David R. Gibson, DC, FTSB, DAAPM, DAAMLP

Greensboro Accident & Injury **(336) 274-2520**
526 North Elam Avenue, Suite 101 ***fax* (336) 274-2528**
Greensboro, NC 27403 **DavidGibson@triad.rr.com**

SELECTED OCCUPATIONAL HISTORY

Private Practice, Greensboro Accident & Injury Chiropractic, NC, 1997- Presently

Staff Doctor, Accident & Injury Chiropractic, Garland, TX, 1996

Staff Doctor, West Dallas Metrex, Dallas, TX, 1995

Staff Doctor, Newton Chiropractic, Carrollton, TX 1994

EDUCATION and LICENSURE

Fellow, Trauma and Spinal Biomechanics

Doctorate of Chiropractic, Parker Chiropractic College, Dallas, TX, 1994

Bachelor of Science in Mechanical Engineering, The Ohio State University, Ohio, 1986

Diplomate, American Academy of Pain Management

Diplomate, American Academy of Medico-Legal Practice

Licensed in the State of North Carolina, License # 2180, 1996-presently

Doctor of Chiropractic, Licensed in the State of Texas, License # 6190, 1994-1997

SELECTED POST-GRADUATE EDUCATION & CERTIFICATIONS

Acute vs Degenerative Intervertebral Disc Disease-*advanced training on sensory nerve ingrowth into degenerating intervertebral discs and its role in triggering chronic discogenic pain following trauma. This course covered the pathophysiological mechanisms behind nerve ingrowth, including annular fissures, inflammatory mediators, and nociceptive activation, and how these factors contribute to the conversion of pre-existing but asymptomatic disc degeneration into a functionally limiting condition post-trauma. Special emphasis was placed on legal causation standards, including the "but for the accident" argument, the Eggshell Plaintiff Doctrine, and MRI findings that support the distinction between pre-existing asymptomatic degeneration and post-traumatic pain syndromes in personal injury litigation.* National Spine Management Group, Federation of Chiropractic Licensing Boards PACE, 2025.

Acute vs Degenerative Intervertebral Disc Disease -*training on sensory nerve in-growth in degenerating intervertebral discs, focusing on the biochemical mechanisms of nociceptive sprouting and the clinical significance of neovascularization in chronic discogenic pain. The course examined the role of nerve growth factor (NGF), calcitonin gene-related peptide (CGRP), and substance P, which drive sensory nerve expansion and increase pain perception in degenerative discs. Clinical applications included the use of high-intensity zones (HIZ) on MRI as a marker for pathologic nerve ingrowth and the role of regenerative medicine, including platelet-rich plasma (PRP) and stem cell therapy, in mitigating disc-related pain.* National Spine Management Group, Federation of Chiropractic Licensing Boards PACE, 2025.

Acute vs Degenerative Intervertebral Disc Disease–*presentation on intervertebral disc grading with a focus on the Pfirrmann MRI classification system for disc degeneration. This training provided an in-depth examination of Pfirrmann's five-tier grading scale, detailing its clinical and research applications, as well as its role in legal cases differentiating acute trauma from chronic degenerative changes. The course also covered the comparative inter-rater reliability of disc grading systems, including Thompson, Schneiderman, and Modified Pfirrmann scales, highlighting their strengths and limitations. The Pfirrmann system was recognized as the gold standard for assessing disc degeneration severity, with practical applications in treatment planning, surgical decision-making, and medico-legal documentation.* National Spine Management Group, Federation of Chiropractic Licensing Boards PACE, 2025.

Acute vs Degenerative Intervertebral Disc Disease*–evidence-based review of the Fardon et al. criteria for intervertebral disc morphology, focusing on the 2014 revisions and their implications for clinical and legal practice. This training covered the differentiation of disc bulges, protrusions, extrusions, and sequestrations on MRI, ensuring proper classification and reporting of disc pathology. Special emphasis was placed on the role of annular fissures, high-intensity zones (HIZ), and Modic changes in diagnosing symptomatic disc disease and distinguishing pre-existing degenerative changes from acute traumatic injury. The course also explored the relevance of these MRI criteria in personal injury and workers' compensation cases, providing a standardized framework for expert witness testimony and medicolegal reporting*. National Spine Management Group, Federation of Chiropractic Licensing Boards PACE, 2025.

Advanced Imaging for Hip Pathologies-*Completed an in-depth course on advanced imaging techniques for the hip joint, focusing on MRI and MR arthrography (MRA) for diagnosing intra-articular and periarticular conditions. Key learnings included MRI protocols for femoroacetabular impingement (FAI), labral tears, avascular necrosis (AVN), and osteoarthritis. The course emphasized appropriate indications for MR arthrograms in labral pathology, interpretation of T1-weighted, STIR, and fat-suppressed proton density sequences, and the role of 3D isotropic imaging in detecting subtle cartilage and labral defects*. National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE, 2025

Radiographic Analysis and Interpretation of Hip Pathology-*Completed comprehensive training on radiographic analysis of the hip joint, including standard imaging protocols such as AP pelvis, AP hip, frog-leg lateral, and Dunn views. Developed proficiency in identifying radiographic markers of common hip conditions, including cam and pincer lesions in FAI, joint space narrowing in osteoarthritis, subchondral sclerosis, and femoral head collapse in AVN. Training included structured radiographic reporting for enhanced communication between musculoskeletal providers and orthopedic specialists.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE, 2025

Interventional Hip Injection Therapy in Musculoskeletal Management-*Acquired specialized knowledge in hip injection therapy, including diagnostic and therapeutic applications of corticosteroids, platelet-rich plasma (PRP), and hyaluronic acid. The course covered fluoroscopic vs. ultrasound-guided techniques, indications for intra-articular vs. periarticular injections, and clinical decision-making for non-surgical management of osteoarthritis, labral pathology, and trochanteric bursitis. Emphasis was placed on interprofessional collaboration between chiropractors and orthopedic surgeons in coordinating post-injection rehabilitation and optimizing patient outcomes.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE, 2025

Surgical Considerations and Postoperative Rehabilitation in Hip Pathology-*Completed advanced training on surgical indications and post-surgical rehabilitation for hip pathology, including total hip arthroplasty (THA), arthroscopic labral repair, core decompression for AVN, and surgical fixation for SCFE. Gained expertise in preoperative patient selection criteria, surgical referral guidelines, and post-surgical rehabilitation protocols. Training included rehabilitation timelines for THA, hip arthroscopy, and osteotomies, with a focus on gait retraining, strength progression, and functional return to activity.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE, 2025

Advanced Analysis of Circulating Biomarkers of Concussion-*Detailed outline providing a comprehensive review of circulating biomarkers in concussion. The course examined critical markers—including Glial Fibrillary Acidic Protein (GFAP), Ubiquitin C-terminal Hydrolase-L1 (UCH-L1), S100B, Tau Protein, and Neurofilament Light Chain (NFL)—with emphasis on cellular localization and roles in neuronal and glial injury. Training detailed temporal dynamics of biomarker release, analytical validity, and clinical utility in early diagnosis and patient monitoring. The program further explored the integration of biomarker data into multimodal diagnostic frameworks to enhance precision in concussion management. National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.*

Genetic Profiles and Concussion Severity-*A comprehensive review focusing on genetic determinants influencing concussion outcomes, specifically examining APOE and MTHFR genes, was attended. Extensive review provided insight regarding APOE's function in lipid transport, neuronal repair, and synaptic plasticity, with emphasis on clinical implications of the ε4 allele in exacerbating neuroinflammatory responses. Seminar content also addressed MTHFR function in folate metabolism, impact on homocysteine regulation, and consequences of common polymorphisms on vascular and neural health. The genetic-focused curriculum underscored the importance of personalized medicine for optimizing therapeutic strategies in concussion care*. National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Laboratory Certifications and Testing Validity-*A detailed presentation on the validity of laboratory testing was completed, critically analyzing regulatory frameworks that ensure high-quality diagnostic assays. Extensive overview of the Clinical Laboratory Improvement Amendments (CLIA; 42 CFR 493) elucidated how federal standards guarantee accuracy, reliability, and timeliness of laboratory results. Additional oversight provided by the State of Texas was examined, emphasizing the complementarity of state-specific regulations with federal mandates. Rigorous accreditation processes administered by the College of American Pathologists (CAP) for Laboratory Developed Tests were detailed, ensuring that assays meet stringent analytical and clinical performance criteria.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Interprofessional Care Coordination of Concussion *-A comprehensive presentation integrating multidisciplinary insights was successfully completed, combining advanced scientific concepts with clinical applications in concussion diagnosis and management. Educational experience synthesized data from circulating biomarkers, genetic markers, and laboratory validation processes to foster a holistic understanding of the neurophysiological and molecular underpinnings of concussion. Curriculum utilized scientific rigor to delineate contributions of each component to evidence-based clinical decision-making and personalized patient care. Overall, the course enriched proficiency in incorporating sophisticated diagnostic strategies into clinical practice, thereby enhancing capacity to deliver optimized, patient-centered care.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Developmental Stenosis and Spinal Trauma Developmental Spinal Stenosis and Spinal Trauma *Delivered a one-hour educational course examining the anatomical, clinical, and medicolegal implications of developmental spinal stenosis in the cervical spine, with a focus on its significance in personal injury litigation. The presentation provided an in-depth review of normal spinal canal dimensions, the anatomical boundaries of the cervical canal, and the pathophysiology of central canal narrowing. Special attention was given to cases where intervertebral disc herniation contributes to symptomatic stenosis, particularly in individuals with pre-existing developmental narrowing. Discussed the role of advanced imaging modalities in assessing canal diameter, differentiating congenital predisposition from trauma-induced exacerbation, and supporting causation analysis in legal cases. Emphasized the importance of objective documentation in establishing the impact of spinal injuries on long-term function and prognosis, as well as its relevance in determining case valuation and settlement considerations*. National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025

