## LBORC-NUFA Poster Abstracts 2023: Residents

Every year at the American Academy of Osteopathy Convocation, the Louisa Burns Osteopathic Research Committee (LBORC) and the National Undergraduate Fellows Association (NUFA) together host a research poster presentation session for residents and medical students. The 2023 poster abstracts for residents are presented here.

## CASE STUDY

Jackilyn Barr, DO; Gregory Heller, DO Resolution of Plica Band Syndrome with Osteopathic Manipulative Treatment

**Introduction/Background:** Plica band syndrome is a type of synovitis that can cause anterior or anteromedial knee pain. Plica band syndrome may be a result of overuse or be traumatic in origin. While arthroscopy is the gold standard, physical exam is typically sufficient for diagnosis as a palpable band is normally present. After identification of an inflamed plica band, treatments are limited to anti-inflammatories, ice, activity modification, physical therapy, and arthroscopic debridement.

**Case:** The report is of a 57-year old male presenting with left-sided anteromedial knee pain with a palpable, tender band after starting a new exercise routine. History was negative for inciting injury and exam was without concern for osseous, ligamentous, or meniscal injury. Soft tissue technique was utilized by applying inhibitory pressure across the palpable band until a release of the tissue was appreciated.

**Results:** Following treatment, the taut band was no longer appreciated, and the area was non-tender. The patient noted improvement in his gait and no pain while walking afterward.

**Discussion:** Current treatments for plica band syndrome are limited, particularly for those who are unable to take anti-inflammatory medications or commit time and capital to physical therapy visits. This case demonstrates that osteopathic manipulative treatment may offer a quick, effective, and non-invasive alternative for management of plica band syndrome. Aziza Bomani-Bailey, DO; Hugh Ettlinger, DO FAAO, FCA

# Happy Feet are Dancing Feet, Response to OMT in a Patient with Morphea Profunda: A Case Report

**Introduction/Background:** Morphea or localized scleroderma is an autoimmune condition characterized by sclerotic skin changes. Morphea profunda involves deeper structures including subcutaneous tissues, muscles, or bones. It is associated with significant morbidity from atrophy and decreased range of motion (ROM). Depending on the severity, treatment includes a combination of observation, steroids, phototherapy, physical therapy, or immunosuppressants. Currently, no published cases show benefits of Osteopathic Manipulative Treatment (OMT) in morphea profunda, though OMT can improve other restrictive diseases, such as Stiff Person Syndrome.

**Case:** HG, a 74-year-old female, with recently diagnosed morphea profunda, presented to St. Barnabas Hospital's OMT clinic with 2-year history of burning, bilateral ankle pain, associated with skin tightening, itchiness, loss of sensation, loss of ROM, and instability. The patient required a cane and caregivers for ambulation. Physical exam demonstrated decreased sensation and ROM of both ankles with 1+ Achilles reflexes and large, hyperpigmented, macular patches on bilateral lower extremities, and forearms. Osteopathic Structural Exam (OSE) showed moderate and severe somatic dysfunctions in cranium and lower extremities.

**Results:** After 9 appointments over 7 months, HG showed significant improvement in ROM, mobility, and pain. Following the 6th visit, she reported unassisted walking along the beach and dancing all night in heels,

for the first time since symptoms began.

**Discussion:** Treatment focused on reducing postural decompensation and improving biomechanical and respiratory-circulatory function by improving ROM, promoting lymphatic drainage, and decreasing inflammation. HG demonstrated significant improvement of symptoms, OSE, range of motion, and activities of daily living after initiation of OMT, in conjunction with standard medical management. This case is limited by a sample size of one, so further research on use of OMT in Morphea profunda is indicated.

## Xiawei Zhong, DO; Zachary Campo, DO; Martin, Torrents DO

## Effect of OMT on post-anoxic brain injury resulting in intractable myoclonus

**Introduction/Background:** Symptomatic myoclonus after cardiac arrest secondary to post hypoxic brain injury is referred to as Lance-Adams syndrome (LAS). It is a rare complication of anoxic brain injury post cardiopulmonary resuscitation, with less than 200 reported cases to date and no found use of OMT on these patients.

