as the patient exhales
- Perform the technique through several breathing cycles until adequate myofascial release is obtained
- Reassess TART criteria

Supine Rib Raising (Sympathetic Treatment)

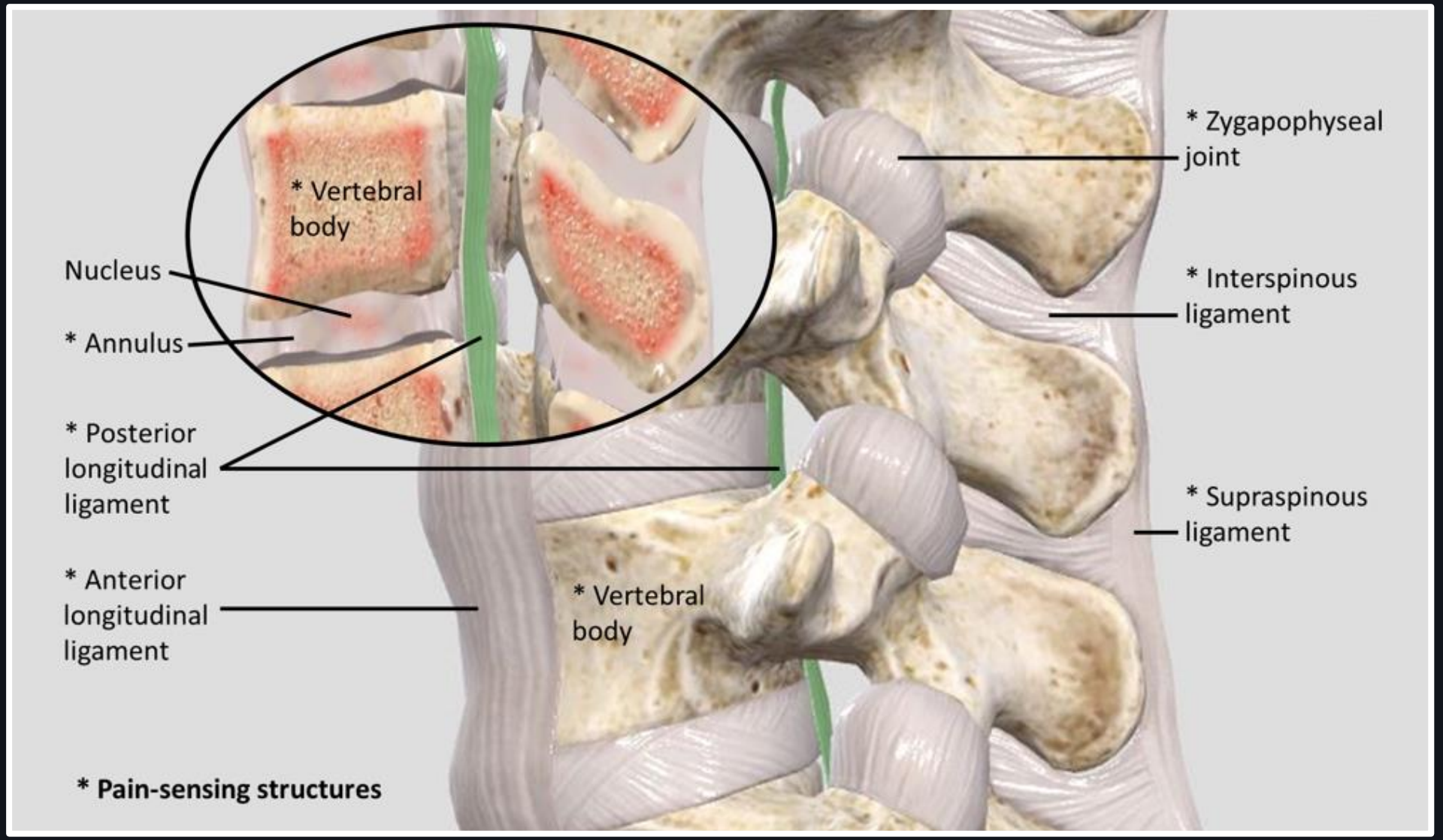
- The physician slides both hands under the patient's ribs
- The pads of the fingers lie on the paravertebral tissues over the rib heads on the side near the physician
- Leaning down with the elbows, the physician lifts the fingers into the paravertebral tissues, simultaneously drawing the fingers in
  - This lifts the spine off the table and places a lateral stretch on the paravertebral tissues
- This technique may be performed as an intermittent kneading technique or with sustained deep inhibitory pressure
- Continue for 30-60 seconds, then work your way up and down the entire rib cage, along the rib heads
  - Hold until there is a feeling of softening of the tissues and a change in respiration
  - This may take between 30 seconds to a few minutes
- Reassess for improved spring/mobility of the ribs