Conservative vs. Surgical Management of Rotator Cuff Tears-*an advanced course reviewing the comparative outcomes of conservative and surgical interventions for rotator cuff tears. The course provided an in-depth analysis of clinical and structural outcomes over one-and two-year follow-ups, including patient-reported functional scores and imaging assessments. Special emphasis was placed on evidence-based decision-making regarding physical therapy, pain management, and surgical repair techniques for full-thickness rotator cuff tears. The curriculum also explored patient selection criteria, discussing factors that influence the decision to pursue surgery versus conservative treatment, including age, tear size, and functional demands. Additionally, the course evaluated long-term complications associated with both treatment modalities, such as re-tear rates and residual weakness. Advanced imaging techniques, including MRI evaluation of postoperative tendon integrity, were also discussed to provide a comprehensive understanding of treatment efficacy.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Non-Surgical and Rehabilitative Interventions for Frozen Shoulder-*studied a comprehensive review of non-surgical and rehabilitative treatments for frozen shoulder (adhesive capsulitis). The course covered the pathophysiology of the condition, risk factors, and rehabilitation techniques, including corticosteroid injections, manual therapy, stretching protocols, and hydrodilatation. Additionally, it provided a critical evaluation of systematic reviews, highlighting the effectiveness of various interventions in improving range of motion and reducing pain. The curriculum also emphasized the importance of staging in frozen shoulder management, differentiating between the freezing, frozen, and thawing phases and their respective treatment approaches. The role of multidisciplinary care was examined, including collaborations between physical therapists, orthopedic specialists, and pain management physicians to enhance patient outcomes. The session concluded with a discussion on the latest clinical guidelines and emerging therapies, such as platelet-rich plasma (PRP) injections and extracorporeal shockwave therapy, as potential adjuncts to rehabilitation.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Diagnosis and Management of Shoulder Instability and Labral Tears-*completed a course on the evaluation and treatment of shoulder instability and labral pathology, including Bankart and SLAP lesions. The curriculum covered the role of conservative management, indications for surgical intervention, and current arthroscopic repair techniques. The course also examined postoperative rehabilitation strategies to optimize functional outcomes for patients with recurrent dislocations or labral injuries. Special attention was given to patient-specific factors influencing treatment, such as athletic demands, history of prior dislocations, and the presence of associated bony defects like Hill-Sachs or glenoid fractures. The session reviewed the latest arthroscopic advancements, including suture anchor techniques, capsular plication, and the Latarjet procedure for cases with significant glenoid bone loss. Furthermore, rehabilitation protocols were discussed in detail, highlighting progressive strengthening exercises, proprioceptive training, and return-to-sport criteria for competitive athletes*. National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Acromioclavicular (AC) Joint Injuries and Proximal Humerus Fractures-*The doctor participated in an educational program focused on the classification, diagnosis, and treatment of AC joint injuries, arthritis, and proximal humerus fractures. The session included discussions on surgical indications, such as AC joint reconstruction and distal clavicle excision, as well as fracture management techniques, including open reduction and internal fixation (ORIF) and reverse shoulder arthroplasty. The course emphasized evidence-based rehabilitation strategies to improve post-surgical recovery. Detailed case studies were presented to highlight different treatment pathways based on patient demographics, including young athletes with AC joint separations and elderly individuals with osteoporotic proximal humerus fractures. The curriculum also addressed complications associated with these conditions, such as post-traumatic arthritis, nonunion, and hardware-related issues following surgical repair. Advanced surgical planning techniques, including 3D imaging for complex fracture patterns, were explored to enhance surgical precision and patient outcomes.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Interventional Pain Management in Spine Care-*This course review the fundamental principles of interventional pain management, focusing on patient selection, procedural indications, and evidence-based techniques for spine-related pain. It detailed criteria for determining patient candidacy and the role of interventions such as epidural steroid injections, facet joint injections, and radiofrequency ablation in managing radiculopathy, spinal stenosis, and facet-mediated pain. The course outlined commonly utilized imaging modalities, including fluoroscopy and ultrasound guidance, emphasizing procedural accuracy, safety, and radiation exposure reduction. Contrast-enhanced imaging techniques were reviewed to highlight the importance of precise needle placement in optimizing treatment efficacy. Pharmacologic agents, including corticosteroids and local anesthetics, were examined for their mechanisms of action, clinical applications, and risks. Strategies for optimizing medication selection, minimizing adverse effects, and tailoring pharmacologic interventions to patient needs were discussed to enhance clinical decision-making.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Advanced Interventional Techniques for Spine Pain-*This program provided an in-depth review of interventional procedures for managing spine-related pain, including transforaminal, interlaminar, and caudal epidural steroid injections, as well as facet joint injections, medial branch blocks, and sacroiliac joint injections. Each procedure was analyzed in terms of its indications, mechanisms of action, and procedural execution, ensuring a thorough understanding of their role in pain management. Comparisons were drawn between different injection techniques, highlighting their relative effectiveness in addressing radiculopathy, facet-mediated pain, and sacroiliac joint dysfunction. The program described the importance of image-guided precision in these interventions, emphasizing the use of fluoroscopy and ultrasound for enhanced accuracy and safety. Detailed case discussions were included to illustrate patient selection criteria, contraindications, and post-procedural expectations. Additionally, the impact of adjunctive therapies such as physical rehabilitation and pharmacologic co-management was reviewed to underscore the importance of a multidisciplinary approach in optimizing patient outcomes. The application of radiofrequency ablation (RFA) for chronic pain syndromes was outlined, with a focus on patient selection, procedural methodologies, and clinical efficacy based on current research and long-term outcome data. Technical considerations such as optimal electrode placement, lesioning parameters, and post-procedural care were discussed to maximize procedural success and durability of pain relief. Emerging advancements in pulsed and cooled RFA techniques were also reviewed, demonstrating their potential in expanding the scope of interventional pain management.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Neuromodulation in Spine Care-*This course provided a detailed overview of the principles and clinical applications of spinal cord stimulation (SCS), emphasizing its role in modulating pain perception through neuromodulation techniques. It outlined the mechanisms of SCS in disrupting nociceptive pathways, including its effects on dorsal column activation, inhibition of pain transmission, and neuromodulatory plasticity. The program examined patient selection criteria, discussing the importance of identifying appropriate candidates based on neuropathic pain profiles, previous treatment failures, and psychological suitability. The structured trial procedures were reviewed, focusing on temporary lead placement, pain relief assessment, and outcome evaluation prior to permanent implantation. The course reviewed long-term efficacy considerations, including the impact of SCS on functional improvement, opioid reduction, and overall quality of life. It compared traditional SCS modalities, such as tonic stimulation, high-frequency (10 kHz), and burst stimulation, highlighting their distinct mechanisms of action, clinical efficacy, and patient-reported outcomes. The curriculum also analyzed closed-loop feedback systems, detailing how real-time neurophysiologic adjustments optimize stimulation parameters to enhance patient comfort and maximize analgesic effects.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Understanding Pain Referral Patterns in Cervical and Cranial Vascular Disease-*Development of a comprehensive understanding of pain referral patterns associated with cervical and cranial vascular diseases, with a particular emphasis on di8erentiating vascular-origin pain from musculoskeletal conditions. They examined the neuroanatomical basis of vascular pain, including the role of the trigeminocervical complex and the autonomic nervous system in mediating referred pain from the internal carotid and vertebral arteries. The course covered specific diagnostic criteria for identifying vascular pain syndromes, including internal carotid artery dissection, vertebral artery dissection, and basilar artery insu8iciency. Participants learned to recognize critical clinical presentations such as Horner's syndrome, cranial nerve deficits, and pain patterns mimicking cervicogenic headache or radiculopathy. Advanced case-based discussions reinforced the ability to integrate patient history, symptom patterns, and risk factors into di8erential diagnoses. Emphasis was placed on the necessity of early vascular screening to prevent misdiagnosis and inappropriate manual therapy interventions.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2024.

Vertebrobasilar Assessment & Red Flags in Clinical Practice-*Attendees received specialized training in vertebrobasilar assessment, focusing on the identification of neurological red flags suggestive of vertebrobasilar insu8iciency (VBI) and arterial dissection. They practiced the implementation of standardized screening protocols, including the vertebral artery test, cranial nerve examination, and positional assessment of dizziness and drop attacks. The course provided in-depth instruction on recognizing high-risk populations, including patients with hypertension, connective tissue disorders, and recent infections predisposing them to vascular injury. Through clinical simulations, participants refined their ability to distinguish vascular from vestibular and musculoskeletal dizziness, ensuring appropriate triage andreferral decisions. Discussion of imaging modalities such as CT angiography (CTA) and magnetic resonance angiography (MRA) guided clinical decision-making for emergent vs. routine vascular assessments. This module reinforced the importance of interprofessional collaboration with neurologists, radiologists, and vascular specialists.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2024.

Pathological Reflexes & Neurological Screening -*A critical component of the course involved the identification and interpretation of pathological reflexes as indicators of upper motor neuron dysfunction and central nervous system pathology. Participants performed hands-on assessments of Hoffman's sign, Tromner's sign, and the Babinski reflex to detect corticospinal tract involvement in conditions such as cervical myelopathy, stroke, and demyelinating diseases. They explored the physiological mechanisms behind these reflexes, including the loss of descending cortical inhibition and subsequent hyperexcitability of spinal interneurons. The course emphasized the integration of these neurological findings into broader clinical evaluations, correlating them with patient symptoms and risk factors for vascular and spinal cord pathology. Participants gained expertise in determining when advanced imaging, such as MRI or electromyography (EMG), was warranted for further neurological assessment. Discussions covered di8erential diagnoses of upper versus lower motor neuron lesions, ensuring a systematic approach to complex neurological presentations.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2024.

Clinical Decision-Making & Safe Chiropractic Management – *description of an evidence-based CeAD detection tool to stratify patient risk and determine when immediate referral or conservative management was indicated. Discussed approaches to provide safe chiropractic management, modifying techniques to accommodate patients at risk for vascular events. They reviewed contraindications for high-velocity, low-amplitude cervical manipulations and explored alternative therapeutic interventions, such as mobilization, soft tissue therapy, and graded isometric exercises. Clinical discussions reinforced the necessity of continuous reassessment, ensuring that patients with evolving neurological symptoms were promptly directed to appropriate medical care. By the conclusion of the course, participants demonstrated proficiency in integrating vascular, neurological, and musculoskeletal assessments to enhance patient safety and optimize clinical outcomes*. National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2024.

Medical Records and Litigation - *Completed a specialized training program focused on the critical role of medical records in legal proceedings, emphasizing their impact on court testimony and litigation outcomes. Gained expertise in creating comprehensive and defensible documentation that aligns with healthcare standards and legal requirements. Developed skills in recording objective findings, patient history, causation, and treatment rationales to support testimony. Enhanced proficiency in preparing for depositions and trial testimony by ensuring consistency and clarity in records. This training underscored best practices for addressing challenges posed by opposing counsel and highlighted strategies for maintaining credibility under cross-examination. Graduates of this program are equipped to provide medical-legal documentation that strengthens both litigation success and patient advocacy.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Complex Medical Testimony and Jury Communication - *Completed an advanced workshop on effective jury communication through medical testimony, focusing on the simplification of complex medical concepts. Acquired practical skills in using layperson-friendly language to explain technical terms and presenting compelling visual aids like MRIs and anatomical models. Developed expertise in structuring testimony to engage jurors and maintain their attention while addressing the legal and medical aspects of a case. Learned techniques for managing cross-examination with professionalism, emphasizing objectivity and neutrality. The program also covered strategies to frame the long-term impacts of injuries in relatable ways for jurors. This training equips practitioners to clearly and effectively convey medical findings, ensuring they resonate with lay audiences and legal professionals alike.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Expert Witness Training and Litigation Preparedness - *Completed a comprehensive course on the roles and responsibilities of expert witnesses in personal injury litigation. This program focused on the admissibility of expert opinions, preparation for depositions, and courtroom testimony. Gained critical knowledge in delivering impartial, evidence-based opinions to assist courts in understanding complex medical issues. Developed the ability to align testimony with established legal precedents and effectively handle cross-examination. The course emphasized the importance of independence, integrity, and clarity in presenting evidence, ensuring practitioners are prepared to navigate the legal system as trusted experts. This training provided the tools necessary to support litigation outcomes while maintaining professional credibility.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Understanding Legal Precedent and Its Role in Personal Injury Litigation - *Completed a detailed educational series on legal precedent in personal injury litigation, focusing on its application in evaluating negligence, causation, and damages. Explored the significance of established diagnostic and treatment standards in ensuring predictability and fairness in court rulings. Gained insights into the challenges of introducing innovative medical techniques within the framework of legal precedent. Learned how precedent influences admissibility of evidence, calculation of damages, and settlement negotiations. This program emphasized the importance of aligning medical practices with recognized legal standards to mitigate risk and improve case outcomes. Graduates are well-equipped to navigate the intersection of healthcare and law, ensuring their practices meet both clinical and legal benchmarks.* National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Interprofessional Spine Management Grand Rounds –Thoracic Adjustment and Cervical Radiculopathy –*received advanced educational materials on cervical spine anatomy, neuroanatomy, and radiculopathy to practicing healthcare providers, focusing on the motor and sensory functions of cervical spinal nerves. Was presented with comprehensive white papers, quizzes, and instructional content that emphasized the clinical relevance of cervical nerve exit patterns, muscular innervation, and dermatomal sensory distributions in the upper extremities. Provided evidence-based insights on cervical radiculopathy, integrating pathophysiology, diagnostic strategies, and management approaches to enhance interprofessional understanding and patient outcomes. Discussed collaboration with multidisciplinary teams to ensure alignment of educational content with current best practices and emerging trends in spinal biomechanics and trauma management. Demonstrated expertise in translating complex anatomical and neurological concepts into actionable knowledge for improving patient care in the clinical setting*. National Spine Management Group 2025, Federation of Chiropractic Licensing Boards, PACE Program 2025.

Advanced Strategies for Personal Injury Case Management. *This course explored critical aspects of personal injury (PI) cases, including liability and personal injury protection (PIP) insurance, strategies for documenting causality, bodily injury, and persistent functional loss, and the effective use of ICD-10 S and M codes. The program integrated personalized treatment plans, standard operating protocols (SOPs), and macros for streamlined documentation while addressing primary care challenges in managing PI cases. Practical case studies emphasized collaboration and precision to optimize patient outcomes and ensure compliance with insurance and legal standards.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Optimizing Documentation and Management in Personal Injury Cases for Chiropractors. *This session emphasized the importance of accurate documentation in PI claims, exploring the nuances of liability insurance, medical expenses coverage, and the role of causality in linking injuries to incidents. The lecture included strategies for managing acute and chronic conditions using ICD-10 coding, employing macros in documentation to enhance efficiency, and collaborating with attorneys and other providers. Participants gained actionable insights for integrating ethical and detailed recordkeeping into their practices.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Best Practices for Chiropractors in Personal Injury Clinics. *This session provided an in-depth analysis of exceeding policy limits in PI cases, leveraging umbrella insurance policies, and documenting persistent functional loss for fair compensation. It highlighted the role of chiropractors in supporting legal efforts through comprehensive records, causation evidence, and expert testimony. The workshop emphasized integrating technology, adhering to ethical standards, and maintaining objective measures to ensure credibility and optimize patient outcomes*. National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Documentation, Strategy, and Management in Personal Injury Cases. *This session was designed to equip healthcare providers with tools for effective PI case handling. Topics included understanding pre-determined treatment plans versus SOPs, overcoming administrative and financial challenges in PI cases, and accurately coding acute and chronic conditions using ICD-10 standards. Emphasis was placed on creating tailored documentation strategies, utilizing macros for efficiency, and balancing automation with personalization. Attendees were trained to strengthen collaborations with legal teams and improve multidisciplinary patient care.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Expert Testimony Training: Key Legal Concepts for Physicians in Personal Injury Cases *Completed a comprehensive course focusing on the roles and qualifications of medical professionals in personal injury litigation. This course emphasized the distinctions between treating physicians and medical experts, strategies for establishing expertise, and overcoming legal objections to credibility. Detailed exploration of courtroom dynamics, jury evaluation, and the effective use of CVs to demonstrate professional qualifications was included. Practical applications for managing objections and leveraging transcripts to maintain consistency in testimony were also discussed. This training provided advanced strategies to enhance credibility and professionalism in medical-legal contexts.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Advanced Training in Legal Testimony and Expert Qualifications *Completed specialized training on integrating advanced spinal diagnostics with legal testimony requirements. Emphasis was placed on bridging the gap between clinical care and expert analysis, including causation, prognosis, and future medical needs. Participants were instructed on meeting Rule 702 standards and ensuring credibility through clear communication and comprehensive documentation. This training has been instrumental in providing expert testimony with confidence and precision in complex legal settings.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Presentation Development: Effective CV Strategies in Legal Testimony *Participated in an intensive training on creating impactful CVs for medical-legal applications. The session highlighted essential elements of a strong CV, such as education, certifications, and prior testimony, ensuring alignment with legal standards like Rule 702 of the Federal Rules of Evidence. Instruction covered practical methods for streamlining direct examinations and addressing objections through pre-prepared documentation. The training underscored the importance of maintaining updated, organized CVs to showcase qualifications and strengthen courtroom credibility.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Courtroom Preparation: Communication and Professionalism in Testimony *Attended a targeted lecture on the importance of effective communication and professionalism during legal proceedings. The program focused on presenting complex medical information clearly, handling objections with composure, and aligning testimony with legal standards. Practical examples included cross-examination preparation, transcript review for consistency, and collaboration with attorneys to frame evidence effectively. This training emphasized the integration of medical knowledge with legal processes to enhance the impact and reliability of expert testimony.* National Spine Management Group, Federation of Chiropractic Boards, PACE Program, 2025**.**