Case: A man in his 40's was admitted to ICU after cardiopulmonary arrest following unsuccessful attempt of tracheostomy tube exchange. Past medical history include tracheal stenosis post tracheostomy, ESRD on hemodialysis, previous stroke, and heart failure The patient exhibited seizure-like activity with myoclonus on initial presentation, with CT,MRI head, and continuous EEG negative for acute intracranial pathology. The MRI head showed chronic bilateral striatocapsular and thalamic lacunar infarcts. The patient was initially treated with levetiracetam and later transitioned to Depakote and Clonazepam due to persistent myoclonus, which resulted in severe restriction of activities of daily living. Upon consultation with the OMM team, the patient was treated with various cranial, visceral and soft tissue techniques focusing on cranio-sacral dysfunction, and autonomic nervous system balancing.

**Result:** A decrease in myoclonus severity and frequency was observed and documented after a total of 8 OMT sessions. The patient was eventually discharged at a state where he is able to perform basic functions with minimal assistance.

**Discussion:** This case illustrates the benefits of OMT for myoclonus related to acute hypoxic brain injury,

refractory to standard of care. Limitations include no post treatment follow up of the patient's function, and lack of objective measurement of the myoclonus.

Brittany Fisher, DO; Roshny Vijayakar, DO; John Coppinger, DO; Veera Motashaw, DO

### Stalled out: An Osteopathic Approach To A Post-Traumatic Gastroparesis

**Introduction/Background:** Gastroparesis is a burdensome condition affecting more women than men. In the US, up to 35% of cases are idiopathic, 29% diabetic, and other causes include cancers, post-operative changes, auto immune or connective tissue diseases. We describe a case of gastroparesis failing conventional treatment, and the approach that provided relief.

**Case:** A 38-year-old female with anxiety/depression, headaches, previous hip fracture, and endometriosis with multiple abdominal surgeries, and a new left costal lipoma presented with persistent nausea, vomiting, and constipation since a car accident one year prior. She was diagnosed with gastroparesis, and attempted laxatives and promotility agents with no relief.

**Results:** Screening revealed Zink compensation R/R/R, diminished cranial rhythmic impulse, fatty non-tender mass over L ribs 9-10, Occipito-atlantal, thoracic inlet, and abdominal diaphragm restrictions, L/L sacral torsion, R anterior innominate, R lateral tibial torsion, and flattened R arch. After two treatments, the patient had natural a bowel movement, decreased nausea, improved intake, and headache relief. On subsequent follow up, Zink compensation normalized, the lipoma shrank, and nausea resolved. Two weeks later, the lipoma was non-palpable and vomiting subsided. By the final visit, only spinal facilitation remained with improved mood and resolution of gastroparesis as a diagnosis and its presenting symptoms.

**Discussion:** With each session of osteopathic manipulative treatment (OMT) patient symptoms improved. After five sessions over 10 weeks, complete resolution was achieved. One year later the patient remains symptom free. Using an osteopathic approach, gastroparesis can be treated economically and efficiently by addressing visceral and autonomic dysfunctions. Patients and physicians may benefit from considering OMT earlier in patient care to improve patient outcomes and reduce costs. Lara Householder, DO, MS; Anna Veach, DO; John Diefenderfer, DO

### Intersegmental sacral dysfunction as primary etiology of low back pain in a college athlete: A case study

**Introduction/Background:** The sacrum has 5 separate segments at birth that begin to fuse around age 18 with complete fusion around 30 years of age. Although much attention is given to sacral dysfunctions, osteopathic literature and teaching focuses on treatment of the articulations or motion of the whole sacrum, rather than intersegmental sacral dysfunctions.

**Case:** GG is a 19 year old cis female who presented to our outpatient clinic with 8 months of constant, severe, low back pain. Onset was insidious, although she is a college basketball athlete with a significant history of left leg genu valgus and leg length discrepancy status post multiple corrective surgeries at age 12. Previous treatments were chiropractic, physical therapy, and athletic training care which included cupping, dry needling, and use of a TENS unit. Medical management included NSAIDs, muscle relaxers, and topical creams and patches. None of these provided relief and she was forced to limit her activity. Examination revealed a complex intersegmental sacral somatic dysfunction. Osteopathic treatment was performed applying balanced ligamentous principles to each sacral segment.

**Results:** The patient had significant reduction in pain after one treatment and complete resolution of pain after her second. She was able to return to her full training and competition schedule.

**Discussion:** We theorize that the patient had intersegmental sacral dysfunctions that were not painful until sacral fusion began. This case highlights the importance of identifying and treating these types of sacral dysfunctions, especially in the pediatric and young adult populations. Anatomy literature addresses sacral segments and fusion but there is an opportunity for osteopathic thought in this area as current teaching and literature does not address intersegmental sacral somatic dysfunction.