Anterior Longitudinal Ligament



Thoracic Anterior Longitudinal Ligament



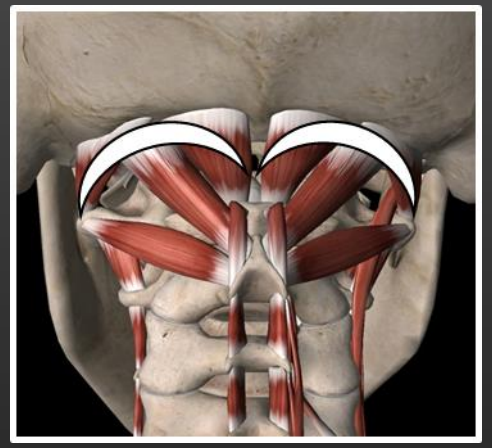
Images modified from Complete Anatomy

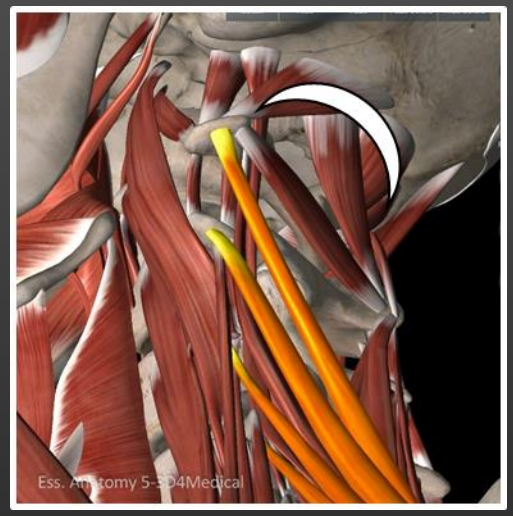
Rib Raising & Anterior Longitudinal Ligament Release – Seated Modification (Sympathetic Treatment)

- Physician positions themselves in front of the patient
- Patient is seated on the table with their arms resting on the physician's shoulder
- The patient's head resting on their arms
- Place finger tips on the ribs or spinous processes, working up or down the spine from the upper-thoracic to mid-lumbar region
- Put pressure on the spine, posterior to anterior, holding for a few seconds or with a springing motion, then moving on, for a total of about two minutes
- Ideally the P-A pressure is maintained until a tissue texture change with a fascial release is palpated

Suboccipital Release/Inhibition (Parasympathetic CN X - Vagus)

