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in teaching, promoting, and researching the science, art, and philosophy of osteopathic medicine, with the goal of integrating osteopathic principles and osteopathic manipulative treatment in patient care.

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Below are topics available to reserve if you would like to support your portfolio with academic writing:

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• Osteopathic approaches for the cardiac patient
• The body triune: osteopathic treatment of mind and spirit for today’s patient
• Beyond Spencer technique: OMT for shoulder overuse
• Using OMT to treat patients with long-term side effects of radiation for cancer treatment

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The mission of The AAO Journal is to facilitate a forum, with a sense of belonging, ensuring the opportunity for the present osteopathic community and its supporters to honor the past accomplishments, promote the osteopathic tenets, and advance osteopathic research and its influence within the medical field.

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☐ Submission emailed to editoraaoj@gmail.com or mailed on a flash drive or CD to the AAOJ managing editor, American Academy of Osteopathy, 3500 DePauw Blvd, Suite 1100, Indianapolis, IN 46268-1136

☐ Manuscript formatted in Microsoft Word for Windows (.doc, .docx), text document format (.txt), or rich text format (.rtf)

Manuscript Components

☐ Cover letter addressed to the AAOJ’s editor-in-chief with any special requests (eg, rapid review) noted and justified

☐ Title page, including the authors’ full names, financial and other affiliations, and disclosure of financial support related to the original research or other scholarly endeavor described in the manuscript

☐ “Abstract” (see “Abstract” section in “AAOJ Instructions for Contributors” for additional information)

☐ “Methods” section
  • the name of the public registry in which the trial is listed, if applicable
  • ethical standards, therapeutic agents or devices, and statistical methods defined

☐ Four multiple-choice questions for the continuing medical education quiz and brief discussions of the correct answers

☐ Editorial conventions adhered to
  • terms related to osteopathic medicine used in accordance with the Glossary of Osteopathic Terminology
  • units of measure given with all laboratory values
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  • journal articles and other material cited in the “References” section follow the guidelines described in the most current edition of the AMA Manual of Style: A Guide for Authors and Editors
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Please include permission to forward the manuscript to The Journal of the American Osteopathic Association if the AAOJ’s editor-in-chief determines that the manuscript would likely benefit osteopathic medicine more if the JAOA agreed to publish it.

Questions? Contact editoraaoj@gmail.com.
Spring is in the air! With it, graduates ready their caps and gowns, and thoughts turn to summer fun, sports and hiking, and vacation for some. This issue of The AAO Journal features two articles on sports-related injuries that are responsive to osteopathic manipulative treatment (OMT): Drew D. Lewis, DO, FAAO, and Jonathan Pickos, OMS V, detail a case of restoring full squat range of motion with upslipped innominate; David M. Kanze, DO, FAAO, describes a new approach to treating scapular dysfunction; and Edward K. Goering, DO, and Lisa Qiu, OMS II, illustrate how OMT benefited an amateur soccer player suffering from worsening hip pain. These injuries are common in athletes, which begs the question, how can OMT help in injury-specific athletic concerns?

A review of the literature shows a paucity of studies on OMT in specific athlete populations. In reviewing the literature, there is a 2017 article by Curcio detailing the use of Spencer technique with baseball pitchers. Stress fractures seem to be another area of interest for OMT studies and in particular, prevention of stress fractures in long distance runners. Brumm et al performed a study on 1800 collegiate athletes and found a statistical decrease in the number of stress fractures in male athletes after receiving OMT.

Using OMT for prevention, not just disease or injury, seems to be a concept the profession is just beginning to explore. While we think of prevention in the public health arena, OMT for the primary purpose of prevention is a concept not currently taught at osteopathic medical schools. Indeed, we teach that one must have a somatic dysfunction diagnosis in order to bill and code for OMT.

Athletic performance improvement with OMT is taking on another layer of complexity, but this too is an area ripe for exploration. Short track speed skater Apolo Anton Ohno purportedly credits OMT for at least 1 of his 2 gold medal Olympic wins.

While the majority of us do not perform to the level of Olympic athletes, the question of primary prevention OMT for sports injury needs further exploration. I live near Eugene, Oregon, known as “Track Town USA,” which hosts some of the top track and field athletes every June. Collaboration with events such as these, as well as with collegiate teams, is primed with early findings of OMT improving athletic outcomes. Moving OMT beyond the insurance realm is a prerequisite in order for these collaborations to occur, and recognizing its benefit in terms of health promotion, not just disease prevention.

As for me, I don’t fall in the “extreme athlete” category and will happily hike while plodding along at my snail’s pace. For those inclined towards sports OMT and performance though, the “pump has been primed” for OMT to be the next big thing in athletic performance and injury prevention. Are you up for the task?

In Gratitude,

Janice Blumer, DO, FAAO

References
## AAO Calendar of Events

Mark your calendar for these upcoming Academy meetings and educational courses.

### 2019

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<th>Event</th>
<th>Location</th>
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<td>AAO Publications Committee's teleconference—7 p.m. Eastern</td>
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<tr>
<td>June 13-16</td>
<td>“Introduction to Osteopathic Manipulative Medicine: Integrating OMM Into Clinical Practice and Teaching”—Lisa Ann DeStefano, DO, course director—The Pyramids in Indianapolis</td>
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<td>June 19</td>
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<tr>
<td>Aug. 2-3</td>
<td>SAAO Executive Council’s meeting—Indianapolis</td>
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<td>Aug. 16-18</td>
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<td>Sept. 2</td>
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<td>Nov. 15-17</td>
<td>“Traditional Osteopathic Techniques of Carl Philip McConnell, DO”—Richard G. Schuster, DO, course director—Ohio University Heritage College of Osteopathic Medicine in Dublin</td>
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<td>Nov. 28-29</td>
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<td>Dec. 11</td>
<td>Committee on Fellowship in the AAO’s teleconference—8 p.m. Eastern</td>
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### Continuing Studies: The Nose and Throat

**Andrew Goldman, DO, Course Director**  
October 4–6, 2019  
University of New England COM | Biddeford, Maine

This will be an in-depth exploration of the nose, mouth and throat. We will hear anatomy lectures from Frank Willard, PhD and Mark Schuenke, PhD. There will be special dissections relevant to the course that will be on display for the participants during the extended lunch hour of the second day of the course.

SCTF faculty will present lectures and labs with practical information for treatment of the mid-face, mouth and throat. This course follows The Eye in 2016 and The Ear in 2017. Both of these courses were excellent and very well received. This course will also keep to that high standard and will be full of useful information and experiences. We’re looking forward to sharing it!

**Prerequisites:** 2 Approved Basic Courses; 1 of which must have been an SCTF Basic Course.

**CME:** 18.5 hours 1-A CME Anticipated

**Course Tuition:** $825 before August 3rd | $875 after August 3rd

**Lodging:** Group Lodging at Holiday Inn Express, Saco  
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### Stay Connected:

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Restoring Full Squat Range of Motion by Applying OMT to Superior Innominate Shear: A Case Report

Drew D. Lewis, DO, FAAO, and Jonathan Pickos, OMS V

Abstract
Hamstring injuries in sports are common and often require rest or more active rehabilitative efforts before returning to sport-specific participation. This case report provides a potential framework of osteopathic manipulative treatment (OMT) for an acute traumatic superior innominate shear where traditional medical treatment, including physical therapy sessions, failed to provide significant and/or complete resolution.

In the present case report, a 17-year-old male high-school athlete presented with hamstring strain and proximal hamstring and low back pain, following a hurdle injury with fall on extended knee. He was found to have significant somatic dysfunctions related to his condition. An OMT approach was utilized to provide relief, restore his full squat range of motion, and ultimately return to non-restricted football and basketball participation.

Background
Hamstring strains represent a large portion of musculoskeletal injuries in sports at the high school, collegiate, and professional levels with track, football, and rugby athletes being particularly susceptible to these injuries. The common origin of the hamstring musculature on the ischial tuberosities of the pelvis represents a possible intersection for hamstring injuries and unilateral superior innominate shears. By extrapolation, it is possible that a superior innominate shear could cause a hamstring strain and vice versa. The overall incidence of unilateral superior innominate shear, otherwise known as innominate upslip, has not been identified or examined.

Travell and Simons detailed the relationship between painful conditions related to dysfunction of the quadratus lumborum muscle and the predisposing and perpetuating issue of a leg length discrepancy or short leg syndrome. In the authors’ experience, quadratus lumborum strains can be causative or maintaining factors of superior innominate shear somatic dysfunction and similarly painful conditions.

In a study by Qureshi et al examining the effects of somatic dysfunctions (SD) on leg length discrepancy (LLD), the authors found 26% of participants displayed a left superior shear, and approximately 7% demonstrated a right superior shear, all of which were asymptomatic. The possible connection between hamstring strain injuries and superior innominate shear has not been further investigated.

The purpose of this case report is to provide an osteopathic manipulative medicine approach to a patient who is an athlete suffering from chronic hamstring strain symptoms related to a track and field injury that failed to resolve with physical therapy.

Optimal management of the patient’s recovery included addressing significant somatic dysfunctions, progressive increases in activity participation for athletics, and stretching prescription for persistent muscular tightness.

Report of Case

Presentation
A 17-year-old boy presented to the authors in a clinical setting. He described a chief complaint of 10 weeks of right proximal hamstring pain, decreased range of motion, and limited activity in high

(continued on page 8)
school summer football sports preparation. The symptoms started during track season after a misstep during hurdle training where the patient described clipping a hurdle with his back (left) leg and landing with the right leg at approximately 45 degrees of hip flexion with the leg fully extended and ankle dorsiflexed (see Image 1). He described a burning, pins and needles as well as sharp-stabbing pain with tightness. Pain was rated a 5 to 7 out of 10. Symptoms were present over the whole posterior thigh region but radiated up into the buttock at times (see Figure 1). Symptoms were aggravated with walking or sitting for extended periods. Pain was persistent since the injury and range of motion worsened with increasing activity. The patient also reported weakness in the knee with “cutting” movements and the knee giving out on him once while playing basketball. No knee pain, clicking, or swelling occurred either immediately after the hurdle injury or later, and he denied any diagnosed knee joint condition. He denied any prior injuries to the knee, hip, or low back. Functionally, he reported jogging was OK but running was not tolerated. He had to cancel playing in the summer basketball league and was anxious that he would not be able to participate in summer football training.