Understanding No-Fault vs. Tort Systems in Personal Injury Law *This course provided an overview of the foundational differences between no-fault and tort systems in personal injury law. Learners reviewed the roles of Personal Injury Protection (PIP) and liability insurance in each system and discussed the impact of legal frameworks on claim resolution. The program presented scenarios illustrating the serious injury threshold and limitations on non-economic damage claims. Participants explored comparative examples from states like New York, Florida, and Texas. Key legal principles and practical implications were analyzed to foster deeper comprehension of legal processes and their effects on injured parties. The course concluded with a discussion of litigation risks and strategic considerations for attorneys and insurance adjusters.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Advanced Documentation Techniques for Traffic-Related Injuries *This program reviewed medicolegal documentation requirements for injuries caused by traffic accidents. Participants were introduced to the importance of recording both external and internal injuries with precision to support accident reconstruction and legal proceedings. The course discussed methodologies for documenting typical injuries based on their mechanisms and severity, including the use of the Abbreviated Injury Scale (AIS) and AO fracture classifications. Participants analyzed case studies to evaluate documentation practices and their role in litigation outcomes. Additional topics included forensic photography, injury diagrams, and the ethical responsibilities of medical practitioners. The session emphasized the intersection of clinical expertise and legal evidence requirements*. National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Exploring Deposition Strategies in Personal Injury Cases *This course provided a comprehensive overview of depositions as a pivotal element of the discovery process in personal injury litigation. Participants discussed the structure and function of depositions, including their role in fact-finding, preserving testimony, and shaping litigation boundaries. The curriculum reviewed techniques for questioning witnesses, assessing credibility, and uncovering new evidence. Real-world examples illustrated how depositions influence settlement strategies and trial preparation. The session highlighted the interplay between deposition records and courtroom testimony, emphasizing the importance of consistency and strategic communication. Practical exercises included drafting deposition questions and analyzing transcripts.* National Spine Management Group, Federation of Chiropractic Licensing Boards, PACE Program, 2025.

Personal Injury Protection (PIP): State-Specific Requirements and Legal Implications *This course offered an in-depth review of PIP insurance regulations across various states, focusing on the financial and legal nuances of no-fault systems. Participants explored mandatory and optional coverage levels, subrogation rights, and the interaction between PIP and health insurance. The curriculum highlighted significant differences in coverage requirements between states like Michigan, New York, and Florida. Case studies presented challenges in coordinating benefits and navigating waiver options. Learners reviewed the legal mechanisms of subrogation and discussed how PIP impacts settlement negotiations and claimant recovery strategies.* National Spine Management Group, Federation of Chiropractic Licensing Boar, PACE Program, 2025.

Primary Spine Care 15: Advanced MRI and X-Ray Documentation in Clinical Practice, *Interpreting and utilizing X-ray and MRI findings in creating demonstrative documentation. Advanced identification of spinal disc lesions, herniations, bulges, protrusion, extrusion, and fragmentations through computer graphics. Identification and demonstrative documentation of vertebral motor unit pathology and reporting demonstratively using computer graphics.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Primary Spine Care 15; Advanced MRI Interpretation in Clinical Practice, *Utilization of thin slice acquisitions with T2 Fat suppressed, STIR, proton density, T1 and T2 sequencing for advanced identification of spinal disc lesions, herniations, bulges, protrusion, extrusion, and fragmentations. Better visualization of intradural and extradural lesions, neoplasms, and infections.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Primary Spine Care 15; Ethics in Clinical Practice, *Ethical, collaborative relationships with medical PCPs and specialists using advanced documentation and accurate reporting of imaging and advanced imaging. Creating a collegial relationship when conflicts arise in concluding accurate diagnosis to allow consensus and the evidence to determine final diagnosis.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Primary Spine Care 15; Spinal CAT Scan Interpretation, *Understanding the utilization of CAT Scan slicing and the reformatting when using bone and soft tissue windows. Correlating MRI to CAT Scan when either creates an unclear conclusion to render a complete image of the morphology of the indeterminate pathology. Understanding the physics of CAT Scan and the radiation levels with different types of CAT Scan technology.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Primary Spine Care 15; Connective Tissue/Strain Sprain Pathology, *Understanding the morphology and physiology of connective tissue at the cellular and extra-cellular levels in building a foundation to understanding the function and interaction of ligaments, tendons, muscles, and bones, Identifying connective tissue pathology and the repair process with a foundation of r permanent aberrant sequella.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Primary Spine Care 15; Advanced Spinal Biomechanical Engineering, *Understanding the concepts of normal vs. pathological movement of vertebral motor units in accurately concluding diagnosis on biomechanical pathology when considering excessive motion. An evidence-based approach to determining translation, angular deviation and rotations beyond pathobiomechanical limitations in the spine.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Primary Spine Care 15; Trends in Spinal Care, *An evidence-based approach to concluding accurate diagnosis, prognosis, and treatment plan, Eradicating the non-specific back pain dogma utilizing X-ray digitizing based on literature standards, Creating treatment plans with identifying the primary spinal lesions using evidence-based tools.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Primary Spine Care 15; Documentation in Clinical Practice, *Understanding and including all historical elements; current history, past history, family history, and social history when documenting a 99201, 99202, 99203, 99204, and 99205. The application of time as the prime element as per Medicode in coding examinations and re-examination with face to face, review of records and the time necessary to document in an electronic health record.* Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2023

Spine Management Grand Rounds Internet Live and recorded Regularly Scheduled Series – Diagnosis and Referral of Cauda Equina Syndrome – *detailed overview of the anatomy of the lumbar spine and surrounding neurological systems was presented and outlined. Clinical symptoms and risks of clinical progress where discussed. Upper vs lower motor neuron lesions were reviewed and correlated to cauda equina syndrome. The difference between suspected and confirmed cauda equina syndrome was detailed and explained. Emphasis was placed on early intervention and emergency surgical referral in patients with cauda equina syndrome.* **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards – PACE, State University of New York at Buffalo Jacobs School of Medicine, and Biomedical Sciences – 2023**

Spine Management Grand Rounds Internet Live and recorded Regularly Scheduled Series – Vertebral Artery Anatomy and Pathologic Injury – *in-depth review of the anatomical course of the vertebral artery in the cervical spine with specific emphasis on the V1, V2, V3 and V4 segments and their anatomic boundaries. Specific epidemiology of Cervical Artery Dissection (CAD) was presented and outlined. Risk factors for CAD such as atherosclerosis, inflammation, and genetic tissue disorders such as Marfans and Ehlers-Danlos Syndromes were detailed. Clinical symptoms of CAD were presented such as Horner's Syndrome, cerebral ischemia, vertigo, and nausea were presented. Detailed review of hemodynamic versus thromboembolic causes of ischemia post CAD were reviewed. National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards – PACE, State University of New York at Buffalo Jacobs School of Medicine, and Biomedical Sciences – 2023*

Spine Management Grand Rounds Internet Live and recorded Regularly Scheduled Series *Medical Legal Opinions – evidence-based workflows –* *a detailed review of the process to effectively render a medical legal opinion on the causality, bodily injury and persistent functional loss of a traumatically injured spine patient. Focus was on clinical correlation of the mechanism of action, patient history, physical examination, imaging films/studies and persistent functional loss. Emphasis was placed on interprofessional communication and differentially diagnosis pre-existing conditions versus those that are acutely present post injury. Segmental spinal analysis of intervertebral disc and arthritic pathology was presented.* National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards – PACE, State University of New York at Buffalo Jacobs School of Medicine, and Biomedical Sciences – 2023

Spine Management Grand Rounds Internet Live and recorded Regularly Scheduled Series Characteristics of TMJ disc, meniscus and IVD tissue â€“ *a comprehensive review of the common histological characteristics in the temporomandibular disc, meniscus and intervertebral disc was presented. A particular perspective on tissue engineering was provided with emphasis on biomechanical properties. Overview of cell sources, scaffolding and stimuli was presented in the context of tissue engineering and therapeutic approaches to degeneration in those particular tissues. Focus was on similarity and differences between these fibrocartilage discs in terms of their similarities and their differences.* National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards â€“ PACE, State University of New York at Buffalo Jacobs School of Medicine, and Biomedical Sciences â€“ 2023

Specialty Research in MRI Physics – The Hardware – magnet types including permanent, resistive and superconducting magnets. *Volume RF, surface, quadrature and phase array coils and other hardware necessary for the generation of MRI imaging.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in MRI Physics – Physics of Image Generation 1 – *magnetization, excitation, relaxion, acquisition, computing and display. T1 relaxion and relaxation curves, T2 relaxation, phase and phase coherence, T2 relaxion curves.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in MRI Physics – Physics of Image Generation 2 – *gradient coils, signal coding including slice encoding gradient, phase encoding gradient, Frequency encoding gradient. Gradient specifications and slice thickness. Filling k-space, k-space symmetry and k-space filling technique.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in MRI Physics – Physics of Image Generation 3 – *pulse sequences, spine echo sequences including multi-slicing and multi-echo sequencing. T1, T2, proton density contrast and their applications. Turbo spine echo, fast advanced spine echo (HASTE) sequence and gradient echo sequence. Inversion recovery sequence including STIR and FLAIR sequence. Choosing the right sequence pros and cons, T1, T2 and PD parameters.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in MRI Physics – Physics of Image Generation – technical parameters and artifacts – *repetition time, echo time, flip angle, inversion time, number of acquisitions, matric and field of view. Slice thickness, slice gap, phase encoding direction 1 and direction 2 and relation to bandwidth. Motion artifact, para-magnetic artifact, phase wrap artifact, susceptibility artifact, clipping artifact, spine and zebra artifacts. Effects on image quality and acquisition.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – Supply of Chiropractic Care and Visits to Primary Care Physicians for Neck and Back Pain – *discussion of primary care visits and lower back pain. Expenditures and contributions to disability data. Discussion of supply of chiropractic care in context of visits for lower back pain and primary care physicians. Estimated national impact of primary care visits and expenditures was outlined with a focus on chiropractic's assistance in managing lower back pain. Defining an "episode" of lower back pain and relationship to collection of epidemiological data.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – Safety of Chiropractic Care in Lower Back Pain and Migraine Headaches – *review of adverse events associated with chiropractic care in the treatment of migraine. Outline of a prospective 3-armed, single-blinded, placebo RCT. Discussion of transient and mild events following chiropractic intervention. Randomized clinical trials and meta-analysis reviewed and discussed relating to the diagnosis and management of lower back pain including*