Alecia Lentz, DO; Tracy Koehler, PhD; Garrett Caldwell, DO; Nicole Fremarek, DO

The 5 Models of Osteopathic Medicine, An approach to Transgendered Care: A Case Report

**Introduction/Background:** Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual and Plus (LGBTQIA+) individuals face significant health disparities and are underrepresented within the healthcare system. These individuals often do not receive care due to perceived stigma, healthcare knowledge deficits, and discrimination. These individuals have unique needs and this can contribute to health disparities.

**Case:** The patient is a 24-year-old Caucasian, transgendered, male who began testosterone therapy for gender dysphoria in 2016. He is status post (s/p) bilateral mastectomy in 2019. He initially presented to our clinic in 2020 for 4 years of back pain and poor posture. Osteopathic Manipulative Treatment (OMT) and intermittent Physical Therapy was instituted.

**Results:** This patient has continued to find improvement with OMT and has inspired thought on how transgender patient care can be seen through the 5 Models of Osteopathic Medicine including, but not limited to:

- Biomechanical: postoperative fascial changes, poor posture
- Respiratory-Circulatory: risk of postoperative lymphedema, cardiac arrhythmias, or lung disease
- Neurological: chronic pain facilitation and autonomic dysregulation
- Metabolic: physiologic changes due to hormone therapy
- Behavioral: psychologic changes with gender dysphoria and increased risk of depression/suicide

**Discussion:** Special considerations must be taken for LGBTQIA+ individuals. Addressing all aspects of health allows for improved outcomes and enables patients to obtain appropriate health care in areas needed most. In the literature, OMT has proven to be a safe, effective treatment in common complaints not specific to LGBTQIA+ patients and can provide a holistic approach to care. This case study is limited to a transgendered male approach of understanding LGBTQIA+ healthcare needs. Further studies could include a 5 Models approach to patient intake or evaluating specific somatic dysfunctions per transgender population.

*Jenna Martini*, *DO*; *Anna Veach*, *DO* **Osteopathic Treatment of Chronic Chest Pain After Trauma**  **Introduction/Background:** Chest pain is the second most common cause for emergency room visits and accounts for nearly three million outpatient visits in the United States annually with musculoskeletal etiology making up an estimated 40% of these cases. Despite this, there is a dearth of evidence-based recommendations for effective treatment of musculoskeletal chest pain and recommendations are often vague. This case study explores osteopathic manipulative medicine (OMM) as an effective option for treatment.

**Case:** 52-year-old male with past medical history of coronary artery disease, status post coronary artery bypass graft with one year of chronic chest pain following a bicycle accident with direct impact to hischest. He had constant sternal pain which significantly disrupted activities and sleep. Extensive priorchest imaging and cardiac evaluation were negative. There was no significant improvement withmedications, physical therapy, acupuncture, chiropractic care, or massage. Osteopathic exam andtreatment was targeted towards areas of somatic dysfunctions including: rib cage, sternum, pericardialfascia, and diaphragm.

**Results:** Patient had significant reduction in pain and stopped pain medications after one OMM treatment, with complete resolution of pain after 6 treatments over 8 weeks. Not only was he able to resume normal activities but also cancelled a scheduled cardiothoracic exploratory surgery.

**Discussion:** There is limited guidance for treatment of patients with musculoskeletal chest pain, which is associated with a significantly impaired quality of life. This case study demonstrates resolution of chronic post-traumatic chest pain using OMM in a medically complex patient who did not improve with other commonly recommended therapies. Study may be limited by concurrent chiropractic care. Further research is recommended to explore rates of success using osteopathic medicine for the common condition of musculoskeletal chest pain.

#### David Risov, DO; Roderick Geer, MD

#### An Osteopathic Approach To Refractory Sternal Pain

**Introduction/Background:** Chest pain causes can be cardiovascular, pulmonary, musculoskeletal, gastroenterologic, and psychogenic. A 2013 review<sup>1</sup> showed that chest pain accounted for 1 to 3% of PCP visits, with 21% to 49% of the chest pain diagnosed as musculoskeletal in

origin. Serious underlying cardiac or gastrointestinal issues are typically ruled out initially, however if origin is deemed to be musculoskeletal, options for conservative therapy (NSAIDS, topical creams, injections, stretching, PT) are non-specific and can be lacking in effectiveness.