The patient did not have a history of any surgeries. Family and social history were also non-contributory.

**Physical and Osteopathic Structural Exam**

The patient’s vital signs were stable. Upon cognitive examination, the patient was alert, oriented, and in no acute distress. He followed commands without difficulty. Mood and affect were appropriate, and he was well groomed. Language was normal in fluency, content, context, intelligibility, and response latency. Gait exam revealed slight tilt of torso to left; otherwise, no ataxia or imbalance was appreciated. Heel and toe walking were without weakness or difficulty. Cranial nerves were grossly intact. Gait exam revealed normal stride, heel/toe progression without gross asymmetry or deviation.

A modified ASIA (neurologic) exam was performed for the lower half of the body. Sensation was intact to light touch in the bilateral L2-S2 dermatomes. Deep tendon reflexes were 2/4 in the bilateral patella and 2/4 in the bilateral Achilles. A motor exam revealed 5/5 full strength in lower limb muscles assessed, including hip strength.

His goals were to “get better and go back to sports without pain.”

**Medical History and Review of Systems**

Medical history was significant for growth of 8 inches (height 77 in.) over the prior 2-3 years. Cetirizine was taken daily for environmental allergies, and the patient reported a history of asthma.
(continued from page 8)

When attempting to squat to full depth (see Image 2) as well as decreased range of motion with knee extension on the right. Hip flexion, internal rotation, external rotation, and knee flexion were without gross deficits bilaterally.

A focused structural exam was performed at the first visit. The following somatic dysfunctions were appreciated: right quadratus lumborum (QL) tender point, biceps femoris (BF) tender point, left-on-left forward sacral torsion, and right superior innominate shear (upslip).

First Treatment

The somatic dysfunctions were treated with osteopathic manipulative treatment (OMT) techniques. Still technique was used for the right superior innominate shear. Counterstrain was used for tender points of the quadratus lumborum and semimembranosus muscles. Soft tissue techniques were used for general muscular tightness in the thoracic and lumbar regions (see Table 1). On reexamination, the somatic dysfunctions were resolved, and the patient experienced immediate improvement in range of motion (approximately 25° by visual estimation) while squatting.

(continued on page 10)
Second Treatment
The first follow-up visit occurred 1 week later. The patient reported significant improvement, decreased pain, and increased ability to participate in football practice.

A broader osteopathic structural exam was performed, revealing significant somatic dysfunctions of the lower extremities, pelvis, sacrum, lumbar, and thoracic spine (see Table 2).

Figure 2. Pain diagram on follow-up at third OMT session. Legend: o o o = pins and needles; • • • = tightness; // / = stabbing; X X X = burning; ▲ ▲ ▲ = aching.

Treatment Course
At the third visit, 2 weeks after the initial visit, the patient reported tolerating athletics and weightlifting well. He still experienced residual tightness in the proximal hamstring that minimally limited his participation in football practice (see Figure 2). He rated his pain 3/10 and was doing much better from his initial presentation. He had yet to participate in basketball at full speed and was planning to do so between his third and fourth visits.

The patient continued to demonstrate a minimal superior innominate shear on the right side as well as a residual tender point in the right quadratus lumborum muscle (see Table 3).

At the fourth visit, 3 weeks after the initial visit, the patient reported minimal hamstring tightness, rating his pain 3/10 (see Figure 3) and reporting continued improvement in activity for football practice. He also participated in full-contact basketball and experienced no significant symptoms.

He continued to demonstrate a significantly improved and now minimal superior innominate shear on the right side as well as a residual tender point in the right quadratus lumborum muscle (see Table 4).

At the conclusion of the fourth OMT treatment, a self-stretch for the right QL was prescribed and demonstrated, and a patient education handout was provided. The goal of this self-stretch was (continued on page 11)
to help address the persistent minute right superior innominate shear and maintain balance of the pelvis long-term.

**Fifth Treatment**

At the fifth visit, 7 weeks after the initial visit, the patient reported minimal right hamstring tightness, rating his pain (<2/10) (see Figure 4). He described continued improvement in activity for football practice, and he also reported full participation with basketball with no significant symptoms experienced.

His minimal superior innominate shear and sacral torsion from the prior visit resolved and did not return. Some common compensatory (fascial) patterns were present as well as a few tender points (see Table 5).

At the end of the fifth visit, the patient demonstrated his squat range of motion, which he described as feeling full, without restriction (see Image 3).

(continued on page 12)

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**Table 3.** Third OMT session, given 2 weeks after initial visit.

<table>
<thead>
<tr>
<th>Body area</th>
<th>Somatic dysfunctions</th>
<th>Technique applied</th>
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<tr>
<td>Lower extremity</td>
<td>Semimembranosus tender point (tp), right</td>
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<tr>
<td></td>
<td>Biceps femoris tp, right</td>
<td>CS</td>
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<tr>
<td></td>
<td>Psoas tight, left</td>
<td>ME, Still</td>
</tr>
<tr>
<td></td>
<td>Piriformis tight, left</td>
<td>ME</td>
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<td>Lumbar</td>
<td>Lumbar paraspinal tightness, bilaterally</td>
<td>ST</td>
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<tr>
<td></td>
<td>Quadratus lumborum tp, right</td>
<td>CS</td>
</tr>
<tr>
<td></td>
<td>Iliac crest high left; pelvic roll right</td>
<td>ME</td>
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<td></td>
<td>fascial pattern</td>
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<td>Thoracic</td>
<td>Thoracic paraspinal tightness, bilaterally</td>
<td>ST</td>
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<td></td>
<td>Thoracolumbar shift, right fascial pattern</td>
<td>ME</td>
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<td>Pelvis</td>
<td>Superior innominate shear, right (but</td>
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<td></td>
<td>considerably improved)</td>
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<td></td>
<td>Anterior rotation, right innominate</td>
<td>ME, leg tug</td>
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<tr>
<td>Sacrum</td>
<td>Left-on-left forward sacral torsion</td>
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(continued from page 11)

Discussion
This case presents an example of the utility of OMT in an athlete with hamstring strain and proximal hamstring and low back pain. He presented with numerous somatic dysfunctions that would not have resolved without a detailed understanding of the mechanism of injury and a thorough osteopathic structural exam.

The mechanism of injury in this case, that of a hurdler landing on the right lower extremity with the hip in relative flexion and knee fully extended, certainly would not surprisingly support a superior shear dysfunction of the innominate. But as the hip was flexed approximately 45° per the patient’s account, it is not surprising that there would also be an induced innominate rotation. As we use leg lugs at approximately 30° to de-rotate an anterior rotation, it may be surmised that a compression through the extended landing leg (right) into the pelvis at >30° of flexion would induce an anterior innominate rotation. The anterior innominate rotation would separate the hamstring origin and insertion, which may have contributed to irritation and attachment pain in the region of the muscle’s origin, the ischial tuberosity.6

In the authors’ experience, quadratus lumborum strains are extremely common to find with superior innominate shears, are often concomitant findings ipsilateral to the shear, and may be either a cause of or secondary to the superior innominate shear. In this case, the quadratus lumborum strain would appear to have occurred secondarily, with the mechanism of injury fitting a likely cause for a superior innominate shear. Whether cause or contributor to the innominate shear, resolving somatic dysfunction of the quadratus lumborum is imperative to achieve correction of superior innominate shear dysfunction. In this patient’s case, the resolution of the right superior innominate shear occurred concurrently with the resolution of the right quadratus lumborum strain.

In 5 visits, a young man with 10 weeks of pain (7/10), decreased squat range of motion, and decreased physical activity in athletics was able to obtain full squat depth range of motion and progress to full-speed, full-contact participation in football and basketball. These outcomes correlated with restoration of normal pelvic alignment by reducing a significant superior innominate shear, otherwise known as an innominate upslip.2 Unilateral superior innominate shear dysfunctions result in changes to the position of the sacroiliac joint and alter mechanics in global movement of the pelvis.2 This may provide an explanation as to why the patient experienced significant pain and decreased range of motion when attempting to perform a full squat and with side-to-side movements in athletics.

The patient experienced no pain or discomfort during the treatments applied and experienced an immediate improvement in ability to squat fully and without pain. Research has not been done to examine how long it takes after a superior innominate shear from a traumatic mechanism to resolve on its own. However, this case demonstrates it is possible for individuals to experience prolonged symptoms up to 10 weeks after initial injury, and traditional medical diagnosis and treatment (eg, rest, anti-inflammatory medications, and physical therapy) may not identify the source of pain and may not provide significant improvement.

OMM was provided on 5 occasions. Treatments focused on key somatic dysfunctions of the lumbar spine, pelvis, and lower extremities to address pain in the proximal hamstring region and decreased range of motion.

Conclusion
The patient demonstrated a mechanism for acute traumatic superior innominate shear in an athlete that failed to resolve over 10 weeks, which included 12 physical therapy sessions. The mechanism of injury demonstrated may represent a common injury pattern for athletes participating in track and field sports, especially hurdlers, who present with a complaint of hamstring pain, tightness, and/or significant activity limitations. Further, the superior innominate shear not traditionally being considered in clinical practice may contribute to prolongation of symptoms and transitioning from acute to chronic injury.

To date, minimal research has been conducted on the incidence and prevalence of traumatic innominate superior innominate shear, and it would be beneficial for further research to collect data on these numbers as well as best clinical practices for management of acute and chronic traumatic superior innominate shear injuries.

