

ASSOCIATION OF CHIROPRACTIC COLLEGES RESEARCH AGENDA CONFERENCE 2021 ABSTRACTS OF PROCEEDINGS

PLATFORM PRESENTATIONS

Symptoms of multiple sclerosis masked as lumbar disc herniation sequelae

Philip Afghani, Melissa Ferranti

Objective: To describe the case of a patient who presented with lumbar disc herniation sequelae that masked symptoms of multiple sclerosis. **Clinical Features:** A 45-year-old female presented with lower back pain with radiation and paresthesia that were consistent with lumbar disc herniation sequelae from a previous motor vehicle collision (MVC) injury. **Interventions and Outcomes:** The patient was initially treated with chiropractic care for an MVC 2 years previously. After an initial improvement, her symptomatology improved, and she was released with occasional recurrence of symptoms that responded well to care. She returned 2 years post initial injury with lower back pain and paresthesia in bilateral legs and occasionally in her upper extremities. Patient attributed symptoms to previous injury, but after an evaluation she was referred to a neurosurgeon and underwent MRI with contrast where plaques were noted in her spinal cord, and she was subsequently diagnosis with multiple sclerosis. **Conclusion:** Patients with recurrence of symptoms consistent with previous injuries such as disc herniation or symptom progression should be monitored for the development of underlying neurological disorders that may present with similar symptoms. Patients with progressive neurological symptoms should be referred for a neurosurgical consult. (This is a conference presentation abstract and not a full work that has been published.)

Shockwave therapy combined with cold laser for a CrossFit athlete with chronic shoulder impingement: a case report

Whitney Amos McNary

Objective: To show the outcome of treatment using Shockwave therapy combined with cold laser for a CrossFit athlete with chronic right shoulder impingement. **Clinical Features:** A 31-year-old male presented with chronic right shoulder pain. The pain was described as dull and radiating into right arm. Noticeable bony protuberance over A/C joint. Radiograph revealed mild osteoarthritis in the right A/C joint. Moderate decreased range of motion (ROM) with pain, pinpoint pain over A/C joint. The Mumford procedure was the recommended medical treatment. **Intervention and Outcome:** The patient received chiropractic adjustments and manual therapy in his right shoulder region with slight improvement. Shockwave therapy combined with cold laser was introduced at reevaluation. Patient was advised to rest and/or limit his workout regime. Patient was compliant with treatment visits, however, did not limit his activity. The patient was treated 1 to 2 days/week for 8 weeks resulting in a reduction of pain, improved ROM, and improved function. Opioid analgesic therapy cores also significantly decreased. **Conclusion:** This case shows that with this type of patient, Shockwave therapy along with cold laser can improve a chronic shoulder impingement providing a potential alternative to surgical intervention and opens the door for future research. (This is a conference presentation abstract and not a full work that has been published.)

Analyzing insurance claims to determine patterns of chiropractic care for low back pain and their association with treatment escalation

Brian Anderson, Steve McClellan

Objective: Use insurance claims for low back pain to estimate risk of treatment escalation for different patterns of chiropractic care compared to medical care only. **Methods:** Retrospective analysis of insurance claims data from a single Fortune-500 company. Patterns of chiropractic care were: 1, exclusive chiropractic care; 2, initial chiropractic care followed by medical care; 3, some combination of chiropractic and medical care. Treatment escalation included any claims with imaging, injection, emergency room, or surgery. Modified Poisson regression modeling was used. **Results:** Claims (83,025) were categorized into 11,114 unique patient first episodes. Chiropractic care was present in 2977 (27%) claims; 2528 (85%) of these were initiated with chiropractic care, while 2343 (79%) were exclusive to chiropractic care. The estimated relative risk of treatment escalation was: 0.54 (0.50–0.58, $p=0.001$) for pattern 1; 1.71 (1.57–1.86, $p=0.001$) for pattern 2; 1.16 (1.06–1.28, $p=0.002$) for pattern 3. **Conclusion:** For claims associated with low back pain, exclusive chiropractic care had half the risk of treatment escalation compared to medical care only. However, the risk of those with both chiropractic and medical care were higher than those with medical care only. (This is a conference presentation abstract and not a full work that has been published.)

A case report of a 91-year-old female with chronic left heel pain associated with a Haglund deformity and her response to low level laser and Kinesio taping

Alejandro Aponte, Bethany Aponte

Objective: Demonstrate the management of chronic left heel pain of a 91-year-old female and her response to low level laser therapy in combination with Kinesio tape. **Clinical presentation:** 91-year-old female presents with severe chronic heel pain that began insidiously 4 years ago. Upon visual inspection, bruising along inferior anterior portion of the tibia most likely due to anticoagulant medication. Haglund deformity of her left heel was suspected, with associated edema, hyperesthesia and pain affecting her ability to walk (0/10)PSFS and sleep (2/10)PSFS. Patient has a history of heart disease and hypothyroidism and is currently taking medication for such. **Intervention and Outcome:** Class-3B laser was applied to the patient's heel and Achilles tendon followed by the application of 2 strips Kinesio tape, one from the calcaneus to the superior aspect of the Achilles tendon and the second with 50% stretch horizontally over the inferior portion of the Achilles tendon. After 8 treatments, significant improvement is reported as per patient-specific functional scale, walking(7/10) and sleeping(10/10). **Conclusion:** Cold laser therapy and Kinesio tape combination treatment can be a safe alternative treatment for patients with symptomatic Haglund deformities with risk factors such as age and heart disease. (This is a conference presentation abstract and not a full work that has been published.)

Functional neurologic management of concussion-related symptoms in an adolescent athlete: a case study

Jason Belcher, Nicholas Snyder

Objective: Current evidence points toward extended recoveries (>21 days) for concussion patients that present with oculomotor abnormalities and dizziness detected by vestibular/ocular motor screening. **Clinical Features:** A 15-year-old female presents with headaches, photophobia, dizziness, and difficulty focusing on distant objects following a concussive injury sustained during a soccer game. Examination revealed oculomotor deficiencies, coordination deficits, elevated resting heart rate (RHR) and blood pressure (BP), and cervical ligamentous sprain with cervical muscular strain. **Intervention and Outcome:** Functional neurologic rehabilitation exercises, full spine chiropractic manipulation, cervical stretches and range of motion exercises, myofascial release therapy, and guidance for the patient's return to school consisting of 12 visits over 4 weeks was performed. At the 7th appointment, 16 days from injury, the patient was asymptomatic. At re-exam the patient was asymptomatic with no functional deficits, with additional improvements to RHR and BP. She received clearance for return to full participation in sports. **Conclusion:** This case demonstrates that concussion management with functional neurologic rehabilitation exercises warrants further research into the possibility of reducing recovery timelines for athletes with sports-related concussion. (This is a conference presentation abstract and not a full work that has been published.)

Pancoast tumor resulting in cervicobrachial neuralgia

Emma Berntheizel, Charles Fischer, Lauren Tollefson, Eric Stefanowicz

Objective: The purpose of this report is to present a case of neck and unilateral arm pain that led to the diagnosis of a Pancoast tumor in a patient with a history of smoking. **Clinical Features:** A 52-year-old African American male presented to a chiropractic office complaining of right-sided cervicobrachial pain and numbness into the right upper extremity. After a trial of conservative care where the patient initially improved, the numbness and weakness began to progress rapidly. **Intervention and outcome:** Initial radiographic imaging examination revealed tracheal deviation, followed by a chest CT that demonstrated a large mass-like lesion in the apex of the right lung, highly suggestive of bronchogenic carcinoma. Subsequent allopathic referral for evaluation and management resulted in chemotherapy and radiation. **Conclusion:** This report describes a presumptive case of cervical radiculopathy with no indication of medical red flags, that quickly developed into an urgent indication for imaging and referral to an oncology center. While the patient's eventual status illustrated a classic presentation of a Pancoast tumor, his initial exam and workup indicated a case of cervical radiculopathy that responded well to chiropractic manipulative therapy. (This is a conference presentation abstract and not a full work that has been published.)

Patient characteristics associated with self-reported adherence to chiropractic treatment recommendations: a pilot study

Serena Bezdjian, James Whedon, Robb Russell, Ian Coulter

Objective: Current guidelines suggest the use of nonpharmacologic therapies, such as those offered by chiropractors, as a widely adopted approach for the

management of spinal pain. However, to be effective the patient must adhere to the treatment plan suggested. The present pilot study examined the feasibility of developing and administering a patient survey to assess self-reported adherence to treatment recommendations from doctors of chiropractic at an academic health center. **Methods:** Participants included adult patients with spine pain seen by a doctor of chiropractic at an academic health center. A total of 62 respondents completed an institutional review board-approved 32-item anonymous survey. The survey was administered between October 2019 and March 2020. The survey items were developed by the authors and vetted by the university faculty members who serve as healthcare practitioners at the academic health center. **Results:** Overall, 89% of respondents adhered to their clinic appointments. Although 82% of respondents said that their doctor's recommendation made sense, only 44% of respondents reported completely following treatment recommendations for at-home stretching and exercise. **Conclusions:** Although patient self-reported adherence to clinic appointments was high, adherence to treatments was not. Future research should also survey practitioners to corroborate patient adherence. (This is a conference presentation abstract and not a full work that has been published.)

Utilizing cranial and infant inversion therapy in the treatment of plagiocephaly: two case reports

Charles Blum, Jeffrey Mersky

Objective: This study investigated the use of cranial and infant inversion therapy for the treatment of plagiocephaly in 2 infants initially considered needing helmet therapy. Also specifically discussed is infant inversion therapy as a diagnostic (Peiper-Isbert reaction) or treatment (DeJarnette pediatric cranial procedure) modality. **Clinical Features:** Two 4-month-old infants were presented to 2 different chiropractic offices for assessment and treatment of plagiocephaly as an alternative to helmet therapy. **Intervention:** Similar care was offered, which focused on sacro occipital technique pediatric cranial procedures and inversion therapy in the office and for parents to perform at home. Care was provided over a 3-month period and averaged around 6-8 office visits. **Outcome:** Within the first 2 visits the parents noticed the child having better cervical ranges of motion, and by the 4th office visit, improvement in plagiocephaly was beginning to be noticed. Neither child necessitated utilizing helmet therapy. **Conclusion:** There have been published studies on cranial treatment of plagiocephaly, however there is a paucity of studies published on infant inversion therapeutic applications. In these 2 cases the cranial and inversion therapy was well tolerated and may offer an alternative for helmet therapy if a child is resistant or the parent(s) prefers another conservative therapeutic option. (This is a conference presentation abstract and not a full work that has been published.)

Utilization of telehealth in the management of an exacerbation of cervicgia in a chiropractic patient during the COVID-19 pandemic: a qualitative case report

Gina Bonavito-Larragoite, Oowais Siddique

Objective: This case study illustrates an example of the shift from the traditional hands-on delivery of chiropractic care to engaging through telehealth. **Clinical features:** A 31-year-old female patient was referred to the chiropractic clinic with an exacerbation of cervicgia with associated headaches. Due to the COVID-19 pandemic, the chiropractic clinic was limiting in-person treatment to emergencies. The patient was treated by this provider in 2015 and 2018 for the same condition with positive outcomes. She reports insidious onset several weeks prior with a constant dull pain at the base of the neck radiating between the shoulder blades, provoked by poor posture with computer use and uncomfortable sleep. Visual examination of posture and cervical range of motion was performed. Veteran was instructed to self-palpate musculature of the neck and shoulders. She reported tenderness in the cervical paraspinal, scalene, trapezius muscles bilaterally, left greater than right. **Intervention and Outcome:** Treatment provided through video conferencing included home-based exercise program, acupressure with mindfulness and durable medical equipment. Follow-up phone call reports cervicgia resolved, and headaches managed with acupressure. **Conclusion:** Successful chiropractic management via telehealth occurred utilizing the diverse skills available to the chiropractor without use of hands-on spinal manipulative therapy. (This is a conference presentation abstract and not a full work that has been published.)

An analysis of the relationship between the concentration of chiropractic physicians and sociodemographic data: a pilot study in Connecticut

Ryan Burdick, Stephanie Halloran, Brian Coleman, Anthony Lisi

Objective: To investigate the geospatial distribution of chiropractors in Connecticut and its relationship to population health characteristics and sociodemographic factors. **Methods:** Cross-sectional analyses of public data sources was used. Chiropractic provider locations were obtained from the National Provider Identifier Registry (September 2020); demographics from the US Census Bureau (2016-2018); and population health characteristics from DataHaven, a Connecticut health equity nonprofit organization (June 2020). Data were analyzed with descriptive statistics. **Results:** Chiropractic provider location densities varied across demographics and geography.

Overall chiropractic provider density was 23 per 100,000 residents. For individuals eligible for Medicare and/or Medicaid beneficiaries (36% of the general population, SD 11%), chiropractic provider density was 16 per 100,000 in regions +1 SD, and 24 per 100,000 in -1 SD. When compared with a schema incorporating median income, poverty rate, and population density, the aggregated rate of doctors of chiropractic (DCs) per capita was highest in wealthy towns (30 DCs per 100,000 residents) followed by suburban (29 per 100,000), urban-periphery (25 per 100,000), urban core (14 per 100,000), and rural (11 per 100,000). **Conclusion:** Chiropractic provider locations per capita are more concentrated in regions with affluent residents and less concentrated in areas with higher percentages of Medicare/Medicaid populations. (This is a conference presentation abstract and not a full work that has been published.)

Lower extremity vascular occlusion presenting as lumbar radiculopathy: a case report

Tara Cheuvront

Objective: To describe the importance of appropriate diagnosis and comanagement of a patient. **Clinical Features:** A 55-year-old male patient with multiple comorbidities including a history of smoking and alcoholism had a chronic history of lower back pain and bilateral leg pain. After a short course of conservative care with only minor improvement, patient was referred for special testing. **Intervention and Outcome:** Lumbar x-rays demonstrated moderate degenerative changes of the lumbar spine in addition to atherosclerosis of abdominal aorta and bilateral iliac arteries. Patient was then referred for lower extremity Doppler ultrasound. Findings were consistent with a 90% occlusion of left iliac artery and 75 percent occlusion of right iliac artery. Patient underwent vascular surgery in which 4 stents were placed in left iliac artery and 3 stents were placed in right iliac artery. He continues to be comanaged with his cardiologist. Patient had full resolution of bilateral lower extremity pain. **Conclusion:** Ruling out red flags with proper diagnosis and referral for comanagement is of utmost importance to provide the best possible care for a patient presenting with potential lumbar radiculopathy but symptomatology revealed to be related to significant vascular occlusion of the lower extremities. (This is a conference presentation abstract and not a full work that has been published.)

Virtual physical examination education during COVID

Katherine Clark, Julie Johnson

Objective: To describe the development and implementation of virtual clinical experiences for students. **Methods:** To convey clinical experience with examination procedures, flow, and case types in a virtual setting. Clinicians were tasked with creating a virtual learning environment for students. Cases were created, edited, and presented by a team of clinicians. Virtual exams were orchestrated and schedule in Microsoft Teams. Groups of 4-6 interns met with a clinician for presentation, discussion, demonstration, and practice of clinical exams. Limited credits could be earned in this manner. **Results:** Most students had at least 50 patient encounters before going virtual. This live introduction and then deeper discussion online gave a unique perspective of student understanding. Virtual exams reviewed how to use orthopedic and neurologic testing leading to a differential diagnosis and make proper referrals. Students were challenged to create a report of findings and discuss alternate treatment options. Feedback indicated that the process aided the student in thinking less like a technician and more like a clinician. **Conclusion:** Virtual experiences provided a valuable learning experience for students and will be incorporated in the educational process after distancing limitations are lifted. (This is a conference presentation abstract and not a full work that has been published.)

