Incorporating OMM to Enhance Your Clinical Practice

Osteopathic diagnosis and approach to thoracic/lumbar spine and rib cage regions

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Clinical significance

- Thoracic cage musculoskeletal restrictions can affect multiple systems (ie cardio, respiratory, GI)
- Treatment has shown to help with PN, asthma, HTN, arrythmia, HRV, costochondritis, lymphatic flow.
Approach to patient

• Formulation of differential diagnosis.
• Physical and structural examination to further narrow your differential utilizing
  1. Observation 2. Palpation 3. Motion Testing
• Consider the need for any special test or studies.
• Course of treatment (including osteopathic manipulative treatment if indicated).
Osteopathic Structural Exam – Observation / Look

- Visualize somatic clues to internal or systemic disease
- Expands the database for diagnosis and treatment
- See how patients walk, move, sit, stand, carry themselves
Forward Bend Test

- The rib hump would be noticed on the side of the convexity or concavity?
OMT clinical integration

- Type I curves can contribute to functional scoliotic curves.
- OMT can be used to treat muscle hypertonicity and short leg from pelvis dysfunctions which may contribute to scoliotic curves.
- OMT can also help with structural scoliosis to help with patient comfort and slow progression of the curvature.
Osteopathic Structural Exam – Palpation / Feel

• Assess skin, fascia, muscles, tendons, and ligaments.

• Adds to observation
  - is the skin cool or hot to touch?
  - is the skin moist or dry?
  - does the muscle feel tight or soft?
  - does the tissue feel edematous (boggy)?
Motion testing

- Utilizing motion testing to check for asymmetry, resistance to movement, decrease range of motion, in order to diagnose somatic dysfunctions.
- Motion testing may be active or passive.
- Testing involves the characteristics of the joint and its tissues.
Gross Thoracic Motion Testing

- Normal Range of Movement: Thoracolumbar Spine (approximate degrees of motion)
- Flexion 80 degrees
- Extension 20 degrees
- Lateral bend 35 degrees
- Rotation 45 degrees

Segmental Diagnosis
Somatic Dysfunction

- Definition - Impaired or altered function of related components of the somatic (body framework) system; skeletal, arthrodial and myofascial structures; and related vascular, lymphatic and neural elements.
Diagnostic Criteria for Somatic Dysfunctions

• T.A.R.T.
  - Tissue Texture Change
  - Asymmetry
  - Restriction of Motion
  - Tenderness or Subjective complaint of pain
Motion is Fundamental to Life

• D.O. are the pre-eminent providers in health to attend to optimizing motion and function
• Movement is one of the biggest clues to life
• When movement is harmoniously coordinated between the parts and the whole, it benefits the health tremendously, and relieves states of disease and dysfunction
Tissue Texture Changes

• Acute Changes
  – Warm/Hot - Increased Temperature
  – Boggy/rough texture
  – Increased moisture
  – Increased tension
    • Rigid/boardlike
  – Much Tenderness
  – Edematous
  – Erythema test
    • Redness lasts

• Chronic changes
  – Cool/or only a slight increase in temperature
  – Thin/smooth texture
  – Dry
  – Slight increased tension
    • Ropy/stringy
  – Less tender
  – No edema
  – Erythema test
    • Red fades fast or blanching
Clinical significance

• Diagnosis somatic dysfunction can assist with finding the cause of a patient’s complaint.

• It is an anatomical structural restriction that is preventing optimum function thus affecting physiology including autonomic, lymphatic, and muscular.

• Clinical significance and correlation is imperative when making the connections to whether a finding is significant.
Sympathetic innervation

The sympathetic chain ganglia travels in close proximity along the thoracic spine and rib heads.
Vicerosomatic Reflexes

- Inflammation is a powerful stimulator of local nociceptors.
- The convergence of visceral nociceptors with the nociceptors from all somatic tissues produces several clinical effects:
  - Referred pain
  - Segmental facilitation at the spinal cord level
As a rule, organs above the thoracoabdominal diaphragm manifest their sympathetic VSR in the paravertebral soft tissues at or above the level of T5, while organs below the diaphragm manifest their sympathetic VSR at or below the level of T5.
Abnormal barriers –

Somatic dysfunction

• Alterations in range of motion is essential for structural diagnosis

**RESTRICTIVE BARRIER**

• Physician must evaluate:
  – Total range of motion
  – Quality of range of motion
  – Feel at end point of range of motion

Manipulative medicine is aimed at restoring and maximizing normal physiologic motion
Case Presentation Findings - Making the diagnosis

- On examination you find that the transverse process of vertebral segments from T3 to T6 are posterior on the right. As you motion test in flexion and extension there is no change to the posterior transverse processes.

- Your diagnosis ???

- Which Fryette Law does this illustrate?
Diagnosing - Thoracic Somatic dysfunction

• On examination you find that the transverse process of vertebral segments from T3 to T6 are posterior on the right. As you motion test in flexion and extension there is no change to the posterior transverse processes.

• Your diagnosis would be: T3-T6 Neutral Sidebent Left and Rotated Right

• Properly documented as T3-T6 N Sl Rr
Physiologic Motion of the Spine - Fryette’s Principles

- **First Principle**: When side bending is introduced into a neutral spine, the bodies of the vertebra will rotate to the side of the convexity. That is, side bending and rotation occur in opposite directions, and is not affected by flexion or extension.
- Applies to group curves (3 or more vertebral bodies) or neutral curves.
- “Type I” Somatic Dysfunctions follow Fryette’s First Principle.
Type I Dysfunctions

- Forms group curves in the spine.
- Neutral (no forward or backward bending; a.k.a. flexion or extension) segments.
- Rotation and side bending are to opposite sides.
- Formed gradually, usually as compensation.
- Maintained by long paraspinal restrictor muscles – erector spinae.
Case Presentation Findings - Making the diagnosis (con’t)

• Tenderness with palpation at T2. Asymmetry noted at T2 with the T2 transverse process more posterior on the left in extension and improved in flexion.