References
The Combined Shoulder Technique: A Novel Approach in the Treatment of Scapular Dysfunction—A Case Report

David M. Kanze, DO, FAAO

Abstract
Athletes who throw overhead experience injuries to their throwing shoulders secondary to the mechanics of throwing. The process of throwing is a coordinated, complex set of movements known as the kinetic chain. Disruption anywhere about this chain can result in injury to the throwing shoulder. The scapula’s interaction with the thoracic cage allows for normal motion, and injury or imbalance of the scapular stabilizers can result in SICK scapular syndrome and this, in turn, can result in an injury to the glenohumeral joint itself.

Osteopathic manipulative treatment (OMT) can be utilized to restore the kinetic chain to its full function and to decrease SICK scapular syndrome, thereby preventing injury and treating it if it occurs. The present case will demonstrate this and introduce a novel technique to treat the entire shoulder joint.

Introduction
The shoulder is a unique joint, designed for mobility not stability. The true shoulder joint is the glenohumeral joint but all 3 joints of the pectoral girdle—the glenohumeral, acromioclavicular, and the sternoclavicular—will be considered as the shoulder for the purpose of this paper. The scapulothoracic joint, a pseudojoint, is considered part of the shoulder as it contributes to its motion. This joint system is integral to the motion of the arm and, therefore, restrictions of this system contribute to dysfunctions of the arm, pectoral girdle, neck, and thoracic cage. This system is part of an overall system known as the kinetic chain. The kinetic chain is a complex, full-body activity of overhead throwing. If working properly, it can provide accuracy and velocity to a thrown object, in this case a baseball. The chain itself refers to a sequence of force transferring motions that occur while throwing.

Throwing is a continuous, fluid group of movements that begin with the lower extremities and core. In baseball, the chain begins with the plant foot, which is contralateral to the throwing arm. The kinetic chain provides support and builds kinetic energy that is ultimately transferred through the throwing arm to the release of the object from the fingers. Dysfunction anywhere along the chain can cause disruption of the entire chain with resultant injury to the shoulder or arm. This case depicts a novel approach to treating the kinetic chain and the shoulder with osteopathic manipulative treatment.

Case Report
A 17-year-old male, left-handed pitcher, presented to the clinic with a chief complaint of 2 weeks of decreasing pitch velocity accompanied by increasing, aching, non-radiating, up to 6/10 left shoulder pain. He denied any other symptoms in the shoulder or arm except for a lack of “cut” on his slider. The slider spins away from the batter, and his was becoming flat going through the hitting zone. He noted the pain increased while throwing “breaking pitches” and decreased when his arm was taped across his body, in adduction, and iced. He also reported mild, right-sided, non-radiating, achy, low back pain that began after slipping on a wet mound throwing a pitch in practice. He stated that his right leg, his plant foot, slid forward and turned outward during the pitch and that his back pain began shortly thereafter. The shoulder pain

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began approximately 1 week later. He noted some overall relief with 600 mg of ibuprofen. He denied any previous trauma to the shoulder but did note having “elbow difficulties” the previous season. His review of systems was negative except as noted above.

History
The patient’s medical and surgical histories were negative. He was born full-term via non-induced, spontaneous vaginal delivery without instrumentation to a primigravid mother. He denied any history of trauma. He denied having any allergies. He occasionally took up to 600 mg of ibuprofen for pain. He was a high school student and avid baseball player, specifically a pitcher.

Examination
A physical exam depicted a physically fit 6 feet, 7 inches, 195-pound adolescent boy in no acute distress. His blood pressure was 128/78 mm Hg with a heart rate of 60 beats per minute and a respiratory rate of 18 breaths per minute. His neck was supple with a full range of motion. The Spurling test was negative bilaterally, Lhermitte sign was not present, and the cervical compression test (axial) was negative. His cardiac exam revealed a regular rate and rhythm without murmurs, rubs, or thrills. The respiratory exam was clear to auscultation without rhonchi, rales, or wheezes. The musculoskeletal exam revealed an inferior and prominent left scapula with tenderness about the left coracoid process in addition to full active and passive range of motion of the left elbow and wrist. The full can, empty can, Hawkins, Neer, lift off, and O’Brien tests were negative bilaterally.5

The patient’s gait displayed out-toeing of right foot with mild external rotation of the right lower extremity and decreased extension of the right lower extremity and left upper extremity. Observation of throwing motion unveiled back and left shoulder pain. The back pain was reported with right leg lift and right leg drive. The shoulder pain was reported with arm cocking and mostly with maximum internal rotation during arm deceleration.6,7

The neurologic exam revealed 2/4 and equal bilateral reflexes at C5, C6, C7, L4, and S1. The patient’s strength was 5/5 bilaterally at shoulder flexors, extensors, internal rotators, external rotators, adductors, and abductors except left shoulder abduction was 4+/5 due to pain. Strength was 5/5 at elbow flexors, extensors, pronators, supinators, wrist flexors, extensors and lumbricals, hip flexors, adductors, abductors, hamstrings, quadriceps, foot dorsiflexors, and plantar flexors bilaterally as well.

The osteopathic structural exam revealed tight right plantar fascia with a dropped median cuneiform; tight right gastrocnemius and soleus; tight right hamstrings; an outflare of the right innominate; a right-on-right sacral torsion with L3-5 neutral, side-bent right, rotated left; a tight linea alba; a very tight left latissimus; tight paraspinal muscles from the sacrum through the thorax; T12 flexed, rotated and side-bent right; tight left rhomboid and trapezius musculature with decreased scapular thoracic joint glide bilaterally, left greater than right; tender points in the left supraspinatus, left infraspinatus and about the left coracoid process with mild internal rotation of the left humerus; left proximal ulna adduction; an elevated left first rib with inhalation; left ribs 3-5, C7 flexed, rotated and side-bent right; C2 flexed, rotated, and side-bent right; and a mild left side bending rotation of the sphenobasilar synchondrosis.

Treatment
After verbal consent was obtained from the patient and his mother, osteopathic manipulative treatment was applied to the somatic dysfunctions detailed above. Treatment commenced with release of his linea alba, utilizing ligamentous articular strain (LAS).5 LAS was then applied to the plantar fascia and cuneiform of his plant (right) foot. LAS and myofascial release (MFR) were applied to the tight muscles in his right leg. LAS was again utilized to treat the innominate dysfunction. Osteopathic cranial manipulative medicine (OCMM) was used to treat his sacrum and his L5. T12 and the paraspinal muscles were treated with MFR. The ribs were treated with LAS and respiratory assist muscle energy. The neck was treated with LAS, and the head was treated with OCMM. The elbow was articulated with a modified high-velocity, low-amplitude technique (HVLA).

After the tender points were treated with counterstrain (CS), the scapula and glenohumeral joints were treated with the combined shoulder technique, a technique that consists of myofascial release to the scapula followed by the simultaneous use of LAS and muscle energy to the muscles surrounding the joints and to the glenohumeral joint itself. The patient was instructed not to pitch that day and to begin throwing the following day if pain free. He was instructed to follow up in 2 weeks.

The patient returned to the clinic for his 2 week follow-up pain-free and, more importantly to him, throwing harder than he had prior to treatment.9 He reported being pain-free approximately 2 days after his treatment and also noted pain-free “long toss” warm-up sessions. He began throwing harder 4 days post-OMT without discomfort and was up to his full velocity and back to throwing breaking pitches 3 days after that (1 week post-OMT). He noted that his back symptoms began to recur after lifting his backpack on the
morning of his follow-up appointment, and he was worried that his pain and pitching impairments would return.

Physical examination that day revealed a new posterior right innominate that was treated with muscle energy technique. The remainder of his somatic dysfunctions, found previously, were greatly improved or resolved after his second treatment. Of note, posttreatment, his left (pitching) shoulder had increased range of motion compared to his right as described by Wilk et al and Bailey et al.\textsuperscript{10,11}

**Combined Shoulder Technique**

Seventeen muscles attach directly to the scapula, and multiple others influence its motion.\textsuperscript{4} The combined shoulder technique addresses the majority of these muscles. If needed, the technique is utilized after other treatments are performed. It is not a technique to be performed alone. It is rooted in the first tenet of osteopathy,\textsuperscript{14} and it is employed as such. A complete orthopedic assessment must be performed prior to applying this technique to rule out rotator cuff, labral or bony pathology. This technique is executed after treatment of the ribs, particularly the first rib on the affected side, the clavicles, pelvis, and sacrum. In most athletes, treating the lower extremities also would take place prior to engaging the combined technique. This is secondary to throwing being a whole-body motion and not simply a motion of the shoulder and upper extremity.\textsuperscript{1}

The combined shoulder technique is divided into 2 distinct parts and can be used as such. The “scapular wheel” will be described first and the muscle energy/LAS (MELAS) technique for the glenohumeral joint and rotator cuff, second.

**The Scapular Wheel**

The scapular wheel is an indirect myofascial technique applied to the posterior and anterior fascia and musculature of the shoulder. The patient is generally supine, although the technique can be applied to a seated or lateral recumbent patient. The physician is seated next to the patient. The physician's cephalad hand contacts the acromion while the caudad hand contacts the angle of the scapula. (See Figures 1 and 2.)

The cephalad hand gently applies pressure through the acromion to “steer” the scapula into its direction of ease. The caudad hand gently guides the scapular angle into the direction of ease as well. This position is held until a balance point is obtained and is maintained until a release is felt. The scapula will then display increased motion and the scapulothoracic joint should glide more freely as well. This portion of the technique provides the needed relaxation of the scapulothoracic joint, its fascia and in general, some of the major muscle movers of the shoulder, specifically the latissimus dorsi, trapezius, pectoralis minor, biceps brachii (both heads), coracobrachialis, omohyoid, serratus anterior, and rhomboid major and minor. Pectoralis major can also be affected with this portion of the

(continued on page 16)
technique. The deltoid, triceps, and rotator cuff muscles may show signs of improvement after this portion of the technique as well, but not always.