Does telehealth reduce the dosage of face-to-face visits for chiropractic care? A case series during the COVID-19 pandemic

Michael Cole II, Jason Napuli, Ross Mattox

Objective: To illustrate successful case management and utilization of telehealth during the COVID-19 pandemic, which led to short courses of live care in a VA chiropractic clinic. **Clinical Features:** Case 1: 83-year-old male referred to chiropractic clinic with chronic low back pain. Case 2: 71-year-old male referred to chiropractic clinic for chronic low back pain with stenotic features. **Intervention and Outcomes:** During COVID-19 clinic shuttering, the initial consultations were conducted via telehealth. Both patients received home exercise plans and recommendations. Subsequent telehealth visits were aimed at providing patient reassurance and modifying home exercise plans and were also supplemented with virtual whole health services. Both patients reported decreased pain and increased mobility with home exercise plans. Following clinic reopening, both patients presented in person with less pain than at the virtual consult and were successfully released from care following just two visits each of live chiropractic care. **Conclusion:** Telehealth allowed for successful management of chronic back pain during the COVID-19 pandemic while clinics were shuttered, possibly reducing the number of live visits within a VA chiropractic clinic necessary before discharge. Further studies to demonstrate the utility of telehealth in chiropractic care should be considered. (This is a conference presentation abstract and not a full work that has been published.)

Association between provision of chiropractic care in veterans with spine pain and risk of unnatural death including suicide death

Brian Coleman, Zachary Cupler, Vivian Ly, Harini Bathulapalli, Suzanne Decker, Clinton Daniels, Michael Anderson, Joseph Goulet

Objective: To examine if receiving chiropractic care by veterans with spine disorders affects risk of unnatural death, including suicide. **Methods:** A cross-sectional analysis of veterans who entered the VA Musculoskeletal Disorders Cohort from 2004 to 2013 with back or neck pain. We used the Mortality Data Repository to identify cause of death occurring after 1 year but within 5 years of cohort entry. The association between chiropractic care use within 1 year after index spine diagnosis and unnatural death was modeled using logistic regression, controlling for covariates including age, gender, race, marital status, pain severity, inpatient musculoskeletal disorders cohort entry, medical and mental health comorbidities. **Results:** There were 684,080 veterans included in the study, with 6293 dying from unnatural causes within 5 years of cohort entry. Risk of unnatural death was significantly lower ($OR = 0.751$, 95% confidence interval = 0.612–0.921) in those receiving chiropractic care when controlling for other covariates. **Conclusion:** Suicide prevention is a priority for the Veterans Health Administration with the goal to equip and empower diverse communities to participate in suicide prevention. In veterans with spine pain, the provision of chiropractic care is associated with a lower risk of unnatural death, including suicide death, likely due to co-occurrence of other self-preserving behaviors. (This is a conference presentation abstract and not a full work that has been published.)

Parsonage-Turner: a case study

Stephan Cooper, Mark Pfefer, Chelsey Holstrom, Paige Pulliam

Objective: Describe a rare case of Parsonage-Turner syndrome (PTS) involving the shoulder and the intervention using a multidisciplinary approach. **Clinical Features:** A 52-year-old male experienced a new episode of weakness and severe, burning pain in the left shoulder and radiation of pain in the upper arm. **Intervention and Outcome:** The patient consulted a chiropractor complaining of severe left shoulder pain, abduction weakness although full range of motion (ROM) was possible, and scapular winging. Cervical ROM was normal, but shoulder pain increased slightly with flexion. The patient denied a history of trauma or overuse. The initial differential diagnosis included cervical radiculopathy and rotator cuff pathology. An MRI of the shoulder was obtained when there was no improvement following a short trial of chiropractic care. Structural and signal abnormalities suggestive of PTS were present. The patient was significantly improved after 8 months using a combination of pharmacologic and nonpharmacologic management. Some residual weakness with no shoulder pain continued. **Conclusion:** PTS can mimic other conditions commonly seen in chiropractic practice. Although rare, PTS should be an included differential diagnosis in severe, nontraumatic shoulder pain. (This is a conference presentation abstract and not a full work that has been published.)

Characteristics and productivity of the chiropractic workforce in the Department of Veterans Affairs

Kelsey Corcoran, Douglas Peterson, Xiwen Zhao, Eileen Moran, Anthony Lisi

Objective: To assess the characteristics and productivity of chiropractors employed by the Department of Veterans Affairs (VA). **Methods:** Cross-sectional and serial analyses of VA administrative data were conducted. Characteristics and productivity of the chiropractor workforce were evaluated from fiscal year (FY) 2016 to FY2019. Productivity was measured as work relative value units (wRVUs). **Results:** From FY2016 to FY2019, the number of chiropractor employees increased from 102 to 167. In FY2019, the average chiropractor was male, white, and 45.9 years old with 5.2 years of VA experience. In FY2019, the VA chiropractor workforce was 25.1% female, 10.8% racial minority, and 20.4% veteran, and the number of individuals from each of these groups increased from FY2016. The average annual productivity of a chiropractor increased from 3034 wRVUs in FY2016 to 3100 wRVUs in FY2019. In FY2019, chiropractor age was the only facility or provider characteristic studied that was significantly correlated with a productivity increase (coef = 21, $p = .038$) after adjusting for other covariates. **Conclusion:** Provider characteristics and productivity metrics of the VA chiropractor employee workforce are presented. These results may be relevant to future modeling of chiropractor personnel in VA and other healthcare systems. (This is a conference presentation abstract and not a full work that has been published.)

Recognizing and expediting care of mental health disorders presenting for pain complaints to a US Veterans Affairs chiropractic clinic: a report of 3 cases.

Clinton Daniels, Derek Anderson, Zachary Cupler

Objective: This case series describes a representative display of coordination of care between a chiropractic and behavioral therapy clinic within an integrated hospital-based system. **Clinical Features:** This report describes the recognition of untreated mental health symptoms, referral to behavioral health providers, and the subsequent treatment approaches. These individuals had musculoskeletal complaints with comorbid mental health symptoms and were predominantly referred to a behavioral health service for concern for adjustment

disorder, but also endorsed depressive symptoms, anxiety, and 1 case indicated suicidal ideation. **Intervention and Outcome:** All 3 cases presented to mental health provider following chiropractic referral; 1 was managed with individual cognitive behavioral therapy; 1 responded well to individual cognitive behavioral therapy transitioned to group-based pain skills, resiliency, and mindfulness therapy; and 1 patient necessitated additional referral to primary care-mental health integration for pharmacological treatment. The 3 patients responded positively to interdisciplinary care and realized functional improvements. **Conclusion:** All 3 cases utilized mental health services following referral from a chiropractic provider. Different approaches to mental health care were afforded to each of these individuals to meet their individual preferences and needs. (This is a conference presentation abstract and not a full work that has been published.)

Information literacy of matriculating chiropractic students assessed via research readiness survey

Barbara DelliGatti, Annette Osenga, Krista Ward, Donna Odierna, Monica Smith

Objective: We report using research readiness surveys to develop our clinical research literacy (CRL) curricula. **Methods:** We pilot-tested (2015–2016) a prevalidated research readiness survey from Central Michigan University, which tests information literacy (IL) skills in higher education. From the pilot, we created our own research readiness survey (RRS) to test 4 critical IL skills: determining the information needed, accessing information effectively, critically evaluating information, and using information ethically and legally. We collected RRS data and demographics for 8 freshman cohorts (2017–2018). **Results:** For $n = 253$ students, the average score was 17 (SD 3.84) out of a maximum possible score of 28. One-way ANOVA (Tukey post hoc) showed significant differences ($p = .008$) in RRS score by prior degree, for example, bachelor vs associate degree holders. Incoming cohort groups also varied in IL subset skills, such as critically evaluating information ($p = .002$). **Conclusion:** We used information from RRS data and other sources to structure three courses in clinical research literacy (CRL): CRL I (basic), CRL II (intermediate), and CRL III (proficient). The RRS data on students' prior knowledge and their IL needs also encouraged student self-reflection, and supported our customizing the IL presentations within the CRL series to each cohort's specific needs. (This is a conference presentation abstract and not a full work that has been published.)

Faculty perceptions of an abrupt transition to online teaching during the COVID-19 pandemic: a descriptive survey

Amberly Ferguson, John Crouse, Judy Bhatti, Elissa Twist, Ward Jones

Objective: Examine chiropractic faculty perceptions and methods used during the rapid transition to online teaching due to the pandemic. **Methods:** A descriptive 21-question online survey was administered to 65 chiropractic faculty at a single chiropractic institution following a mandatory term of online teaching. **Results:** The survey had a 49% response rate ($n = 32$). Most faculty had no previous online teaching experience ($n = 27$). All respondents ($n = 32$) rated the transition as a challenge, with over half ($n = 19$) reporting this to be moderate to significant. The challenges included the lack of interaction/classroom dynamic, uncertainty with student assessment, and loss of sense of community. Along with challenges, positive opportunities such as synchronous and asynchronous instruction and chat contributions from reserved students were reported. Faculty ($n = 20$) reported a 3.3 mean increase in work hours. For hands-on/lab-based classes and lecture-based classes, instructors found faculty-created videos ($n = 17$) to be most useful for online learning. Thirteen respondents prefer to never teach online, 15 would like all or a portion to be online instruction. **Conclusion:** Rapid change from face-to-face to online learning presented challenges and opportunities to chiropractic educators. Faculty developed and explored new online methods of instruction and assessment not previously used in their face-to-face classes. (This is a conference presentation abstract and not a full work that has been published.)

Directing the specific adjustive thrust toward a chiropractic subluxation significantly alters sensorimotor integration compared to directing the thrust at a normally functioning vertebrae

Heidi Haavik, Kelly Holt, Christopher Merkle, Nitika Kumari, Imran Amjad, Muhammad Samran Navid, Imran Khan Niazi

This study aimed to compare neurophysiological outcomes of an adjustive thrust directed at a chiropractic subluxation in the cervical spine compared to a thrust directed at a normally functioning cervical motion segment. In this parallel group randomized controlled trial, 96 participants with evidence of a chiropractic subluxation in their cervical spine were randomly allocated to receive a specific adjustive thrust, using an Activator Adjusting Instrument, to a subluxated cervical vertebrae or to a cervical vertebrae deemed to be functioning normally. Somatosensory evoked potentials (SEPs) from median nerve stimulation were recorded before and immediately after the intervention. The amplitude of the N30 SEP peak was the primary outcome measure (an indicator of early sensorimotor integration [SMI]). A 2-way ANOVA revealed a significant interactive effect ($p < .01$) with a significant N30 peak decrease ($p < .01$) in the subluxation adjustment group ($-16.76\% \pm 28.32\%$), and a

nonsignificant ($p = .4$) increase in the nonsubluxation thrust group (19.58% $\pm$ 55.09%). This study showed that directing a specific adjustive thrust to a chiropractic subluxation resulted in significant neurophysiological changes in SMI similar to those observed in previously published papers, while thrusts directed at nonsubluxated segments had no significant effect. (This is a conference presentation abstract and not a full work that has been published.)

Organization and implementation of telehealth due to the COVID-19 pandemic in a VA chiropractic clinic: a descriptive report

Valerie Johnson, Robb Russell, Enya Katz, Celeste Holder

Objective: With the spread of COVID-19, the chiropractic department at Veterans Administration, Greater Los Angeles Healthcare System (VAGLAHS) rapidly transitioned to telehealth as the predominant form of patient care. The purpose of this study is to describe the rapid implementation of chiropractic care to telehealth using real time video conferencing and phone calls. **Methods:** This is a retrospective description of chiropractic clinic operations at VAGLAHS and the transition from in-person care to telehealth from March 24, 2020, through July 31, 2020. **Results:** Initial telehealth visits were conducted by phone. Video or phone visits were then offered before gradual resumption of face-to-face visits. Clinical telehealth services include consultation, follow-up visits, modified physical exam, working diagnosis, ordering imaging/labs, prosthetics, referral to other departments, and treatment, including dietary assessment/counseling, stress management, and activity prescriptions. **Conclusions:** Chiropractic telehealth services at VAGLAHS allowed for continued clinical care and created a bridge for veterans to practice self-care while waiting for the resumption of in-person care. It also allowed the department to avoid cessation of the chiropractic resident's clinical duties. It has permitted the creation of hybrid visits where the initial component of the visit is conducted remotely. (This is a conference presentation abstract and not a full work that has been published.)

Conservative chiropractic management of a male patient with neuralgic amyotrophy: a case study

Jene Jordahl, Meredith Meyers, Kody Johnson

Objective: The purpose of this case study is to describe the successful chiropractic management of a patient with neuralgic amyotrophy. **Clinical Features:** A 37-year-old male patient presented with severe bilateral shoulder pain followed by atrophy and loss of both function and range in the right shoulder girdle, particularly those innervated by the C5 nerve root. **Intervention and Outcome:** The patient was initially given tramadol to help with the severe shoulder pain. Following initial presentation, the patient was treated with a combination of spinal manipulative therapy, vitamin supplementation, therapeutic exercises, and Russian stimulation. The patient was seen for treatment 34 times over the course of 8 months, with the patient regaining full range of motion after 6 months as well as restoration of activities of daily living. **Conclusion:** This patient avoided unnecessary surgery with conservative chiropractic care. The integration of chiropractic manipulation, vitamin supplementation, therapeutic exercises, and Russian stimulation resulted in improvement in range of motion and muscle strength initially lost due to neuralgic amyotrophy. (This is a conference presentation abstract and not a full work that has been published.)

Retrospective analysis of referral practices to a hospital-based chiropractic clinical setting over the past 3 years

Matthew Jordan, Cady Roedl, Kyler Case, Nathan Hinkeldey, Heather Meeks

Objective: To report consultation practices of different healthcare providers to a hospital-based chiropractic clinic for the use of program development. **Design:** Retrospective review of 3 years (9/1/2017–9/1/2020) of consults to a VA chiropractic clinic were analyzed and categorized by clinic and then by specialty in order to assess referral patterns. **Results:** Providers from more than 150 different clinics referred patients to the chiropractic clinic for evaluation and treatment. The concentration of referrals was greatest from primary care (69%) followed by inpatient (11%), pain management (7%), specialty care (6%), mental health (4%), and emergency department (3%). **Conclusion:** This report serves to illustrate that providers from many different areas of the hospital are referring patients to an integrated chiropractic clinic. It also serves to illustrate potential referral mechanisms that chiropractors in other facilities looking to integrate can report. (This is a conference presentation abstract and not a full work that has been published.)

Implementation of a primary spine care model in an academic primary care clinic

Louis Kazal, Jr., James Whedon

Background: Evidence-based guidelines from the American College of Physicians recommend nonpharmacological therapies as the first-line approach for low back pain, but most primary care clinicians lack training in nonpharmacological treatment of low back pain. We describe the successful implementation of a model for primary care management of low back pain that addresses the gap between current primary care practice and evidence-based recommendations. **Methods:** A primary spine care clinician (PSCC) was embedded in an academic primary care setting. At 1 year, we surveyed the

clinic's primary care physicians to evaluate the implementation of this model. **Results:** Physicians reported high levels of satisfaction with model implementation and quality of care. Eighty-eight percent referred spine patients to the PSCC, and 59% favorably changed their imaging ordering habits as a result of implementation. Eighty-one percent said it made spine care easier; 0% said it was harder. Comments revealed high confidence in the PSCC, and 100% of physicians accepted the PSCC as a portal-of-entry clinician. **Conclusion:** Integration of a PSCC in our primary care practice allowed us to provide evidence-based low back pain care while simultaneously achieving high levels of physician acceptance. (This is a conference presentation abstract and not a full work that has been published.)