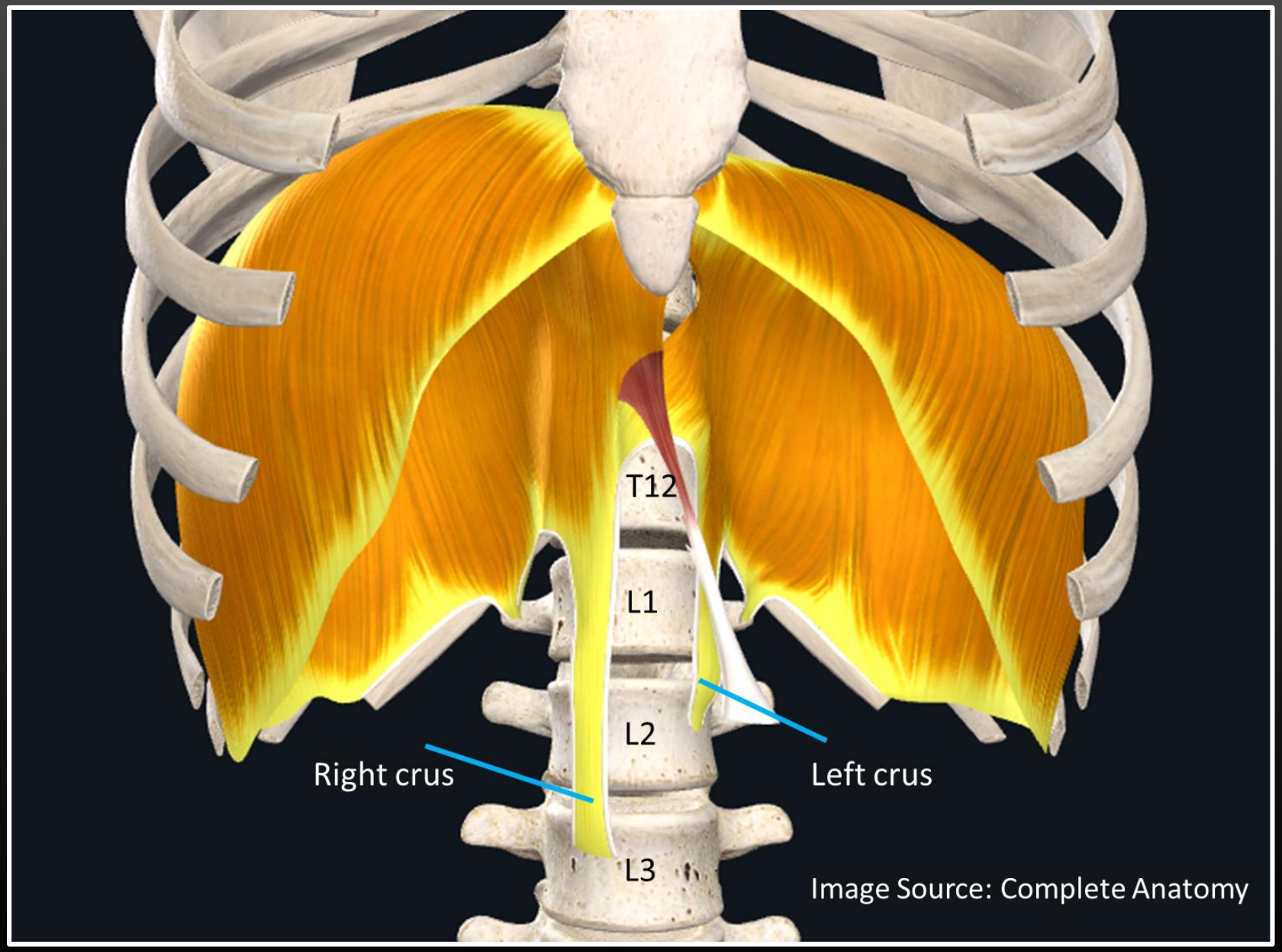
- Place your finger tips inferior to the inferior nuchal line in the soft tissues of the suboccipital triangle musculature
- Balance the head on your finger pads with the posterior cranium resting off of your palms
- Slowly extend your interphalangeal joints to contact the deeper tissues of the suboccipital area
- Maintain this position until the tissues soften and the weight of the head comes into the palm of your hands
- If the patient can tolerate additional pressure, exert traction in a cephalad direction
- The occiput gently settles into your palms as the release occurs
- Reassess the area for greater ease of motion/TART resolution





Anatomy Images: Complete Anatomy

Thoracic Diaphragm



Supine Thoracic Diaphragm Release – Classic "Doming of the Diaphragm"

- Contact the infero-lateral rib cage with your hands
  - Thumbs pointed toward each other medially and positioned *inferior to the costal margin* approaching the xiphoid process.
- Palpate the diaphragm, through a respiratory cycle and feel for restriction of motion and tissue texture abnormalities
- Slowly and gently follow the diaphragm motion (posterior, superior and lateral directions) as the patient exhales
  - Use a "scooping" motion under the costal margin
  - This can be very tender to the patient – use verbal and non-verbal cues from the patient

- Hold the end position and resist inferior motion of the diaphragm during inhalation
- During exhalation follow the diaphragm, as described above, to a new barrier
- Repeat for several respiratory cycles
- Repeat as you "walk" your thumbs laterally, treating the entire diaphragm
- Reassess the motion and tissue texture of the respiratory diaphragm