Muscle Energy Ligamentous Articular Strain
The MELAS portion of the technique is utilized to treat and balance the rotator cuff musculature with the larger major movers of the shoulder while providing restabilization and balance of the glenohumeral joint. The technique is 2-fold, but it occurs simultaneously after the initial setup. The initial setup consists of the patient lying supine with the physician being seated next to the patient. The patient’s arm is brought into 90° of abduction with elbow flexed, thereby giving the physician a “handhold” to balance the glenohumeral joint. The elbow is placed into the abdomen of the physician. The patient’s arm is then moved into the feather-edge of the barrier of external rotation with the patient’s hand on the posterior deltoid of the physician. This is the initial setup and should be fine-tuned so that the glenohumeral joint is in balance before applying the isometric muscle energy portion of the technique (see Figure 3). Once the balance point is achieved, the patient will internally rotate (throw) the affected arm against the physician’s deltoid (see Figure 4). The physician resists this action for 3-5 seconds. There is then a pause of 2 seconds followed by repositioning of the arm to the next barrier’s feather edge and the process is repeated 3-5 times.14

The glenohumeral joint is to remain at its balance point throughout the muscle energy sequence. This is accomplished by maintaining pressure with the physician’s abdomen on the patient’s elbow. The area should then be rechecked for improvement in range of motion and pain.

Discussion
The patient injured himself while slipping off a pitching mound, causing somatic dysfunctions in his right foot and sacrum. This foot injury with resultant sacral dysfunction created, via the latisimus dorsi attachments to the thoracolumbar fascia and humerus, left scapular malposition with resultant scapular dyskinesis, leading to an initial loss of throwing velocity followed by pain.12 The findings of scapular malposition and dyskinetic movement compelled the diagnosis of SICK scapular syndrome.

SICK scapular syndrome is defined as scapular malposition, inferior medial border prominence, coracoid pain and malposition, and dyskinetic motion of the scapula.12 It is common among throwing athletes with injury and is amenable to OMT.

After removing the shock from the system13 by releasing the linea alba, treatment commenced at the initiation point of the injury, the right foot. Treatment of the foot began a gradual unwinding of the kinetic chain, with resultant resolution of the shoulder pain and increase in velocity. In this case, the foot injury was the key lesion.8 The scapular dysfunctions were most likely due to the disruption of the beginning of the kinetic chain for which combined shoulder
(continued from page 16)
technique addressed much of the shoulder dysfunctions at one time.

Conclusion
The pitcher in this case presented with shoulder pain secondary to a slip off the mound and disruption of the kinetic chain. The shoulder pain resulted from SICK scapular syndrome secondary to an injury inferiorly along the kinetic chain. The patient was treated osteopathically to resolve his somatic dysfunctions, and a novel technique was created in order to treat SICK scapular syndrome in coordination with the osteopathic tenets. The first tenet of osteopathy states, “The body is a unit of mind, body and spirit,” and the second tenet states, “Structure and function are interrelated.”

This case demonstrates how osteopathic principles, especially these tenets, must be utilized in order to treat dysfunctions related to pitchers and other overhead-throwing athletes. The use of OMT can potentially prevent injuries and prolong careers. Future studies are required to confirm that OMT can prevent and treat injuries in overhead throwing athletes.

Acknowledgements
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References
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Below are the answers to The AAO Journal’s March 2019 quiz on the article titled “Osteopathic Structural Findings in Women During Menstruation” by Kelsie L. Cabrera, DO; Adrianna M. Darwish, DO; Kelly L. Lurz, DO; Rance L. McClain, DO; Elizabeth McClain, DO; Joshua Cox, DO; and Larry Segars, PharmD.

1. b. Dysmenorrhea has been correlated to have a statistically significant increase in structural findings in lumbar, innominate dysfunction, and posterior Chapman’s points.
2. c. The most common Chapman’s point found on menstruating women with dysmenorrhea was fallopian tube.
3. c. Dysmenorrhea occurs in 75% of women throughout their lifetimes.
4. c. Viscerosomatic reflexes to the uterus are found between the spinal levels of T9-L2.
Counterstrain as a Diagnostic and Treatment Tool for Rectus Femoris Origin Injuries: A Case Report

Edward K. Goering, DO, and Lisa Qiu, OMS II

Abstract
Counterstrain (CS) is an osteopathic manipulative technique that utilizes indirect and passive positions of strained tissues to address musculoskeletal dysfunctions. As such, CS has potential as a treatment option for muscle strain injuries, such as rectus femoris origin (RFO) injuries. This case highlights an instance where the CS technique was used as an effective and inexpensive diagnostic tool to confirm the involvement of the reflected head of the rectus femoris muscle (RHRF) in an RFO injury.

The presentation of symptoms in this case, like many other hip pain cases, was nonspecific, making it difficult to diagnose without the use of advanced imaging techniques, which are often time consuming and costly for patients. The use of CS was able to support a diagnosis of a reflected head of the RFO injury. After an osteopathic structural examination, it was noted that the patient had multiple bilateral tender points of the anterior thoracic region and hip: anterior thoracic-10 (AT10), proximal psoas (PP, formerly abdominal lumbar 2), iliacus, and reflected head of the rectus femoris (RHRF).1 In his 1981 text, Jones referred to an anterior medial trochanter tender point that is similar to the RHRF point; however, the location was described to be more lateral, rather than inferior, to the anterior inferior iliac spine than the RHRF point.2 Once all tender points were identified, treatment using the CS technique was administered weekly over the period of a month, and the patient noted markedly reduced tenderness of the tender points treated and was able to reincorporate soccer and other athletic activities back into his life.

Introduction
Injuries of quadriceps and hamstring muscle groups are common among athletes, especially with sports that require repetitive kicking. Within those muscle groups, the rectus femoris muscle is highly susceptible to injuries due to its origin and insertion points overlapping the hip and knee joints, respectively.3,4 This muscle arises from two heads that attach to the ilium: the direct head and the reflected head. The tendon of the direct head originates at the anterior inferior iliac spine (AIIS) while the tendon of the reflected head originates from the upper region of the acetabulum rim (see Figure 1). At its distal end, the rectus femoris muscle tendon inserts at the upper pole of the patella.3 Due to its unique layout across 2 major joints, the rectus femoris muscle is subject to significant stretch and stress, particularly when the knee is flexed and the hip is extended, risking potential strains, avulsions, or other injuries.6–8

Furthermore, a retrospective review of pelvic and hip MRI procedures in rectus femoris origin injuries showed that a majority of acute RFO injury cases involved the reflected head, and a majority of the chronic RFO cases involved the direct head.9 Acute RFO injuries stemming from the reflected head have been reported.10–13 Unfortunately, current guidelines are not well defined regarding
whether the evaluation of such injuries leads to operative versus nonoperative care, nor are those evaluations well documented.

Individuals with injuries to the RFO often present with nonspecific symptoms of anterior hip pain and ambiguous physical exam findings. Often, in order to pinpoint the exact location(s) of the pain, multiple imaging procedures are required such as x-ray, MRI, and CT scans. Through the use of osteopathic manipulative medicine (OMM), the identification of tender points, which are small areas of hypersensitive tissue found in the muscular, tendinous, and ligamentous tissues, can be performed. Specifically, the identification of the RHRF tender point, which is located on the superior rim of the acetabulum below the AIIS (see Figure 2), can play a critical role in the diagnostic process, making OMM an appropriate first-line treatment option in RFO injuries.

Report of Case
A 25-year-old male amateur soccer player approached one of this paper’s authors in a nonclinical setting. He presented with persistently worsening bilateral hip pain that began on the right hip around 24 months previously.

History
The patient had been a competitive soccer player since the age of 11. During the ages of 11 through 18, he played soccer approximately 20 hours per week. While attending undergraduate college, he played 6 hours per week, and by 2014, he played recreationally 2 hours per week.

Beginning in September of 2015, after the reduction in his time playing soccer, he began experiencing significant pain in his right hip during soccer play. This limited his ability to play for more than 45 consecutive minutes. He played through the pain for a year, at which point he could no longer play soccer for more than a few minutes at a time before the pain became intolerable. This pain not only inhibited his athletic endeavors, but also affected his activities of daily living such as walking long distances and climbing stairs.

At this point, a physical therapist was consulted who then initiated a strengthening and stretching regimen as a treatment of weak hip flexors. The patient also was instructed to take a break from any soccer play for 4 months. After 4 months of rest and physical rehabilitation, he returned to playing soccer recreationally by slowly transitioning back to 2 hours per week. He noted that after the physical therapy sessions, the pain was attenuated but still present. He was then able to play soccer for up to an hour before the pain was too intense to continue.

Throughout the following year, the right hip pain gradually worsened and similar pain presented in the left hip as well, though the severity of the pain in the left hip never reached the same intensity as that of the right hip. The patient reported that at times, he could not flex his hips enough to walk upstairs without pain and had to slowly rise out of bed in the mornings to minimize the pain.

Two years after the onset of his hip pain, in September 2017, he was able to play soccer for 30 minutes before needing to stop and stretch due to bilateral hip pain. Eventually, while attending medical school, the patient found he could not sit in class for more than
30 minutes and sought advice from the school’s OMM department.

**Initial Presentation**

Following an informal discussion of symptoms, the patient received an osteopathic structural exam to investigate the potential source of the hip pain, and a thorough medical history was taken. The patient denied any self-treatment or self-medication including nonsteroidal anti-inflammatories, acetaminophen, or other pain-related medications. Aside from the physical therapy sessions, the patient did not seek other medical attention for this problem. Prior to the onset of the hip pain, the patient was involved in a minor car accident where he was rear-ended at low speed. The patient did not seek medical attention following that incident. No other history of trauma nor of pertinent medical procedures was reported.