Exploring barriers to publishing research in a chiropractic student population

Jeffrey Krabbe, Marc Lucente, Jesse Hodges

Objective: The Council on Chiropractic Education (CCE) Accreditation Standards list research-related competency as a goal of the doctor of chiropractic program. However, how meaningful the educational experiences are to students, in terms of providing productive, rewarding research experiences that result in publication, is uncertain. This study aims to evaluate the attitudes of chiropractic students toward research and perceived barriers to performing and publishing research. **Methods:** A 25-item online questionnaire with a 5-point Likert scale was distributed to the entire student body of a chiropractic program. Demographic variables, attitudes toward research, and perceived barriers to performing and publishing research were gathered. Combined data were analyzed by descriptive statistics and analysis of variance. **Results:** Most students demonstrated positive attitudes toward research and the importance of its role in the chiropractic profession. However, most of the responses indicated that they did not receive adequate training in academic writing and felt there were not enough opportunities to conduct research in school. Students reported various types of barriers that challenged their progress in the field of research. **Conclusion:** Chiropractic students have positive attitudes toward research and publication, but the presence of several barriers impedes their participation. (This is a conference presentation abstract and not a full work that has been published.)

Patterns of care for new visits for low back conditions in the Veterans Health Administration

Anthony Lisi, Erica Abel, Lori Bastian, Vivian Ly, Joseph Goulet

Objective: To describe clinics seen by patients with new visits for low back conditions in the Veterans Health Administration (VA). **Methods:** A serial cross-sectional analysis of an existing musculoskeletal diagnosis cohort between October 1, 2016, and September 30, 2017. Patients with an on-station visit including a low back diagnosis identified by ICD-10 codes after at least 1 year without such a visit were included. The clinic in which the visit occurred and clinics in which other visits including low back diagnoses occurred within the next 365 days were identified by Stop Code. **Results:** We found 55,628 patients (mean age 48.2 years; 11.8% female; 61.3% white) meeting criteria. The most common locations for new visits were primary care (76.5%), emergency department (6.9%), comprehensive women's health (2.8%), and physical therapy (2.2%). Chiropractic clinics accounted for 0.4%. Within the next year, this group received 285,551 other visits for low back diagnoses. The most common locations for these visits were primary care (22.5%), physical therapy (20.3%), chiropractic care (9.0%), and physiatry (3.9%). **Conclusion:** New visits for low back conditions in the VA most commonly occur in primary care. Chiropractic clinics are a common location for subsequent visits. (This is a conference presentation abstract and not a full work that has been published.)

The role of exercise in concussion management: an umbrella review

Anne Maurer, Mark Pfefer, Troy Peters, Rachel Gilmore, Angela Segovia, Chris Todden, Paige Pulliam

Introduction: Current guidelines recommend a period of physical and cognitive rest after a concussion with gradual progressive return to activity after symptoms abate. Although uncontrolled activity and exercise can exacerbate symptoms after concussion, recent research suggests that prolonged rest beyond the first couple of days after concussion might prolong recovery. The aim of this study was to review evidence on the role and timing of exercise in concussion management. **Data Sources and Selection:** A search was conducted of medical literature using MEDLINE, CINAHL, and Cochrane central register. All eligible articles were reviewed then scored using the methodology for Joanna Briggs Institute (JBI) Umbrella Reviews. Two independent reviewers performed the scoring of articles. **Results:** Four out of 10 review articles were considered eligible for this JBI Umbrella Review. No class I evidence is available for the effectiveness of exercise after concussion. New research suggests that absolute rest beyond the first few days might slow recovery. **Conclusion:** Assessment of exercise tolerance can be used to determine recovery from concussion. It is likely that subthreshold graded activity is beneficial in concussion recovery. There are also likely benefits with subthreshold activity used in chronic postconcussion syndrome. (This is a conference presentation abstract and not a full work that has been published.)

Triage of progressive dizziness: a case report

Heather Meeks, Matthew Jordan, Nathan Hinkeldey

Background: To discuss the role of the chiropractor in triage of a patient presenting with acute onset of worsening dizziness of unknown etiology. **Case Presentation:** We present a 66-year-old female who presented to a hospital-based chiropractic clinic with acute onset worsening dizziness with multiple comorbid conditions. Patient presented to the chiropractic clinic for routine management of low back pain; however, upon review of systems, the patient indicated symptoms as described above. **Intervention:** The patient was immediately transported to the ED for further evaluation and workup by the appropriate medical professionals. Patient was admitted for observation with suspected intracranial hemorrhage. **Conclusion:** The role of the chiropractor in a multidisciplinary setting includes not only evaluation and management of musculoskeletal conditions but also the identification of red flag signs and initiation of appropriate triage in efforts of providing complete and comprehensive patient-centered care. This case report highlights the importance of detailed history, review of systems, and physical examination in an outpatient clinical setting, regardless of the specialty of the practitioner. (This is a conference presentation abstract and not a full work that has been published.)

Median nerve entrapment in a cyclist: a case study and review of bicycle-fitting guidelines for the clinician

Stuart McIntosh, Mark Pfefer, Stephan Cooper, Jason Qualls, Chelsey Holstrom

Objective: Distal neuropathies related to excessive handlebar gripping have been identified in cyclists. This case describes the treatment and ergonomic interventions in a recreational cyclist with bilateral median nerve entrapment syndrome. **Clinical Features:** A 62-year-old male experienced a new episode of bilateral hand pain and numbness following several hour long bicycle sessions while riding a new bike. **Intervention and Outcome:** The patient consulted a chiropractor and was diagnosed with bilateral median nerve entrapment syndrome related to bicycle grip pressure. Pain and sensory changes were present without motor deficit. The patient received 3 sessions of chiropractic spinal and extremity manipulation and instrument-assisted soft tissue mobilization. Although significantly improved, symptoms recurred immediately upon his return to cycling. The patient was treated twice more and ergonomic interventions were implemented. Ergonomic interventions included adjusting the saddle height and raising the handlebars to decrease grip pressure and adding bar end extensions to allow grip variety. Subsequently, the patient had ongoing and lasting improvement. **Conclusion:** We review basic bicycle ergonomics and recommendations for chiropractors to intervene appropriately with related problems. (This is a conference presentation abstract and not a full work that has been published.)

Conservative management of femoral acetabular impingement: an umbrella review

Branon McMichael, Mark Pfefer, Rachel Gilmore, Stephan Cooper, Shelby Waldman, Steven Reece, Chantal Sheldstad

Introduction: Femoral acetabular impingement (FAI) causes hip pain as a result of contact between the femur and acetabulum occurring within normal ranges of motion. FAI is seen in general populations but is more common in persons performing repetitive hip flexion. The abnormal bony features include both cam deformity of the femoral head/neck and pincer lesions of the acetabulum. Both are visible on plain radiographs, but computed tomography and magnetic resonance arthrography may be necessary to visualize the labrum. The purpose of this project is to review published literature to determine if evidence supports nonoperative treatment. **Data Sources and Selection:** A search of medical literature using MEDLINE, CINAHL, and Cochrane central register was performed. All eligible articles were reviewed, then scored by two independent reviewers using methodology for Joanna Briggs Institute (JBI) Umbrella Reviews. **Results:** Ten review articles were considered eligible. No class I evidence is available for the effectiveness of nonoperative treatment for FAI. **Conclusion:** The reviewed literature promotes nonoperative treatment for FAI. Although limited, there is some indication that rehabilitative exercises, improvement of sensory-motor control, and nonsteroidal anti-inflammatory medication may be effective. There are limited long-term studies examining various interventions for FAI. (This is a conference presentation abstract and not a full work that has been published.)

The impact of nutrient-dense foods on chiropractic students' athletic performance

Zak Monier, Greg Hollandsworth, MaryAnne Dimak, Amber Cedillos, Melany Bates, Chris Malaya, Katie Pohlman

Objectives: To assess the impact of nutrient-dense food diet on athletic performance compared to regular dietary practices. **Methods:** Participants in this pilot randomized clinical trial were volunteer chiropractic student athletes. The food group consumed 3 nutrient-dense products/day for 4 weeks versus the regular diet group who continued their normal routine without any dietary supplements. Athletic performance was measured at baseline and week 5 with a standardized, timed (in seconds) performance test: 500 m row, 40 air squats, 30 sit-ups, 20 push-ups, 10 pull-ups. Food consumption and exercise were monitored. **Results:** Sixteen/17 participants (mean age: 25.4 + 3.6 years, 35%

female) completed the study protocol ($n = 8/\text{group}$). The food group consumed 86% of their products. No difference between group for exercise amount (food: 5.3 ± 1.4 , regular: 5.1 ± 2.6 per week). While athletic performance time had a clinically meaningful decrease ($-0.22.3 \pm 39.4$ s, 95% confidence interval [CI]: $-53.97, 32.72$) with a larger decrease in the food group ($-0.27.6 \pm 43.5$ s, 95% CI: $-14.01, 48.01$) compared to the control group ($-0.17.0 \pm 37.1$ s, 95% CI: $-8.73, 63.98$), it was not statistically significant ($p = .607$). **Conclusions:** For athletes, there is a literature gap between nutritional knowledge, dietary intake, and athletic performance. While this pilot study hypothesized that a nutrient-dense diet would positively impact athletic performance, a larger sample size would be needed to determine if this is true. (This is a conference presentation abstract and not a full work that has been published.)

Did wearing a mask in an academic setting change oxygen saturation levels?

Vanessa Morales, Kristie Rice, Mehra Harati

Objective: The COVID-19 pandemic required worldwide policy changes to prevent the spread of this novel virus. With the wide use of social media, messages regarding masks and fear of decreased oxygen saturation spread. This study set out to compare oxygen saturation levels while using a mask within an academic institution and not using a mask when at home. **Methods:** University students and employees were invited to participate in this self-controlled case series with a blinded data analyzer. Participants were asked to complete hourly logs for 2 work-day weeks, identifying mask usage and oxygen saturation rates with a self-supplied pulse oximeter. Paired t -test was used to compare oxygen saturation. **Results:** Twenty-four participants (age mean: 29.3, range: 21–68) collected data from 857 hours without a mask and 262 hours with a mask. On average, participants wore the mask 10.9 hours/work week. Oxygen saturation findings were not statistically significant or clinically meaningful when using a mask (average: 98.2, 95% confidence interval [CI]: 97.55, 98.80) compared to not using a mask (average: 98.2, 95% CI: 97.97, 98.43). **Conclusion:** This study demonstrated that the use of masks in an academic setting did not impact oxygen saturation. Mask use is a viable precaution in the event of a pandemic or other pathogenic outbreak. (This is a conference presentation abstract and not a full work that has been published.)

Guidance concerning chiropractic practice in response to COVID-19 in the United States: a summary of state regulators' web-based information

Shawn Neff, Christopher Roecker, Casey Okamoto, Samuel Holguin, Jason Napuli, Ross Mattox, Nathan Hinkeldey, David Paris

Introduction: The COVID-19 pandemic led to unprecedented changes. State chiropractic licensing boards play an important role in protecting the public via regulation of licensure and provision of guidance regarding standards of practice. **Objective:** The purpose of this study was to summarize the guidance provided in each of the 50 United States, related to chiropractic practice during the COVID-19 pandemic. **Methods:** A review of public websites of governors and state chiropractic licensing boards was conducted in the United States. Descriptive statistics were used to report the findings. **Results:** Stay-at-home or shelter-in-place orders were issued in 86% of all states. Chiropractors were classified as essential providers in 54% of states, nonessential in one state, and no guidance was provided in 44%. Twenty-seven states provided information regarding protecting against infectious disease. Only 22 states provided recommendations regarding chiropractic telehealth. Eight states warned against claims regarding spinal manipulation protecting against COVID-19. **Conclusion:** State guidance during the COVID-19 pandemic was heterogeneous, widely variable in accessibility, and often no guidance was provided by state chiropractic licensing boards. Some state chiropractic licensing boards chose to assemble guidance for licensees into a single location, which we identified as a best practice. (This is a conference presentation abstract and not a full work that has been published.)

The impact of COVID-19 on the chiropractic profession: A cross-sectional survey on opinions, professional changes, and personal hardships of US chiropractors

Shawn Neff, Rebecca Deyo, Annabelle Mac Auley, Dana Lawrence

Background: Currently, there are few studies analyzing how COVID-19 has impacted the chiropractic profession. In overall healthcare, there is limited research on specialty-based stress levels both before and during COVID-19. **Methods:** An electronic survey was sent to US chiropractors nationwide via social media and email. The survey collected personal and practice demographic information, office protocols, changes made during COVID-19, chiropractic profession opinions/stances, information related to stress, and personal beliefs/opinions. Data was analyzed using descriptive statistics. **Results:** 750 US chiropractors responded. Just over half of respondents reported moderate levels of stress, and just over 30% reported severe levels due to a variety of reasons related to both personal and professional circumstances. The primary stressors were financial and business concerns. A majority reported beliefs that the chiropractors should not advertise an immune benefit to spinal manipulation, while 13% of the respondents believed chiropractors should. Eighteen percent added telehealth to their services. **Conclusion:** Stress levels were high across the

population. A range of opinions existed regarding spinal manipulation and immunity benefits. The majority reported there was insufficient evidence to support such a belief; however, a group of respondents believed that chiropractors should be marketing immune-enhancing benefits to the population. (This is a conference presentation abstract and not a full work that has been published.)

Empathy and perceived stress of 3rd-year chiropractic students

Lia Nightingale

Objective: To assess empathy and perceived stress of students at the end of a chiropractic program and compare scores as they progressed throughout the program. **Methods:** Three cohorts of students ($n=280$) were given the Toronto Empathy Questionnaire (TEQ) and Perceived Stress Scale (PSS) at the end of the chiropractic program. Previously, these cohorts were also assessed during the 1st and 2nd year of the program. Combined data were analyzed by descriptive statistics, repeated measures analysis of variance, and Pearson's correlation coefficient. **Results:** Average empathy scores did not significantly change throughout the curriculum, although a greater disparity in empathy scores was identified by gender, with male scores decreasing by the end. Female students reported a stronger urge to help people. Average stress scores were unchanged from the 2nd year. Education and age were less likely to influence empathy and stress scores by the end of the program. Several empathy traits were negatively influenced by stress; most notably, the inability to control irritations inversely impacted students' interest in how others feel. **Conclusion:** Caring for patients in clinic did not significantly influence empathy in chiropractic students. Targeted interventions should be incorporated into the curriculum to enhance student's empathy skill development. (This is a conference presentation abstract and not a full work that has been published.)

