Incorporating OMM to Enhance Your Clinical Practice – Emergency and Primary Care Focus - Cases
Lymphatics Approach

- Sheldon Yao, DO
OMM in emergency or urgent care setting

• Approach each case with perspective of finding key somatic dysfunctions based on presentation.

• Organize and target your treatment with the 5 models of osteopathic treatment in mind – especially biomechanical, autonomic, and lymphatic.
Previous studies of osteopathic manipulative treatment (OMT) have examined its use in several clinical settings, but no study to date has been specific to emergency medicine.

This article examines the use of OMT in the practice of emergency medicine by osteopathic physicians.

Osteopathic physicians who identified their practice as emergency medicine were surveyed to determine OMT use, including techniques used, graduate medical education, and factors affecting usage.

Use of OMT was common (55%), with a large minority (28%) of osteopathic physicians reporting daily or weekly usage.

Techniques most often used include soft tissue treatment, high velocity/low amplitude treatment, and muscle energy treatment.

These findings indicate that further investigation into the indications and efficacy of OMT in emergency medicine is warranted.
Top 10 Reasons For Emergency Room

1. 786 - RESP SYS/OTH CHEST SYMP*
2. 789 - OTH ABDOMEN/PELVIS SYMP*
3. 780 - GENERAL SYMPTOMS*
4. 465 - AC URI MULT SITES/NOS*
5. 847 - SPRAIN OF BACK NEC/NOS*
6. 724 - BACK DISORDER NEC & NOS*
7. 784 - SYMPTOMS INVOL HEAD/NECK*
8. 599 - OTH URINARY TRACT DISOR*
9. 787 - GI SYSTEM SYMPTOMS*
10. 682 - OTHER CELLULITIS/ABSCESS*
OMM for respiratory complaints

- Asthma exacerbation
- COPD exacerbation
- Pneumonia
- Influenza
Muscular Considerations

• Increases use of accessory muscles
• Excessive work to breath can quickly lead to exhaustion
• Thoracic Diaphragm: Major muscle of inspiration
• Responsible for 60% of change in thoracic pressures
Respiration involves the movement of 146 joints.
Muscles of Inspiration:
- Accessory
  - Sternocleidomastoid (elevates sternum)
- Principal
  - External intercostals (elevate ribs, thus increasing width of thoracic cavity)
  - Intercostal part of internal intercostals (also elevates ribs)
  - Diaphragm (domes descend, thus increasing vertical dimension of thoracic cavity; also elevates lower ribs)

Muscles of Expiration:
- Quiet breathing
  - Expiration results from passive recoil of lungs and rib cage
- Active breathing
  - Internal intercostals, except interchondral part
  - Abdominals (depress lower ribs, compress abdominal contents, thus pushing up diaphragm)
  - Rectus abdominis
  - External oblique
  - Internal oblique
  - Transversus abdominis
LYMPHATIC RESPONSE

- Diaphragm flattened decreases V/P gradient between thorax and abdomen
- Decreased lymph flow
- Pulmonary interstitium becomes congested
Pulmonary Lymphatics

- Extrapleural lymphatics and lung parenchyma drain primarily into the right lymphatic duct and thoracic duct.
- The right lymphatic duct runs above apex of right lung and drains into the right subclavian vein.
- The thoracic duct runs from below diaphragm on right at the cysterna chyli and crosses to the left around the level of T5-T6.
- Restriction here can cause decreased lymph drainage.
- Thoracic duct drains into the left subclavian vein.
- The thoracic duct and large lymphatic vessels are under sympathetic control.
- Therefore: increased sympathetics will lead to constriction of the large lymph vessels and decrease lymphatic drainage.
Lymph Drains from Peripheral Toward Central

Heart and Lungs
Chronic lymphatic congestion with resultant poor oxygenation of the cells is associated with:

- increased infection
- increased mortality
- increased healing time
- increased fibrosis and scarring if healing does occur
- decreases effectiveness of medications
Effects of Increased Sympathetic Tone