**Physical and Osteopathic Structural Exam**

The patient stated that, at the beginning of the school term (September 2017), it was painful to climb up stairs due to his bilateral hip pain. Physical examination findings showed decreased active and passive ranges of motion and motor strength across the hip joint bilaterally.

Presentation of this case, like many other hip pain cases, was non-specific and ill defined, making it difficult to diagnose without the use of advanced imaging techniques, which are often time consuming and costly for patients.

In this case, the use of counterstrain (CS) was able to support a diagnosis of a reflected head of the rectus femoris origin (RFO) injury. After an osteopathic structural examination, it was noted that the patient had multiple bilateral tender points of the anterior thoracic region and hip: anterior thoracic-10 (AT10), proximal psoas (PP, formerly abdominal lumbar 2), iliacus, and RHRF.

Physical examination findings showed minimal atrophy of the right rectus femoris muscle. Active and passive range of motion (ROM) were decreased in marked flexion and external rotation of the hip bilaterally, with the right hip having significantly less ROM with pain on flexion. The muscle strength of the more affected right leg was reduced with flexion and external rotation, partly due to the pain induced. Deep tendon reflexes of the lower extremities were normal.

Upon further osteopathic structural examination, several CS tender points were found to be very sensitive to palpation: R-iliacus (IL), R-AT10, R-PP, R-RHRF and L-RHRF. Of all these tender points, the patient indicated that the R-RHRF tender point was the most tender. Although the RHRF tender points were present bilaterally, the right side presented with more tenderness to palpation than the left.

Overall, clinical impressions were that the bilateral anterior hip pain partly resulted from an inflamed and strained RHRF muscle. These injuries are often seen by the first author in an acute phase. While the injury was no longer acute, the patient had not exacerbated the injury to the extent of an avulsion injury. The marked decrease in hip flexion and RHRF tender points bilaterally supported the diagnosis. The remaining CS tender points likely resulted due to compensation of the surrounding muscles in response to the prolonged bilateral anterior hip pain.

**Treatment and Follow-up Plan**

The physician used the CS treatment model to address the patient’s anterior hip pain. This technique is used to address musculoskeletal dysfunctions by placing the patient in an indirect and passive position. Thus, the utilization of this technique relies heavily on the physician’s palpatory skills in the diagnosis of CS tender points, which are small areas of hypersensitive tissue found in the muscular, tendinous, and ligamentous tissues.

After identifying the CS tender points, the physician continues to monitor the tender point with light pressure, not inducing tenderness, while placing the patient into a position that shortens the tender tissues, providing relief of the tender point tension and the nociceptive feedback association with the tension. This position is...
(continued from page 21)

held for 90 seconds, after which the physician returns the patient passively and slowly to a neutral resting position.16 The principles of CS revolve around the proprioceptive theory, which explains the agonist-antagonist relationships between muscle groups and the neuromuscular imbalances that are a result of the neural and reflex mechanisms engaged by overexcited muscles.17

According to the patient in the present case, the R-RHRF registered as the most sensitive CS tender point. Treatment of this tender point requires the patient lie supine with the physician standing on the affected side, lifting the affected leg to induce hip flexion to 90°, followed by slight internal rotation of the hip and abduction or adduction of the hip as needed (see Figures 3 and 4).

Two-thirds reduction of tenderness was achieved and the treatment position was held with the patient remaining passively relaxed until therapeutic pulse was noticed by the physician through the slight pressure monitoring the tender point. All of the other CS tender points noted earlier were addressed similarly using their respective treatment positions as listed by Jones in his 1995 text.1,17 Upon completion of the treatment session, the patient was instructed to stay well-hydrated and return for subsequent treatments on a weekly basis until this problem with hip pain was sufficiently improved.

Figure 4. The CS treatment position for the R-RHRF tender point. This view highlights the internal rotation of the hip joint that is needed for this CS tender point treatment.

(continued on page 23)
improve after CS treatment of specific tender points, it is important to reevaluate the patient using advanced imaging and consider other treatment plans.

Conclusion

Physicians with the knowledge of OMM, particularly the CS technique, should consider using it as a first-line diagnostic and treatment tool for patients with nonspecific anterior hip pain. This technique is noninvasive, cost effective,atraumatic, and diagnostic to the tissues involved.

Counterstrain allows for accurate identification of muscle tender points and addresses many of the underlying structural causes of RFO injuries as well as other musculoskeletal dysfunctions. Treatment using the CS technique to address RFO strain injuries involving the RHRF provides a noninvasive option that could greatly benefit patients. It has been shown that counterstrain for the hip musculature has resulted in the increase of strength and decrease of pain in tender points.18 It would be beneficial and necessary to see more clinical research with long-term follow-up conducted that evaluates the effectiveness CS for RFO specific injuries.

Acknowledgement

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Persistent Postoperative Swelling Following Arthroscopic Meniscectomy: A Case Report

Tiffany R. Noblitt, OMS V, and Regina K. Fleming, DO

Abstract
After arthroscopic meniscectomy, it is important to ensure each patient regains as much of the original function of the knee as possible. The inherent structural and functional relationships among the bones, muscles, fascias, and lymphatics are vital. Each element should be a focus of treatment to reap maximum benefits and reduce long-term dysfunction. While increased range of motion and strengthening exercises are the current focus of postoperative rehabilitation, a more direct approach to the fascial and lymphatic systems should be instituted for those patients reporting swelling as a long-term sequela. In this case report, osteopathic manipulative treatment reduced recovery time for a 65-year-old woman following arthroscopic meniscectomy.

Introduction
The risk of complication during an arthroscopic procedure is a concern to patients. Therefore, reduction and treatment of these complications should be an area of focus postoperatively. There have been several studies that mention the immediate and long-term complications of meniscectomy procedures in the older population. Hame et al1 reported complication rates of 0.4% for pyogenic arthritis, 0.8% for deep vein thrombosis, and 0.3% for pulmonary embolus after arthroscopic meniscectomy in a population over 65 years of age.

A study of patient expectations following meniscus surgery shows those patients older than 55 years have higher expectations of a shorter recovery time than patients younger than 35 years (P = 0.008).2 Many of these patients’ recoveries do not hold up to their high expectations prior to surgery. This discrepancy may in part be due to the lack of standard protocol for knee rehabilitation after an arthroscopic procedure.3

Jeong et al3 provides us with a general progression of phasic rehabilitation programs over the first 6 postoperative weeks. Prior to discharge, patients are given instructions on managing pain and swelling of the knee with ice, elevation, and rest. Following this immediate period, the first phase includes maximum protection of the joint followed by a steady decrease of protection and increase in weight-bearing and range of motion exercises as tolerated. The final phase incorporates a return to daily living activities and sports.3 Most rehabilitation programs that follow this phasic approach focus on restoring range of motion and muscle function.3 They do not focus on reduction of swelling specifically. Initial swelling and effusion are common but are not expected to persist beyond 1 to 2 weeks postoperatively.4

Reports of long-term swelling have been documented in immediate and long-term follow-up studies. Reigstad et al5 conducted a study of 876 patients who underwent any simple arthroscopic procedure in which 43 patients reported swelling of the knee or calf during a follow-up survey 2.12 to 5.08 years later. Similarly, Chatain et al6 reported that 6% of patients (n=214) reported significant to severe swelling on an International Knee Documentation Committee subjective evaluation form at 10 years follow-up after medial meniscectomy. Treatment options directed specifically towards swelling as a

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long-term sequela fall back on maintenance of range of motion and function, not reduction of the swelling itself.

Case Report

History of Chief Complaint
A 65-year-old woman presented to the Osteopathic Manipulative Medicine (OMM) Clinic complaining of significant swelling, pain, and stiffness in the right knee. Her pain began about 14 months prior to her visit, at which time she sustained a medial meniscus tear to the right knee diagnosed by an orthopedic surgeon via an MRI of the knee. The surgeon performed a medial meniscectomy approximately 6 weeks prior to her visit to the OMM clinic. There were no immediate postoperative complications. The patient stated that after surgery, there was significant swelling in the right lower extremity, including the knee. The swelling had not decreased. The swelling was worse at the end of the day. If she did not wear the compression hose and elevate the leg regularly, then the swelling got worse. She rated her pain as a 3/10 on the pain scale, and she denied numbness, tingling, radiation, and weakness of the extremities. She stated that exercising on the recumbent bicycle with no tension helped decrease the pain and stiffness, but it had no effect on the swelling. She had been compliant with all postoperative recommendations for rehabilitation and had been continuing with physical therapy due to the swelling and stiffness in the knee.

Medical and Surgical History
Patient has hypertension (lisinopril 20 mg PO qd) and had a medial meniscectomy performed 6 weeks ago to the right knee.

Social History
Patient denies any tobacco, alcohol, and illicit drug use. She reported taking approximately 1 cup of caffeinated coffee per day.

Physical Exam
Patient was a 65-year-old white woman in no acute distress. On examination the patient’s blood pressure was 110/76 mm Hg, heart rate was 68 beats per minute, respiratory rate was 12 breaths per minute, height was 5 feet, 4 inches, and weight was 190 lbs. She was awake, alert, and oriented to person, place, and time with pleasant affect. No abnormalities were noted upon examination of the head, eyes, ears, nose, throat, cardiac, or respiratory systems. Cranial nerves II-IX were grossly intact. Deep tendon reflexes were +2/4 in upper and lower extremities bilaterally. The incision site on the right knee was well healed with no erythema or drainage. Significant swelling was noted with 2+ pitting edema on the entire right lower extremity. The swelling stopped about 1 inch above the patella. Pulses were strong and equal bilaterally in the lower extremities.

Osteopathic structural examination revealed a right posterior fibular head, a right externally rotated tibia, a left-on-left sacrum, an anteriorly rotated innominate on the right, restrictions of the Achilles, popliteal, and inguinal fascia on the right, an interosseous membrane strain in the right lower extremity, and the thoracic inlet was flexed, rotated left and sidebent left. Respiratory diaphragm was restricted bilaterally.