Direct Thoracic Diaphragm Release
Respiratory Assisted for Medically Stable Patients (Part One)

This technique is notably less uncomfortable and better tolerated by most patients than the classic "Doming of the Diaphragm"

- Patient lies supine with the head turned to one side (to avoid breathing on the physician)
- Physician stands at the side of the table/bed
- Test the motion of the lower ribs and thoracic diaphragm, by compressing posteromedial, prior to the treatment
- Physician places their thumbs, thenar & hypothenar regions & fifth fingers along the lower/anterolateral aspect of the rib cage, along the region of the attachment of the thoracic diaphragm
- The patient is instructed to take a deep breath and exhale fully

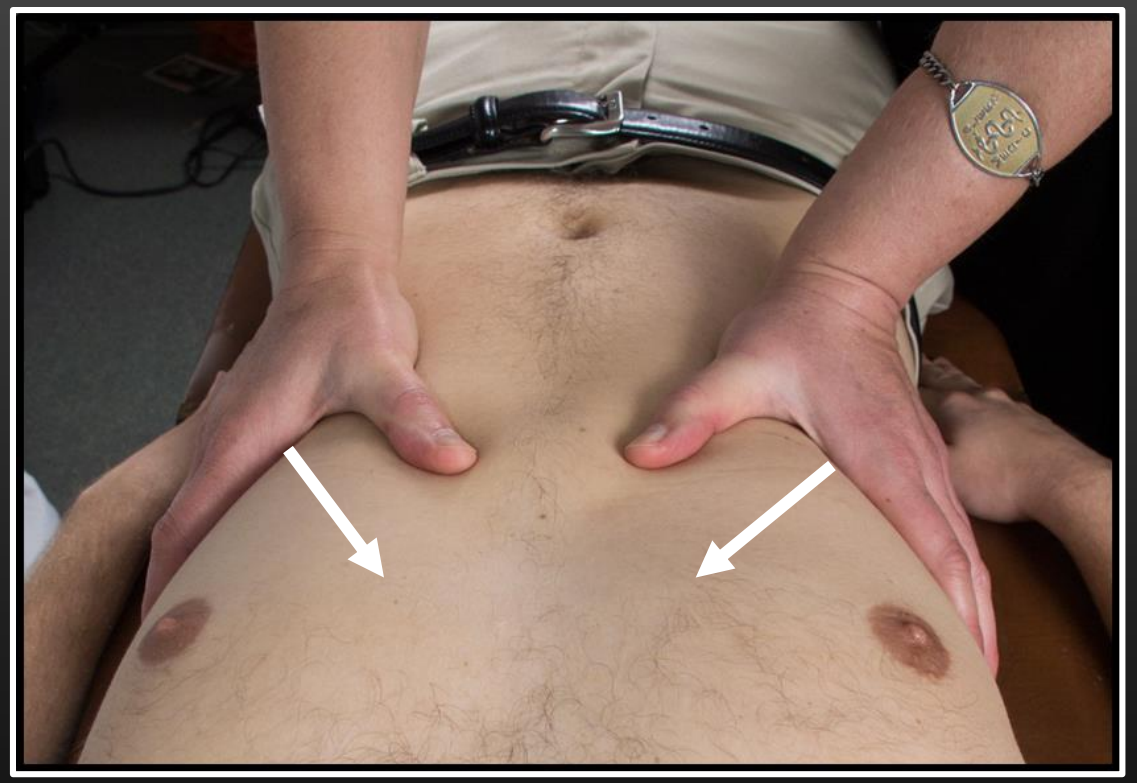
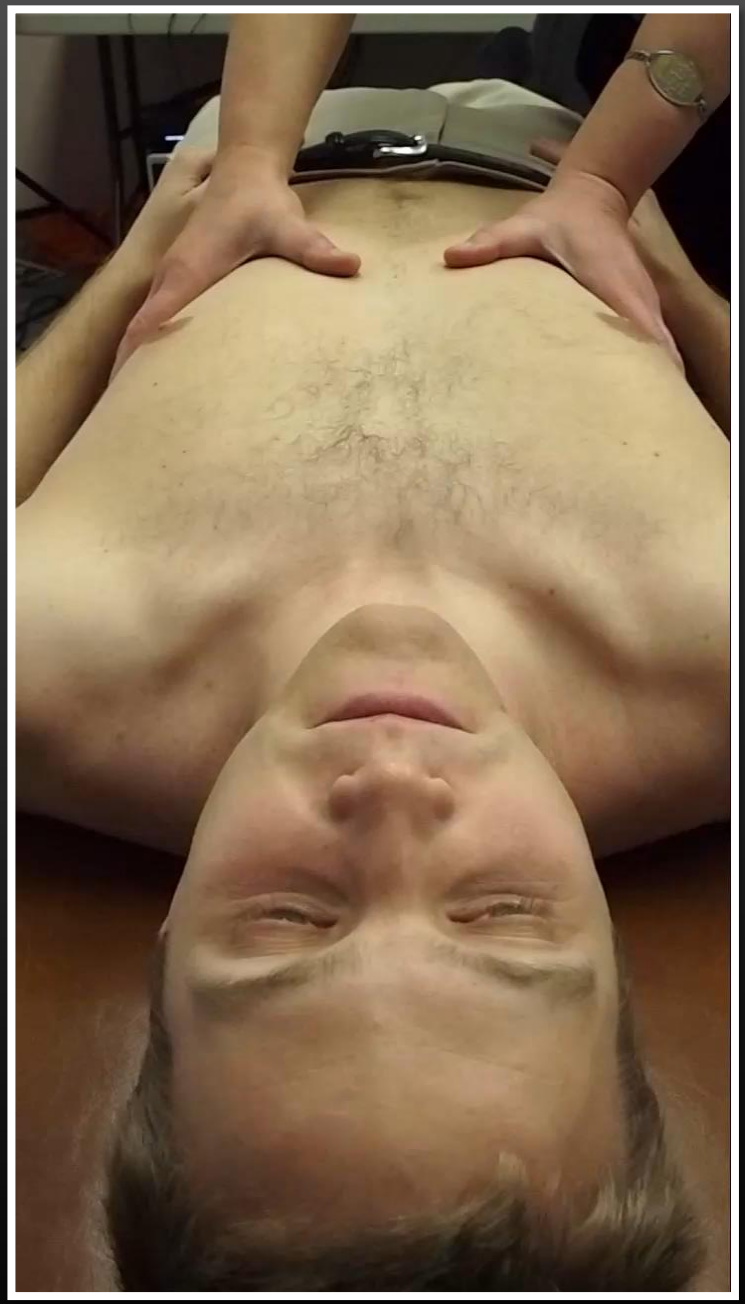