- Increased sympathetic tone to the lungs →
  - Epithelial hyperplasia
    - Increase in goblet cells
      - Producing profuse, thick tenacious mucus which is difficult to expectorate
  - Increased interstitial tissue congestion
  - An overall decrease in lung secretions
  - Increased vasoconstriction to lung tissue
  - A relative increase in bronchiole dilation
Effects of increased PSNS tone

- Increased parasympathetic tone to the lung may cause:
  - Thinning of secretions
  - Profuse secretions
  - Relative bronchiole constriction
OMT Goals:

• Improve venous and lymphatic flow
• Improve arterial supply to the lungs
• Ease removal of accumulated bronchial secretions and phlegm.
• Decrease the workload of breathing.
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.
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.
OMT to help remove restrictions to Lymph Flow

- Doming the diaphragm and thoracic inlet myofascial release techniques are used to improve diaphragmatic movement and lymphatic drainage.
OMT to promote lymph flow

- Always first treat regions of possible obstruction – treat from proximal to distal.
- Improve thoracic compliance and diaphragm movement
- Augment lymph flow with pumping techniques first ensuring that there are no contraindications**
Demo and practice

- Thoracic inlet myofascial release
- Diaphragm doming
- Thoracic pump
- Pedal pump
Clinical correlations

- Given the techniques we just reviewed what other presentations can be addressed?
Clinical correlations

• Lymph techniques can be applied to any infectious or inflammatory process as long as there are no contraindications.

• Cellulitis

• Edema

• Acute sprain (ie ankle)

• Skin infections

• Lymphedema
Practice small group discussion/application.
Autonomic Model

• To Shan Li, DO
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Acute Abdominal Pain

- Common presentation in ER
- Quick and accurate assessment is required
- Utilizing osteopathic skills can assist with diagnosis and help localize the source of pain
- An understanding of viserosomatic reflexes will help guide diagnosis and treatment
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
Visceral Innervation

- The innervation of all abdominal and pelvic viscera comes through 3 nerves and 3 ganglia.
- Greater splanic nerve > celiac ganglion, T5 – T9
- Lesser splanic nerve > superior mesenteric ganglion, T10 – T11
- Least splanic nerve > inferior mesenteric ganglion, T12 – L2
Visceral Innervation

- T6-T9: R: liver, gall bladder, duodenum, pancreas,
- T6-T9: L: spleen, stomach, pancreas
- T10-T11: Sm. Bowel through transverse colon, kidney & proximal ureter, ovaries & proximal fallopian fall. Tubes, testes.
- T12-L2: Bladder & distal ureter, sigmoid colon-rectum, uterus, prostate, distal fallopian tubes
Visceral Sympathetics

- Thyroid T1-4
- Mammary T1-6
- Esophagus T1-6
- Lung T1-6
- Heart T1-6
- Stomach T5-9 Left
- Liver T5-9
- Gallbladder T5 Right
- Pancreas T7 Right
- Spleen T7 Left
- Small intestine to right colon T10-11
- Left colon to rectum to pelvic organs T12-L2
- Appendix T10 (T9-T12)
- Ovary/Testes T10-11
- Kidney T10-11
- Uterus T12-L2
- Bladder T12-L2

Levels cited from Kuchera, *Osteopathic Considerations in Systemic Dysfunction*
FIG. 6-7 Segmentalization of sympathetic nervous system.
Spinal cord facilitation

- Reduced threshold for firing of the interneurons receiving nociceptive input
- Exaggerated segmental autonomic and alpha-motor response; produces boggy spasm, increased temperature, increased sweat.
- Exaggerated ascending tract input to higher centers, produces hyperasthesia, and referred pain
- Alters autonomic outflow to viscera
Hypersympathetic tone - Clinical consequences

- Impairs GI motility
- Decreases GI secretions
- Hypoperfusion of Abdominal contents
- Decreased Oxygen Supply to abdominal viscera
- Prolonged Healing Time
- Decreased Lymphatic drainage
Treating segmental facilitation