adverse event reporting. Risk of injury to the head, neck or trunk following an office visit for chiropractic spinal manipulation, as compared to office visit for evaluation by primary care physician. National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – Chiropractic and Pain Management in Primary Care – *evaluation of the analgesic effects of spinal manipulation on both healthy and pain inflicted patients. Discussion of evidence of increased in pressure pain thresholds in musculoskeletal pain at both local and remote sites. Detailed knowledge of patient population regarding demographics and socioeconomic factors as well as disease-specific characteristics. Suggestion that lower back pain should not be seen as benign and self-limiting with focus on management. Describe the communication system surrounding the management of chronic pain from the perspectives of allopathic providers, acupuncture and chiropractor providers, and chronic musculoskeletal pain patients. Chiropractic manipulative treatment (CMT) association with lower healthcare costs among multiply-comorbid Medicare beneficiaries with an episode of chronic low back pain was reviewed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – Perceptions of Chiropractic Care – *demographic review of data on the perceptions of chiropractic care. Review of patient interest, trustworthiness, costs and frequency of visits was discussed. Nationally representative survey to compare characteristics and use of survey respondents with positive and negative perceptions of DCs and chiropractic care. Positive perceptions of DCs were more common than those for chiropractic care. US adults generally perceive DCs in a positive manner. Describe the preferences of older adults for low back pain co-management by MDs and DCs and identify their concerns for receiving care under such a treatment model.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – Chiropractic and Post-Surgical Care and Care for Veterans – discussion of persistent post-surgical lower back and radicular pain response to chiropractic care. Relevant anatomy related to lower back pain and intervertebral disc injury was outlined and presented. *Discussion and development of an integrated care pathway for doctors of chiropractic, primary care providers, and mental health professionals who manage veterans with low back pain, with or without mental health comorbidity, within Department of Veterans Affairs health care facilities. Support for the inclusion of chiropractic care as a component of multidisciplinary health care for low back pain, as currently recommended in existing guidelines with a focus on US Service Members. Discussion of availability of chiropractic care to military healthcare systems, referral and interprofessional communication models.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – Effects of Chiropractic Care Combined with Medical Care, First Contact and Provider Type – *differences in outcomes, patient satisfaction, and related healthcare costs in spinal, hip, and shoulder pain patients who initiated care with medical doctors (MDs) vs those who initiated care with doctors of chiropractic (DCs). Pain of muscuoloskeletal origin and epidemiology of reduced productivity. Comparison of data on health outcomes, patient satisfaction, and related healthcare costs in patients consulting differing first-contact care providers for musculoskeletal pain.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – Integrating Chiropractic Care into Primary Care and Private Sector Healthcare Facilities – *suggestion of a diverse role for chiropractors within conventional health care facilities. Discussion of chiropractic's effectiveness for managing musculoskeletal disorders, particularly spine-related pain and disability. Descriptions of doctors of chiropractic who work in nongovernmental, private sector health care settings in the United States. Shared electronic health records, face-to-face informal consultations methods for interprofessional communication.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Primary Care and Internal Medicine – American College of Physicians – Guideline Recommendations – Non-Invasive and Non-Pharmacological - *American College of Physicians (ACP) developed this guideline to present the evidence and provide clinical recommendations on noninvasive treatment of low back pain. Systematically review the current evidence on non-pharmacologic therapies for acute or chronic non-radicular or radicular low back pain. Comparative benefits of non-pharmacological therapies in acute/subacute low back pain including exercise, spinal manipulation, lumbar supports, acupuncture, laser, ultrasound and traction. Discussion of first and second line therapies with reduction in opioid prescription.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Growth of Interventional Pain Management Techniques and Current Trends in Pharmacological Management of Neuropathic Pain. *ESI comparison to gabapentin in lumbosacral radicular pain – current trends and future progress of pain management interventions. Mode of action, required dosage, advantages and side effects profiles of currently available pharmacological approaches*. National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Therapeutic Effects of Spinal Injection Therapy - *Facet, medial branch blocks, prolotherapy and epidural interventions utilization within the Medicare population, effectiveness on lumbar central canal stenosis with and without steroids and effect on prevention of spinal surgery, herniated disc, fibromyalgia and chronic musculoskeletal pain.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Adverse Events Associated with Injection Therapy – *transforaminal and interlaminar epidural steroid injections, anesthesia technical considerations, effects on cervical radiculopathy midline versus paramedian approaches and perineurial injection of autologous conditioned serum. Review of FDA risk assessment.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Correlation of MRI Findings and Injection Outcomes - *MODIC Changes on MRI and effectiveness of facet injection, facet joint signal change on MRI with fat suppression comparison with SPECT/CT. Discussion of Modic 1, 2 and 3 with correlation of clinical outcomes and patient selection criteria.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Therapeutic Effects of Botulinum Toxin and Dry-Needling in Myofascial Pain Syndrome – *cost effectiveness, patient response and triage of therapeutic interventions. Physiological review of trigger point etiology and clinical presentation of acute and chronic pain. Functional response of intervention including relief and recurrence.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Systematic Review Technical Considerations in Cervical Epidural Analgesia - *Chemical blockage of cervical nerve roots, review of anatomical structures and correlation with MRI imaging. Blockage effects on the respiratory, circulatory and neurological systems. Review of cervical epidural space (CES) borders and variants in patient population.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Trends in opioid analgesic abuse and mortality in the USA, Evaluation of Opioid Pain Management in Injured Children, assessment of opioid reporting in Veteran Affairs – *Emergency visitation in pediatric injury, pain management and adoption of best practices. Trends in use of prescription opioid medication using RADARS (Research Abuse, Diversion and Addiction Related Surveillance System), comparison between legitimate pharmacy channels and diversion and abuse. Opioid use prevalence and incidents in Veteran Affairs, new prescriptions or long-term conversion and relationship to persistent growth in opioid use.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Electrodiagnostic Testing, Transforaminal Epidural Steroid Injection, Intra-articular Facet Joint Injection, Spinal Manipulation Post-Epidural Injection– *Needle EMG, active versus chronic denervation in lumbar, cervical spinal pathologies and differential diagnosis of spinal stenosis and intervertebral disc herniation. Systematic review of facet joint injections, clinical trials and conservative therapy in lower back pain. Results of spinal manipulation post-epidural injection in the cervical spine.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Radiofrequency Ablation and outcome measures - medication, function and pain in relation to pain of spinal origin. *Medial Branch Block as prognostic tool prior to lumbar facet radiofrequency denervation. Clinical comparison disc herniation, disc bulge, cervical and lumbar radiculopathy. Diagnosis and patient triage correlation to anatomical spine structures. Long, short term risk factors and outcomes in radiofrequency ablation.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Pain Management – Clinical and Procedural – Role of Cannabinoids in Pain Management – *review of pharmacological, botanical or synthetic origins of cannabinoids. Mechanism of action in alleviation of pain including analgesic, anti-inflammatory effects, modular actions on neurotransmitters and interactions with prescribed or endogenous opioids.* National Spine Management

Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – Wrist Anatomy and Osseous Kinematics – *normal kinematics using biplanar radiographic model were reviewed. Discussion of extensive database of carpal bone anatomy and kinematics from a large number of healthy subjects. 3-D motion of each bone was calculated for each wrist position and discussed. Database constructed including high-resolution surface models, measures of bone volume and shape, and the 3-D kinematics of each segmented bone.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – **Normal Motion of the Shoulder and Glenohumeral Instability** – *normal motion of the shoulder joint compared with clinical implications of glenohumeral joint instability including surgical recommendations. Review and overview of the anatomy of the glenohumeral joint, emphasis on instability based on the current literature. Description of detailed anatomy and anatomical variants of the glenohumeral joint associated with anterior and posterior shoulder instability*. National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – Orthopedic Testing and Shoulder Pathology Diagnosis - *use of orthopedic special tests (OSTs) to diagnose shoulder pathology and clinical examination. Review OST clusters, examination of methodology and illustration of their use in arriving at a pathology-based diagnosis. Discussion of examination of the biceps tendon and clinical relevance. Review of SLAP lesion and shoulder impingement syndrome were reviewed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – Electrodiagnostic Testing and Carpal Tunnel Syndrome – *Review of the most common mononeuropathy in the human body. Relationship between clinical findings, neurological examination and electrodiagnostic testing in the diagnosis of carpal tunnel syndrome. Acute and chronic symptoms including progression of the disorder were reviewed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – Current Concepts in Elbow Disorders – *Detailed anatomy of osseus, ligamentous and muscular structure of the elbow was reviewed. Common disease of elbow disorders and their treatment was discussed. Lateral epicondylitis and medial collateral ligament injury of the elbow were outlined. Rheumatoid arthritis, posttraumatic osteoarthritis, and elderly patients with comminuted distal humeral fractures. Surgical design and technique were outlined.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – Differentiating Cervical Spine from Shoulder Pathology – *anatomical review of cervical spine and glenohumeral joint focus on similarities and differences. Cervical disorders masking shoulder pain, cervical radiculopathy, cervical spondylotic myelopathy, facet and discogenic pain patterns were outlined. Details of shoulder pathology parsonage-tuner syndrome, subscapular neuropathy and thoracic outlet were presented.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of

Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – MRI of the Shoulder and Shoulder Girdle – *review of MRI analysis of scapular fracture. Detailed review of scapular function rehabilitation and training on chronic pain syndromes. Reliability of magnetic resonance imaging versus arthroscopy for the diagnosis and classification of superior glenoid labrum anterior to posterior lesions.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery -Cataloging Movements of the Ankle, Hip and Spine - *Review Standardization and Terminology Committee (STC) of the International Society of Biomechanics (ISB) and classification of joint kinematics. Standard for the local axis system in each articulating bone is generated and presented. Rationale for international standards among researchers was presented.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery -Cataloging Movements of the Shoulder, Elbow, Wrist and Hand - *Review Standardization and Terminology Committee (STC) of the International Society of Biomechanics (ISB) and classification of joint kinematics. Standard for the local axis system in each articulating bone is generated and presented. Rationale for international standards among researchers was presented.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – MRI and Diagnosis of Shoulder Disorders – *normal and abnormal shoulder anatomy as viewed on MRI was presented. Review and presentation of MRI in the diagnosis and treatment of brachial plexus injury. Discussion of preganglionic avulsions and muscular denervation. Comparison of CT myelography to MRI myelography were outlined. Enhanced three dimensional T1 high-resolution isotropic volume excitation MR in the evaluation of shoulder pathology. Comparison with two-dimensional enhanced T1 fat saturation MRI were discussed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Extremity Surgery – Clinical Evaluation of Upper and Lower Extremity Pathology – *review of relevant anatomy in shoulder, elbow, wrist, hip, knee and ankle was presented. Physical examination including orthopedic, neurological and range of motion testing was presented and compared with findings on MRI results.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Fusion Surgery and Lumbar Stenosis – *efficacy of fusion and decompression surgery in patients with lumbar spinal stenosis. Review of degenerative spondylolisthesis and patient selection criteria. Discussion of correlation of MRI, CT findings and clinical evaluation. Review of sedimentation sign on MRI and indications of prognostic factors. Surgery versus nonsurgical treatment outlined and outcomes discussed. Compensation for lumbar spinal stenosis and clinical sagittal plane deformity was presented.* National Spine Management Group, Federation of

Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Posterior Lumbar Interbody Fusion and Adjacent Segment Degeneration (ASD) – *adjacent segment degeneration as major consequence of spinal fusion. Review of occurrence and location with correlation between surgical outcomes were discussed. Discussion of age, BMI and pre-existing stenosis in cranial adjacent segment as risk factors. ASD prevalence in radiographic evidence between cranial and caudal segments were reviewed. Presentation of risk factors and pre-operative radiological features. Facet sagittalization and tropism were discussed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Morbidity and Mortality Predictions in Spinal Surgery – *Review of the Charlson Comorbidity Index (CCI) and the American Society of Anesthesiologist (ASA) Physical Status Classification System. Review of index outcomes and relation to costs of care. Discussion of index rating and likelihood of complications. Review of classification system in cerebral spinal fluid (CSF) leaks.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Spondylolisthesis, clinical and radiographic classifications - *classification system that considers disc space height, sagittal alignment and translation, and the absence or presence of unilateral or bilateral leg pain was discussed. Detailed review of spondylolisthesis etiology, clinical presentation and imaging findings was reviewed. Review of inter and interobserver reliabilities of radiographic and clinical criteria. Review of consensus driven treatment options for degenerative spondylolisthesis presented. Transforaminal Lumbar Interbody Fusion (TLIF) in degenerative disc disease with associated spondylolisthesis grade I was reviewed and correlated.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Sagittal Alignment and Spinal Surgery, Clinical Outcomes and Follow up – *discussion of outcomes and sagittal alignment in single unilateral transforaminal lumbar interbody fusion (TLIF). Detailed review of surgical TLIF procedure and associated mid and long-term clinical outcomes. Discussion and presentation of influence of pelvic incidents and lumbar lordosis mismatch and post-operative residual symptoms. Analysis of adjacent segment disease following fusion.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Complications and Outcomes in Adult Spinal Deformity Surgery – *review of surgical approaches and complications in correction of adult spinal deformity. Relevance of age, comorbidities, blood loss, osteoporosis and smoking were discussed. Discussion of Cobb Angle, Sagittal Vertical Axis, Pelvic Tilt, Thoracic Kyphosis were reviewed and examined in relation to transpsoas lateral interbody fusion (LIF), percutaneous pedicle screw (PPS), transforaminal lumbar interbody fusion (TLIF). Comparison between minimally invasive and traditionally open procedures was provided and reviewed. Discussion of minimally invasive surgery options were emphasized and outcomes reviewed with correlation to diagnosis and procedural coding.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Surgical Interventions in Lumbar Disc Herniation – *review of differences in surgical treatment of recurrent lumbar disc herniation. Clinical correlation between plain film radiography, MRI studies and clinical presentation were reviewed. Data on frequency in management of recurrent lumbar intervertebral disc herniations presented. Duration of symptoms and influence of patient outcomes in sciatica patients undergoing micro-discectomy and decompressions.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Length of Stay in Lumbar Spinal Surgery – *discussion on epidemiology of lumbar surgery outcomes and hospital stay. Correlation to clinical presentation and comorbidities were reviewed. Outline of decompression and instrumental fusion in the lumbar spine. Review of costs of lumbar surgery, trends in hospital stay and costs both on a cumulative and daily basis. Comparison of the nationwide inpatient sample and national surgical quality improvement program databases for lumbar spine fusion procedures was reviewed and presented.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Pre-Surgical Planning and Implant Design – *3-D printing and surgical planning discussion a variety of historical materials in the creation of patient specific implants based on unique individual anatomy. Historical trends in the creation of prosthetics with 3-D modeling software using neuroimaging data. Review of treatment complex spinal pathologies and surgical planning was discussed. Outline of current and future barriers to global implementation and commercialization was reviewed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Spine Surgery Procedures in Medical Specialty Training – *discussion of current spine surgery training including fellowship programming in the United States. Accreditation Council for Graduate Medical Education (ACGME) cases logs were reviewed and discussed. Variability of procedures within programs and between medical specialty programs were outlined. Differential utilization between orthopedic and neurosurgical fellows was reviewed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Orthopedic Spine Surgery – Cerebral Spinal Fluid Dynamics, Central Nervous System Pathology and Intracranial Hypotension – *pathophysiology and various craniospinal disorders. Directional phase contrast MRI (4D Flow) was reviewed along with the anatomical and physiological properties of cerebral spinal fluid. Specific disorders such as Alzheimer's disease, hydrocephalus, Chiari Malformation and syringomyelia. Clinical correlation of CSF dynamics to understanding disease process was reviewed including normal and abnormal flow patterns. Recent advancements in fluid flow studies were outlined and presented. Signal intensity changes on MRI study in cervical spondylotic myelopathy was discussed and compared to normal parameters. Fluid dynamics patterns within syringomyelia and Chiari malformation was discussed and correlated to MRI findings and clinical presentations. Spinal microsurgical exploration surgery and resultant CSF leak and spontaneous intractable intracranial hypotension was reviewed and its pathoanatomical presentation outlined. Review of the natural and surgical history of Chiari malformation Type I in pediatric population and clinical correlation with MRI studies.* National Spine Management Group, Federation of

Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2021.

Specialty Research in Neurosurgery – Anatomy and Physiology of the Blood Brain Barrier – *Review of consequences of alterations in homeostatic control of the neuronal environment. Discussion of blood flow alterations and altered vessel permeability as determinants in the pathophysiology of brain injury. Review present day literature on the anatomy, development and physiological mechanisms of the blood–brain barrier. The blood brain barrier's role in the maintenance of the extracellular environment. Vascular anatomy of the spinal cord was review in relation to the physiology of the neural environment.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neurosurgery – Spinal Cord Anatomy, Physiology and Vascular Reactivity – *detailed review of the blood supply of the spinal cord, anatomy of the vascular system and physiology of blood flow. Pathophysiology of various conditions including Thoracic Aortic Occlusion and Spinal Cord Injury were discussed with specific relation to risk of neurological deficit. Severity and duration as an effect was reviewed and correlated clinically. Cerebral circulation and aging, discussion of effects on cognitive functioning and cerebrovascular disease in aging.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neurosurgery – Upper Cervical Spine Anatomy and Cerebral Spinal Fluid Flow – *MRI flow imaging and computational fluid dynamics in healthy patients with Chiari Malformations. Review of abnormal cerebral spinal fluid flow oscillations and their effects on healthy patients. Discussion of nonlaminar complex spatial and temporal variations with associated pressure waves and pressure gradients causing syringomyelia, headaches and other clinical manifestations in Chiari I malformation. Microsurgical anatomy and internal architecture of brainstem in 3D images and surgical considerations. CSF hydrodynamic changes, spinal cord injury and development of post traumatic syringomyelia (PTSM). Impact of spinal cord nerve roots and denticulate ligaments on cerebral fluid dynamics in the cervical spine was reviewed and discussed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neurosurgery – Compression and Degeneration in Chronic Nerve Root Entrapment – *differentiation between peripheral nerves and spinal nerve roots and effects of electrostimulation. Discussion of various stimulating or recording neurosurgical implants and success vs failure rates. Review of the nerve root compression and its relation to consequences of disc herniation and acute compression during surgery. Maximum pressure level a spinal nerve root can sustain is reviewed. Discussion of microsurgical anatomy of lumbosacral nerve rootlets, Rhizotomy and chronic spinal cord injury. Review of qualitative grading of severity of lumbar spinal stenosis on morphology of dural sac on MRI studies, review of classification systems and the consideration of impingement of neural tissue.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland

University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neurosurgery – Anatomy of Circle of Willis, Cerebral Arteries and Stroke Etiology – *discussion of stroke by embolism, source and cause in diagnosis and long-term treatment. Review of complex nature of embolus transport and its relation to etiology. Image based hemodynamics with discrete particle dynamics in relation to the distribution of emboli across the various cerebral arteries. Detailed anatomy of Circle of Willis reviewed and discussed with particular focus on size/inertia dependent trends in embolus distribution to the brain, distribution of cardiogenic versus aortogenic emboli among anterior, middle and posterior cerebral arteries, left versus right brain preference in cardio-embolus and aortic emboli transport and source-destination relationship for embolisms affecting the brain. Detailed review of the microsurgical anatomy of the posterior cerebral artery in three dimensional images.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neurosurgery – Stroke Therapy, Implementation and Cost-Effectiveness – *review of endovascular therapy in addition to standard care in acute ischemic vessel occlusion stroke. Comparison in National Institutes of Health Stroke Score (NIHSS) score, symptom onset, Alberta Stroke Program Early CT Score (ASPECTS) and occlusion location. Considerations in acute management and revascularization of tandem occlusions in acute ischemic stroke with literature review. Discussion of Transcirculation Pipeline embolization device deployment as a rescue technique.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neurosurgery – Surgical Approaches and Outcomes in Spine Surgery 1 – *review of historical interventions, multilevel decompression and instrumented fusion in reduction of neural compression and spinal column stabilization. Discussion of morbidity and mortality in relation to surgical procedures. The use of the modified fragility index to predict 30-day morbidity and mortality from spine surgery. Differences in patient selection for minimally invasive versus open surgical procedures, and review of post-surgical outcomes. Morbidity, mortality and health care costs for patients undergoing spine surgery following ACGME resident duty-reform.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neurosurgery – Surgical Approaches and Outcomes in Spine Surgery 2 *Predisposing factors for dural tears in lumbar spine surgery including degenerative conditions, prior surgery and age related indicators were reviewed. Discussion and review of re-admission rages in spine surgery through metanalysis and systematic review. Bibliometric study of the most important minimally invasive (MIS) spine surgery papers including Level III and IV studies with focus on moving toward Level I and Level II.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Emergency Medicine and Spine Pain – *review of lack of guidelines for the management of lower back pain in the ED. Frequency of lower back pain visitation in the emergency department including environmental/sociocultural dimensions and physical/psychospiritual dimensions were reviewed. Discussion of utilization of significant healthcare*

resources with complete description of lower back pain characteristics, health services use in non-urgent lower back pain patients presenting to the ED. Managing spine pain in the ED using usual and customary medical intervention. Extent of appropriate CT and MRI scans in the hospital setting, accessibility reviewed in conjunction with presented national data. National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Medication Usage and Motor Vehicle Accidents – *review of ADHD medication utilization and motor vehicle accident data and frequency of motor vehicle accident sin this specific patient population. Review of the prevalent and preventable cause of morbidity and mortality among patients and concepts of restricting based on prognostic factors.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Emergency Department Imaging Perspectives – *review of imaging protocols among a spectrum of clinical indications, perspective on aging populations and clinical complexity. Review of CT, MRI, plain film imaging and ultrasound and their relationships to internal medicine and musculoskeletal disorders examined on an emergency basis through patient generated national survey data. Details of specific contexts in which imaging has become concentrated and targeted efforts for optimization of utilization. considerations of utilization of CT in the emergency department and evaluation to increasing trends. Review of quality improvements in imaging utilization. Comparison between pediatric and adult imaging protocols and trends. Discussion and analysis of "Choose Wisely" recommendations and creating of guideline/policy/clinical pathways in New England EDs. MRI utilization in pediatric ED reviewed and analyzed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Cauda Equina Syndrome and Other Emergent Conditions – *traumatic injuries to the thoracolumbar spine and overall impact on emergency services. Discussion of exact definitions of Conus Medullaris Syndrome (CMS) and Cauda Equina Syndrome (CES). Diagnosis in acute phase and radiological findings clinically correlating with physical examination findings. Parameters for spinal regions of traumatic injury were presented and reviewed. Case presentations for neck and spine were included and reviewed with particular focus on differential diagnosis and case uniqueness.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Emergency Medicine Residency Curriculum – *review of Ohio State University Emergency Medicine Residency Program Musculoskeletal Emergencies Curriculum. Outline of the significant nature of musculoskeletal emergency presentations to ED. Details in the training required to master clinical experience, self-directed learning and small group didactics. Case study reviews and discussion was presented with particular focus on infection vs non-infections and traumatic vs non-traumatic presentations in ED.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Opioid vs Non-Opioid Medications in the Emergency Department – *discussion of limited evidence of long-term outcomes of opioids with non-opioid medication for chronic pain. Literature review on effectiveness for opioid interventions. Discussion of alternative recommendations, evidence demonstrating lack of benefit and poor long term outcomes.*

Variation in physician opioid prescriptions discussed. Patterns of opioid initiation at first visits for pain in the ED in the United States including frequency and dosage. Emergency Department data concerning the persistent pain after motor vehicle accidents and comparison between opioid and NSAID prescribed in the ED. National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Concussion and Repeat ED visits – *review of patients presenting to ED with concussion with re-visitation within 72 hours. Mechanism of injury including closed head injury, assault, fall and motor vehicle accidents discussed. Epidemiological evidence presented regarding number of visitations, characteristics and care paths reviewed. Discussion of adoption of a more comprehensive discharge plan to further prevent repeat visits was outlined.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – CDC Epidemiology of ED Visits in the United States, Adults Over 65 and Motor Vehicle Accidents – *Evaluation of data from the National Hospital Ambulatory Medical Care Survey and frequency of ED visitation. Percentage of visits requiring hospital admission was reviewed along with patterns of need for critical care. Review of imaging ordering statistics and clinical diagnosis was discussed. Details of primary and secondary ED diagnosis presented in relation to sprain/strain, contusion and spinal pathology including herniated intervertebral disc, facture and spinal cord compression.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – National Hospital Ambulatory Medical Care Survey – *a review of the current representative data on ambulatory care visits to hospital emergency departments in the United States. Demographics, residence, insurance class, chief complaint with focus on traumatic injury, diseases of the nervous and musculoskeletal systems were outlined.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Lower Back Pain and Emergency Room Visits – *detailed analysis of impact of lower back pain on ED globally. First systematic review of the trends in the literature including lower back pain as significant complaint and the variables in its definition. Discussion of the proper diagnosis and triage of lower back pain and its current impact on ED management was reviewed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – Spinal Cord Injury without Radiographic Abnormality (SCIWORA) in Adults – *case reports – detailed review of Spinal Cord Injury without Radiographic Abnormality was presented. Syndrome of post traumatic myelopathy demonstrable on MRI with no evidence of osseous injury on plain film or CT scan. Reporting of incidence was included with detailed discussion of case presentations, accurate diagnoses and triage was reviewed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – CDC Traumatic Brain Injury Data – Related Emergency Department Visits, Hospitalizations, Deaths – United States, 2007 and 2013 – *traumatic brain injury, short and long term adverse clinical outcomes, death and disability reviewed and compared based on CDC data over a 7 year period. Mechanism of causation including motor vehicle accidents, falls and assault. Public health recommendations and interpretation of data was presented.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – *CDC Data, Trends in Emergency Department Visits for Ischemic Stroke and Transient Ischemic Attack – relationship between stroke and statistical cause of death, type of stroke and prognosis related to recurrence was discussed. Specific definitions of ischemic stroke, transient ischemic attack with etiology and relationship to emergency visits were outlined and presented.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Emergency Medicine – US Emergency Department Use by Children – *pediatric utilization of emergency medicine resources, description of trends on a national basis. Detailed analysis of specific demographics including race and resident status were reported and reviewed. Discussion in allocation of resources including insurance class and coverage were reviewed. Anticipated expansion of Medicaid was considered and reviewed. Estimates of nonurgent ED visits by children were presented and discussed.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2022.