Assessment
1. Right knee pain s/p medial meniscectomy
2. Pedal edema on the right
3. Somatic dysfunction of the thoracic, lower extremity, sacrum, pelvis, and rib regions

Treatment Approach
Based on the physical exam, osteopathic manipulative treatment (OMT) was performed to the above mentioned somatic dysfunctions. The tibia, fibula, and rotated innominate were treated with muscle energy. Myofascial release was performed on the regions of fascial restriction: Achilles, popliteal, inguinal, respiratory diaphragm, and thoracic inlet. The interosseous membrane strain and sacrum were treated with the Fulford percussion hammer.

The patient tolerated treatment well and all somatic dysfunctions resolved with treatment. A follow-up examination was scheduled for the following week.

At her 1-week follow-up, the patient stated that the swelling was significantly decreased since the treatment. She had no pain or stiffness. She said she woke up the morning after her treatment and the swelling was “almost all gone.” She stated that her range of motion was better and it was easier for her to walk. On physical exam, she had trace pedal edema. No somatic dysfunctions of the knee were noted and regional range of motion and ambulation were markedly improved on physical exam. A second follow-up was scheduled for 1 month after the initial visit.

At her 1-month follow-up from initial visit, the patient stated the swelling in her knee and calf had not returned after her first treatment and that she had not needed to continue physical therapy past the date of her treatment because she was doing “so much better.” She stated her knee range of motion was greatly improved and ambulation at that time was normal.

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Discussion
Healthy fascial layers stretch and distort easily, allowing the neurovascular bundles to course through freely. These layers can become dysfunctional through trauma, somatic dysfunction of the immediate area, or sympathetic from a dysfunction in sympathetic innervation. The key function of the lymphatic system includes removal of interstitial fluid and plasma proteins that build up from cellular metabolism, infection, inflammation, trauma, or system dysfunction. Lymphatic vessels course through the entire body following the neurovasculature. Extracellular fluid is moved into lymphatic vessels through inherent movement of the surrounding muscles against an uphill gradient created by the lack of hydrostatic and osmotic gradients beyond the edge of the vessel. This means that as dysfunction occurs, the inherent movement relied upon to move fluid into the lymphatic system is lost, which can create excess extracellular fluid, or edema.

The fascia is intimately connected to the lymphatic system as the lymphatic vessels course through the superficial fascia along with fat and other vascular structures. Fascia also acts as the primary transmitter of inherent motion used by the lymphatics to pump lymph fluid against gravity towards the lymphatic ducts. The inherently loose connective tissue structure of the superficial fascia provides a potential space for any excess extracellular fluid to accumulate, creating many of the palpatory soft tissue texture changes noted during dysfunction. With mechanical stress, fibroblasts within the fascia remodel the surrounding cytoskeleton either by short-term rearrangement or by long-term increases in synthesis, which can lead to dense, fibrotic changes.

According to Kuchera, Zink brought the fascial and lymphatic systems together by defining regions of terminal lymphatic drainage where lymphatic homeostasis is most likely compromised. These regions include the thoracic inlet, the respiratory diaphragm, the inguinal region, the popliteal space, and the Achilles region. A fascial approach to terminal lymphatic drainage regions encourages lymphatic flow by realigning fascial planes and restoring inherent movement of the musculature. In this case, trauma and a subsequent surgical procedure led to a distortion and rearrangement of the fascial layers of the knee, causing pain, stiffness, and edema. OMT can help realign the fascial layers, thus increasing the lymphatic drainage and thus leading to resolution of swelling, pain, and stiffness in the affected joint.

Conclusion
Joint swelling is a common complaint during rehabilitation following knee surgery, but it is not expected to persist beyond 1 to 2 weeks postoperatively. Joint swelling can have a negative effect on joint mobility and quality of life for patients. As demonstrated in this case, the addition of OMT to standard medical care allowed complete resolution of the patient’s persistent swelling and restoration of range of motion of the knee and a return to normal ambulation. All aspects of joint mobility including somatic dysfunction of bone, muscle, fascia, and lymphatics should be addressed. This comprehensive approach will help ensure optimal recovery of joint function and improve quality of life for patients.

References
Integrating Osteopathic Evaluation and Treatment in a Case Report of Acute Chest Pain

Sheldon. C. Yao, DO, FAAO

Abstract
Chest pain is an emergent presentation associated with a wide differential diagnosis including cardiac, pulmonary, gastrointestinal, and musculoskeletal origins. The evaluation of acute chest pain can be costly and can be a financial burden on the health care system. Integrating osteopathic diagnosis and treatment can assist with identifying and alleviating potential musculoskeletal sources of pain. This case illustrates how applying osteopathic manipulative medicine (OMM) benefited a 61-year-old woman presenting with anterior chest wall pain.

Patient response to OMM can assist physicians with better managing acute chest wall pain syndromes. Improved musculoskeletal education can potentially improve medical management of chest pain of musculoskeletal origin.

Case report

History
A 61-year old woman with a medical history of hypertension presented to the office with a chief complaint of left-sided chest pain. Three days prior to the office visit, the patient began to experience new onset left-sided chest pain. The pain was intermittent, 7/10 on a pain scale, exacerbated with activity, associated with shortness of breath, radiated to the left side of the neck and face, and was accompanied by palpitations. She denied dizziness, nausea, and diaphoresis.

The patient first saw her internist emergently and was referred to a cardiologist. Her cardiac work-up included an electrocardiogram, an echocardiogram, bloodwork, chest x-ray, chest computed tomography (CT) scan and a cardiac catherization. All results were negative. She also was referred to a pulmonologist. Pulmonary function tests were normal, and the pulmonologist started her on a course of tapering steroids, which resulted in no pain relief. The patient was scheduled to travel abroad within a week’s time and was concerned to travel due to her pain. Approximately 1 year prior, she was treated with OMM for left-sided upper back, neck and shoulder pain following a motor vehicle accident. Prior to the current complaints, she had significant alleviation of her pain with the OMM treatment.

Medical history included 10 years of hypertension. The patient denies any family history of coronary artery disease or myocardial infarction. Her father and grandfather had hypertension and hyperlipidemia. While she denied smoking, alcohol use, or illicit drug use, she reported drinking 1 cup of caffeinated coffee daily. Medications included atenolol (50 mg once a day), multivitamins, and calcium supplements. She worked as an office administrative assistant, and she stated that she exercises regularly and stays physically active.

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Review of Systems
The patient reported left-sided chest pain, palpitations, shortness of breath, neck and back pain. She denied any acute weight changes, fatigue, weakness, abdominal pain, reflux, nausea, diarrhea, constipation, frequency, urgency, or dysuria.

Physical Examination
On physical examination, the patient’s blood pressure was 115/75 mm Hg, heart rate was 84 beats per minute, respiratory rate was 12 breaths per minute, oxygen saturation was 99% on room air, and body mass index was 18.7. The patient appeared well nourished and had a normal gait.

Examination of head, ears, eyes, nose, and throat revealed no irregularities. Neck rotation to the left was decreased due to pain.

Cardiovascular examination was unremarkable: no murmurs, clear lung fields, no wheezing, and good respiratory excursion. The patient’s abdomen was soft, non-tender, non-distended with no palpable masses, and normal bowel sounds auscultated in all 4 quadrants. Examination of the chest wall revealed mild distress with movements of the patient’s left arm. Pain was reproduced with palpation of the anterior chest wall over ribs 3-4 along the left mid-clavicular line.

Neurological examination also was unremarkable: no focal neurologic deficits, no tremors or fasciculations noted, CN2-12 grossly intact, motor strength 5/5 bilaterally. Sensory exam was normal, and reflexes were +2/4 lower extremities bilaterally symmetrical.

Osteopathic structural examination revealed occipitoatlantal joint flexed, sidebent right, rotated left; C3 flexed, rotated and sidebent left; C7 extended, rotated and sidebent left; thoracic inlet restriction; an exhalation dysfunction of the left ribs 3-5; anterior rib 3 tenderpoint; a sternal restriction to superior, clockwise, and left lateral glide; anterior diaphragm restriction; left trapezius and left scalene muscle hypertonicity and tenderness; left shoulder restriction to abduction and external rotation; T3 flexed, rotated and sidebent left; T7 extended, rotated and sidebent left; L1 flexed, rotated and sidebent left; bilateral psoas spasms and increased paravertebral muscle spasms from T1-T8 on the left.

Assessment
The patient was a 61-year old woman with musculoskeletal left anterior chest wall pain and significant somatic dysfunctions (SD) of the cervical, thoracic, upper extremity, and ribs, which were contributing to the chest wall pain.

Treatment
Osteopathic manipulative treatment was applied to address the noted somatic dysfunctions. Suboccipital release and myofascial release (MFR) were applied to the head, cervical, and thoracic regions. Counterstrain (CS) was utilized to treat the rib 3 tenderpoint. Muscle energy technique (MET) was applied to treat the rib exhalation dysfunctions, balanced ligamentous tension (BLT) to the restricted sternum, and doming of the diaphragm to facilitate excursion. Muscle hypertonicity of the upper thoracic cage and shoulder girdle musculature was treated using an MFR technique that utilized the arm as a lever to affect those fascial restrictions. Segmental dysfunction of the head and spine were treated using BLT. The thoracic cage was treated with thoracic inlet MFR and bilateral rib raising. The bilateral psoas muscle spasm was treated with facilitated positional release (FPR). Abdominal diaphragm doming was also performed.

Sacral and innominate and lower extremity diagnosis and treatment was not performed due to time constraints.

Response to treatment
Immediately after the treatment, the patient noted improvement of the chest pain to 2-3/10 pain. The patient returned for a follow-up visit 4 days later, and she reported no longer having pain or palpitations and having a marked improvement in breathing.