**Case:** A 58 year old female with history of multiple car accidents who presented for several-year history of generalized sternal pain refractory to multiple different anti-inflammatory medications and gels, previous sternoclavicular injection, and several courses of physical therapy. Cardiac and rheumatologic work up were negative and MRI showed mild bilateral sternoclavicular joint arthropathy and incidental small hiatal hernia. Pain was thought to be secondary to costochondritis with osteopathic exam revealing thoracic/posterior rib dysfunctions, SC joint restrictions, and manubrial fascial restriction. Over 3 months, she had monthly OMT treatments mainly focused on muscle energy and myofascial treatments to her thoracic spine, ribs, sternoclavicular joints and sternal fascia.

**Results:** The patient experienced significant relief of her symptoms after each treatment. She reported up to 70% relief after each treatment and was able to decrease her pain medications, including discontinuing twice per day gabapentin, as well as decreasing frequency of as needed Celebrex.

**Discussion:** Sternal pain can be caused by a multitude of issues, including serious cardiac or GI origins. However, if these underlying causes are ruled out, there are not many well-established conservative treatments. OMT should be considered as a first-line treatment for patients with sternal pain of musculoskeletal origin.

 Ayloo A, Cvengros T, Marella S. Evaluation and treatment of musculoskeletal chest pain. *Prim Care*. 2013 Dec;40(4):863-87, viii. doi: 10.1016/j. pop.2013.08.007. PMID: 24209723.

## Carissa Rosten DO; Katherine Nixon, DO; LeAnn Jons Cox, DO

## An Osteopathic Approach to Plagiocephaly in the Absence of Pre-Post Sphenoid Fusion

**Introduction/Background:** The pre and post sphenoid fuse through the sphenoid sinus during the 8th month of gestation. This does not occur in the Trisomy 21 fetus. As a result, the sphenoid does not correctly transfer cranial motion from the sphenobasilar synchondrosis to

the face. This contributes to both atypical plagiocephaly patterns and Down's facies, since the extraocular muscles originate on the (now untethered) greater wing of the sphenoid. The sphenoid sits vertically, contributing to an atypical brachycephaly.

**Case:** 7 month male presents with postural plagiocephaly apparent at 6 weeks.

Born at 35.2 by cesarean section, Trisomy 21, Atrial and Ventricular Septal defects, GERD, hypotonia. Neonatal intensive care for 5 weeks upon birth for hypoglycemia, poor feeding (required nasogastric tube), and hypoxemia.

Osteopathically: left lateral strain, brachycephaly, right tongue deviation, Atlas Rr, right SI joint restriction

#### **Results:**

OMT visits twice weekly (x4), then weekly (x4), then biweekly.

Visit 11: reduced cranial asymmetry, reduced brachycephaly, reduced GERD, discontinued famotidine.

Resolved: noisy breathing, torticollis, and difficulty suckling.

**Discussion:** In the Trisomy 21 patient, altered cranial mechanics require an atypical plan of care. Standard cranial treatments assumed a fused sphenoid and did not retain improvement in this patient. The left lateral strain was held primarily by the right styloglossus muscle. Direct inhibition and myofascial release to this muscle permitted temporal motion. The occiput itself carried an intraosseous strain and improved with direct cranial approach. Treating atlas reflexively softened the stylopharyngeal muscles, as these developed from the same somite. Treating a patient with Down's requires consideration of not just the innate cranial mechanism, but of muscular and embryologic influences on the altered development of the skull.

## Megan Sofka DO; Athina Giovanis DO 26.2 Miles: A Case Study of Osteopathic Manipulative Treatment in Marathon Training

Running is a popular sport worldwide and includes up to 40 million people who run regularly in the U.S. It is also a sport that is prone to injury of the lower extremity, with a wide range in incidence ranging from twenty percent to up to eighty percent of all runners sustaining an injury each year. Injuries vary in the lower extremity, but frequently occur in the knee due to overuse. Subsequently knee pain is a common complaint among long-distance runners. Numerous causes have been linked to the source of runner's knee pain, however the most common include overuse, malalignment, and trauma. A characteristic pain pattern includes patellofemoral pain, which is anterior knee pain that encompasses the patellar region.