Specialty Research in Neuroradiology – radiographic evolution of a Schmorl's node – *acute Schmorl's node and progression to chronic stage comparison to serial MRI. Endplate fracture and acute presentation and correlation to clinical findings and pain patterns. Presentation in plain film radiograph and MRI images were compared and contrasted in both acute and chronic stages.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – syringomyelia, fluid dynamics and spinal cord motion – *scoliosis curve patters and syrinx characteristics versus Chiari I malformation. Normal MRI appearance and motion artifacts related to cerebral spinal fluid motion related phenomena and common appearances on MRI imaging. Syrinx wall and fluid motion and correlation to cardiac cycle with comparison between systolic and diastolic presentations.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – Spinal Biomechanics, Thoracolumbar Deformity and Surgical Outcomes – *full spine analysis, adjacent spinal biomechanics and its impact on surgical outcomes. Sagittal alignment pelvis to cervical spine and association with kyphosis and lordosis mechanical positioning.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – MRI and EMG comparison in denervated muscle diagnosis – *lumbar spine pathology and age in relation to paraspinal muscle size and fatty infiltration. Fatty*

degeneration of paraspinal muscle in degenerative lumbar kyphosis and CT versus MRI digital analysis. Positive correlations with edema on MRI and fibrillations, positive sharp waves, denervation and the level of reduced recruitment pattern. National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – association between annular tear and disc degeneration – *high intensity zone (HIZ) in lumbar disc and association to annular fissure on MRI. Identification of duel HIZ and its relationship to acute inflammation and calcified tissue and its association with discogenic pain patterns. Influence of phenotype, population size and inclusion sequence. T1, T2 and STIR imaging comparison and correlation.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – degenerative cervical myelopathy – *paraspinal muscle morphology, clinical symptoms and functional status. Review of fatty infiltration, asymmetry findings and correlation with clinical symptoms and functional scores. Review of complex anatomical arrangement of superficial and deep muscle layers in the cervical spine, correlation to MRI findings.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – MRI Neurography, Diffuse Tensor Imaging (DTI) – *diagnostic accuracy and fiber tracking in spinal cord compression. Review of spinal cord structural integrity, peripheral neuropathy and correlation to diffuse tensor imaging findings. Comparison in combining DTI with T2 and T2 alone and its value in magnetic resonance neurography.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – Nomenclature and Classification of Lumbar Disc Pathology – *modified Pfirrmann grading system and lumbar disc degeneration. Consensus driven description of intervertebral disc nomenclature including intervertebral disc bulge, herniation, protrusion, broad based disc herniation, extrusion and sequestration.* National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.

Specialty Research in Neuroradiology – MRI evaluation of intradural tumor – *neuroimaging of spinal tumors and correlation to histological study. Determining method of choice for evaluation, review of numerous types of intradural-extramedullary masses including meningioma and schwannoma. Signal intensities, contrast enhancement patterns, presence of cysts and other key differentiation findings of spinal cord tumors.* **National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.**

Specialty Research in Neuroradiology – Spinal Cord Compression, Myelomalacia, MRI Imaging and Clinical Correlation – *positional cervical spinal cord compression and fibromyalgia. T1 and T2 weighted images, comparison of hypo and hyperintense signals and extent of intramedullary changes on MRI. Review of MRI findings associated with myelomalacia and discussion of correlation with clinical findings.* **National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.**

Specialty Research in Neuroradiology – MRI Characteristics of Lumbar Facet Synovial Cyst – *formation characteristics of synovial cyst, relation to degenerative changes in spinal facet joints as demonstrated on MRI. Pre and post-surgical procedural MRI were reviewed and compared. Surgical management and subsequent resection were demonstrated*. **National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023.**

Specialty Research in Neuroradiology – Variability in MRI Diagnostic Error Rates – *in depth review of quality of MRI imaging and comparison to consistent MRI diagnosis between facilities. Errors of interpretation in the study examinations were considered and presented. Impact of radiological diagnosis, location of MRI study and reading radiologist and impact on treatment choice and clinical outcomes.* **National Spine Management Group, Federation of Chiropractic Licensing Boards, Cleveland University College of Chiropractic, ACCME Joint Sponsorship with the State University of New York at Buffalo, Jacobs School of Medicine, 2023**.

Clinical Grand Rounds – **Aberrant Spinal Motion and Degenerative Disc Disease** – *research analysis of mechanic factors as etiology of intervertebral disc degeneration. Review of spinal tissue mechanics and their relation to mechanical stress was discussed and corelated to abnormal changes in the structure and composition of the intervertebral disc. Detailed discussion of ingrowth of pain transmitting nerve fibers into degenerative intervertebral discs and their relationship to acute and chronic pain was presented. Clinical correlation between congenital malformations of the spine, including scoliosis, kyphosis, spina bifida, spondylolysis and Klippel Feil syndrome), accidental back injury or ligament injury, occupational exposure and causing aberrant mechanical loading of lumbar spine, and intervertebral disc degeneration visible on T1, T2 and STIR MRI, sagittal and axial sequences was presented*. **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021**

Clinical Grand Rounds – **Diagnosis of Lumbar Facet Syndrome** – *overview of the most common pain syndrome in the lumbar spine including societal burdens was presented. Discussion of facet joint arthrosis being the most frequent facet joint pathology in the human spine. Outline of level of correlation between clinical symptoms, physical examination findings and degenerative spinal conditions was discussed. Presentation of diagnostic facet block and the medical necessity of such a referral when indicated was outlined*. **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021**

Clinical Grand Rounds – **Prevalence of Spinal Degeneration** – *discussion of the clinical occurrence of spinal degenerative conditions such as Diffuse Skeletal Hyperostosis (DISH), central stenosis, foraminal stenosis, degenerative disc disease and osteoporosis was presented. Advanced imaging and plain film radiological utilization in the diagnosis of spinal degermation was outlined and reviewed. Acute versus degenerative conditions in the spine were reviewed and detailed in relation to traumatic and non-traumatic events. Consensus driven parameters in the identification and rating of degenerative change severity was discussed*. **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021**

Clinical Grand Rounds – **Biomechanical Analysis in Patient Crash Injuries** – *Detailed review of the difference between biomechanical and biomedical analysis of injuries was presented. Outline of necessity of the use of properly credentialed biomechanical and crash investigation professionals in the diagnosis, management and reporting of crash injuries. Review of specific research related to forces during Activities of Daily Living and those sustained in a crash were presented. Details of a proper biomechanical analysis were discussed and specific review of a biomedical report omitting the*

mathematical calculations needed to determine force and injury potential was presented. Additional review of methods needed to determine expertise of the biomechanist or accident investigation was discussed. **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021.**

Clinical Grand Rounds – **Advanced Imaging Upper Cervical Spine and Documentation** – *Discussion and review of ligament injury in the upper cervical spine. Focus was on missed diagnosis due to a lack of imaging and interprofessional communication. Discussion of upper cervical anatomy including occipital condyles, C1/C2 articulation in both MRI, plain film and CT scanning was presented using imaging slides. Clinical documentation was reviewed with particular attention paid to clinical documentation errors form other providers. Discussion on case management and interprofessional communication to correct documentation errors was emphasized***. National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021**

Clinical Grand Rounds – **Facet Joint Thresholds and Alteration of Motion Segment Integrity** – *discussion of the predominant mode of joint loading of the cervical facet joints during whiplash injury related to retraction tension on the facet joint capsule. Review of shear forces, translation of the inferior and superior facet joint as well as injury risk due to excessive stretching of spinal ligaments was presented. Overview and discussion of mechanical trauma to ligament tissue and subsequent microstructural damage not visibly detected was outlined. Threshold for microstructural changes during retraction, reduced ligament stiffness and unrecovered strain was discussed in detail. Individual response to facet joint capsule response supported in the medical literature was presented***. National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021.**

Clinical Grand Rounds – **Mechanical Response of Damaged Human Cervical Spine Ligaments** – *discussion of the biomechanical properties of cervical spinal ligaments under sub-failure loads. Ligaments discussed were the Anterior Longitudinal Ligament, Posterior Longitudinal ligament and the Ligamentum Flavum. Deformations exceeding physiological limitations were presented and reviewed. Grade I and Grade II injuries were outlined and discussed. Presentation included observed ligamentous injury significantly compromising ligament ability to give tensile support within physiological spinal motion. Findings were clinically correlated to long term sequalae in Alteration of Motion Segment Integrity and the AMA Guides to the Evaluation of Permanent Impairment 5th and 6th Editions***. National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021.**

Clinical Grand Rounds – **Classification of Degenerative Cervical Degenerative Disc Disease** – *review of a radiographic rating system for objective assessment of intervertebral disc degeneration in the cervical spine. The degree of degeneration was organized based on loss of disc height, formation of osteophytes and the presence of diffuse sclerosis of adjacent vertebral bodies. Specific details of assessment were outlined and presented. Comparison of plain film radiographs to cadaver specimens was demonstrated and discussed. Review of interobserver validity of the grading system between observers was presented.* **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021**

Clinical Grand Rounds – **Biomechanical Compensation and Intervertebral Disc Extrusion** – *detailed review of MRI documented lumbar disc extrusion measuring 12mm including STIR, T1 and T2 sagittal and axial images. Presentation of radiographic biomechanical analysis outlining sagittal alignment and vertebral body rotations. Discussion of co-management of spinal pathology while considering both the biomechanical and anatomical components of spine pain. Radiographic review included lateral neutral, lateral flexion, lateral extension and AP views. Clinical correlation and discussion of pre and post-*

surgical care was outlined. **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021.**

Clinical Grand Rounds – **Nomenclature and Morphology of Intervertebral Disc Pathology** – *updated review and demonstration of intervertebral disc nomenclature related to intervertebral disc degeneration, trauma and other pathology. Specific attention paid to the agreed upon nomenclature between the Combined Task Forces of the North American Spine Society, American Spine Society, American Society of Spine Radiology and American Society of Neuroradiology. Details were provided in comparison to intervertebral disc herniation and intervertebral disc degeneration. Radial fissures were reviewed and outlined including circumferential, transverse and radial pathology and its anatomical relation to the intervertebral disc*. **National Spine Management Group, LLC, Federation of Chiropractic Licensing Boards, State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences – 2021**

Graduate- Medical Educator, The State University of New York at Buffalo, Jacobs School of Medicine and Biomedical Sciences.

Spinal Biomechanical-Engineering, *A course describing the structural and functional organization of the spinal-pelvic system. Fundamental and advanced concepts on spinal biomechanics are introduced by presenting a coherent spinal model describing normal segmental coupling, regional adaptation and global compensation. The clinical model is a structural and mechanical engineering approach based on x-ray physics, mathematics and statistical analysis. The normal movements of gait are integrated in this total biomechanical approach to explain spine distortion, predictable functional scoliosis and lumbar disc failure. Case studies are demonstrated to radiographic analyses and physical findings to determine clinical solutions and soft tissue rehabilitation.*
PACE Recognized by The Federation of Chiropractic Licensing Boards, Weldon Spring, MO, 2017

Stroke Anatomy and Physiology: Brain Vascular Anatomy, *The anatomy and physiology of the brain and how blood perfusion effects brain function. A detailed analysis of the blood supply to the brain and the physiology of ischemia.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Stroke Anatomy and Physiology: Stroke Types and Blood Flow, *Various types of stroke identifying ischemia, hypoperfusion, infarct and penumbra zones and emboli. Cardiac etiologies and clinical features as precursor to stroke with associated paradoxical emboli and thrombotic etiologies. Historical and co-morbidities that have etiology instroke inclusive of diabetes, coagulopathy, acquired and hereditary deficiencies.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Stroke Principles of Treatment an Overview for the Primary Care Provider, *Stroke type and treatments performed by vascular specialists. The goals of treatment with the physiology of the infarct and penumbra zones and the role of immediate triage in the primary care setting. Detailing the complications of stroke and future care in the chiropractic, primary care or manual medicine clinical setting.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Clinical Evaluation and Protocols for Identifying Stroke Risk, *The neurological history and examination for identifying stroke risks with a focus on supra and infratentorial regions, upper and lower motor lesions, cranial nerve signs, spinal cord pathology, motor and sensory pathology and gait abnormalities. Examining genetic and family histories along with dissection risk factors. Stroke orthopedic testing and clinical guidelines pertaining to triage for the primary care provider.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

MRI Protocols Clinical Necessity, *MRI slices, views, T1, T2, STIR axial, stacking, FFE, FSE and sagittal images. Clinical indication for the utilization of MRI and pathologies of disc in both trauma and non-trauma sequellae, including bulge, herniation, protrusion, extrusion and sequestration.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