Photo credit: Tom Shay Photography

•Do *not* use this modification in any condition where bronchial spasms or air trapping might be expected to compromise the patient's condition (acute asthma, COPD, etc.)

Direct Thoracic Diaphragm Release (Part Two) Respiratory Assisted for Medically Stable Patients

- During exhalation, the physician increases the pressure on the rib cage, with a vibratory motion, exaggerating the exhalation motion
- During inhalation, the physician maintains compression of the ribs until just before the inhalation is complete, at which time the compressive force is rapidly released
- The patient should experience a sudden intake of air, filling the vacuum created with the released ribs
- Repeat this three times (or more, as necessary)
- Reassess the motion of the lower ribs and thoracic diaphragm after the treatment
- ➢ Patients will frequently start laughing or become a little embarrassed because the influx of air may create a sucking or snorting sound. This is a normal occurrence.



https://youtu.be/Hqpejuh8Bxs

Click on image for video with audio

Thoracic Diaphragm Myofascial Balancing – treat bilaterally

- Physician stands at the side of or behind the patient (supine or lateral recumbent)
- Slide one hand under the patient, spanning over the lower ribs. (observe the photograph)
- The top hand spans over the lower anterolateral ribs with the costal margin running roughly between the middle two fingers region, and the thumbs of both hands resting on the lateral aspect of the ribs
- Compress your two hands, focusing your attention at the mid diaphragm region
- Test the motion of the thoracic diaphragm, taking note of areas of restriction
- Using a general myofascial release technique, either directly or indirectly, release the restrictions between your hands
- Reassess the motion of the thoracic diaphragm