• No techniques that are painful or involve rapid movements
• Treat facilitated areas first
• Direct treatment to osseous tissues
• Anatomical location of ganglia
• May require frequent treatment with acute process
OMT to improve thoracic compliance and balance sympathetic tone

- Myofascial release
- Muscle energy to clavicles, rib, and spine
- Inhibition to accessory muscles of respiration
- Articulatory techniques to the thoracic spine and ribs
- Rib raising (seated or supine)
OMT to address parasympathetic innervation

- Suboccipital release
- OA decompression
- Myofascial to upper cervical region
- BLT to upper cervical spine
Demo and practice

- Rib raising
- Suboccipital release
- Ganglion inhibition
- Mesenteric lift
Clinical correlations

• Given the autonomic techniques we just reviewed what other presentations can be addressed?

• Practice small group discussion/application.
Autonomic treatments can be applied to many conditions as most presentation have a hypersympathetic component ie pain, decreased blood flow, compression of neurovascular structures.

- Cardiac
- Pulmonary
- Gastrointestinal
Head and Neck Considerations

• Michael Terzella, DO
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Common Head and Neck Diagnoses

- Headache
- Otitis media
- TMJ
- Sinusitis
- Neck pain/ Whiplash
- Torticollis

- Review three treatments:
  - Galbreath tech.
  - FPR for C-spine
  - Sinus drainage
Some techniques you may use:

- Sinus Drainage Technique
- Galbreath Tech.
- Base Spread
- V-Spread
- CV4

- Suboccipital Release
- Cervical MFR
- Cervical MET
- Cervical FPR (not on the koya web page)
Antibiotics and Topical Nasal Steroid for Treatment of Acute Maxillary Sinusitis A Randomized Controlled Trial

- Ian G. Williamson, MD; Kate Rumsby  JAMA. 2007;298(21):2487-2496.

Objective  To determine the effectiveness of amoxicillin and topical budesonide in acute maxillary sinusitis.

Design, Setting, and Patients  A double-blind, randomized, placebo-controlled factorial trial of 240 adults (aged 16 years) with acute nonrecurrent sinusitis. Patients were randomized to 1 of 4 treatment groups: antibiotic and nasal steroid; placebo antibiotic and nasal steroid; antibiotic and placebo nasal steroid; placebo antibiotic and placebo nasal steroid.

Intervention  A dose of 500 mg of amoxicillin 3 times per day for 7 days and 200 μg of budesonide in each nostril once per day for 10 days.

Main Outcome Measures  Proportion clinically cured at day 10 using patient symptom diaries and the duration and severity of symptoms.

Results  The proportions of patients with symptoms lasting 10 or more days were 29 of 100 (29%) for amoxicillin vs 36 of 107 (33.6%) for no amoxicillin (adjusted odds ratio, 0.99; 95% confidence interval, 0.57-1.73). The proportions of patients with symptoms lasting 10 or more days were 32 of 102 (31.4%) for topical budesonide vs 33 of 105 (31.4%) for no budesonide (adjusted odds ratio, 0.93; 95% confidence interval, 0.54-1.62). Secondary analysis suggested that nasal steroids were significantly more effective in patients with less severe symptoms at baseline.

Conclusion:  Neither an antibiotic nor a topical steroid alone or in combination was effective as a treatment for acute sinusitis in the primary care setting.
An Osteopathic Approach to Chronic Sinusitis

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• Background: Patients with sinus pain and discomfort often seek additional adjunct therapies.

• Objective: To determine the efficacy of osteopathic manipulation techniques (OMT) to relieve sinus pain in our outpatient allergy clinic setting.

• Methods: Sixteen patients who presented to our clinic in pain and requesting alternative therapies for relief of their chronic sinus pain were offered to receive OMT treatment as an adjunct to their office visit. One patient declined participation after receiving printed information about the OMT techniques. The remaining fifteen patients were given a symptom score card to assess the severity of their sinus pain before offering OMT. The OMT offered consisted of four different direct pressures and "milking" techniques combined with one sinus drainage technique. These five techniques were selected to relieve sinus pain, pressure, and congestion by unblocking nasal passages and improving lymphatic flow. Each technique was given for 3 minutes and the entire process took approximately 18 minutes to complete.