Knee pain is assessed in active patients in various specialties including primary care, orthopedics, and sports medicine. The imaging and treatment of knee pain is highly diverse, including imaging, medication, injections, physical therapy, and adjunctive therapies such as ice or wearing a brace. The role of osteopathic manipulative treatment (OMT) in runners requires a closer inspection of a possible role of OMT for marathon running and its distinct training preparation and recovery methods since literature is limited. A 40-year old female presented with a 2-month history of bilateral knee pain while preparing for the New York City marathon. Prior to OMT, the patient was evaluated by an Orthopedic physician, including imaging of both knees, showing mild degenerative joint disease. After 10 applications of OMT, utilizing various treatment modalities, the patient expressed resolution in bilateral knee pain despite continuing her training for both a half marathon and full marathon.

## Yang (Jenny) Song, DO; Michael Waddington, DO

Symptomatic Mitigation of a Rare Case of Chronic Active Epstein-Barr Virus (CAEBV) Disease Using Lymphatic Osteopathic Manipulative Treatment

**Introduction:** Chronic active Epstein-Barr virus (CAEBV) disease is defined as elevated EBV infection in the bloodstream as well as tissue infiltration, lasting for greater than 6 months, in the context of immunocompetency. CAEBV has been shown to involve the central nervous system in the first case ever autopsied, with MRI showing multiple abnormal intensity areas in the brain and spinal cord.

**Case Presentation:** A 32-year-old immunocompetent female with a 15-year history of neck and back pain, fatigue, sore throat, earaches, lightheadedness, and chronic sinus pressure presents for a neuromuscular specialty (NMM) consultation. Her symptoms have been worsening despite physical therapy and naturopathic approaches. Cranial MRI 14 years ago displayed concern for demyelination. Her neurological examination has been unremarkable without myelopathy.

The lymphatic system, responsible for excreting wastes and toxins, impacts the immune system significantly. Chapman point release for the middle ear, oropharynx, sinuses, cerebellum, cerebrum, neck, and lungs, thoracic inlet release, craniosacral therapy, and re-doming of the diaphragm were employed to decrease sympathetic tone, increase myofascial motion, and improve lymphatic return to areas of visceral pathology.

**Results:** The patient reported amelioration of thoracolumbar and cervical stiffness and resolution of ear, nose, and throat symptoms, as well as lightheadedness, post 3 NMM treatment visits spaced 4 weeks apart.

**Discussion:** Lymphatic manipulation techniques were able to effectively improve CAEBV symptoms. Further research is needed to elucidate the role of mononucleosis on nervous system and autonomic dysfunctions. The mechanisms of EBV reactivation should be explored further to shed light on novel antiviral therapies. Our case is limited by confounding factors such as the patient's previous caesarian section and cholecystectomy yielding surgical scars and adhesions resulting in neuro-myofascial changes, and her anxiety altering symptomatic perception.

Karen Vega, DO; Hugh Ettlinger, DO, FAAO, FCA

## A Case Study of Osteopathic Manipulative Treatment (OMT) in Deformational Plagiocephaly (DP)

**Introduction/Background:** DP is an asymmetric head shape due to unilateral flattening, an abnormality that may result from prematurity with increased hospital stay with prolonged supine positioning, or congenital torticollis. Risk factors also include being male and premature birth. Diagnosis of DP is made upon physical exam (PE) by a pediatrician at 2 months of age. Treatment for DP ranges from caregiver education on repositioning and physical therapy, to cranial orthotics and surgery. Currently, treatment recommendations do not include Osteopathic Cranial Manipulative Medicine (OCMM), a treatment modality offered by OMM specialists applied in the cranial region.

**Case:** We present a case of a 4-month-old male diagnosed with DP, referred to the SBH Women's Health Center (WHC) OMM clinic for further evaluation and management. His birth history is significant for preterm delivery

via repeat cesarean section, and immediate admission into the neonatal intensive care unit for a total of 9 days, during which he received phototherapy for hyperbilirubinemia, requiring prolonged time in supine position. On initial OMT visit his PE was notable for right (R) frontal bossing and R occipitoparietal flattening. An osteopathic structural examination (OSE) was notable for midline supraocciput and bilateral intraosseous strains, and right upper and left lower sacral poles resistant to lateral distraction. OCMM and Balanced Ligamentous Tension (BLT) were applied for OMT.

**Results:** By the 4th treatment, his mother reported decreased preference to R rotation, with significant improvement on PE of his R frontal bossing by the 6th visit. OSE in cranial and sacral regions developed lateralization and reduced.

**Discussion:** OMT using OCMM and BLT, in addition to caregiver positional education, was used in this case to safely treat and help improve DP in this infant.