Radioulnar synostosis in an adolescent baseball player

Aidan O'Brien, Ashley Ruff, Austin Panter, Norman Kettner

Objective: The objective of this case report is to identify the features of congenital radioulnar synostosis on diagnostic imaging and inform clinicians of the possibility of this condition masquerading as a musculoskeletal and/or ligamentous injury in the setting of acute pain. **Clinical Features:** The patient, a 13-year-old male with a history of radioulnar synostosis, presented with right medial elbow pain after pitching a baseball game. An ulnar collateral ligament (UCL) sprain was suspected, and a diagnostic ultrasound evaluation was performed. The UCL was unremarkable; however, a possible radial head subluxation was observed. A follow-up radiographic series demonstrated subluxation of the radial head as a result of the underlying radioulnar synostosis. **Intervention and Outcome:** The patient underwent a course of rehabilitation for the elbow joint dysfunction. Treatment provided short-term symptom relief, however pain returned with pitching. The patient was referred to an orthopedic surgeon and lost to follow-up. **Conclusion:** While radioulnar synostosis is a rare congenital skeletal malformation, it is important for clinicians to be aware of the related diagnostic features of this condition and the possibility of the condition masquerading as an acute musculoskeletal and/or ligamentous injury such as a radial head subluxation. (This is a conference presentation abstract and not a full work that has been published.)

Spinal posterior-to-anterior stiffness measurements can be affected by padding on the support table

Edward Owens, Ronald Hosek, Muhammad Salman, Brent Russell

Objectives: Very different posterior-to-anterior stiffness (PAS) measures are reported for similar patient populations. Padding on the table used to support the patient is not often described, but could affect measurements. We sought to assess that effect in a laboratory setting. **Methods:** We used a custom-built stiffness-testing system to apply loads to and measure displacement of the L3 vertebra of a mannequin designed with moveable joints and stiffness characteristics similar to a human spine. We tested PAS with the mannequin on 3 test surfaces: soft foam, stiff foam, and firm surface (no padding). **Results:** We calculated mean stiffness under the three conditions—no padding: 12.1 (SD 2.17) N/mm; soft foam: 8.8 N/mm (SD 1.58); firm foam: 13.2 N/mm (SD 2.36). While the no-padding condition and the firm foam were not statistically different, the soft foam was significantly different ($p < .001$) from each of them. **Conclusion:** Foam padding on the patient support structure could have contributed to some differences in PAS reported in the literature on human testing. This suggests that it is important for future researchers to report on the support surface conditions of the testing apparatus used. This is rarely seen in the literature. (This is a conference presentation abstract and not a full work that has been published.)

Effects of muscle activity on lumbar spinal stiffness in asymptomatic adults: an investigation using a novel rolling device

Isabelle Pagé, Gregory Kawchuk

Objective: To determine how the contraction of different spinal muscles may influence spinal stiffness at all lumbar levels. **Methods:** A mechanical device was used to measure spinal stiffness (N/mm) from L1 to L5 in 12 asymptomatic participants, while muscle activity from four pairs of thoracolumbar muscles was recorded. A baseline measurement was collected with the participants

holding their breath at normal exhalation. Participants stiffness was then measured while performing (1) an isometric hip extension, (2) an isometric shoulder flexion, and (3) a deep held inhalation. Mixed-model analyses of variance were used to evaluate the effects of the perturbations on spinal stiffness at each lumbar level. Friedman's test was then computed to evaluate the differences in muscle activity between the perturbations. **Results:** Globally, the designed perturbations generated activity in different muscles with different magnitudes ($p \leq .05$). Increased spinal stiffness was observed at each spinal level during the hip extension and at L5 during the held inhalation ($p < .05$). A differential effect of the spinal levels on the spinal stiffness was observed during the hip extension and held inhalation ($p < .05$). **Conclusion:** This study provides evidence that the magnitude of muscle activity influences spinal stiffness, but not equally between lumbar levels. (This is a conference presentation abstract and not a full work that has been published.)

Attitudes toward use of Dynamed by chiropractic students: a survey

Mark Pfefer, Rebecca Wates, Simone Briand, Troy Peters

Objective: Dynamed is an evidence-based point-of-care resource that health professionals can use to inform care. Dynamed can be accessed via a desktop or mobile platforms. Questions that are raised during the clinical encounter can trigger point-of-care searches that give providers information that can be implemented in the visit. **Purpose:** The purpose of this project was to review features available within Dynamed and to survey chiropractic students on attitudes about using Dynamed. **Methods:** A convenience sample of student volunteers from a single chiropractic college completed an online Canvas-based training program on using point-of-care resources including Dynamed. Participants were assigned a search of a typical "medical" complaint and a typical musculoskeletal complaint commonly encountered by a chiropractor. The participants completed a qualitative survey related to use of Dynamed. **Results:** One hundred twenty-four students completed the survey. A majority of students rated ease of use, breadth of coverage, and provision of quality medical information as excellent. **Conclusion:** There was consensus that Dynamed could be useful as a point-of-care resource when clinical questions are raised, but there was concern that other databases would need to be accessed to find information specific to chiropractic care. (This is a conference presentation abstract and not a full work that has been published.)

Practice characteristics of chiropractors with a pediatric certification

Katherine Pohlman, Michael Swain

Objective: To describe contemporary practice characteristics of chiropractors that hold a diplomate in pediatrics. **Methods:** This validated workforce survey was distributed through both electronic and paper-based modes to all 328 diplomates listed on the International Chiropractic Pediatric Association website and provided by the International Chiropractor Association Council on Chiropractic Pediatrics with descriptive analysis conducted. **Results:** The responding paediatric chiropractors ($n=149$, 50.8%) were predominantly female (86.6%) and white (98.6%). On average paediatric chiropractors have 20.8 ± 7.6 years of practice experience and practice 30-39 hours/week (40.8%). Sole practitioner was the most common practice setting (57.7%). Patient payment method was most commonly private payer (31.1%). Patients were most commonly female (62.1%) and 14.6% were aged <3-years. The most common reason patients sought care was for prevention/wellness care (57.5%). The most common manual therapy used for those <3-years-old were cranial techniques, and for children >3-years-old was high-velocity, low-amplitude techniques. **Conclusion:** This study found paediatric chiropractors are demographically homogenous with similarities to general chiropractors except that one-thirds of pediatric chiropractors patients were aged <18-years, seeking care for a wide range of health conditions. Workforce information are relevant for many stakeholders, especially those allocating research efforts and educational training. (This is a conference presentation abstract and not a full work that has been published.)

SafetyNET: The continuation of a research program to support a patient safety culture for spinal manipulation therapy

Katherine Pohlman, Martha Funabashi

Objective: SafetyNET started as a funded-team grant with a goal to support an open patient safety culture among spinal manipulation therapy (SMT) providers. Since the completion of the initial grant, two trainees continue to lead and expand this goal. **Methods:** Using a pyramid-style conceptual model, the dynamic nature and multiple dimensions of patient safety culture can be defined: "values" is the foundational layer, followed by "strategies," and at the tip, the ultimate goal, "performance." **Results:** The initial grant included 4 distinct areas that all resulted in novel manuscripts: qualitative ($n=2$), health law ($n=4$), community-based ($n=4$), and basic science ($n=5$). To further expand knowledge relevant to the conceptual model (values, strategies, and performance), these explorations continue to be refined and conducted in a vast area of populations. Projects include 5 property measurements studies, 6 reporting systems in unique settings/populations, 2 basic science investigations exploring mitigation strategies, 2 secondary data analyses for adverse event information, and surveys distributed to over 7000 SMT providers, educators, and students. **Conclusion:** SafetyNET continues to promote patient safety through research projects exploring optimal data collection of values, strategies,

and performance, ultimately supporting an open patient safety culture for SMT providers. (This is a conference presentation abstract and not a full work that has been published.)

The prevalence of suicide prevention training and suicide-related terminology in US chiropractic training and licensing requirements

Morgan Price, Clinton Daniels, Zachary Cupler

Objective: To summarize the prevalence of suicide prevention education (SPE) and suicide risk factor terminology in US doctor of chiropractic programs (DCPs), doctor of chiropractic residency programs (DCRPs), continuing education (CE), diplomate training programs (DTPs), and US licensure requirements. A secondary objective was to provide recommendations to enhance SPE for the profession. **Methods:** A review of public-facing electronic documents and websites occurred from April to May 2020 for DCPs, DCRPs, institutional CE, DTPs, and state licensing requirements. Data were extracted to tables and descriptive statistics were used to report the findings. **Results:** Of 19 DCPs, 54 courses were relevant. None specifically mentioned SPE, but risk factor-related terminology was highlighted. For the 10 DCRPs, their mandatory training included SPE. Two states required SPE as part of relicensure; these were attainable through 4 CE courses. No DTP handbooks included requirements of SPE. **Conclusions:** SPE in the chiropractic profession is largely lacking and widely varied at this time in the United States. The development of profession-specific SPE, both institutional CEs and curriculum development in the DCPs, would better prepare chiropractors for recognizing patients with suicidal ideation. (This is a conference presentation abstract and not a full work that has been published.)

Among older adults with chronic low back pain, recipients of spinal manipulation report higher satisfaction with care and quality of life as compared to recipients of opioid analgesic therapy

Daniel Rossi, James Whedon, Anu Kizhakevettill, Serena Bezdjian, Andrew Toler, Eric Hurwitz, Jon Lurie, Mariaa Bangash

Introduction : Chronic low back pain (cLBP) is the world's leading cause of disability, and up to 19% of older adults experience cLBP in any 3-month period. Both opioid analgesic therapy (OAT) and spinal manipulative therapy (SMT) are used to treat cLBP, but little is known about their effect upon health-related quality of life (HRQOL) and satisfaction with treatment. The objective of this study was to compare patients' perspectives on the use of SMT vs OAT in terms of HRQOL and satisfaction with treatment. **Methods:** Four cohorts of Medicare beneficiaries were assembled according to previous treatment received as evidenced in Medicare claims data: SMT, OAT, and two crossover cohorts. Surveys (1986) were mailed to Medicare beneficiaries; 195 responded. We used a 0–10 numeric rating scale to measure satisfaction and the SF-12 to measure HRQOL. **Results:** Recipients of SMT were more likely to be very satisfied with their care (85%) than recipients of OAT (53%). The SMT cohort self-reported significantly higher HRQOL. The mean differences in scores were 12.85 for physical health and 9.92 for mental health. **Conclusion:** Long-term recipients of SMT have higher self-reported rates of satisfaction and HRQOL as compared with long-term recipients of OAT. (This is a conference presentation abstract and not a full work that has been published.)

Rapid widespread adoption of telehealth for chiropractic care in the Department of Veterans Affairs during the COVID-19 pandemic

Gregory Roytman, Brian Coleman, Kelsey Corcoran, Christine Goertz, Cynthia Long, Anthony Lisi

Objective: To assess the use of face-to-face and telehealth chiropractic care in the Veterans Health Administration (VHA) during the early stages of the COVID-19 pandemic. **Methods:** A serial cross-sectional analysis of VHA administrative data, including the number of unique patients, visits, and procedural codes for face-to-face and telehealth (video or telephone) chiropractic care from June 2019 to July 2020. **Results:** From June 2019 to January 2020, face-to-face and telehealth use remained stable. From February to April 2020, face-to-face patients decreased from 21,228 to 1009 (–21-fold) and visits decreased from 29,899 to 1262 (–24-fold). Telehealth use rose over the same period from 24 to 4144 patients (+173-fold) and 24 to 4879 visits (+203-fold). By July 2020, face-to-face use rose by 7893 patients (+8-fold) and 10,532 visits (+8-fold). Telehealth declined over the same period by 1596 patients (–3-fold) and 1015 visits (–2-fold). The most frequent procedural code categories in telehealth visits were evaluation and management services, patient education/self-care, and therapeutic exercises. **Conclusion:** Face-to-face visits decreased early in the pandemic but began to increase after April 2020. Telehealth use rapidly increased during the early stage of the COVID-19 pandemic, and decreased later, but has remained higher than pre-pandemic levels. (This is a conference presentation abstract and not a full work that has been published.)

Reliability and validity of an automated method of crepitus analysis in a spine phantom

Gregory Roytman, Gregory Cramer

Objective: Establishing biological markers is fundamental to assessing function and pain of zygapophyseal (Z) joint origin. The reliability and validity of such methods is essential to their future use in research and clinical care. **Methods:**

Vibration data was collected from 10 piezoelectric accelerometers attached to a silicone-embedded spine phantom simulating Z joint crepitus when perturbed by vibrations generated by a mechanical activator. MATLAB was used for programming. To remove “noise,” frequency spectra of recordings were inspected to obtain a cutoff frequency. Waveforms were then filtered using a 5th-order low pass filter. Automation was applied to recordings to determine the order that each accelerometer recorded crepitus events. Automation was then compared to analysis of 2 human observers (OB1 and OB2) in two runs of 30 mock crepitus events. **Results:** Run 1 showed automation misreading 3 events, same as OB2, while OB1 misread 2 events. Run 2 showed automation misreading 3 events and each observer misreading 1 event. Average time to completion over the 2 runs was: automation = 5.68 min (+0.27), OB1 = 31.33 min (+10.42), OB2 = 22.48 min (+5.34). **Conclusion:** Automation identified crepitus faster and with accuracy similar to human observers. (This is a conference presentation abstract and not a full work that has been published.)

Angular kinematics of supine cervical spine adjustment: phase 2

Brent Russell, Mackenzie Keller, Ronald Hosek, Shari Wynd, Edward Owens

Objectives: Although supine cervical adjustments (SCAs) are frequently used by chiropractors, they have been claimed to sometimes cause adverse events, particularly in relation to excessive axial rotation. Evidence is lacking for this notion, however, as there has been insufficient investigation of the motions occurring during SCAs. The present institutional review board-approved work extends a previous study; its primary aim was to compare measured rotational magnitudes to values perceived by both patients and doctors. **Methods:** Participants were 7 licensed faculty DCs in the roles of patients and doctors. Patients were outfitted with inertial measurement units overlying the forehead and sternum to measure axial rotation. Doctors performed SCAs while also wearing a finger-mounted force transducer. Afterward, both completed questionnaires to provide estimates of total perceived rotation. **Results:** For 12 SCAs, the mean peak measured rotational was 29.2° (9.9). Most perceived values were 45°, with only 2 measured values greater than perception. Measured forces (mean 69.7 N [21.3]) were on the low end of those reported by others. **Conclusions:** In 2 phases of this study, we found peak rotational magnitudes of SCAs to average less than 30°. The results suggest that even experienced DCs may incorrectly perceive rotational magnitudes. (This is a conference presentation abstract and not a full work that has been published.)

Postinjection fibrosis and gluteal pain: a case report

Virginia Salata, Nathan Hinkeldey, Heather Meeks

Objective: To describe a case of gluteal pain complicated by postinjection fibrosis. **Clinical Features:** An 85-year-old veteran presented with 12 months of nonresolving right gluteal pain. The pain was directly related to area of fibrosis noted to have occurred postinjection 30 years ago. It was noted that “giving out” would occur in the hip related to pain. Examination was unremarkable other than pain with palpation over the area of fibrosis. Soft tissue mass was confirmed via MRI to be postinjection granuloma vs old hematoma. **Intervention/Outcome:** The patient was treated for 1 visit using instrument-assisted soft tissue mobilization (IASTM) (Graston Technique) and experienced complete resolution in clinic with lasting resolution at 3-month follow-up. **Conclusion:** One visit of IASTM over an area of symptomatic fibrosis provided immediate resolution of 12 months of gluteal pain in this case. (This is a conference presentation abstract and not a full work that has been published.)