Approximately 3 weeks after her last visit, the patient returned to the office and noted that she no longer had chest pain but had residual chronic left neck and back pain. She denied taking any pain medication or steroids during that time.

Discussion
Acute chest pain is an emergent presentation. Physicians tend to focus their clinical evaluation and decisions on eliminating life threatening conditions based on standard medical care. While important causative factors must be ruled out, the most common cause of chest pain is of musculoskeletal origin. The emphasis on the diagnosis and exclusion of cardiac and pulmonary conditions of lower frequency necessitate a disproportionate use of resources. As seen in this case, all of the patient’s procedures and tests cost approximately $6500. (Based on national average costs: electrocardiogram $75, echocardiogram $1400, bloodwork cardiac enzymes $120, chest x-ray $350, chest computed tomography scan $1000, and cardiac catherization $3800.)

The battery of tests that patients undergo can also result in false positives and can increase risks. Overall, the health care cost of...
(continued from page 28)

chest pain evaluation is a significant financial burden. In fact, acute chest pain accounts for over 6 million emergency department visits and costs more than $10 billion per year in the United States.²

The serious nature of cardiac and pulmonary diseases justifies a proportional response in ruling them out as causes of chest pain. However, because the majority of chest pain presentations are of musculoskeletal origin, perhaps what is truly called for is an improved training and a greater level of proficiency in diagnosing musculoskeletal sources of chest wall pain. Preclinical and clinical medical education has been found to be lacking in musculoskeletal education.³,⁴ This is a potential opportunity for osteopathic medicine to fill this void and demonstrate the benefits of appropriate musculoskeletal examination and treatment. Musculoskeletal evaluation and treatment could be carried out concurrently with some of the standard tests (eg, EKG, cardiac enzymes, troponins, etc.) that are performed in the emergency department setting.

As this case illustrates, performing an osteopathic structural exam and applying osteopathic manipulative treatment can be useful in the diagnosis and treatment of musculoskeletal chest wall pain. Somatic dysfunctions of the thoracic cage and musculoskeletal structures affect rib cage mobility and can potentially contribute to chest pain.⁵

Five Models of Osteopathic Care

When applying osteopathic manipulative medicine to any patient, it can be useful to utilize the 5 models of osteopathic care to address somatic dysfunction to promote health and optimize healing.

Following a biomechanical approach, restrictions of the thoracic cage and upper extremities were treated with osteopathic techniques to decrease muscle spasms and improve joint mobility.⁶ CS to the rib tenderpoint targeted hypertonic intercostal muscles that could contribute to the exhalation dysfunction. Rib 3 on the left was the key rib of the group dysfunction. Treatment of rib 3 dysfunction with MET was performed first, followed by BLT of the thoracic spine to remove thoracic cage biomechanical restrictions and restore proper motion and function. Treatment of the left upper extremity with MFR addressed musculoskeletal hypertonicity of the pectoralis muscles and other muscles connecting from the shoulder girdle to the cervical and thoracic region that contributed to the patient’s cervical and back pain. Studies have shown that treating thoracic cage restrictions can reduce pain and improve pulmonary function.⁷,⁸ Applying osteopathic treatments following the biomechanical model potentially improved thoracic cage compliance and decrease work of breathing.

Following the circulatory-respiratory model of treatment, the thoracic inlet release, rib raising, and abdominal diaphragm technique were applied to enhance lymphatic drainage and to promote inflammation clearance. These treatments were utilized to remove any restrictions that would potentially reduce proper circulation and lymphatic drainage. Studies have shown that impaired lymphatic circulation directly affects disease processes through decreased clearance of inflammatory mediators.⁹ The goals of osteopathic manipulative treatment included improving the circulation and delivery of medications to the region, thus improving the effectiveness of the oral steroids. One key region of focus was the treatment of the psoas muscle spasm.

Evaluation and treatment of the psoas muscle is important due to its effect on diaphragmatic movement. The psoas muscle attaches to the lumbar spine, and its fascia connects into the 12th rib and arcuate ligaments. Spasm of the psoas muscle can restrict the lumbar spine where the diaphragm anchors through the posterior arcuate ligaments. Treating the psoas and thoracic and lumbar paraspinal muscles is paramount to improve thoracic cage excursion, as movement of lymph is dependent upon the diaphragm to be able to create pressure changes in the thoracic cage with respiration.⁶

Following the neurologic model, treatment of the suboccipital region and the thoracic spine helped to address any autonomic imbalance that might have contributed to the patient’s pain and palpatations. Prior publications have demonstrated the effects of osteopathic manipulation on the autonomic nervous system, specifically to the heart.¹⁰,¹¹,¹²

The pain relief the patient immediately obtained from the osteopathic treatment served diagnostic as well as therapeutic purposes. She expressed significant relief with the resolution of her pain and the confirmation of her pain being of musculoskeletal etiology alleviated her concerns and allowed her to continue her activities as planned. This demonstrates the effect of osteopathic treatment on the behavioral model, as the treatment was able to immediately reduce the patient’s pain, anxiety, and stress. Patients suffering from noncardiac chest pain have been found to have increased anxiety, somatic symptoms, and exaggerated sense of bodily sensations compared to healthy controls.¹³,¹⁴ It is of utmost importance for physicians to consider the whole person, body, mind, and spirit when evaluating and treating patients with chest pain.

Lastly, the metabolic-energy model focuses on the body’s ability to maintain a balance between energy production, distribution, and expenditure.⁶ OMT in this case helped to address somatic dysfunctions that increased the amount of work the patient’s body needed.

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to overcome and thus decrease overall allostatic load. Allostasis is the adaptation to stressful challenges that activates our neuroendocrine-immune system. Prolonged increased allostatic load can lead to disease and pain.\textsuperscript{15,16} In this case, treatment of musculoskeletal dysfunction potentially decreased the amount of energy expenditure, decreased pain, and improved medication delivery and removal of metabolic byproducts in the region.\textsuperscript{6}

Conclusion

This case exemplifies the value of integrating an osteopathic approach and treatment in the case of chest pain. Cardiac, pulmonary, gastrointestinal, and other potential life-threatening etiologies of chest pain must be investigated and ruled out. This case illustrates the potential benefits of integrating osteopathic principles and practice in the evaluation and treatment of chest pain presentations.

Although the patient’s results were positive, further studies establishing the efficacy of OMM in the diagnosis and treatment of chest wall pain are in need. This case supports the overall need for improved musculoskeletal evaluation and training in medical education. Integrating lectures and hands-on workshops across allopathic and osteopathic training programs can potentially improve physician evaluation and approach to musculoskeletal chest pain.

References

New in the AAO’s Online Store

Mindful Relationships: Seven Skills for Success—Integrating the Science of Mind, Body and Brain
B. Grace Bullock
ISBN: 978-1909141704
189 pp., Paperback
$29.50 ($26.55, member price)

Human existence depends on relationships. Our brains rely on interconnected neural networks to function. Our minds relentlessly encode complex matrices of meaning to make sense of the world. And our physical and psychological development is contingent on the social bonds we share with others. 

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ISBN: 978-1909141681
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Far from being simply a sequence of techniques, as practiced in many countries, osteopathy is an independent primary health care system based on principles applied through a manual practice: a unique profession that takes care of the whole person through the application of five models (biomechanical, neurological, respiratory-circulatory, metabolic, and behavioral). These conceptual models of the relationship between structure and function allow osteopaths to evaluate treatment with the aim of promoting health rather than curing disease. This book is intended as a manual for both students and osteopathic ....

Foundations of Morphodynamics in Osteopathy
Torsten Liem and Patrick Van den Heede, editors
ISBN: 978-1909141247
703 pp., Hardcover
$110 ($99, member price)

In 35 chapters written by the editors and a team of internationally renowned contributors, the book covers the underlying principles of osteopathic palpation from a biodynamic and “morphodynamic” perspective, and their application in the cranial field and the spinal cord. It emphasizes the importance of considering not just the patient’s physical self, but also the inner consciousness. It teaches how to assess tissue-energy characteristics, and to use this understanding in managing the whole patient. The work discusses biophysical, neurobiological and psychological interactions as well as the interplay of developmental dynamics and further epigenetic influences on the organism. As well as the primary respiratory mechanism ....
Touro University Nevada College of Osteopathic Medicine (TUNCOM) is seeking qualified osteopathic physicians (D.O.) for a full-time assistant professor position in the Department of Osteopathic Manipulative Medicine. Responsibilities include teaching osteopathic medical students the principles of osteopathic manipulative medicine both in the classroom and clinic settings and in providing support for program development.

MINIMUM QUALIFICATIONS:
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2. Experience teaching and utilizing a variety of osteopathic manipulative medicine techniques;
3. Licensed or eligible for licensure to practice medicine in the state of Nevada;
4. Proficient in basic communication tools including email, Word and PowerPoint

PREFERRED QUALIFICATIONS:
The ideal candidate is preferred to be certified in Neuromusculoskeletal Medicine / Osteopathic Manipulative Medicine or Special Proficiency in Osteopathic Manipulative Medicine though candidates who have proven experience in providing high level osteopathic manipulative medicine services will be considered.

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This course will:

- provide basic and refresher knowledge and skills for program directors and core teaching faculty who supervise osteopathic manipulative treatment (OMT) in clinics.
- help MD students and graduates obtain the prerequisites for entering osteopathic-recognized residencies.
- be valuable for clinicians interested in adding OMT to their skill set.

Through a combination of lectures and hands-on workshops, attendees will learn the basics of osteopathic manipulative medicine, which encompasses osteopathic tenets, palpatory diagnosis and OMT. The curriculum includes lessons on muscle energy technique; thoracic spine technique; articular techniques; functional techniques; myofascial release; and high-velocity, low-amplitude thrust.

Course registration includes one copy of Greenman's Principles of Manual Medicine, 5th edition.