## Ambreen Wajid, DO; Hugh Ettlinger, DO, FAAO, FCA

## Banging Out Concussions: The Role of Osteopathic Manipulative Treatment in Post-Concussion Syndrome in Children

**Introduction/Background:** Post-concussion syndrome (PCS) can have a significant and wide range of impact on children. This condition is characterized by a variety of symptoms that can persist for weeks or even months after a concussion and can interfere with a child's ability to participate in activities, attend school, and interact with friends and family. It is important for children with PCS to receive appropriate medical care and support in order to manage their symptoms and prevent further complications.

**Case:** This case involves a 6-year-old child who presented with a history of severe concussion 18 months prior from a tree branch falling on his head. His PCS symptoms involved dizziness, slowed response time, head/neck/shoulder pain, and cognitive impairment. Over the next 1.5 years, the patient was treated with Osteopathic Manipulative Treatment (OMT), including osteopathy in the cranial field, balanced ligamentous tension, and myofascial release.

**Results:** Throughout the time at OMT clinic, the patient and his mother endorsed gradual and sustained improvement of his PCS symptoms. The patient's dizziness, cognitive impairments, and head/neck/shoulder pain had significantly improved, which correlated with the reduction of severe somatic dysfunction initially found, such as the sphenobasilar synchondrosis compression and decreased motion in the sacrum.

**Discussion:** This 6-year-old child with PCS found sustained improvement in their physical and mental symptoms through OMT. Although limited to only one patient, this case study demonstrates the benefit and role that OMT has in treating children with PCS, as it provides a non-invasive modality to alleviate a multitude of physical and mental symptoms.

## EDUCATION AND PUBLIC HEALTH

Samantha Tyler, DO; Ryan McMunn, DO; Emily Ruedinger, MD

Approaching the barrier: Improved pediatric resident knowledge and confidence in osteopathic manipulative medicine after a resident-led educational intervention

**Background:** Osteopathic manipulative medicine (OMM) is a safe, effective, low-cost intervention focused on optimizing bodily function through applied anatomy. Only two ACGME accredited pediatric residencies have osteopathic recognition, leaving most pediatric residents without residency-level osteopathic education. Literature suggests exposure to osteopathic training during residency increases resident utilization of OMM in patient care. Offering osteopathic education at more sites will bridge this educational gap and likely increase patient access to OMM.

**Objective:** This study aimed to assess pediatric residents' knowledge of one osteopathic technique, confidence in performing OMM, and likelihood to perform OMM in patient care after an educational session about OMM.

**Methods:** Two DO residents at the University of Wisconsin pediatric residency designed and taught a required half-day educational session to MD and DO residents about OMM, including basic principles and hands-on application of four techniques (soft tissue, counterstrain, muscle energy, and visceral). Participating residents were sent pre- and post-session, anonymous, voluntary surveys to determine the intervention's impact. Analysis was performed using unpaired t-tests.

**Results:** Data from eighteen pre-session (29% DOs, 55% response rate) and fifteen post-session (27% DOs, 45% response rate) surveys revealed a statistically significant increase in residents' knowledge about (p=0.029) and confidence in performing (p=0.029) OMM following the educational session. There was a non-significant trend toward increased likelihood to personally perform OMM in patient care.

**Conclusion:** A single, required, half-day, resident-led educational session about OMM effectively increased pediatric resident knowledge about and confidence in performing OMM techniques. Similar sessions can equip pediatric residents with the ability to effectively incorporate OMM into patient care. Further research should assess the optimal frequency of such activities and explore their effects on long-term knowledge and utilization of OMM.

Matthew Wysong, DO; Duane Copenheaver, DO; Lydia Powers, DO; Ryan Flaherty, DO

## Incorporation of an osteopathic-focused lecture series into an already established pediatric residency curriculum

**Introduction:** In 2022, 19.7% of pediatric interns were osteopathic graduates. Despite this volume, few residency programs have dedicated osteopathic education. Thus, it is challenging for osteopathic residents to maintain and sharpen osteopathic skills. As a result, allopathic residents have minimal exposure to osteopathy and a limited view of its application. This project implemented an osteopathic-focused curriculum and assessed understanding of OMT amongst MD and DO residents.

**Methods:** The first of four lectures was a brief introduction into osteopathy followed by 3 case-based lectures where OMT was integral to the care plan. These lectures were attended by DO and MD residents. A 6 question Likert scale survey was distributed pre- and post-curriculum assessing for understanding of OMT, indications for OMT, comfort utilizing OMT and clinical benefit of OMT.