• Results: Each patient was given a symptom score card to rate their symptoms before and after manipulation. Data was plotted and statistical analysis computed with GraphPad Software using paired t-test. OMT was not associated with any adverse effects or complaints. Nine of the 15 patients reported symptom relief immediately following OMT. The average reported sinus pain/congestion before OMT was 3.07 (Moderate.) Following OMT, sinus pain/congestion decreased to 2.33 (Minimal.) Average decrease in symptom score after OMT was 0.74 with a p-value of 0.0012 via paired t-test. Subjective data reported by the patients showed symptom improvement immediately following each OMT session. Four of the fifteen patients reported minimal pain during the procedure. No other adverse effects were reported.

• Conclusion: This study demonstrated that after OMT, utilizing direct pressure and sinus drainage technique, the overall sinus pain/congestion for all patients improved (p=0.0012). All fifteen patients reported feeling more relaxed after OMT.
The Use of Osteopathic Manipulative Treatment as Adjuvant Therapy in Children With Recurrent Acute Otitis Media

Miriam V. Mills, MD; Charles E. Henley, DO, MPH; Laura L. B. Barnes, PhD; Jane E. Carreiro, DO; Brian F. Degenhardt, DO


- **Objective** To study effects of osteopathic manipulative treatment as an adjuvant therapy to routine pediatric care in children with recurrent acute otitis media (AOM).

- **Study Design** Patients 6 months to 6 years old with 3 episodes of AOM in the previous 6 months, or 4 in the previous year, were placed randomly into 2 groups: one receiving routine pediatric care, the other receiving routine care plus osteopathic manipulative treatment. Both groups received an equal number of study encounters to monitor behavior and obtain tympanograms. The pediatrician was blinded to patient group and study outcomes, and the osteopathic physician was blinded to patient clinical course.

- **Main Outcome Measures** We monitored frequency of episodes of AOM, antibiotic use, surgical interventions, various behaviors, and tympanometric and audiometric performance.

- **Results** A total of 57 patients, 25 intervention patients and 32 control patients, met criteria and completed the study. **Intervention patients had fewer episodes of AOM, fewer surgical procedures, and more mean surgery-free months.** Baseline and final tympanograms obtained by the audiologist showed an **increased frequency of more normal tympanogram types in the intervention group.** No adverse reactions were reported.

- **Conclusions** The results of this study suggest a potential benefit of osteopathic manipulative treatment as adjuvant therapy in children with recurrent AOM; it may prevent or decrease surgical intervention or antibiotic overuse.
Intramuscular Ketorolac Versus Osteopathic Manipulative Treatment in the Management of Acute Neck Pain in the Emergency Department: A Randomized Clinical Trial

- Tamara M. McReynolds, DO; Barry J. Sheridan, DO From the Departments of Emergency Medicine at Darnall Army Community Hospital in Fort Hood, Tex, and Brooke Army Medical Center at Fort Sam Houston in San Antonio, Tex.

- Ketorolac tromethamine injected intramuscularly (IM) has been shown to be an effective analgesic in treating patients with acute musculoskeletal pain in the emergency department (ED).

- The authors compare the efficacy of a single dose of IM ketorolac to osteopathic manipulative treatment (OMT) as delivered in the ED for the management of acute neck pain. A randomized clinical trial was conducted in three EDs.

- A convenience sample of 58 patients with acute neck pain of less than three weeks' duration were enrolled. Subjective measures of pain intensity on an 11-point numerical rating scale were gathered from patients immediately before treatment and one hour afterward. Subjects received either OMT or 30 mg, IM ketorolac.

- Subjects' perceived pain relief was also recorded at one hour after treatment on a subjective 5-point pain relief scale. Twenty-nine patients received IM ketorolac, and 29 patients received OMT. Although both groups showed a significant reduction in pain intensity, 1.7±1.6 (P < .001 [95% CI, 1.1–2.3]) and 2.8±1.7 (P < .001 [95% CI, 2.1–3.4]), respectively, patients receiving OMT reported a significantly greater decrease in pain intensity (P=.02 [95% CI, 0.2–1.9]). When comparing pain relief at one hour post treatment, there was no significant difference between the OMT and ketorolac study groups (P=.10).