Course Times
Thursday from 1 to 6 p.m.
Friday and Saturday from 8 a.m. to 6 p.m.
Sunday from 8 a.m. to 4 p.m.

Continuing Medical Education
28 credits of AOA Category 1-A CME anticipated.

Meal Information
Morning coffee and tea will be provided Friday through Sunday, as well lunch.

Course Location
The Pyramids, Building Three
3500 DePauw Blvd., Lower Level, Conference Rooms A and B
Indianapolis, IN 46268

Course Director
Lisa Ann DeStefano, DO, has chaired the Department of Osteopathic Manipulative Medicine at the Michigan State University College of Osteopathic Medicine (MSUCOM) in East Lansing since 2004. A protégé of the late Philip E. Greenman, DO, FAAODist, Dr. DeStefano edited the fourth and fifth editions of the textbook Greenman’s Principles of Manual Medicine.

A 1993 graduate of MSUCOM, Dr. DeStefano is board certified in osteopathic manipulative medicine and neuromusculoskeletal medicine and in osteopathic family medicine.

Travel Arrangements
Contact Tina Callahan of Globally Yours Travel at (480) 816-3200 or globallyyourstravel@cox.net.

Registration Fees

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* The AAO’s associate members, international affiliates and supporter members are entitled to register at the same fees as full members.
Course Description
The goal of this course is to help participants continuously consider the functional reasons for pain and to find function rather than to eliminate pain. This course will help participants acquire a working knowledge of how myofascial release palpatory and treatment techniques can be used alone or in conjunction with other manual medicine methodologies. This course also hopes to help participants in developing the ability to think about specific anatomical areas in three dimensions both statically and dynamically and the ability to assess and treat specific myofascial problems.

Course Times
Friday and Saturday from 8 a.m. to 5:30 p.m.
Sunday from 8 a.m. to 12:15 p.m.

Continuing Medical Education
20 credits of AOA Category 1-A CME anticipated.

Meal Information
Morning coffee and tea will be provided Friday through Sunday.
Lunch will be provided Friday and Saturday.

Course Location
The Pyramids, Building Three
3500 DePauw Blvd., Lower Level, Conference Rooms A and B
Indianapolis, IN 46268

Travel Arrangements
Contact Tina Callahan of Globally Yours Travel at (480) 816-3200 or globallyyourstravel@cox.net.

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A 1993 graduate of MSUCOM, Dr. DeStefano is board certified in osteopathic manipulative medicine and neuromusculoskeletal medicine and in osteopathic family medicine. In 2003, she received the Osteopathic Faculty Award and the Guiding Principles Award from MSUCOM. She has lectured widely in the United States and internationally, and she received the AAO’s Thomas L. Northup award in 2018.

Registration Fees

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Myofascial Release
Aug. 16-18, 2019

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Register online at www.academyofosteopathy.org, or submit this registration form and your payment by email to GWatts@academyofosteopathy.org; by mail to the American Academy of Osteopathy, 3500 DePauw Blvd., Suite 1100, Indianapolis, IN 46268-1136; or by fax at (317) 879-0563.
Course Description
This course will explore the traditional osteopathic thought, approach and technique of Carl McConnell, DO, a premier osteopathic clinician who, at the time of his death, was thought to have best understood Dr. Still’s teaching. The course is designed to lead participants through approaches requiring increasing palpatory appreciation for precision, specificity and anatomical localization. McConnell understood the osteopathic lesion differently than we currently understand it, which greatly influenced his application and choice of technique. Central to his thought was identifying and treating the “key lesion.” These concepts will be explored in this experientially driven course. This is an intermediate to advanced course intended for experienced clinicians, but all skill levels will benefit from the principles of palpatory precision and discussion of osteopathic philosophy and art.

Prerequisite
Registrants must have an understanding of osteopathic manipulative medicine.

Course Times
Friday and Saturday from 8 a.m. to 5:30 p.m.
Sunday from 8 a.m. to noon.

Continuing Medical Education
20 credits of AOA Category 1-A CME anticipated.

Meal Information
Morning coffee and tea will be provided Friday through Sunday.
Lunch will be provided Friday and Saturday.

Course Location
Ohio University Heritage College of Osteopathic Medicine
6775 Bobcat Way
Medical Education Bldg. 1, Floor 2
Dublin, OH 43016 (see campus map)

Travel Arrangements
Contact Tina Callahan of Globally Yours Travel at (480) 816-3200 or globallyyourstravel@cox.net.

Course Director
Richard G. Schuster, DO, is in solo private practice in Indianapolis, doing direct primary care and osteopathic manual medicine.

Dr. Schuster graduated from the Ohio University Heritage College of Osteopathic Medicine in 1994 after completing an undergraduate fellowship in osteopathic principles and practice. He completed a family medicine residency at the Firelands Regional Medical Center in Sandusky, Ohio, and a postdoctoral fellowship in sports medicine at the Toledo Hospital in Ohio.

The chair of the AAO’s 2015 Convocation, Dr. Schuster is a member of the AAO’s Board of Trustees and the vice chair of the AAO’s Education Committee.

Dr. Schuster has a strong interest in medical education, and his academic interests include musculoskeletal medicine, biomechanics and functional anatomy, with an emphasis on how the body transmits and organizes information to coordinate movement.

Registration Fees

<table>
<thead>
<tr>
<th>Category</th>
<th>On or before Sept. 5, 2019</th>
<th>Sept. 6–Nov. 5, 2019</th>
<th>On or after Nov. 6, 2019</th>
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<tbody>
<tr>
<td>Academy member in practice*</td>
<td>$800</td>
<td>$850</td>
<td>$1,050</td>
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<tr>
<td>Resident or intern member</td>
<td>$600</td>
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<td>Student member</td>
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<tr>
<td>Nonmember student</td>
<td>$600</td>
<td>$650</td>
<td>$850</td>
</tr>
</tbody>
</table>

* The AAO’s associate members, international affiliates and supporter members are entitled to register at the same fees as full members.

Registration Form

Traditional Osteopathic Techniques of Carl Philip McConnell, DO
Nov. 15-17, 2019

Name: __________________________ AOA No.: __________
Nickname for badge: __________________________
Street address: __________________________
City: __________ State: ______ ZIP: ______
Phone: __________ Fax: __________ Email: __________

Credit card No.: __________ Cardholder’s name: __________ Expiration date: __________ 3-digit CVV No.: __________
Billing address (if different): __________

I hereby authorize the American Academy of Osteopathy to charge the above credit card for the amount of the course registration.

Signature: __________________________

By registering for this course, you agree to abide by the AAO’s code of conduct, photo and video release, and cancellation policy.
Component Societies and Affiliated Organizations
Calendar of Upcoming Events

June 8-12, 2019
The Osteopathic Cranial Academy
Introductory Course in Osteopathy in the Cranial Field
Course director: Richard F. Smith, DO
Associate director: Matthew Gilmartin, MD
Marriott La Jolla Hotel in California
40 credits of AOA Category 1-A CME anticipated
Learn more and register at cranialacademy.org.

June 13-16, 2019
The Osteopathic Cranial Academy
Annual Conference—The Second Brain:
An Exploration of the Gut-Brain Axis
Conference director: Michael Kurisu, DO
Assistant director: Ali Carine, DO
Marriott La Jolla Hotel in California
22.25 credits of AOA Category 1-A CME anticipated
Learn more and register at cranialacademy.org.

June 21-23, 2019
Rocky Mountain American Academy of Osteopathy
Osteopathy and the Brain: Mood and Anxiety Disorders
Course director: Ellice Goldberg, DO
Faculty: Teodor Huzij, DO
Rocky Vista University
Parker, Colorado
18 credits of AOA Category 1-A CME anticipated
Learn more at www.ColoradoDO.org.

July 17-21, 2019
Osteopathy’s Promise to Children
Foundations of Osteopathic Cranial Manipulative Medicine
(The 40-Hour Basic Cranial Course)
Course director: R. Mitchell Hiserote, DO
Osteopathic Center San Diego
40 credits of AOA Category 1-A CME anticipated
Learn more and register at the-promise.org/cme/.

Aug. 9-11, 2019
Indiana Academy of Osteopathy
The Dental/Body Connection
Course director: Charles A. Beck, DO, FAAO
Drury Inn Conference Room
Carmel, Indiana
20 credits of AOA Category 1-A CME anticipated
Learn more and register at www.indianaacademyofosteopathy.com.

Sept. 6-8 and Sept. 20-22, 2019
The Osteopathic Cranial Academy
2-Weekend Introductory Course
in Osteopathy in the Cranial Field
Conference director: Zina Pelkey, DO, FCA
New York Institute of Technology
College of Osteopathic Medicine
Old Westbury, New York
40 credits of AOA Category 1-A CME anticipated
Learn more and register at cranialacademy.org.

Sept. 7, 2019
Osteopathy’s Promise to Children
OMT for Systemic Disorders and Physiological Functions:
Cardiopulmonary & Immune Systems
Course director: Hollis H. King, DO, PhD, FAAO
Osteopathic Center San Diego
8 credits of AOA Category 1-A CME anticipated
Learn more and register at the-promise.org/cme/.

Oct. 4-6, 2019
The Northern California Academy of Osteopathy
The Cranial Approach of Beryl Arbuckle
Course director: Kenneth J. Lossing, DO
San Rafael, California
22.5 credits of AOA Category 1-A CME anticipated
Learn more at kennethlossing.com/classes.

Oct. 5, 2019
Osteopathy’s Promise to Children
OMT for Systemic Disorders and Physiological Functions: Gastrointestinal & Nervous Systems
Course director: Hollis H. King, DO, PhD, FAAO
Osteopathic Center San Diego
8 credits of AOA Category 1-A CME anticipated
Learn more and register at the-promise.org/cme/.

Visit www.academyofosteopathy.org/affiliate-cme for additional listings.