**Results:** We collected 100 pre-curriculum survey responses and 46 post-curriculum. Allopathic residents demonstrated statistically significant increases in comfort explaining differences between MD and DO physicians (65% pre, 71% post, p = 0.0088), comfort explaining basics of OMT (22% pre, 62% post, p < 0.0001), and

comfort identifying clinical indications for OMT (22% pre, 58% post, p = 0.0001.) Combined MD and DO responses demonstrated statistically significant increases in comfort using OMT (0% to 39%, p < 0.0001), seeing clinical benefit in OMT (69% to 86%, p = 0.0014) and likeliness of referral for OMT (62% to 82%, p = 0.001).

**Discussion:** Our 4-part curriculum increased understanding of OMT and its role in patient care. Limitations include fewer post-survey respondents and lack of a validated survey to assess these specific areas. In sum, this work demonstrates significant impact of a brief curriculum on utility and benefit of OMT for all pediatric residents.

## ORIGINAL RESEARCH

Nancy Asseraf DO; Jonathan Torres DO, MPA, FACOFP, FAAO

#### Study Size Variation Based on Specialty and Intervention Type

**Background:** The field of Osteopathic Manipulative Treatment (OMT), a procedure-based intervention, is challenged by modern demands for evidence-based research. Literature review yields criticisms of inadequate study size and lack of long term follow up in OMT studies. To address this, we hypothesize that medication-based interventions and observational cohort studies have larger study sizes compared with prospective, procedure-based interventions typical of OMT studies.

**Methods:** This is an IRB exempt feasibility study of original research published in medical journals from varying specialties. The full study will review articles published between January 2015 through December 2020 within 25 medical/surgical specialties, and will compare OMT studies to procedure and medication-based studies.

For this feasibility study, **The Journal of Bone** & **Joint Surgery and Annals of Surgery** were reviewed between January 2015-December 2015 and January 2015-October 2015 respectively. Intervention, study type, duration, earliest outcome assessment, and final outcomes assessment were analyzed.

**Results:** A total of 274 articles were reviewed in both journals. The average prospective study size for medication and procedure studies were 140 (n=11); 122 (n=30) respectively. 22% of published articles were prospective. Average study size per type are as follows: prospective

(188); Retrospective (880); META (3765); Observational/Cohort (100,616).

**Discussion:** Review of the preliminary data supports our hypothesis. In surgical journals, the average size for prospective study was 188 compared to 100,616 for cohort study, an over 500-fold difference. Limitations of the study involve human error during article review and limited access to full text articles. Despite these limitations, this data supports smaller prospective OMT studies. Further investigation will compare OMT and procedure/ medication medication-based studies over 5 years. The ultimate aim is to dispute criticisms and support the reputation of Osteopathic treatment modalities.

Nicole Fremarek, DO, MBA; Elizabeth Hammond OMS III; Shaunak Digambar OMS I; Hope Tobey, DO, FAAP, FACOP; David Harden, DO, FAAFP; David Redden, PhD; Nicholas Sullivan, DO, MA; Gautam Desai, DO, FACOFPdist.; Kevin Treffer, DO, FACOFP; Albert Kozar, DO, FAOASM

#### "That's The Way We Have Always Done It": Resetting the Hips

**Introduction/Background:** In Osteopathic Medicine, techniques are commonly passed down through generations, including "Resetting the Hips"(RTH). RTH is performed to align the pelvis prior to diagnosing innominate somatic dysfunction (I-SD). In the literature, RTH is discussed and taught inconsistently, has varied terminology, and its' efficacy has not been reported.

**Objective:** This two-part study includes: a survey and a prospective study. Part one aims to determine if and how Osteopathic medical schools (OMSc) teach RTH. Part two aims to determine if RTH impacts I-SD diagnosis. We hypothesize there will be a variation in the way RTH is taught at OMSc and RTH will not impact I-SD diagnosis.

**Methods:** We surveyed Educational Council of Osteopathic Principles (ECOP) members regarding RTH use, taught as active or passive, introduction timing, and terminology used. We conducted a prospective, single-blinded, randomized control study of 150 osteopathic medical students and staff into 3 groups: No RTH, active RTH, and passive RTH. ONMM residents or faculty performed all landmark assessments. We utilized a paired design with comparison made using a RMLE-based score test. The primary hypothesis was compared using McNemar's test for paired proportions using Type I error.