MRI Interpretation of Lumbar Degeneration/Bulges, *MRI slices, views, T1, T2, STIR axial, stacking, FFE, FSE and sagittal images in the interpretation of lumbar degeneration. With the co-morbidities and complications of stenosis, pseudo-protrusions, cantilevered vertebrate, Schmorl's nodes and herniations. Central canal and cauda equina compromise interpretation with management.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

MRI Interpretation of Lumbar Herniations, *MRI slices, views, T1, T2, STIR axial, stacking, FFE, FSE and sagittal images in the interpretation of lumbar herniations. With the co-morbities and complications of stenosis, pseudo-protrusions, cantilevered vertebrate, Schmorl's nodes and herniations. Morphology of lumbar disc pathologies of central and lateral herniations, protrusions, extrusions, sequestration, focal and broad based herniations are defined and illustrated. Central canal and cauda equina compromise interpretation with management.* **[Texas Chiropractic College or PACE Reconized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

MRI Interpretation of Cervical Degeneration/Bulges, *MRI slices, views, T1, T2, STIR axial, stacking, FFE, FSE and sagittal images in the interpretation of cervical degeneration. With the co-morbidities and complications of stenosis, pseudo-protrusions, cantilevered vertebrate, Schmorl's nodes and herniations. Spinal cord and canal compromise interpretation with management.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

MRI Interpretation of Cervical Herniations, *MRI slices, views, T1, T2, STIR Axial, FFE, FSE and sagittal images in the interpretation of lumbar herniations. With the co-morbidities and complications of stenosis, pseudo-protrusions, cantilevered vertebrate, Schmorl's nodes and herniations. morphology of lumbar disc pathologies of central and lateral herniations, protrusions, extrusions, sequestration, focal and broad based herniations are defined and illustrated. Spinal cord and canal compromise interpretation with management.* **[Texas Chiropractic College or PACE Recognized by**

The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017

Medical-Legal-Insurance Documentation, *Accurate and compliant documentation of history and clinical findings inclusive of functional losses, loss of activities of daily living, duties under duress and permanent loss of enjoyment of life. Prognosing static vs. stable care, gaps in care both in the onset and in the middle of passive care with a focus on detailed diagnosing. The integration of chiropractic academia, the court system and the insurance reimburser's requirements for complete documentation.* **Texas Chiropractic College, Academy of Chiropractic Post-Doctoral Division, Long Island, NY, 2017**

MRI Interpretation of Degenerative Spine and Disc Disease with Overlapping Traumatic Insult to Both Spine and Disc, *MRI slices, views, T1, T2, STIR Axial, FFE, FSE and sagittal images in the interpretation of degenerative spondylolesthesis, spinal canal stenosis, Modic type 3 changes, central herniations, extrusions, compressions, nerve root compressions, advanced spurring and thecal sac involvement from an orthopedic, emergency room, chiropractic, neurological, neurosurgical, physical medicine perspective.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Orthopedic Testing: Principles, Clinical Application and Triage, *Integration of orthopedic testing in the clinical setting to develop a differential diagnosis. Utilizing radiographic and advanced imaging inclusive of MRI and CAT scan findings to verify tissue pathology suspected by orthopedic testing conclusions and developing a treatment plan as sequelae.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post Doctoral Division, Buffalo, NY, 2017**

Orthopedic Testing: Cervical Spine, *Integration of cervical orthopedic testing in the clinical setting to develop a differential diagnosis. Utilizing radiographic and advanced imaging inclusive of MRI and CAT scan findings to verify tissue pathology suspected by orthopedic testing conclusions and developing a treatment plan as sequelae.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post Doctoral Division, Buffalo, NY, 2017**

Orthopedic Testing: Cervical Spine, *Integration of cervical orthopedic testing in the clinical setting to develop a differential diagnosis. Utilizing radiographic and advanced imaging inclusive of MRI and CAT scan findings to verify tissue pathology suspected by orthopedic testing conclusions and developing a treatment plan as sequelae.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post Doctoral Division, Buffalo, NY, 2017**

Orthopedic Testing: Lumbar Spine, *Integration of lumbar orthopedic testing in the clinical setting to develop a differential diagnosis. Utilizing radiographic and advanced imaging inclusive of MRI and CAT scan findings to verify tissue pathology suspected by orthopedic testing conclusions and developing a treatment plan as sequelae.* **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards], ACCME Joint Providership with the State University of New York**

at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post Doctoral Division, Buffalo, NY, 2017

Orthopedic Testing: Clinical Grand Rounds, *Integration of orthopedic testing in the clinical setting utilizing both simple and complex patient scenarios. It includes potential stroke, or vertebrobasilar insufficient patients and understanding the nuances in a clinical evaluation with orthopedic testing as a critical part of the evaluation and screening process. How to integrate orthopedic testing in the clinical setting utilizing both simple and complex patient scenarios. It includes potential stroke, or vertebrobasilar insufficient patients and understanding the nuances in a clinical evaluation with orthopedic testing as a critical part of the evaluation and screening process*. **[Texas Chiropractic College or PACE Recognized by The Federation of Chiropractic Licensing Boards],ACCME Joint Providership with the State University of New York at Buffalo Jacobs School of Medicine and Biomedical Sciences, Academy of Chiropractic Post Doctoral Division, Buffalo, NY, 2017**

Spinal Biomechanical Engineering: Cervical Pathobiomechanics, *Spinal biomechanical engineering of the cervical and upper thoracic spine. This includes the normal and pathobiomechanical movement of both the anterior and posterior motor units and normal function and relationship of the intrinsic musculature to those motor units. Nomenclature in reporting normal and pathobiomechanical findings of the spine.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Spinal Biomechanical Engineering: Lumbar Pathobiomechanics, *Spinal biomechanical engineering of the lumbar spine. This includes the normal and pathobiomechanical movement of both the anterior and posterior motor units and normal function and relationship of the intrinsic musculature to those motor units. Nomenclature in reporting normal and pathobiomechanical findings of the spine.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Spinal Biomechanics in Trauma, *To utilize whiplash associated disorders in various vectors of impact and whiplash mechanisms in determining pathobiomechanics. To clinically correlate annular tears, disc herniations, fractures, ligament pathology and spinal segmental instability as sequellae to pathobiomechanics from trauma. The utilization of digital motion x-ray in diagnoising normal versus abnormal facet motion along with case studies to understand the clinical application.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Spinal Biomechanical Engineering & Organizational Analysis, *Integrating spinal biomechanics and pathobiomechanics through digitized analysis.The comparison of organized versus disorganized compensation with regional and global compensation. Correlation of the vestibular, occular and proprioceptive neurological integration in the righting reflex as evidenced in imaging. Digital and numerical algorithm in analyzing a spine.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Spinal Biomechanical Engineering: Cervical Digital Analysis, Digitizing *and analyzing the cervical spine in neutral, flexion and extension views to diagnose pathobiomechanics. This includes alteration of motion segment integrity (AMOSI) in both angular and translational movement. Ligament instability/failure/pathology are identified all using numerical values and models. Review of case studies to analyze pathobiomechanics using a computerized/numerical algorithm.* **Texas Chiropractic College,**

ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017

Spinal Biomechanical Engineering: Cartesian System, *The Cartesian Coordinate System from the history to the application in the human body. Explanation of the x, y and z axes in both translation and rotations (thetas) and how they are applicable to human biomechanics.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Spinal Biomechanical Engineering: Lumbar Digital Analysis, *Digitalizing and analyzing the lumbar spine images to diagnose pathobiomechanics. This includes anterior and posterior vertebral body elements in rotatioal analysis with neutral, left and right lateral bending in conjunction with gate analysis. Ligament instability/failure/pathology is identified all using numerical values and models. Review of case studies for analysis of pathobiomechanics using a computerized/numerical algorithm along with corrective guidelines.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Spinal Biomechanical Engineering: Full Spine Digital Analysis, *Digitalizing and analyzing the full spine images to diagnose pathobiomechanics as sequellae to trauma in relation to ligamentous failure and disc and vertebral pathology as sequellae. This includes anterior and posterior vertebral body elements in rotatioal analysis with neutral, left and right lateral bending in conjunction with gate analysis. Ligament instability/failure/pathology is identified all using numerical values and models. Review of case studies for analysis of pathobiomechanics using a computerized/numerical algorithm along with corrective guidelines.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, NY, 2017**

Establishing Roles and Responsibilities for Interprofessional Care Team Members, *Defining roles in a collaborative environment based upon skills, knowledge and abilities of each provider while engaging patients in the process***, Accreditation Council on Continuing Medical Education (ACCME) in cooperation with Medscape, 2016**

Interprofessional Collaboration to Improve Health Care: An Introduction, *Creating patient centered approaches to healthcare to improve outcomes in treatment models while concurrently reducing risk***, Accreditation Council on Continuing Medical Education (ACCME) in cooperation with Medscape, 2016**

Understanding the Values and Ethics of Interprofessional Collaboration, *Developing ethical Interprofessional relationships in a patient centered paradigm to ensure better outcomes while considering cultural and personal diversity needs of patients,* **Accreditation Council on Continuing Medical Education (ACCME) in cooperation with Medscape, 2016**

Interprofessional Communication: How Can It Improve Healthcare? *The best practices in Interprofessional communication and optimizing the tools in clinical practice to benefit patient outcomes,* **Accreditation Council on Continuing Medical Education (ACCME) in cooperation with Medscape, 2016**

Trauma Qualified, Academy of Chiropractic, Cleveland University-Kansas City, Chiropractic and Health Sciences, Long Island NY, 2018-present

Spinal Trauma Pathology, Triage and Connective Tissue Injuries and Wound Repair, *Triaging the injured and differentially diagnosing both the primary and secondary complaints. Connective tissue*

injuries and wound repair morphology focusing on the aberrant tissue replacement and permanency prognosis potential. **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, New York, 2016**

Spinal Trauma Pathology, Ligament Anatomy and Injury Research and Spinal Kinematics, *Spinal ligamentous anatomy and research focusing on wound repair, future negative sequelae of abnormal tissue replacement and the resultant aberrant kinematics and spinal biomechanics of the spine.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, New York, 2016**

Spinal Trauma Pathology, Spinal Biomechanics, Central Nervous System and Spinal Disc Nomenclature, *The application of spinal biomechanical engineering models in trauma and the negative sequelae it has on the central nervous system inclusive of the lateral horn, periaqueductal grey matter, thalamus and cortices involvement.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, New York, 2016**

Spinal Trauma Pathology, Biomechanics of Traumatic Disc Bulge and Age Dating Herniated Disc Pathology, *The biomechanics of traumatic disc bulges as sequelae from trauma and the comorbidity of ligamentous pathology. Age-dating spinal disc pathology in accordance with Wolff's Law.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, New York, 2016**

Spinal Trauma Pathology, Clinical Grand Rounds, *The review of case histories of mechanical spine pathology and biomechanical failures inclusive of case histories, clinical findings and x-ray and advanced imaging studies. Assessing comorbidities in the triage and prognosis of the injured.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, New York, 2016**

Spinal Trauma Pathology, Research Perspectives, *The review of current literature standards in spinal trauma pathology and documentation review of biomechanical failure, ligamentous failure and age-dating disc pathology.* **Texas Chiropractic College, ACCME Joint Providership with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences, Academy of Chiropractic Post-Doctoral Division, Buffalo, New York, 2016**

Primary Spine Care – Central Nervous System Processing of Pain and Physiology, *Central neural pathways of pain and higher cortical responses to pain and the effect of high amplitude-low velocity forces on mechanoreceptors and proprioceptors. The effects of neuropeptides on the hypothalamus, pituitary and adrenal axis when treating patients.* **Texas Chiropractic College, Academy of Chiropractic, Academy of Chiropractic, Recognized by the PACE Program of the Federation of Chiropractic Licensing Boards, Melville NY, 2016**

Primary Spine Care – MRI, Bone Edema and Degeneration, *The effects of trauma on spinal vertebral segments and the short and long term sequella to morphology. Identifying and diagnosing bone edema, spurring, types of degeneration in assessing biomechanical stability in conjunction with Modic and Pfeiffer changes* **Texas Chiropractic College, Academy of Chiropractic, Academy of Chiropractic, Recognized by the PACE Program of the Federation of Chiropractic Licensing Boards, Melville NY, 2016**

Primary Spine Care – Hospital and Emergency Room Care, *Identifying spinal lesions inclusive of cord and root lesion through examination and advanced imaging in creating an accurate diagnosis, prognosis and treatment plan to effectively triage in collaboration and coordination with medical specialists and emergency department physicians. Differentially diagnosing and triaging disc degenerative bulges, traumatic disc bulges, protrusion herniations, extrusion herniations and fragmented herniations along with managing traumatically induced pain as sequella to degenerative disc trauma,* **Texas Chiropractic College, Academy of Chiropractic, Academy of Chiropractic, Recognized by the PACE Program of the Federation of Chiropractic Licensing Boards, Melville NY, 2016**