➢ Due to the patient's weight on the posteriorly placed hand, minimal pressure, from the posterior to anterior direction, is necessary. The majority of the balancing compression comes from the anterior hand

Thoracic Diaphragm Myofascial Balancing

- This technique works very well to release any remaining restrictions in the thoracic diaphragm after the respiratory assisted thoracic diaphragm release technique has been utilized
- It is also excellent for treating patients who are not strong enough, or stable enough, to tolerate a direct thoracic diaphragm release
- This technique has been well tolerated by patients who are sedated and on a ventilator, or even, with a gentle touch, immediately postoperatively from cardiothoracic surgery **

**Eva Shay, DO's personal experience with patients

Classic Thoracic (Miller) Pump Technique

- Stand behind a supine patient (patient's head turned to the side and their mouth open)
- Place your hands on the anterior thoracic wall with the thenar and hypothenar eminences just distal to the respective clavicles
  - Female patients may feel more comfortable with their own hands over their breast tissue
- Induce a rhythmic pumping action of about 110 to 120 times/min and with a force adequate to comfortably add the passive range of motion available in the patient's chest cage
  - Patient continues to breathe normally during the Tx
  - The motion may be done by moving your whole body from your feet, or generated through a slight extension/flexion of your elbows
- Physician continues the pumping until an increased sense of soft tissue compliance is palpated and decreased tissue congestion is attained. Alternatively if the goal is fluid movement through periodic pressure change, then, the technique should be performed for about 2 min.
- Reassess

Thoracic Pump – Atelectasis Modification

This is a modification that may be added to the Classic Thoracic Pump Technique after a few cycles of pumping:

- As the patient inhales deeply, resist the expansion of the thoracic cage
- As the patient exhales deeply, increase pressure on the thoracic cage and maintain this firm, steady pressure on the thoracic wall
  - You may also induce an rhythmic pumping action of about 110-120 cycles/min during the exhalation cycle, however, maintain firm and steady pressure on the thoracic wall toward the end of exhalation
- Repeat this for several breathing cycles
- As you direct the patient to breathe in deeply on the last cycle, maintain your pressure until the patient is nearing the end of inspiration, then suddenly withdraw your pressure from the patient's chest wall
- Reassess

❖ Do *not* use this modification in any condition where bronchial spasms or air trapping might be expected to compromise the patient's condition (acute asthma, COPD, etc.)

Pedal (Dalrymple) Lymphatic Pump

- Stand at the feet of the supine patient
- Place the palms of your hands on the balls of your patient's foot and place them into dorsiflexion
- Induce a rhythmic motion (of about 110-120 cycles/min or 2 Hertz) by dorsiflexing further, and releasing your pressure
- Continue this motion of dorsiflexion and release in a rhythmic manner
  - This sends an alternating longitudinal wave of motion and creates an oscillatory pumping action
- Continue for about 2 minutes to achieve improved lymphatic circulation
- Reassess

Liver Quiver (Immunity Stimulation)

- Stand on the right side of the supine patient
- Hand Placement:
  - Encompass the liver with both hands through the ribs (image at the right)