**Results:** 28 (54.9%) surveys were returned. 27 (96.4%) teach RTH. 80.8% teach RTH with active hip lowering and 61.5% active leg return. Final prospective data will be analyzed statistically for the poster.

**Discussion/Conclusion:** Variations were found in the teachings and use of RTH. RTH does not impact I-SD diagnosis. These findings will assist in advancing osteopathic OMSc curriculum. Future studies could evaluate prone RTH, interraterreliability, or evaluator dominant eye impact. Limitations include: recruitment population, interrater reliability, and response rate of survey.

Kristopher Schock, DO; Christopher Ciccone, OMS IV; Michael Mitkos, OMS III; David T. Redden, PhD; Hollis H. King, DO, PhD, FAAO, FCA; Albert Kozar, DO, FAOASM

## **Quantifying Osteopathic Palpatory Motion**

**Introduction/Background:** Palpation is an examination procedure in which kinesthetic and tactile perceptual sensations are utilized to feel small finite motions, which is fundamental to manual medicine diagnosis and treatment. Few studies have evaluated human's smallest palpable motion threshold (SBMT).

**Objective/Hypothesis:** To determine the SBMT to the tens of micrometers in trained and un-trained subjects. We hypothesize that osteopathic medical training will improve SBMT.

**Methods:** A prospective, randomized controlled trial of 50 non-trained individuals was compared to 100 trained individuals (students, residents, and experienced practicing physicians), blinded to visual and auditory stimuli, palpated a device containing a movement actuator that produced 6 series of 27 randomly ordered motions or non-motions events: 25% contractions, 25% expansions, and 50% non-motions. Each series was within a defined motion range in sets of 100 micrometers from 50-1050. Participants start with 450-549 micrometer range and move up or down based on <70% correct profile. 2022-2023 results have been added to 2018-2020 data. Groups compared with paired t-tests with significance set at P=.05.

**Results:** To date, Osteopathic physicians (n=10) on average were able to palpate down to  $-356\mu$ m (SD 212 $\mu$ m) with 2 being able to palpate <100 $\mu$ m (20%).

Non-osteopaths (n=20) averaged their smallest palpatory increment at ~418 $\mu$ m (SD 324 $\mu$ m). Student (n=24) and Resident (n=12) averages were similar to physicians but more variable. Complete data and full statistical analysis will be presented.

**Discussion/Conclusion:** We have defined the SBMT in groups of non-trained individuals and trained Osteopaths. Subject's SBMT trends toward being inversely proportional to number of years in training. Future study includes IRB/AAO approval for evaluation of more practicing osteopaths at 2023 convocation. Limitations to the study were sample size, and single sided actuator.

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## Ultrasound Assessment of OMT on Diaphragm Motion

**Introduction/Background:** Recent research has investigated ultrasound (US) as an effective means to assess the diaphragm, but no research has been published that quantifies the effect of Osteopathic Manual Therapy (OMT) on the motion of the diaphragm. Osteopathic principles consider the thoracoabdominal diaphragm motion an important component of health.

Objective/Hypothesis: This prospective, observational, pilot study aims to determine if and how much OMT can affect changes in diaphragm motion based on US measurements obtained before and after treatment. We hypothesize that OMT will increase diaphragmatic movement significantly, both at rest and with maximal inspiratory effort. Methods: 20 "healthy" male & female volunteers ages 18-40 were recruited. Pre-OMT and post-OMT diaphragm assessments were completed using multiple B-mode and M-mode US images: including muscle thickness and motion characteristics of resting (tidal variability) and maximal inspiration of both the zone of apposition (lateral wall) and dome of the diaphragm. All subjects underwent 15 minutes of OMT, which was a combination of an adapted MOPSE protocol and individualized AGR treatment. Final statistical analysis included simple mean, standard deviation, proportions, and paired t-tests.

**Results:** Preliminary data (n=4) demonstrated statistically significant average increase in bilateral diaphragmatic

done and lateral wall motion post OMT in 8 of 12 parameters measured, best exemplified by left zone of apposition maximal inhalation increase of 5.8 cm on average. Final data will be complete with full statistical analysis.

**Discussion/Conclusion:** OMT demonstrated a statistically significant increase in diaphragmatic motion after

OMT. We plan to extend this pilot project to a prospective, randomized study in subjects with and without chronic pulmonary diseases. Limitations include US measurement variability, lack of blinding, and study limited to healthy subjects.