- The authors found that, at one hour posttreatment, OMT is as efficacious as IM ketorolac in providing pain relief and significantly better in reducing pain intensity. The authors conclude that OMT is a reasonable alternative to parenteral nonsteroidal anti-inflammatory medication for patients with acute neck pain in the ED setting.
Sinus drainage technique

- frontal lift
- maxillary lift
- frontal nasion lift
- effleurage of frontal sinuses
- drainage of nasal passages (thumb over thumb along the nose)
- effleurage of maxillary sinuses
- post-auricular and along the SCM lymphatic drainage
Galbreath’s technique
(jaw lift or mandibular drainage)

Assists in the opening of the Eustachian tube to allow for improved lymphatic drainage
Demo and practice

- MFR cervical spine
- Sinus drainage
- Galbreath
Back and Extremity Considerations

- Reem Abu-Sbaih, DO
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Osteopathic Diagnosis

• Trained to diagnose musculoskeletal problems.
• Able to discern whether back pains are due to secondary causes.
• Able to distinguish between acute and chronic via palpation.
Osteopathic Treatment

• Address musculoskeletal restrictions with OMT.
• Apply techniques as indicated based on patient presentation.
Counterstrain

• Localize the tenderpoint.
• Establish a pain scale. Start with a pain scale of 10 out of 10 (no matter how tender the patient is).
• Fold body and place everything into position of greatest comfort, or freedoms.
• Re-establish that the pain is now a 0-10 (mobile point - position where the tender point is no longer tender)
• Hold for 90 seconds.
• Continue to monitor tender point and feel for change in tissues.
• Slowly return patient to neutral position.
• Reassess point to see if tenderness resolved.
Anterior Shoulder CS Points

FIG. 86-1 Location of the anterior tender points of the shoulder girdle.
Muscle Energy

- Patient and physician comfort most important.
- Patient should be examined for somatic dysfunction and a proper diagnosis assessed.
- By applying principles of muscle energy one can treat restrictions of motion.
- Patient must be able to cooperate since it is a direct, active technique.
- Relative contraindication include acutely injured or painful muscles or patients with low vitality.
Muscle Energy Technique

• Isolate the joint or muscle.
• Place it into its barrier.
• Instruct patient to push extremity towards the freedom for 3-5 seconds while providing isometric resistance.
• Relax of 3 seconds and place joint further into the barrier.
• Repeat isometric contraction for a total of 3 times.
• Passive stretch at the end.
• Reassess.
Osteopathic manipulative treatment in the emergency department for patients with acute ankle injuries.

- Eisenhart AW, Gaeta TJ, Yens DP.
- Department of Emergency Medicine, St Barnabas Hospital, Bronx, NY, USA.
- Abstract

STUDY OBJECTIVE: The purpose of this study was to evaluate the efficacy of osteopathic manipulative treatment (OMT) as administered in the emergency department (ED) for the treatment of patients with acute ankle injuries.

METHODS: Patients aged 18 years and older with unilateral ankle sprains were randomly assigned either to an OMT study group or a control group. Independent outcome variables included edema, range of motion (ROM), and pain. Both groups received the current standard of care for ankle sprains and were instructed to return for a follow-up examination. Patients in the OMT study group also received one session of OMT from an osteopathic physician.

RESULTS: Patients in the OMT study group had a statistically significant (F = 5.92, P = .02) improvement in edema and pain and a trend toward increased ROM immediately following intervention with OMT. Although at follow-up both study groups demonstrated significant improvement, patients in the OMT study group had a statistically significant improvement in ROM when compared with patients in the control group.

CONCLUSIONS: Data clearly demonstrate that a single session of OMT in the ED can have a significant effect in the management of acute ankle injuries.
Practice

- Myofascial release T-L spine prone and seated
- MET to joints
- CS to tenderpoints