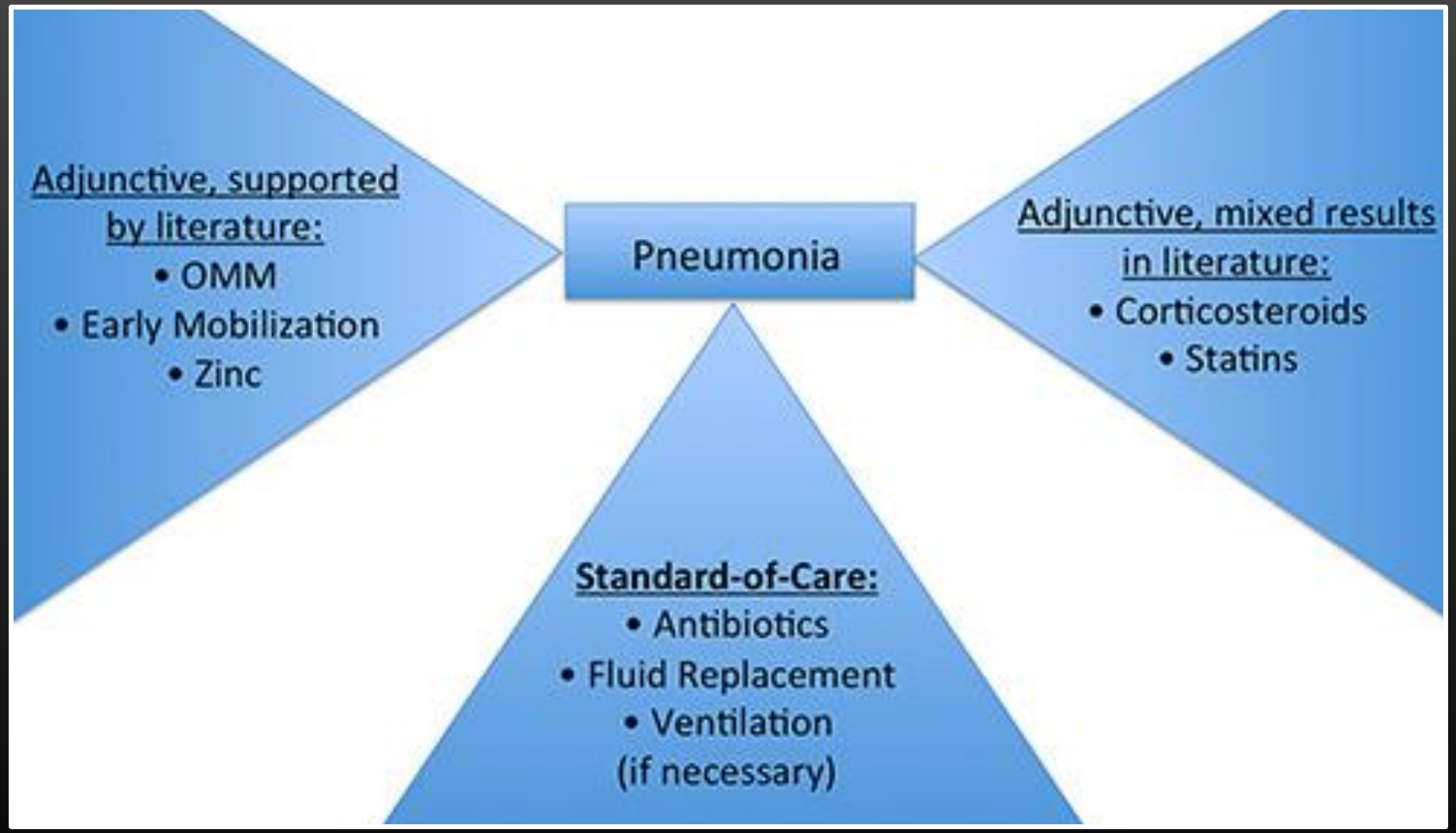
  OR
  - Pass the left hand underneath the lower ribs and the right hand on the abdominal wall immediately below the costal margin
  - Ask the patient to take a deep breath and identify the inferior border of the liver with the fingertips of the right hand. As the patient exhales, move the fingers under the thoracic cage and over the liver
- Have the patient take a deep breath again; as the patient exhales, apply a vibratory motion of the right hand on the liver
- Repeat this procedure rhythmically for about 2–3 minutes, each time penetrating a little deeper into the area underneath the costal margin
- Reassess

- Patient may be treated in the lateral recumbent position, as with the splenic pump

Splenic Pump (Immunity Stimulation)