The influence of spinal manipulation on patients with lumbar spinal stenosis: a pilot study

Dean Smith, Katherine Pohlman, Kurt Olding, Christopher Malaya, Katie de Luca, Joshua Haworth

Objective: To pilot a pretest-posttest study of spinal manipulation on improving function and symptomatology in patients with lumbar spinal stenosis (LSS). **Methods:** Participants received spinal manipulation at the chiropractor's discretion. Data were collected at baseline, midpoint and final visits. Objective data included timed-up-and-go, sit-to-stand, and balance using BTrackS™ force plate. Balance was compared pre-post at baseline and between baseline and final visits. Subjective data included: Activities-Specific Balance Confidence Scale, Zurich Claudication Questionnaire, and numerical pain ratings. Balance data were securely transferred via iDrive; the other measures were collected via REDCap. **Results:** Twelve patients (mean age = 83.5 years) completed the average midpoint visit at 9 visits and the final visit at 13.7 visits. Timed-up-and-go and sit-to-stand decreased by 5.2 and 6.7 seconds at midpoint and 5.4 and 5.7 seconds at the final visit, respectively ($p < .05$). Baseline pre-post ($n = 10$) reductions were found in anterior-posterior sample entropy and mean frequency ($p < .05$) with BTrackS. No changes in balance were found between baseline and final visit. All subjective measures had statistically and clinically meaningful decreases. **Conclusion:** Statistically and clinically significant decreases in objective and subjective outcomes were found after a pragmatic course of spinal manipulation in LSS patients. BTrackS measurements and study design will be explored further. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic health center and teaching clinic as essential service provider during COVID shelter-in-place

Monica Smith, Donna Odierna, Scott Donaldson

Objective: The health center at (blinded) remained open from the second week of the COVID-19 shelter-in-place (SIP) in March 2020. We report our institution's response to health mandates and measures to reduce COVID-19 transmission. **Methods:** Content analysis from review of institutional records, including notifications to the public and internal communications, and transcripts of 15 interviews (June–August 2020) with faculty, staff, and students. **Results:** We describe the timeline of events and processes for developing COVID-related policies and procedures to address sanitation and distancing requirements. Respondents described their experiences and perceptions: communication among administration and clinic personnel; reactions to changes in operations, instruction, and patient care; adapting to challenges like reduced scheduling and treatment time; unanticipated benefits; and suggestions for future SIPs. Initial fears diminished as faculty and students gained confidence in the efficacy of the new procedures. Although there was a reduction in the number of patients and the techniques that could be performed, patients who passed screening received continuing chiropractic care, and students were able to complete their requirements and experience unique opportunities for learning. **Conclusion:** Transparent participatory processes, flexibility, and communication contributed to the successful operation of the health center during the pandemic. (This is a conference presentation abstract and not a full work that has been published.)

A survey of the effects of the SARS-CoV-2 pandemic on chiropractic practice in the state of Georgia

Stephanie Sullivan, Emily Drake, Shawn Neff, Madison Champagne, Angela Seckington,

Objective: To explore chiropractic practice characteristics, symptomatic patient interactions and changes in office protocols as a result of the SARS-CoV-2 pandemic. **Methods:** Chiropractic clinicians in Georgia were contacted through social media, state-specific chiropractic organizations, and local chiropractic university email lists and invited to complete an online 27-item survey assessing the effects of the SARS-CoV-2 pandemic on their practices. Data collection was May 6 through July 19, 2020. **Results:** A total of 254 qualified clinician responses were analyzed, 51% practicing over 21 years. Four practices closed, and 9 closed briefly. Of practices remaining open, 86% reported a decrease in practice volume. Patients with SARS-CoV-2 symptoms were seen by 31 respondents, although 31% of offices reported adapting office protocols to care for symptomatic patients. Overall, clinicians implemented screening procedures (74%) and changed waiting room (89%), adjusting room (86%), and chiropractic care (13%) procedures. The most commonly implemented protocols were cleaning (24%), prescreening (18%), and masks for staff (16%). Telehealth was incorporated (20%), mostly as a complement to in office care (55%), and 80% of clinicians recommended immune and/or wellness support. **Conclusion:** The SARS-CoV-2 pandemic resulted in changes to practice volume, protocols, and the doctor–patient interaction. (This is a conference presentation abstract and not a full work that has been published.)

Burnout syndrome in chiropractic interns: a proposal for a longitudinal study

Gary Tam, Jesse Cooper, Gregory Priest, Katherine Pohlman

Objective: Physician well-being impacts all areas of health care, most importantly patient outcomes. The purpose of this project was to propose a multidisciplinary longitudinal study design by conducting a cross-sectional survey to explore burnout among chiropractic interns. **Methods:** The Professional Fulfillment Index (PFI) was administered to student interns ($n = 108$) at the start of their internship. The PFI contains 3-subscales—professional fulfillment, work exhaustion, interpersonal disengagement—comprising 16-questions rated on a 5-point scale (0, Not at all true; 4, Completely true). The proposed longitudinal study design will distribute the survey again to interns at the end of each of their 3 internship terms. Demographic and relevant term questions will be asked at baseline and respective terms. **Results:** The 89 respondents (82.4%) identified themselves as 52.8% male with an average age of 26.3. The overall average score was 1.6 with subsections as: professional fulfillment, 2.4; work exhaustion, 1.8; interpersonal disengagement, 0.7. **Conclusions:** This survey found burnout to be minimal at the start of a chiropractor's internship. Further longitudinal investigations are needed and strategies developed to ensure this is maintained. Ideally, if students learn ways to avoid burnout while in school, they may be able to minimize this condition throughout their professional practice. (This is a conference presentation abstract and not a full work that has been published.)

Spinal manipulation versus opioids for chronic low back pain among older Medicare beneficiaries: evaluation for long-term outcomes using instrumental variable analysis

Sarah Uptmor, James Whedon, Andrew Toler, Serena Bezdjian, Jon Lurie

Objective: Chronic low back pain (cLBP) affects persons over 65 years old. The elderly also have an increased risk of adverse drug events (ADE) due to comorbidity and poly-pharmacy. We compare rates of ADE and escalation of

care for long-term treatment with spinal manipulation therapy (SMT) and opioid analgesic therapy (OAT), two therapies commonly used to treat cLBP. **Methods:** A retrospective cohort study using Medicare claims data spanning 2012–2016 was used to compare outcomes of SMT and OAT for cLBP. Frequency of ADE and escalated care encounters were estimated via adjusted incidence ratios using Poisson regression, controlling for patient characteristics, and instrumental variable analysis for selection bias. **Results:** Among patients with cLBP who initiated care with OAT, the ADE adjusted rate ratio (RR) was over 200× higher than those who initiated care with SMT (RR 202.39, SE 0.15, $p < .0001$). For those who initially received OAT, the rate of escalation of care was 3.54× higher than initial treatment with SMT (RR 3.54, SE .02, $p < .0001$). **Conclusion:** SMT may be a safer and more efficient option for long-term management of cLBP in Medicare beneficiaries over 65 with regard to risk of ADEs and escalation of care. (This is a conference presentation abstract and not a full work that has been published.)

Among older Medicare beneficiaries with chronic low back pain, initiation of care with spinal manipulative therapy leads to lower long-term healthcare costs as compared to opioid analgesic therapy

James Whedon, Andrew Toler, Ian Coulter, Serena Bezdjian, Todd MacKenzie, Jon Lurie, Anupama Kizhakkeveetil

Objective: The crisis of opioid prescribing in the United States reflects in part a failure in the management of chronic low back pain (cLBP). The direct and indirect costs of using opioid analgesic therapy (OAT) totaled more than \$2.5 trillion from 2015 to 2018. Clinical guidelines recommend nonpharmacological therapies, including spinal manipulative therapy (SMT) for treatment of older adults with cLBP, but the comparative value of OAT versus SMT is unknown. We compared Medicare expenditures for OAT vs SMT for the years 2012–2016. **Methods:** Among fee-for-service Medicare beneficiaries aged 65–84, we analyzed nationally representative Medicare claims data for 2012–2016 to compare the cumulative costs of OAT for long-term care of cLBP as compared to SMT. **Results:** The study sample included 21,731 patients who initiated care with OAT and 6429 who initiated care with SMT. As estimated via propensity weighting, beneficiaries who initiated care for cLBP via OAT incurred overall healthcare expenditures 1.87 times higher than patients who initiated care with SMT (95% confidence interval 1.65–2.11; SE 0.06; $p < .0001$). **Conclusion:** Older adults who initiated care with SMT had lower overall healthcare costs under Medicare. (This is a conference presentation abstract and not a full work that has been published.)

Initial choice of spinal manipulation reduces escalation of care for chronic low back pain among older Medicare beneficiaries

James Whedon, Andrew Toler, Scott Haldeman, Daniel Rossi, Serena Bezdjian, Todd MacKenzie, Jon Lurie, Anupama Kizhakkeveetil

Objective: Due to frequent use of unnecessary procedures, care for chronic low back pain (cLBP) in the United States is inefficient. Both opioid analgesic therapy (OAT) and spinal manipulative therapy (SMT) are used to treat cLBP, but the long-term efficiency of either approach is uncertain. We compared the long-term efficiency of OAT vs SMT and OAT for older adults with cLBP. **Methods:** We conducted a retrospective cohort study using nationally representative Medicare claims data spanning the years 2012–2016. To measure the cumulative frequency of escalated care encounters for treatment of cLBP via OAT vs SMT, we estimated the adjusted incidence rate ratio using Poisson regression, controlling for patient characteristics, and accounting for selection bias through propensity scoring. **Results:** Escalated care occurred more frequently in the OAT cohort ($n = 21,731$) vs the SMT cohort ($n = 6429$). With weighted propensity scoring the adjusted rate ratio for initial choice of OAT vs. SMT was 2.67 (95% confidence interval 2.64–2.69, $p < .0001$). **Conclusion:** Among Medicare older beneficiaries who initiated long-term care for cLBP with OAT, the adjusted rate of escalated care encounters was more than two and one-half times higher as compared to patients who initiated long-term care with SMT. (This is a conference presentation abstract and not a full work that has been published.)

Supply of clinicians who provide spinal manipulation to Medicare beneficiaries

James Whedon, Scott Haldeman, William Schoellkopf, Curtis Petersen, Jon Lurie, Todd MacKenzie

Objective: Spinal manipulation (SM) is recommended for first-line treatment of patients with low back pain. Inadequate access to SM may result in inequitable spine care for older US adults, but the supply of clinicians who provide SM under Medicare is uncertain. **Methods:** We examined fee-for-service Medicare claims from 2007 to 2015 for SM services identified by procedure code. We restricted the analysis to claims for Part B-eligible Medicare beneficiaries with no Part C enrollment. We identified unique providers by National Provider Identifier, and distinguished between chiropractors and other specialties by Physician Specialty Code. We calculated supply as number of providers per 100,000 beneficiaries, stratified by geographic location and year. **Results:** The geographic supply of chiropractors providing SM services ranged from 30/100 k in the District of Columbia to 514/100 k in Minnesota. The supply of other specialists performing the same services ranged from 0 in 5 states to 17/100 k in

Colorado. Nationally, the number of Medicare active chiropractors declined from 47,471 in 2007 to 45,712 in 2015. The count of other clinicians rose from 1147 in 2007 to 1448 in 2015. Conclusion: Chiropractors constitute the majority of clinicians who bill for specific SM services to Medicare beneficiaries. (This is a conference presentation abstract and not a full work that has been published.)

Utilization of chiropractic care reduces use of prescription opioids among older Medicare beneficiaries with spinal pain

James Whedon, Sarah Uptmor, Andrew Toler, Serena Bezdjian, Todd MacKenzie, Louis Kazal

Objective: Among older adults in the United States, spinal pain imposes a heavy burden, which is often aggravated by the hazards of opioid analgesics prescribed for spinal pain. Spinal manipulation as provided by chiropractors may offer a safe alternative to opioids. We hypothesized that among older Medicare beneficiaries diagnosed with spinal pain, recipients of chiropractic care have a lower risk of filling a prescription for an opioid analgesic as compared to nonrecipients. **Methods:** We analyzed nationally representative Medicare claims data for 2012–2016. Among subjects aged 65–99 years with spinal pain, recipients received both primary care and chiropractic care; nonrecipients received primary care but not chiropractic care. We performed Cox proportional hazards modeling to compare risk of filling an opioid prescription. **Results:** There were 12,057 recipients and 57,128 nonrecipients. The adjusted risk for filling an opioid prescription within 365 days was reduced by more than half among recipients as compared to nonrecipients (HR 0.42, 95% confidence interval 0.40–0.44, $p < 0.0001$). **Conclusion:** Older adults with spinal pain who saw both a chiropractor and a primary care physician had a significantly lower risk of receiving opioids, as compared to those who received primary medical care but no chiropractic care. (This is a conference presentation abstract and not a full work that has been published.)

Using a “Medscape Fast Five Quiz” as a learning module for chiropractic students: assessment and treatment of headaches

Jon Wilson, Mark Pfefer, Rebecca Wates, Jaden Butcher, Emmanuela Guillaume

Objective: Chiropractors commonly see patients with a variety of headaches and should have an understanding of diagnosis and management strategies for a variety of headache types. The purpose of this study was to assess current evidence-based knowledge of various types of headaches using a quick survey developed by Medscape, known as a “Fast 5 Quiz.” **Methods:** We have previously investigated migraine knowledge among chiropractic students. Current curricular content includes content related to assessment and management of various types of headaches. Chiropractic student interns were surveyed using an innovative Medscape quiz known as a “Fast 5 Quiz,” this one titled, “Test Your Clinical Knowledge of Various Types of Headaches.” Students in their last year of training were surveyed using this Medscape quiz. A synopsis of general headache assessment and management was distributed to students after completion of the survey. **Results:** Fifty-two percent ($n = 104$) of upper-level chiropractic students from 1 institution completed this survey. Approximately 52% of participants were able to answer 3 out of 5 questions correctly. A majority of respondents incorrectly answered a question about pharmacologic management of headaches. **Conclusions:** Some gaps in knowledge were identified, especially related to pharmacologic management of headaches. (This is a conference presentation abstract and not a full work that has been published.)

The effect of spinal manipulation therapy on balance in patients with multiple sclerosis: a Case Series

Shari Wynd, Victor Kiroz, Heidi Jafek, Brandon Wingate

Objectives: To examine the effect of spinal manipulative therapy in patients with multiple sclerosis using the measurement of postural sway. **Methods:** A total of 5 subjects with multiple sclerosis (MS) were enrolled in this study. Postural sway was measured using a force plate. The area of the center of pressure was measured before and after spinal manipulative therapy (SMT) with patients' eyes open and eyes closed. Comparative statistics were performed on the collected areas of the center of pressure over the duration of the patient care at the clinic. **Results:** The change in area of the center of pressure was decreased by $1.6\% \pm 0.7\%$ when the patient's eyes were closed following SMT. This change was significant compared to the minimal changes ($0.2\% \pm 0.6\%$) in the area of the center of pressure when the patient's eyes were open ($p = .04$). **Conclusions:** Our data show that there is a small reduction in the area of the center of pressure following SMT, indicating that the postural sway was reduced following SMT. Reducing postural sway may help reduce the risk of falls in patients with MS. (This is a conference presentation abstract and not a full work that has been published.)

Implementing diagnostic ultrasonography in an educational clinic: use and attitudes

Nicole Zipay, John (Chin Suk) Cho

Objective: To evaluate the use and benefits of the addition of musculoskeletal ultrasonography (MskUS) in a chiropractic educational clinic. **Methods:** A survey questionnaire was distributed to clinic interns ($n = 168$), in the Fall 2019 and Winter 2020 cohorts, who were provided access to MskUS services for their

patients in an educational chiropractic clinic. We collected self-reported usage and attitudes toward MskUS following the interns first term of clinical experience. Descriptive statistics were used. **Results:** The study's response rate was 60.1% (101/168). Overall, 31.7% of the respondents reported use of MskUS in patient care. Of those respondents, 91% indicated they perceived the experience as beneficial, 62.5% extremely positive, and 38% somewhat positive. Reported benefits include: improved anatomic understanding, exclusion or confirmation of diagnoses, increased confidence, and patient reassurance. Of those respondents that did not report use, 96% reported interest in future utility. The factors that most frequently limited use included absence of indications for imaging and patient ineligibility at the time of survey distribution. **Conclusion:** The findings in this study support MskUS implementation in an educational clinic to enhance student learning and confidence, as well as to increase patient satisfaction. (This is a conference presentation abstract and not a full work that has been published.)