• Diagnosis???

• Which Fryette Law does this illustrate?
Diagnosing Thoracic Somatic Dysfunction

• Tenderness with palpation at T2. Asymmetry noted at T2 with the T2 transverse process more posterior on the left in extension and improved in flexion.

• Diagnosis —
  T2 Flexed Rotated Left & Sidebent Left

• Properly documented as T2FRSL or T2FRISI
Fryette’s Second Principle

When side bending is introduced into a non-neutral spine, the bodies of the vertebrae will rotate toward the side of concavity.

**Type II dysfunction**

- Occur as a result of trauma/abrupt twisting
- Maintained by short restrictors – (rotatores brevis and intertransversari muscles)
- Should be treated before Type I lesions
- Found at apex or extremes of Type I curves
Thoracic Diagnosis Review

Type II Dysfunctions are Non-Neutral
Rotation & SB are coupled to the same side
Notated with Rotation Component written first & subscript omitted
ERS_L is short for ER_L S_L
Flexed dysfunctions become more prominent (less symmetric) in extension
Vice Versa: Extended dysfunctions become more prominent (less symmetric) in flexion

Type I Dysfunctions are Neutral
Rotation & SB are coupled to opposite sides
Notated with Side-bending Component written first & subscript omitted
NSR_L is short for NS_R R_L
Less change in either extreme flexion or extension
Lab Exercise

• Observation
• Palpation of landmarks
• Make a diagnosis of muscle hypertonicity
• Make a somatic dysfunction diagnosis
Move – Intersegmental motion testing - Rotation

- Pt prone, physician places thumbs or fingers on transverse process of segment to be tested.

- Apply a firm downward pressure, one side at a time, and see which TP does not move down easily toward the table.

- The side that resists your downward pressure = the side of the posterior TP = the direction of that vertebra’s rotation
Myofascial Treatment

• Any technique directed at the muscles and fascia
• Although effecting muscle and fascia it effects all the fibroelastic connective tissues, as well as skin, tendons, ligaments, cartilage, blood, and lymph.
Myofascial Treatment

• Relax hypertonic muscles
• Enhance circulation
• Improve venous and lymphatic drainage
• Improve immune responsiveness
• Provide a state of relaxation
• Use alone or with other techniques
Myofascial Physiologic Principles

- Extensibility of connective tissues - tissues placed under prolonged mild tension shows plastic elongation.
- Stretch reflex - stretch of a muscle excites the muscle spindle, resulting in reflex contraction of the muscle. Can use this reflex with active myofascial to stimulate muscle tone in hypotonic muscles.
- Heat (increases elastic response of the muscle to stretch)
Muscle Energy Techniques

- Muscles cause or maintain somatic dysfunctions
- Goal to effect muscle tone via the Golgi tendon reflex to improve joint motion
- Developed by Fred Mitchell, D.O.
Spinal Junctions – Anatomy and Treatment considerations - TL

- Restriction of the T-L junction will affect the abdominal diaphragm.
- Decrease in diaphragm excursion will decrease the potential negative pressure it can draw into the thoracic cavity with inhalation thus decreasing lymph and circulatory flow.
Spinal Junctions – Anatomy and Treatment considerations - CT

- Strain in this region can impair lymphatic drainage and circulation and impinge upon nerve exiting to the upper extremities and innervating the heart and lungs.
Efficacy of osteopathic manipulation as an adjunctive treatment for hospitalized patients with pneumonia: a randomized controlled trial

- Donald R Noll,¹ Brian F Degenhardt,² Thomas F Morley,³ Francis X Blais,⁴ Kari A Hortos,⁵ Kendi Hensel,⁶ Jane C Johnson,² David J Pasta,⁷ and Scott T Stoll⁸

**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.
MOPSE Study OMT protocol

- Sequence: thoracolumbar soft tissue, rib raising, doming of the diaphragm myofascial release, cervical spine soft tissue, suboccipital decompression, thoracic inlet myofascial release, thoracic lymphatic pump, and pedal lymphatic pump.
- **Soft tissue technique** consists of massage, stretching, kneading, and direct inhibitory pressure to relax the musculature.
- **Rib raising** articulates each rib for the purpose of improving rib cage motion and theoretically stimulates the sympathetic chain ganglia.
- **Myofascial release** is a method for reducing tissue tension.
- **Doming the diaphragm and thoracic inlet myofascial release** techniques are used to improve diaphragmatic movement and lymphatic drainage.
- **Suboccipital decompression** involves traction at the base of the skull, which is considered to release restrictions around the vagus nerves, theoretically improving nerve function.
- The **thoracic lymphatic pump** with activation combines rhythmical compressions to the chest wall and the rapid removal of the hands from the chest wall during deep inhalation with the intention of enhancing lymphatic circulation and triggering a sudden expansion of airways and alveoli.
- The **pedal lymphatic pump** gently rocks the patient in a superior-inferior rhythmical motion while supine, to theoretically enhance lymphatic circulation.
Treatments

- Rib raising – Supine & seated
- Diaphragm Doming
- Thoracic pump