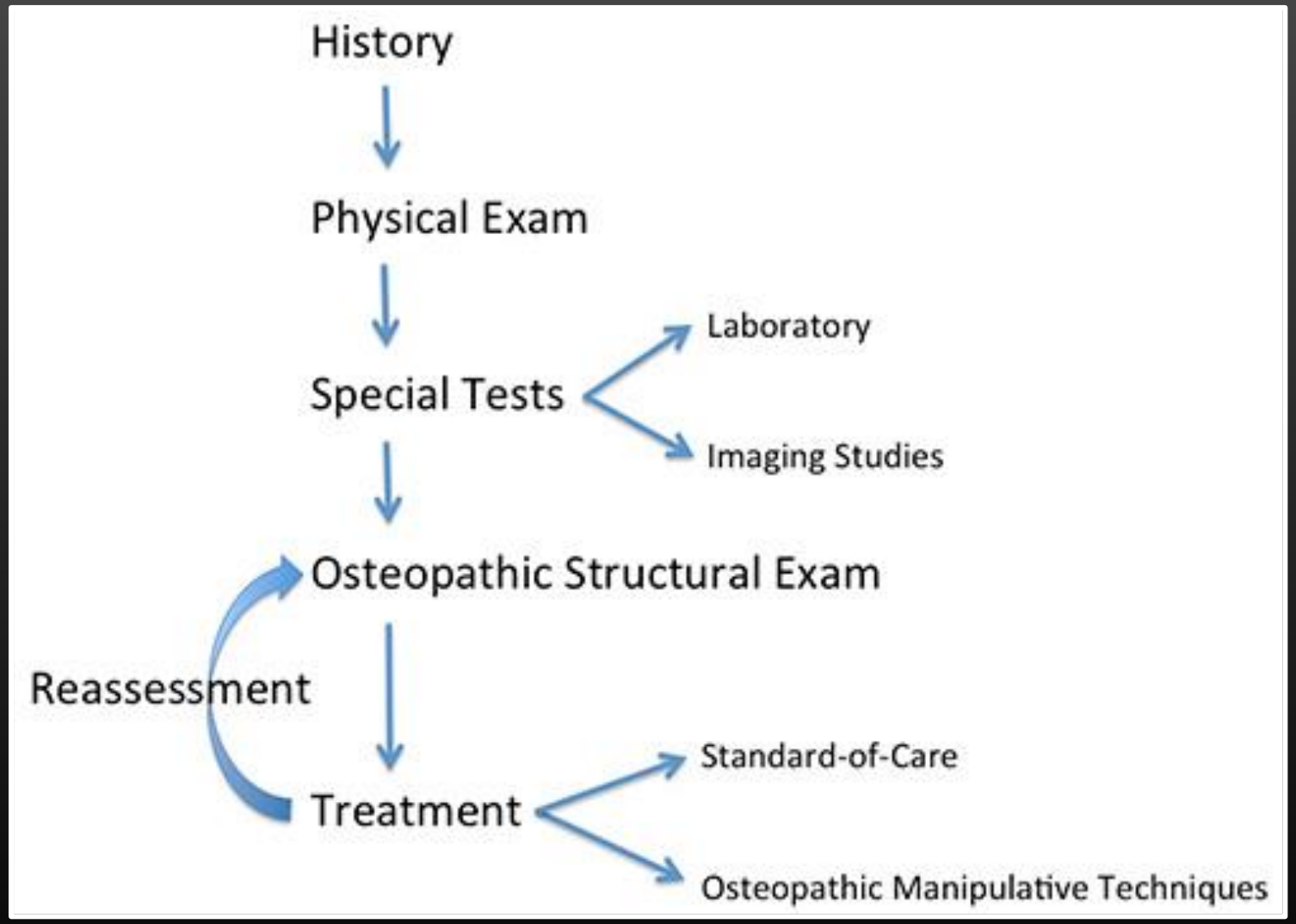
- Stand in front of a patient, lying in the right lateral recumbent position, with their left arm over your shoulder
- Place both hands on the lower left thoracic cage, one anteriorly and one posteriorly with the thumbs meeting in the mid-axillary line
- Ask the patient to take a deep breath and simultaneously lean in such a manner to increase abduction of the arm slightly which will help to increase lateral excursion of the rib cage
- As the patient exhales, lean gently on the thoracic cage and induce a pumping motion to the spleen
- Repeat this procedure rhythmically for about 2–3 minutes
- Reassess

Various components of pneumonia treatment and their efficacy, as supported by current literature



Yao, S., Hassani, J., Gagne, M., George, G., Gilliar, W. Osteopathic Manipulative Treatment as a Useful Adjunctive Tool for Pneumonia. *J. Vis. Exp.* (87), e50687, doi:10.3791/50687 (2014).

Step-by-step approach toward patient care utilized by osteopathic physicians



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