POSTER PRESENTATIONS

Chiropractic rehabilitation of radicular low back pain in male active military member

Philip Afghani, Melissa Ferranti, Trevor Shaw

Objective: To describe the case management of a 42-year-old active military male who presented with low back pain with radiation to the posterior left knee. He was also 2 months postsurgical from open patella tendon debridement and arthroscopic chondroplasty of the left knee and was referred for a functional movement assessment. **Clinical Outcomes:** Following his assessment, it was determined via biomechanical testing that the patient had a flexion intolerance disc derangement with associated core stability and motor control dysfunction, along with bilateral ankle and hip mobility dysfunctions. **Intervention and Outcome:** Chiropractic mobilization of bilateral ankles and spinal fixations along with repeated extension based end-range loading, McGill big 3; curl-ups, bird dogs, lateral planks, monster walk, and single-leg deadlifts were utilized to correct ankle inversion and eversion as well as spinal stability while relieving the associated pain. **Conclusion:** It is evident that even fit, active military can still suffer basic compensatory patterns that can increase the likelihood of pain, especially when rehabbing after surgical knee repair. Regressing back to basic activation exercises, we were able to simulate the proper activation and motor control to decrease pain and improve performance. (This is a conference presentation abstract and not a full work that has been published.)

T4 syndrome—A differential diagnosis of adhesive capsulitis: a case study

Annie Babikian, Robert Butler, Robert Walsh

Objective: To present T4 syndrome as a differential diagnosis to adhesive capsulitis. **Clinical Features:** A 31-year-old male veteran presented with chronic, moderate left shoulder pain ongoing for 2 years. Prior treatments included pain medication and stretching. At consult, pain was rated 5/10 on verbal descriptor scale (VDS) and disability of the arm, shoulder and hand (DASH) score was 20.83%. **Objective findings** included provocative and restricted: left glenohumeral (GH) joint in flexion and abduction, Apley's 3rd position, and thoracic seated Kemp's in extension at T4. In addition, passive range of motion (ROM) of the left GH joint and active cervical ROM were full and nonprovocative. **Intervention and outcome:** Thoracic spinal manipulative therapy (SMT) was delivered to T4 prone on one occasion. Left GH active ROM in abduction significantly increased by 60% and Apley's 3rd position improved, both with decreased pain intensity. **Conclusion:** Adhesive capsulitis was successfully managed with thoracic SMT. Findings were consistent with T4 syndrome, which is underdiagnosed and mismanaged. Further research is warranted to determine the number of cases incorrectly diagnosed. Shoulder pain is often limited to diagnoses of GH pathologies. With failed care of such diagnoses, consideration of spinal differential diagnoses should be included. (This is a conference presentation abstract and not a full work that has been published.)

Initial choice of spinal manipulation for treatment of chronic low back pain leads to reduced long-term risk of adverse drug events among older Medicare beneficiaries

Maria Bangash, James Whedon, Anupama Kizhakkeveetil, Scott Haldeman

Introduction: Chronic low back pain (cLBP) has a prevalence of approximately 23% and is a cause of disability in 11%–12% of the population. Both opioid analgesic therapy (OAT) and spinal manipulative therapy (SMT) are regimens used to treat cLBP, but the long-term risk of adverse drug events (ADE) are uncertain. We compared long-term rates of ADE for OAT vs. SMT among older adults with cLBP. **Methods:** We conducted a retrospective study using nationally representative Medicare claims data from 2012 to 2016. We analyzed the long-term rate of ADE for treatment of cLBP via OAT vs. SMT and estimated the adjusted incidence rate ratio using Poisson regression, controlling for patient characteristics, and accounting for selection bias through propensity scoring. **Results:** The rate of ADE was higher in the OAT cohort ($n = 21,731$) vs. SMT cohort ($n = 6,429$). With weighted propensity scoring, the adjusted rate of ADE was more than 42 times higher for initial choice of OAT vs. SMT (rate ratio 42.85, 95% confidence interval 34.16–53.76, $p < .0001$). **Conclusion:** Among older Medicare beneficiaries who received long-term care for cLBP via

OAT, the adjusted rate of experiencing an ADE was much higher than those who received long-term management with SMT. (This is a conference presentation abstract and not a full work that has been published.)

Pectoralis major tear in a 30-year-old weightlifter: a case report

Jessica Billham, Aaron Welk, Patricia Estrada, Norman Kettner

Objective: This report describes a case of pectoralis major tendon tear in a 30-year-old male weightlifter. It highlights the classic features in both diagnostic ultrasound (US) and magnetic resonance imaging (MRI). **Clinical Features:** The patient presented with left arm pain initiated the night previously during a bench press. The pain localized between the biceps brachii and the deltoid muscles. Mild ecchymosis and swelling was noted only on the upper arm. All shoulder active ranges of motion were painful and restricted, with exception of adduction, which was palliative but weak. These findings persisted through a 4-week trial of conservative care. **Intervention and Outcome:** US revealed complete disruption of the pectoralis major tendon with retraction. MRI confirmed a full-width, full-thickness avulsion of the tendon from the humerus. The patient underwent surgical repair and achieved optimal recovery. **Conclusion:** Full-width, full-thickness pectoralis major tendon tears are uncommon injuries that can be difficult to clinically differentiate from a partial tear. That clinical question must be clarified with imaging findings as treatment recommendations are dependent on it. The favored treatment for full-width, full-thickness tears is surgical repair, and delay can reduce quality of life in an active patient. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic comanagement of a patient with a blocked tear duct: a case report

William Boro, Charles Blum

Objective: To describe chiropractic comanagement of a patient presenting with a blocked tear duct. **Clinical Features:** A 61-year-old female presented October 2019 complaining of constant left eye tearing since early September 2019 due to tear duct blockage, visualized on CT scan. Prior ENT-allopathic assessments prescribed steroids and antibiotics, offering minimal improvement. Subsequent recommendations consisted of surgery for an ethmoidectomy with dacryocystorhinostomy. **Intervention:** Chiropractic care (8 treatments) instituted October/December 2019 consisting of craniofacial/temporomandibular joint (TMJ) therapies: Van Rumpft and DeJarnette (sacro occipital technique [SOT]) cranial procedures, Nimmo TMJ myofascial release, and nasal-specific balloon therapy. SOT pelvic block procedures (category one) and Van Rumpft cervical adjusting were performed at some office visits. **Outcome:** After the first office visit she reported feeling better with less tearing for the first time since early September 2019. At the second visit, patient reported her eye was not tearing and at the third visit (10-days later) reported some exacerbation of the tearing. From early November 2019 through the last office visit mid-December 2019, she reported no tearing, and at a follow-up phone consultation September 2020 she noted no return of her prior condition. **Conclusion:** This report suggests that a subset of patients with tear duct blockage might benefit from chiropractic/allopathic comanagement, and further study is indicated. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic management of notalgia paresthetica: a case report

Cynthia Chapman, Barclay Bakkum, Lisa Barker

Objective: To describe the chiropractic management of a patient who presented with notalgia paresthetica, a sensory neuropathic syndrome of the infrascapular region. **Clinical Features:** A 78-year-old woman was referred by her dermatologist. The patient described her symptoms as burning, itching, and tingling in her right upper back, which had been present for 1 year. She rated her discomfort as 10/10 and noted that topical treatments prescribed by her dermatologist were unhelpful. Exam revealed regions of hyperesthesia adjacent to the right T3, T7, and T10 vertebrae with loss of joint motion at these levels, right convex thoracic curvature, and trigger points in the right rhomboids and right trapezius. **Intervention and Outcome:** The patient received 1 treatment of spinal manipulation to the midthoracic region with the activator instrument, after which she felt 50% better. Acupuncture was next added to her treatment plan. After 8 visits, the patient rated her symptoms as reduced greatly to 0/10, though she still felt them occasionally. The regions of hyperesthesia were decreased by 50%. **Conclusion:** A combination of spinal manipulation and acupuncture appears to have been an effective management strategy for this patient with notalgia paresthetica. Further research is warranted. (This is a conference presentation abstract and not a full work that has been published.)

Comparison of accessibility of telehealth information on state board websites for chiropractic, medical, and physical therapy professions during COVID-19 pandemic

Michael Cole II, Ross Mattox, Jason Napuli

Objective: To compare ease of accessibility of telehealth information on state board websites between chiropractic, medical, and physical therapy professions during the COVID-19 pandemic. **Methods:** State board websites were queried for the term *tele-* to determine if there was a link on the homepage for telehealth guidance. If no, the homepage was queried for the word *COVID* to determine if

there was a link for COVID-related guidance. If yes, that linked COVID page was queried for the term *tele-*. Binary results were entered into a separate spreadsheet for each profession. This search was performed 6 months after emergency declaration in the United States regarding COVID-19. **Results:** Ease of finding information regarding telehealth was variable among state board websites for each profession. Some state boards had a link with telehealth information on the home page, some had a COVID link that led to a telehealth link, and others had neither. **Conclusions:** Telehealth guidance is more readily available for medical doctors and physical therapists compared to the chiropractic profession. Given the uncertainty of in-person care during the COVID-19 pandemic, this information should be readily available to providers. State board websites should include a telehealth guidance link on their home pages. (This is a conference presentation abstract and not a full work that has been published.)

Suicide prevention, public health, and the chiropractic profession: a call to action

Zachary Cupler, Clinton Daniels, Derek Anderson, Michael Anderson, Jason Napuli, Megan Tritt

Objective: Suicide is a major public health concern that has wide-reaching implications on individuals, families, and society. Efforts to respond to a public health concern as a portal-of-entry provider can reduce morbidity and mortality. The objective of this paper is a call to action to initiate a dialogue regarding suicide prevention within the chiropractic profession. **Data Sources and Selection:** We conducted a snowball search strategy in the PubMed database for literature relevant to suicide prevention through May 2020. **Results and Conclusions:** This public health burden requires doctors of chiropractic to realize current strengths and recognize contemporaneous deficiencies in clinical, research, and policy environments. With this better understanding, only then can the chiropractic profession strive to enhance knowledge and promote clinical acumen to target and mitigate suicide risk to better serve the public. We implore the profession to transition from bystander to actively engaged in the culture of suicide prevention beholden to all aspects of the biopsychosocial healthcare model. Suicide prevention improves the health and wellness of one's community while also impacting the broader public health arena. (This is a conference presentation abstract and not a full work that has been published.)

The chiropractor's role in primary, secondary, and tertiary prevention of suicide: a descriptive review

Zachary Cupler, Clinton Daniels, Derek Anderson, Michael Anderson, Jason Napuli, Megan Tritt

Objective: To provide the practicing doctor of chiropractic foundational knowledge to enhance the understanding of relevant primary, secondary, and tertiary public health measures for suicide prevention. **Data Sources and Selection:** A descriptive literature review was performed through May 2020. PubMed was searched using keywords *suicide*, *suicide risk factors*, and *suicide prevention*. Texts and documents pertaining to suicide prevention, Centers for Disease Control, Veterans Health Administration, and the World Health Organization were reviewed. Key literature from the clinical social work and clinical psychology fields were provided by authorship team subject matter experts. **Results and Conclusions:** The database search resulted in 66 articles or sources relevant to the implementation of suicide prevention, screening, and crisis management. No articles reported a position statement regarding suicide prevention and management specific to the chiropractic profession. This descriptive review reports on the following: (1) factors associated with suicide self-directed violence relevant to common conditions seen in the chiropractor's office; (2) how to communicate with the patient about suicide intentions; (3) how to identify a patient at risk through an evidence-based assessment; and (4) considerations for interprofessional collaboration and referral. (This is a conference presentation abstract and not a full work that has been published.)

The effects of cervical spine manipulative therapy on reaction time as measured by the ruler drop test

Edward Feinberg, Wren Burton, Robert Butler, Robert Cooperstein

Objectives: The objective of this study was to test the influence of a cervical spine manipulation on reaction time as measured by the ruler drop test (RDT). **Methods:** Trials of the RDT were conducted on an experimental and control group. The experimental group performed 2 trials of the RDT and received cervical spinal manipulation therapy at spinal levels ranging from C1 to C7 between sessions. The control group performed 2 trials of the RDT and received no treatment between sessions. Experimenters were blinded to participants' group assignment to avoid bias. **Results:** In the control group, the *t* statistic exceeded the critical *t* value. There was a mean improvement of 3.7 centimeters. In the experimental group, the *t* value also exceeded the critical *t* value ($p = .01$); the mean improvement of 6.3 centimeters showed statistical significance. The 2-sample *t*-test was used to determine if the mean change in the centimeters improvement was different between the control and experimental groups. The *t* statistic was less than the *t* critical value ($p = .41$), confirming no statistically significant difference. **Conclusion:** Our study was unable to conclude that cervical manipulation had a measurable effect on reaction time as measured by

the ruler drop test. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic management of an infant fraternal twin with deformational plagiocephaly, facial asymmetry, congenital torticollis, chronic ear infections, and reflux

Melissa Ferranti, Alexis Williams, Michelle Gingras

Objective: To discuss the need for prolonged treatment of an infant fraternal twin presenting with multiple conditions, including delayed developmental milestones. **Clinical Features:** A 2-month-old female twin presented for chiropractic care with congenital torticollis, plagiocephaly, recurrent ear infections, facial asymmetry, reflux, delayed developmental milestones, vertebral subluxations, and "star gazer" presentation. **Intervention/Outcome:** Static and motion palpation along with active range of motion revealed vertebral subluxations of occiput, atlas, L1, and sacrum. Over a period of 16 months, the patient received fingertip digital pressure adjustments, sacro occipital technique cranial work, gastric pull-down manual therapy, and pediatric drop headpiece adjustments. Initial results were decreased reflux, increased right head rotation, and increased duration of active postural head stabilization by the 5th visit. The patient experienced gradual but significant improvements in torticollis, plagiocephaly, and developmental milestones over the rest of the 16 months and ultimately caught up to her twin. Utilizing the patient's twin sibling as a guide for comparison added unique insights into this case. **Conclusion:** The successful chiropractic management of an infant with multiple conditions was described. This study provides supporting evidence that infants with more complex complaints may benefit from prolonged chiropractic care; however, further research is warranted. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic management of cluneal nerve entrapment: a case study

Rachel Gilmore, Mark Pfefer, Jaden Butcher, Alexis Tucker, Chantal Shelstad

Objective: Entrapment of the superior and middle cluneal nerves can cause referral of pain to the upper gluteal region, the hip, and the groin. The purpose of this case report was to describe the chiropractic management of thoracolumbar syndrome in an osteoporotic female. **Clinical Features:** A 77-year-old female with history of significant osteoporosis presented to a chiropractic clinic. Surgery had been recommended to relieve entrapment of the right cluneal nerve where it penetrates the thoracolumbar fascia. Nerve tension tests and tenderness were present in a pattern consistent with Maigne's (thoracolumbar) syndrome, with pain over the right gluteal region and the lateral hip. The patient stated this pain had been unremitting for 3 months. **Intervention and Outcome:** Due to presence of osteoporosis, instrument-assisted spinal manipulation to restricted thoracolumbar segments was provided along with instrument-assisted soft tissue mobilization for 8 visits. Nerve flossing and rehabilitative exercises at home were recommended. The patient had clinically significant improvement at 4 weeks, with continued improvement at 3 months. **Conclusion:** The patient responded positively to instrument-assisted chiropractic care with reduction in pain and improvement in physical function. (This is a conference presentation abstract and not a full work that has been published.)

Feel the burn: 2 cases of adverse events related to ice and heat use

Nathan Hinkeldey, Kyler Case, Cady Roedl, Heather Meeks

Objective: To discuss two patients who presented to a hospital-based chiropractic clinic with abnormal dermatological findings related to cryotherapy and heat use. **Clinical Features:** A 62-year-old male (patient 1) and 70-year-old male (patient 2) presented to a hospital-based chiropractic clinic for evaluation of low back pain. Visualization of the low back demonstrated notable skin discoloration. **Intervention/Outcome:** Patient 1 was instructed on appropriate icing instructions, and pictures of the skin hyperpigmentation were taken in order to ensure no progression. Patient 2 was educated about erythema ab igne and the patient was asked to discontinue heat, and follow-up with primary care physician was coordinated. Pictures were taken of the skin lesion in order to assess waxing or waning of the lesion. **Conclusion:** Patients frequently use heat and ice in order to assist with pain relief. This report serves as a reminder that ice and heat, while mostly benign, can cause adverse outcomes. Skin burns and dermatological conditions like erythema ab igne can present to the chiropractic office; therefore, providers should visualize skin as a part of their physical examination. (This is a conference presentation abstract and not a full work that has been published.)

A clinical trial of the effect of manipulative therapy on passive and active range of motion of the painful hip

Mohsen Kazemi, Sydney Leguard, Sebastian Lilja, Steven Mahaise

Objectives: This study aims to investigate the effects of manipulative therapy of the hip joint on range of motion (ROM) and pain in individuals with symptomatic hips. **Methods:** Nondisabled adult chiropractic students ($n = 20$) were recruited for this double-blinded crossover study. Active and passive hip ROM were measured using the Optotrack® system pre- and postintervention. Intervention consisted of a drop-piece hip manipulation (MT) or an alternative treatment (AT). Subjects were then crossed over and received the other intervention on their 2nd visit a week later. **Results:** Passive abduction was

significantly increased for the MT compared to the AT. At the initial visit, the mean change in numeric pain scale rating was -13% for the MT and -6% for the AT, whereas, at crossover, it was -8% for the MT and -3% for the AT. Moderate to high effect sizes were found for active and passive abduction, adduction, extension, and external rotation in MT. **Conclusions:** Drop-piece manipulation of the symptomatic hip joint may lead to significant increases in passive abduction and moderate to high trends for improvements in all other hip ROM with exception of flexion and internal rotation; however, further research with larger sample size is recommended. (This is a conference presentation abstract and not a full work that has been published.)

Concussion knowledge among North American chiropractors

Mohsen Kazemi, Kevin Deoraj, Milcah Hiemstra, Lauren Santiago

Objectives: To investigate the degree of knowledge North American chiropractors have in regards to concussion diagnosis and management. **Methods:** A Concussion Knowledge Assessment Tool (CKAT) survey was administered to North American chiropractors (NACs) through SurveyMonkey.com. This survey was sent to all practicing members of the American Chiropractic Association (ACA) and Canadian Chiropractic Association (CCA). **Results:** 1321 surveys were completed and analyzed. Average score of the CKAT among NACs was 4.82 out of 9. Using our modified scoring method, chiropractors scored 39.44 out of 48. Chiropractors who were fellows in sport, rehab, or neurology programs scored 5.24 out of 9 ($SD = 1.27$; 95% confidence interval [CI] = 4.96–5) and 40.46 out of 48 ($SD = 3.27$; 95% CI = 39.75–41.17). Schools that teach subluxation theory scored an average of 4.67 ($SD = 1.19$ out of 9) and 39.34 ($SD = 3.34$ out of 48) and schools who taught an evidence-based curriculum scored 4.87 ($SD = 1.20$ out of 9) and 39.54 ($SD = 3.47$ out of 48), respectively. **Conclusions:** North American chiropractors demonstrated the ability to recognize and treat concussions. More investigation is needed in order to address learning gaps and create a standardized treatment guideline for concussions. (This is a conference presentation abstract and not a full work that has been published.)

A retrospective review of patient Optogait results and comparison to side of patient pelvic compensation

Lydia Knutson, Fred Langenegger, John Coleman, Stephanie Sullivan, Martha Herbert

Objective: To compare the effect of Axial Stability Method (ASM) chiropractic care on gait symmetry in patients with left-sided pelvic compensations (LPC) and right-sided pelvic compensations (RPC). **Methods:** Patients were classified as LPC and RPC using ASM chiropractic analysis (a modified form of sacro occipital technique analysis). Eleven LPC and 27 RPC patients performed 30-second march-in-place tests with eyes closed, pre- and postcare, using an Optogait (optical sensor analysis) to measure contact time and lateral position of each step. Patients received a standard series of 10–14 ASM chiropractic treatments that focused on correcting regions of instability. **Results:** For LPC patients, the coefficient of variation (CV) and median values for the difference between left and right foot contact times increased significantly postcare ($p < 0.02$). For all LPC patients, the mean of the midpoint between both feet demonstrated a rightward drift in gait prior to care, with 82% shifting leftward following care. Also, CV of the midpoint decreased significantly postcare ($p < .02$). No significant change in these variables was observed in RPC patients. **Conclusion:** Following ASM chiropractic treatment, the temporal symmetry of gait appears to decrease, and spatial symmetry of gait increases for LPC but not for RPC patients. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic treatment of an adult male with mid-back pain due to spinal accessory nerve entrapment secondary to old malunited right midclavicle fracture: A case report

Shawn LaCourt, Trevor Shaw, Gregory Cofano

Objective: The purpose of this case report is to describe chiropractic care of an adult male with upper back pain secondary to an old malunited right midclavicle fracture. **Clinical Features:** A 21-year-old male presented with upper mid-back symptoms from prolonged sitting. The examination and radiographic studies revealed the patient had a mild atrophy and weakness of the right upper trapezius and SCM due to spinal accessory nerve entrapment secondary to an old malunited right midclavicle fracture. **Intervention and Outcome:** High-velocity low-amplitude manipulation to the spine, manual therapy, and active rehabilitation showed resolution of the patient complaint and increased function after 6 weeks of treatment. **Conclusion:** An adult male with upper mid-back pain due to spinal accessory nerve entrapment secondary to an old malunited right midclavicle fracture improved with a course of treatment including high-velocity low-amplitude manipulation, manual therapy, and active rehabilitation. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic management of a 7-year-old female with Bertolotti's syndrome

Misty Lagasse, Amanda Vozar

Objective: This report will demonstrate the outcome of chiropractic treatment of a child with Bertolotti's syndrome. Research addressing conservative

treatment of a pediatric Bertolotti's syndrome is lacking and often overlooked until the problem worsens in adulthood. Clinical Features: A 7-year-old female presented with lower back pain of a gradual insidious onset 4 weeks prior to the initial visit. The pain was described as achy and worse at night. She pointed to her left lumbosacral area and her gluteals. X-rays revealed spatulated left L5 transverse process articulating with the sacrum and ilium. The left quadratus lumborum and gluteals were hypertonic and tender. Intervention and Outcome: The patient received myofascial release and side posture adjustments to the sacrum and thoracic spine 2–3 days per week. She was prescribed bilateral gluteal, piriformis, and hamstring stretches to be overseen by her parents. After 2 weeks, the patient reported no pain. The patient returned 3 months later with similar pain, which resolved after 1 chiropractic adjustment. Conclusion: The patient responded well to conservative treatment. Chiropractic treatment may be able to delay or possibly eliminate the use of medications and/or surgery for pediatric patients with Bertolotti's syndrome. (This is a conference presentation abstract and not a full work that has been published.)

A case demonstrating how socioeconomic disparity results in delayed access to orthopedic care and poor patient outcomes

Kelsey Lewis, Ross Mattox, Patrick Battaglia

Objective: Describe how delays in management associated with socioeconomic disparity negatively impacted outcomes in a patient with osteonecrosis of the femoral head (ONFH). Clinical Features: A 42-year-old woman was diagnosed with ONFH in March 2017, and she was referred to orthopedics, which was delayed by access to primary care and orthopedic scheduling. The patient was scheduled for a core decompression in April 2018, but postponed several times for lack of “financial backing.” Finances were secured in September 2018. Intervention and Outcome: She underwent surgery in July 2019 without postoperative rehabilitation due to lack of transportation and private insurance. Her symptoms progressed, and a hip replacement was scheduled for March 2020, but was canceled and rescheduled for September 2020 due to COVID-19. In the lapsed time, the patient became progressively more disabled and developed widespread pain and clinical depression. Conclusion: Socioeconomic status influences wait times and outcomes for orthopedic surgeries in the United States. Timelier care would likely result in improved patient outcomes including less disability and better quality of life. Chiropractic physicians may consider advocacy for expanded coverage and more expedient care for their patients through close contact with both the patient and primary care provider. (This is a conference presentation abstract and not a full work that has been published.)

Identifying the start of a low back pain treatment episode using Veterans Health Administration electronic health record data: a pilot study

Vivian Ly, Gregory Roytman, Anthony Lisi

Objective: A pilot study exploring the accuracy of identifying the start of a low back pain (LBP) treatment episode using Veterans Health Administration electronic health record (EHR) data. Methods: EHR data from an existing musculoskeletal diagnosis cohort between October 1, 2015, and September 30, 2016, were compared with manual chart review. Patients with a visit (the index visit) including a low back ICD-10 code after at least 1 year without such a visit were identified using structured query language. A standardized manual chart review process was used by two investigators to extract data from the full-text notes of visits within –365 to +548 days of the index visit and to rate the index visit. Results: We identified 12,146 veterans with an index visit. Manual chart review was conducted on a random subset of 100 cases. The index visit was rated a correct episode start date in 72 cases. The most common reasons for incorrect ratings were LBP treatment occurring prior to the index visit ($n=17$) and no documentation of LBP in the index visit note ($n=7$). Conclusion: A manual chart review process can rate the accuracy of LBP episode start dates in EHR data. (This is a conference presentation abstract and not a full work that has been published.)

Immediate impact of extremity manipulation on dual task performance: a randomized, crossover study

Christopher Malaya, Joshua Haworth, Katherine Pohlman, Dean Smith

Objective: Previous research demonstrated that manipulation of the extremities influenced multisegmental postural sway and improved performance on a lower extremity balancing task. This study sought to investigate if these effects extended to an upper extremity task. Methods: Participants were healthy volunteers, aged 21–32 years. Upper- or lower-extremity manipulations were delivered in this participant and assessor blinded, randomized crossover trial. Postural (center of pressure [COP]) and suprapostural (tube motion) measurements in the frontal plane were evaluated pre-post manipulation under eyes-open and eyes-closed conditions. Path length, range, root mean square (RMS), and sample entropy were analyzed. Results: There were no main effects of manipulation or vision for the suprapostural task. Follow-up to interaction effects indicates that roll path length, range, and RMS of tube motion all decreased (improvement) following lower extremity manipulation with eyes open. There was a main effect of manipulation on medial-lateral COP: path length reduced with both upper and lower extremity manipulation, with larger decreases following upper extremity manipulation. Conclusion: Findings

suggest that manipulation of the extremities enhanced stability (e.g., tube stabilization, standing balance) on performance of a dual task. Further exploration is necessary to better understand how site-specific manipulations influence context-specific motor behavior/coordination. (This is a conference presentation abstract and not a full work that has been published.)

A feasibility study: inclusion of nutrient-rich foods in the care of low back pain patients at a chiropractic teaching clinic

John Marth, Zak Monier, Gregory Hollandsworth, Katherine Pohlman

Objective: Assess the feasibility to add nutritional components into low back pain (LBP) patient care at a chiropractic teaching clinic. Methods: This feasibility study recruited overweight/obese LBP patients seeking care between October and November 2019. Eligibility criteria included average numerical pain rating scale (NRS) ≥ 4 , age 21–64, BMI 25–40 kg/m², moderate/high risk on the Keele-Start-Back (KSB). Both arms received usual chiropractic care and nutritional advice. One group (food) received 4 daily nutrient-dense offerings. Outcome measures at baseline and 6 weeks included KSB (scale: 0–9), Roland-Morris (RM) Disability (scale: 0–24), weight, and adverse events (AE). Feasibility assessed recruitment capacity, food compliance, and adherence to study protocol. Results: Sixty-two individuals were screened with 9 enrolled (mean age: 33.9 $\pm$ 41 years, BMI 31.1 $\pm$ 5.44, NRS 6.2 $\pm$ 1.20). Exclusions reasons: NRS < 4 ($n=54$), age ($n=4$), BMI ($n=16$), KSB low risk ($n=37$). Eight participants completed the study with the following outcome decreases: KSB -3.8 ± 0.89 (food, -3.8 ± 1.83), RM 5.8 ± 3.15 (food, -5.5 ± 1.00), weight -2.9 ± 5.40 (food, -5.6 ± 6.16). One unrelated AE was reported. Participants in the food group were compliant with the offerings, and all participants were able to adhere to the study protocol. Conclusion: While this study was feasible to conduct, recruitment was a challenge, and the nutrient-dense food intervention had only minimal effects on LBP and weight. (This is a conference presentation abstract and not a full work that has been published.)

Alternative management of plantar fasciitis: a case report

Heather Meeks

Objective: To discuss the management of chronic plantar fasciitis in 44-year-old female using a multimodal treatment approach, including cupping therapy. Clinical Features: A 44-year-old female presented to a hospital-based chiropractic clinic with chief complaint of bilateral foot pain. Due to the nature of the patient's occupation, she stood for 12–14 hours at a time and had not found relief with traditional plantar fasciitis management strategies. Intervention and Outcomes: The use of cupping therapy in combination with instrument-assisted soft tissue manipulation and manipulative therapy for plantar fasciitis management provided in a hospital-based chiropractic clinic resulted in subjective improvements in pain during walking, standing, and ambulation. Conclusion: The use of a nontraditional management strategy, including dynamic cupping, resulted in symptomatic relief and improved activity tolerance for a 44-year-old female with chronic foot pain. This report provides a case for the use of alternative management strategies and suggests the need for further research in this area. (This is a conference presentation abstract and not a full work that has been published.)

Integration of chiropractic care within a rural community-based outpatient patient aligned care team setting

Heather Meeks, Nathan Hinkeldey, Matthew Jordan, Juli Olson

Objective: To describe the impact of adding a chiropractor to the community-based outpatient clinic (CBOC) patient aligned care team (PACT) has on provider referral behaviors in a hospital-based setting. Design: Chiropractic services were added to 2 CBOCs 1 day per week at the beginning of fiscal year (FY) 2020. Retrospective review of all consults to the chiropractic service from the CBOCs in FY 2019 and FY 2020 were reviewed and compared. Results: FY 2019 and FY 2020 referrals to the on-station chiropractic clinic were 26 and 295, respectively. Care in the community consults also elevated from 179 in FY 2019 to 369 in FY 2020. Of particular note, included were 22 referrals from podiatry who previously hadn't referred patients for chiropractic care. Conclusion: The addition of a chiropractor to the CBOC PACT setting resulted in significant increase in referrals for utilization of chiropractic care. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic management of patient with trigeminal neuralgia: a case study

Meredith Meyers, Jene Jordahl, Kody Johnson

Objective: To describe the successful chiropractic management of a patient with trigeminal neuralgia. Clinical Features: A 25-year-old male patient presented with burning left side jaw and face pain present for 6 months prior and previously diagnosed by medical doctor as trigeminal neuralgia. Intervention and Outcome: Patient was treated with a combination of cold laser therapy, manual therapy, and mobilization of the mandible and cervical spine. Patient's symptoms decreased after treatment and resolved after 3 months of care. Symptoms returned after pugilistic injury and resolved with additional course of conservative care. Conclusion: Treatment of trigeminal neuralgia with chiropractic manipulation, cold laser therapy, and manual therapy resulted in

the resolution of burning face and jaw pain and allowed the patient to return to normal activities. (This is a conference presentation abstract and not a full work that has been published.)

Battlefield acupuncture for acute headaches: a case series

Mark Pfefer, Rachel Gilmore, Connor Buckles,

Objective: Battlefield acupuncture (BFA) is an ear acupuncture protocol used by the military for immediate pain relief. This case series reports on patients with severe headache presenting to an outpatient chiropractic office who received BFA for acute pain relief. This project also determines feasibility of using BFA in future research as an acute management intervention for headache. **Methods:** Adults who presented to a chiropractic office with severe headache rated as a minimum of 7 on a visual analog pain scale (VAS) were recruited to receive 1 session of BFA. Patients rested in a quiet dark room, and VAS was repeated 30 minutes after intervention. **Results:** Six consecutive patients with severe headache received BFA protocol. One patient had no change in pain score. One patient had a minimal reduction in pain, and 4 patients had at least a 50% reduction in pain score. No adverse events were reported. **Conclusion:** This case series demonstrates that BFA may be useful as an approach to reduce headache pain intensity. Further study is warranted. Future research should assess effects based upon classification of headache types. (This is a conference presentation abstract and not a full work that has been published.)

Immediate changes to lumbosacral dural regions upon simultaneous bilateral compression to the parieto-occipital (asterion) cranial region: a 2-cadaver dissection study

Marc Pick, Charles Blum

Objective: The relationship between clinical applications to the cranium and affects to the sacral region has been questioned. This study sought to assess whether an anatomical functional relationship could be demonstrated through the application of pressures to the cranium with visualization of its effect on the dural volume in a dissected sacral region. **Methods:** Two cadavers (71-year-old female embalmed for anatomical dissection and stored in an emersion tank for over a year and an unembalmed 86-year-old male) were carefully dissected to expose the lumbosacral dural sac. Lateral-to-medial pressure (3–4 kg for embalmed female and 6–9 kg for unembalmed male) was applied by hand simultaneously and bilaterally to cranial contacts just above the asterion. Careful observation of the dural sac pre- and postapplication of pressure was performed and repeated to determine a consistent response. **Results:** It appeared that with application of cranial pressure, the sacral dural sac was measured to have expanded twice the resting diameter observed before cranial pressure was applied. It returned to its resting diameter after the pressure was released. **Conclusion:** This study represents the first attempt to assess if application of pressure to the cranium might cause a response in the lumbosacral meningeal region. (This is a conference presentation abstract and not a full work that has been published.)

Level of knowledge on conservative management of adolescent idiopathic scoliosis among undergraduate students in healthcare: a scoping review

Philippe Rousseau, Chantal Doucet, Isabelle Pagé

Objective: Identify and map the current studies evaluating the level of knowledge of health profession students on adolescent idiopathic scoliosis (AIS) conservative management. **Methods:** This review was based on a standardized framework. The search strategy included three main concepts: “Adolescent idiopathic scoliosis,” “Knowledge,” and “Undergraduate students studying in a healthcare field.” The search strategy was applied to three databases. Full-text articles and conference abstracts were included. Studies identification included (1) duplicate removing, (2) title and abstract screening, and (3) full-text screening (for full-text articles). The quality of the included studies was assessed. Studies’ characteristics were extracted, and results were summarized. **Results:** Searches yielded the identification of 480 citations. After duplicates removal and screening, 2 full-text articles and 2 conference abstracts were included. Three studies evaluated final-year students in physical therapy, while the other evaluated final-year students in chiropractic. Three studies were based on a similar questionnaire. All studies reported an unsatisfactory level of knowledge. **Conclusion:** The results suggest that future health professionals have an unsatisfactory knowledge of the evidence in regard to AIS conservative management. Results also highlight the need to develop a standardized questionnaire to adequately assess this knowledge across institutions and professions. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic student attitudes toward peer examination: analysis of a focus group

Robert Rowell, Tracey Littrell

Objective: To report students’ attitudes and experiences as simulated patients for peer examination in chiropractic education. **Methods:** Two focus groups were conducted with a total of 11 students who had completed the physical diagnosis classes. The discussions were recorded for analysis, and transcripts

were created by an audio-to-text app. Both authors independently read the transcripts and created codes and categories according to the content analysis techniques described by Hsieh and Shannon. Final codes and categories were arrived at by consensus. **Results:** Category examples include communication, professionalism, and personal growth. Students expressed feeling mild discomfort as simulated patients for peer examination activities, consistently reporting feeling awkward and nervous. Students were unanimous in expressing the perceived value of being a simulated patient, stating they learned skills in both communication and physical examination procedures. **Conclusions:** Despite initial attitudes of nervousness, students valued peer examination experiences in physical examination courses. Students felt being a simulated patient helped them learn to be better doctors. Finally, we plan to use the categories and codes from this study to inform the design of a survey to gather the attitudes and experiences of a larger sample of students. (This is a conference presentation abstract and not a full work that has been published.)

Sonographic findings of atraumatic A2 pulley injuries

Ashley Ruff, Erika Evans, Edward Johnnie, Norman Kettner

Objective: A2 pulley injuries are common in a traumatic setting. Sonographic evaluation identified two cases of A2 pulley injuries without traumatic history. **Clinical Features:** Case 1: A 28-year-old male presented to a chiropractic clinic with pain at the 3rd metacarpophalangeal (MCP) joint of 2 months’ duration. Ultrasonography revealed a 1.43 × .47 cm oval, cystic, slightly compressible lesion with peripheral echoes, and through transmission on the volar aspect of the right 3rd proximal phalanx without hyperemia. Incidentally noted, a .51 × .20 cm small oval lesion was found on the left side. Case 2: A 26-year-old female presented with left 4th proximal interphalangeal joint swelling and pain. Ultrasonography revealed a poorly visualized A2 pulley at the volar aspect of the 4th proximal phalanx with a bowstring appearance of the flexor tendon complex. There was associated tenosynovial fluid surrounding the tendons without hyperemia. **Intervention and Outcome:** Case 1 received laser directed to the injury 15 minutes per week. Case 2 engaged in finger strengthening exercises. Both cases were treated conservatively and were pain free in approximately 4 weeks. **Conclusion:** These cases demonstrate A2 pulley injuries in the hand without traumatic history and conservative management. (This is a conference presentation abstract and not a full work that has been published.)

Secretory IgA and upper cervical chiropractic: a prospective, multicenter, observational pilot study

Philp Schalow, Kelly Kimball, Frederick Schurger, George Sooley, Scott Bales, Roderic Rochester, Robert Brooks, Julie Mayer Hunt

Objective: The objective of this study was to observe changes in secretory immunoglobulin A (SIgA) following chiropractic care using upper cervical adjusting techniques (UCATs) at the craniocervical junction (CCJ). **Methods:** Forty-one subjects were enrolled from 5 upper cervical chiropractic offices across North America. Each participant provided a saliva sample at an initial visit prior to care. A second saliva sample was collected after resting 30 minutes following the first UCAT treatment at the CCJ. A third saliva sample was collected after 2 weeks. **Results:** A significant increase of 117.85 µg/mL was observed in mean SIgA 30 minutes after the UCAT treatment compared to baseline ($p < .001$). After 2 weeks, SIgA levels decreased to near original levels. **Conclusion:** Our findings demonstrate an immediate increase in SIgA levels following a corrective UCAT treatment at the CCJ. Further research into the neuroimmunoenocrine effects of chiropractic care is necessary to understand underlying mechanisms. (This is a conference presentation abstract and not a full work that has been published.)

Quantitative utilization assessment of musculoskeletal specialists integration within an established VA hospital telephone care program

Alec Schielke, Robert Walsh

Objective: The purpose of this study is to quantitatively demonstrate the utilization of musculoskeletal specialists after integration into an established telephone care program triage hotline at a level A1 VA hospital. **Methods:** The total number of telephone care program notes from induction of the musculoskeletal specialists’ integration into the service and the following 6-month time frame were collected. The percentage of those total notes that were referred to musculoskeletal specialty for triage were analyzed. A similar time frame from 1 year prior was also collected as a baseline comparison. **Results:** A significant number of telephone care program appointments were triaged to musculoskeletal specialists. **Conclusion:** This study was able to quantitatively demonstrate the utilization of the integration of musculoskeletal specialists into an established telephone care program. Additional investigation in the future could prove further utility and efficiency of such a collaboration in a health care setting. (This is a conference presentation abstract and not a full work that has been published.)

Cervical spinal manipulation effects on pain, disability scores, and range of motion: A 1-year retrospective study in veterans

Margaret Sels, Robert Walsh

Objective: Cervical spinal manipulation therapy (SMT) has been shown in previous studies as effective in reducing pain and disability scores. However,

previous studies have not evaluated the effect of cervical SMT on verbal descriptor scale (VDS), Neck Disability Index (NDI), and range of motion (ROM), collectively, specifically in the veteran population. Methods: A retrospective analysis was performed on 124 veterans from September 2018 to January 2020 from the VA Palo Alto Health Care System who had a diagnosis of segmental dysfunction of the cervical spine. Veterans were treated with HVLA cervical adjustment for a total of 4 to 10 visits, as their primary intervention. Data were collected on VDS, ROM, and NDI scores. Results: Data will be analyzed using an ANOVA test using SPSS. Initial averages of data showed decreased VDS, increased ROM, and clinically significant decreases in NDI scores. Conclusion: Cervical SMT appears useful in increasing ROM and improving activities of daily living, which are reflective in decreased NDI scores. It also shows how VDS individually is not as reliable as NDI scores in evaluating a patient's response to treatment and progression toward healing. (This is a conference presentation abstract and not a full work that has been published.)

Successful conservative management of a postsurgical right ankle

Margaret Sels, Robert Walsh

Objective: To present a case of successful conservative management of a postsurgical right ankle. Clinical Features: 61-year-old male veteran presented with chronic right ankle pain with point tenderness at the medial malleolus and Achilles tendon with limited dorsiflexion of the right ankle despite surgical intervention in 2017. Pain management included heat, eucalyptus oil, and acetaminophen. Pain was rated 5/10 on the verbal descriptor scale (VDS). Intervention: Manipulative therapy of the right talocalcaneal and talocrural joints and interferential current therapy to the surrounding musculature were delivered over 7 visits. Active care was integrated into treatment that included range of motion and strengthening exercises, then progressed to proprioceptive exercises and an at-home program. Outcome: At discharge, the Lower Extremity Functional Scale (LEFS) significantly improved by 15%, dorsiflexion increased by 65%, and acetaminophen was discontinued. In addition, there was a clinically significant decrease in pain intensity and frequency. Conclusion: This case shows successful coupled intervention of manipulation and active care, resulting in increased range of motion, decreased VDS, elimination of medication, and improved LEFS. Future studies should consider using these methodologies for management of chronic ankle injuries. (This is a conference presentation abstract and not a full work that has been published.)

Chiropractic student scores on the Learning and Study Skills Inventory (LASSI) at early entry vs late exit points during the DC training program

Monica Smith, Dale Johnson, Scott Donaldson

Objective: We examine whether LASSI scores change over time in the DC training program. Methods: We have collected LASSI data on incoming early-quarter chiropractic students since 2016 ($N = 502$) to understand their needs and better target our institutional efforts to support their academic success. In 2019 we readministered the LASSI to $n = 32$ student volunteers from our earliest entry cohort who were near graduation. Results: Paired t -test showed significant ($p < .05$) changes comparing LASSI scores (percentage change of early vs late): Reduced Anxiety in Academic Performance (-21%), Increases in Selecting Main Ideas ($+9\%$) and Test Strategies ($+10\%$); and Decreases in Attitude (-12%), Motivation (-6%), Self-Testing (-25%), Information Processing (-8%), Study Aids (-22%), and Time Management (-13%). Conclusion: The LASSI data since 2016 have informed institutional planning, such as development of our Academic Success Center, which supports students and educators. LASSI scores can also inform training programs for evidence-

informed life-long learning in graduate DCs. These initial results warrant further follow-up studies to confirm, and to understand reasons for possible changes in LASSI early vs late. Institutional resources were intensively redirected during COVID-driven shifts to online instruction; therefore, LASSI data collection was interrupted through 2020, with plans to resume in 2021. (This is a conference presentation abstract and not a full work that has been published.)

The instructor's role in teaching chiropractic digitally through the dynamic model of educational effectiveness

Misty Stick-Mueller

Objective: Digital teaching has increased in recent years due to advances in technology, convenience, and most recently, the pandemic. Student success in online learning is variable and dependent upon many factors, with instructor aptitude a significant component in the determination of effective student progress. Students' and instructors' perceptions of characteristics of an effective teacher in a digital learning environment may vary. This presentation will discuss characteristics of effective teachers in a digital teaching environment through the lens of the dynamic model of educational effectiveness. Data Sources and Selection: ERIC, Education Full Text, and Chronicle of Higher Education searches of literature since 2000 examining relationships between effective teaching and online learning in higher education were used. Search terms used were "effective teaching," "effective instruction," "online learning," "online teaching," "higher education," "digital learning," and "dynamic model of educational effectiveness." Results: Use of the dynamic model for educational effectiveness can help to better structure online content for effective student learning. Conclusion: In summary, the dynamic model of educational effectiveness has previous success in the traditional classroom setting and can be adapted for improved digital teaching environments. (This is a conference presentation abstract and not a full work that has been published.)

Assessing conditions seen and treatments delivered by Veterans Health Administration chiropractors: comparing provider self-report with electronic health record data

Brent Young, Anthony Lisi, Stephanie Halloran

Objective: To compare Veterans Health Administration (VA) chiropractors' self-report of diagnoses seen and treatments provided with electronic health record (EHR) data from their visits. Methods: Cross-sectional analysis of VA administrative data from October 1, 2018, through September 30, 2019, was performed assessing ICD-10 and CPT codes of all on-station chiropractic visits. Additionally, secondary analysis of data from a previous VA chiropractor survey to calculate relative frequencies of provider-reported diagnoses and procedures was done. Results: The most frequently seen condition by provider report, low back pain without radiculopathy (LBPwo), was also the most common ICD-10 code grouping (49% of all codes). Considering LBPwo as the index, providers reported seeing neck pain without radiculopathy (NPwo) at a factor of 0.98 times that frequency, upper extremity at 0.62, and lower extremity at 0.62. EHR data showed NPwo diagnoses occurring at a factor of 0.42 LBPwo and upper and lower extremity at 0.02 each. Chiropractic manipulative therapy was the most frequent treatment in the survey and EHR data. Providers reported delivering therapeutic exercise and patient education at high frequencies, yet these CPT codes were rare. Conclusion: There is some agreement and much discrepancy between VA chiropractors' report of practice characteristics and VA EHR data. (This is a conference presentation abstract and not a full work that has been published.)