Cervical Trauma, Evaluation, and Treatment Following MVA. *Examination and Triage of soft tissue injury secondary to motor vehicle accident trauma. Appropriate treatment protocols. Long term effects of soft tissue injury and wound repair.* **Life Chiropractic College, Atlanta, Ga**

Mechanical Diagnosis & Therapy: The Lumbar Spine, *Epidemiology and predisposing factors, Chemical vs. mechanical pain, Pain and connective tissue properties,Anatomical considerations related to mechanical diagnosis and therapy,Diagnosis through repetitive movements, Examination and treatment: postural, dysfunction, and derangement syndromes, Anatomy and biomechanics:the intervertebral disc, Prophylaxis and contraindications, Patient models, analysis and discussion.* **McKenzie Institute, Syracuse, NY**

Compliance, Documentation, Ethics, Sexual Boundaries, and North Carolina Jurisprudence, *Examination of ethical principles and a comparative analysis of morals and ethics, Examination of professional boundaries and professional boundary crossings and violations, Transference and Countertransference in the doctor-patient relationship, NCBCE rules and regulations, Coding Systems, Chiropractic Documentation, Writing subjective complaints, objective findings, assessment and plan.* **Texas Chiropractic College, Houston, Tx**

Accident Reconstruction: Research, Causality and Bodily Injury, *Delta V issues correlated to injury and mortality, side impact crashes and severity of injuries, event data recorder reports correlated to injury, frontal impact kinematics, crash injury metrics with many variables and inquiries related to head restraints.* **CMCS Post Doctoral Division, New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, Long Island, NY**

Accident Reconstruction: Skid Marks, Time, Distance, Velocity, Speed Formulas and Road Surfaces*, The mathematical calculations necessary utilizing time, distance, speed, coefficients of friction and acceleration in reconstructing an accident. The application of the critical documentation acquired from an accident site.* **CMCS Post Doctoral Division, New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, Long Island, NY**

Accident Reconstruction: Causality, Bodily Injury, Negative Acceleration Forces, Crumple Zones and Critical Documentation*, Factors that cause negative acceleration to zero and the subsequent forces created for the vehicle that get translated to the occupant. Understanding critical documentation of hospitals, ambulance reports, doctors and the legal profession in reconstructing an accident.* **CMCS Post Doctoral Division, New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, Long Island, NY**

Accident Reconstruction: Terms, Concepts and Definitions*, The forces in physics that prevail in accidents to cause bodily injury. Quantifying the force coefficients of vehicle mass and force vectors that can be translated to the occupant and subsequently cause serious injury.* **CMCS Post Doctoral Division, New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, Long Island, NY**

Head Trauma, Brain Injury and Concussion, *Brain and head physiology, brain mapping and pathology as a sequella to trauma. Traumatic brain injury, mild traumatic brain injury, axonal shearing, diffuse axonal injury and concussion are detailed in etiology and clinically. Clinical presentation, advanced diagnostic imaging and electrodiagnostic are detailed in analysis to create a differential diagnosis. Balance disorders that are often as a result of trauma are also explored from clinical presentation to advanced imaging and differential diagnosis*. **New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, Long Island, NY**

Neurodiagnostics, Imaging Protocols and Pathology of the Trauma Patient, *An in-depth understanding of the protocols in triaging and reporting the clinical findings of the trauma patient. Maintaining ethical relationships with the medical-legal community***, CMCS Management Post Doctoral Division, New York Chiropractic Council, New York State Department of Education Board for Chiropractic, Long Island, NY**

Diagnostics, Risk Factors, Clinical Presentation and Triaging the Trauma Patient, *An extensive understanding of the injured with clinically coordinating the history, physical findings and when to integrate neurodiagnostics. An understanding on how to utilize emergency room records in creating an accurate diagnosis and the significance of "risk factors" in spinal injury,* **CMCS Management Post Doctoral Division, New York Chiropractic Council, New York State Education Department Board for Chiropractic, Long Island, NY**

Crash Dynamics and Its Relationship to Causality, *An extensive understanding of the physics involved in the transference of energy from the bullet car to the target car. This includes G's of force, Newton's Law, gravity, energy, skid marks, crumple zones, spring factors, event data recorder and the graphing of the movement of the vehicle before, during and after the crash. Determining the clinical correlation of forces and bodily injury.* **CMCS Management Post Doctoral Division, New York Chiropractic Council, New York State Education Department Board for Chiropractic, Long Island, NY**

MRI, Bone Scan & X-Ray Protocols, Physiology and Indications for the Trauma Patient, *MRI interpretation, physiology, history and clinical indications, Bone Scan interpretation, physiology and clinical indications, x-ray clinical indications for the trauma patient,* **CMCS Management Post Doctoral Division, New York Chiropractic Council, New York State Education Department Board for Chiropractic, Long Island NY**

Neurodiagnostic Testing Protocols, Physiology / Indications for the Trauma Patient, *Electromyography (EMG,) Nerve Conduction Velocity (NCV,) Somato Sensory Evoked Potential (SSEP,) Visual Evoked Potential (VEP,) Brain Stem Auditory Evoked Potential (BAER) and Visual-Electronystagmosgraphy (V-ENG) interpretation, protcols and clinical indications for the trauma patient***, CMCS Management Post Doctoral Division, New York Chiropractic Council, New York State Education Department, Board for Chiropractic, Long Island NY**

Documentation and Reporting for the Trauma Victim, *"Understanding the necessity for accurate documentation and diagnosis utilizing the ICD-9 and the CPT to accurately describe the injury through diagnosis. Understanding and utilizing state regulations on reimbursement issues pertaining to healthcare",* **CMCS Management Post Doctoral Division, New York Chiropractic Council, New York State Education Department, Board for Chiropractic, Long Island NY**

Documenting Clinically Correlated Bodily Injury to Causality, *Understanding the necessity for accurate documentation, diagnosis and clinical correlation to the injury when reporting injuries in the medical-legal community. Documenting the kinesiopathology, myopathology, neuropathology, pathophysiology in both functional and structural paradigms,* **CMCS Management Post Doctoral Division, New York Chiropractic Council, New York State Education Department, Board for Chiropractic, Long Island, NY**

MRI Disc Pathology & Spinal Stenosis, *MRI interpretation of bulged, herniated, protruded, extruded sequestered and fragmented disc pathologies in etiology and neurological sequellae in relationship to the spinal cord and spinal nerve roots.* **New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, AACME Joint Sponsorship with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences and CMCS Post Doctoral Division, Buffalo, NY**

MRI Clinical Application, *The clinical application of the results of space occupying lesions. Disc and tumor pathologies and the clinical indications of manual and adjustive therapies in the patient with spinal nerve root and spinal cord insult as sequella*. **New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, AACME Joint Sponsorship with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences and CMCS Post Doctoral Division, Buffalo, NY**

MRI Methodology of Analysis, *MRI interpretation sequencing of the cervical, thoracic and lumbar spine inclusive of T1, T2, STIR and 3D gradient studies to ensure the accurate diagnosis of the region visualized.* **New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, AACME Joint Sponsorship with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences and CMCS Post Doctoral Division, Buffalo, NY**

MRI Spinal Pathology, *MRI interpretation of bone, intradural, extradural, cord and neural sleeve lesions. Tuberculosis, drop lesions, metastasis, ependymoma, schwanoma and numerous other spinal related tumors and lesions.* **New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, AACME Joint Sponsorship with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences and CMCS Post Doctoral Division, Buffalo, NY**

MRI Anatomy & History, *Normal anatomy of axial and sagittal views utilizing T1, T2, 3D Gradient and STIR sequences of imaging. Standardized and desired protocols in views and sequencing of MRI examination to create an accurate diagnosis in MRI.* **New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, AACME Joint Sponsorship with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences and CMCS Post Doctoral Division, Buffalo, NY**

MRI Physics and History, *Magnetic fields, T1 and T2 relaxations, nuclear spins, phase encoding, spin echo, T1 and T2 contrast, magnetic properties of metals and the historical perspective of the creation of NMR and MRI.* **New York Chiropractic Council, New York State Department of Education, Board for Chiropractic, AACME Joint Sponsorship with the State University of New York at Buffalo, School of Medicine and Biomedical Sciences and CMCS Post Doctoral Division, Buffalo, NY**

Training Strength, Endurance & Flexibility, *Fundamentals of Isometric and Isotonic Strength Training. Endurance Training. Flexibility Training: passive-passive assist-passive resist-active assist-active resist. Post-isometric relaxation: Reciprocal Inhibition. Soft Tissue Procedures.* **American Academy of Chiropractic Rehabilitation, University of Bridgeport College of Chiropractic, Bridgeport, Connecticut**

Treatment of Automobile Accident Injuries, *Review of Motor Vehicle Accident Statistics, Understand Cervical Whiplash Mechanism and Dynamics; Vehicle Crash Testing; Understand Cervical Spine Anatomy and Physiology; Head Trauma and Grading; Review Three Stages of Healing: Inflammatory, Repair, and Remodeling; Conservative Rehabilitation Procedures; Orthopedic and Neurological Evaluation of the Head, Spine, and Extremities; Understand Advanced Diagnostic Testing: CT, MRI, Bone Scan, EMG,* **Texas College of Chiropractic, Houston, Texas**

Evaluation of Posture, Strength and Endurance, Treatment Methods & Protocol, *Understanding McKenzie; posture, dysfunction, derangement, end-range loading. Stabilization Exercise; isometric co-contraction, co-contraction combined with arm/leg movements, rocker board/swiss balls.PNF; hold-relax/ contract-relax /contract-relax agonist contract. Proprioceptive Training; small foot, balance board/ balance shoes/ balls, styrofoam rolls, perturbations. Stretching; hypertonic muscles, facilitation techniques.* **American Academy of Chiropractic Rehabilitation, University of Bridgeport College of Chiropractic, Bridgeport, Connecticut**

Evaluating the Musculoskeletal System, Fitness, and ADL Recommendations. Gait Functional Analysis. *Understanding Muscular Strength Evaluations; manual muscle tests, multiple angle isometric, dynamic. Muscular Endurance Evaluation. Flexibility Evaluation; inclinometric (passive and active). Aerobic Fitness; heart rate, PAR-Q. ADL Demonstration/Advice;posture, sit (chairs/ergonomic), stand, sleep, pillows, mattress, lifting, carrying, push, pull.* **American Academy of Chiropractic Rehabilitation, University of Bridgeport College of Chiropractic, Bridgeport, Connecticut**

Stabilization Exercises for Injury. *Assessment Protocols Integrating Muscle/Joint Dysfunction/Motor Control; deep neck flexor, forward head, scapulo-humeral rhythm, arm elevation, hip extension/abduction, squat, balance, sway. Human Locomotions; gait analysis. Functional Testing of Isolated Muscles/Joints; Alaranta trunk flexion/extension patterns, squatting, spinal RON measurements. Evaluation of Muscle Imbalance; tight vs. weak, agonist vs. antagonist.* **American Academy of Chiropractic Rehabilitation, University of Bridgeport College of Chiropractic, Bridgeport, Connecticut**

Chiropractic Peer Review Essentials, *Fundamentals of the Peer Review Process. Peer review report writing format and skill development. State/ Regional/ National, Chiropractic, and cross discipline treatment guidelines. Deposition and court room testimony skill development. Insurance industry red flags,* **Texas Chiropractic College, Houston, Texas**

Fundamentals of Physiotherapy, *Comprehensive analysis of Physical Therapy Modalities. Physiological effects, indications, contraindication and proper dosage of physical therapy modalities. Spinal decompression protocols and guidelines,* **Texas Chiropractic College, Houston Texas**

Peer Review of Diagnostic Testing Procedures, *Plain film radiographs, MRI, CT Scan, Bone Scan, Myelography. Electrodiagnostic testing: EMG, NCV, SSEP,* **Texas Chiropractic College, Houston, Texas**

Rehabilitative Exercise Protocols, *Muscle anatomy and physiology. Understanding of exercise energy systems, progressive resistance exercise methodologies, aerobic/anaerobic exercise training concepts, rehabilitative exercise treatment protocols,* **Texas Chiropractic College, Houston, Texas**

Independent Chiropractic Examination, *Understanding of the Independent Chiropractic Examination Process. Establishing the diagnostic impression.Overview of the causal relation, apportionment, and permanent impairment. Independent Chiropractic Examination report writing and case presentation,* **Texas Chiropractic College, Houston, Texas**

Physical/ Orthopedic/ Neurological Examination, *Physical examination techniques and findings. Utilization of appropriate physical/ orthopedic/ neurologic/ chiropractic examination testing procedures. Independent Chiropractic Examination case presentation analysis,* **Texas Chiropractic College, Houston, Texas**

Documentation Principles, *Documentation methodologies to enhance third party reimbursement. Medicare/C.P.T. billing code analysis. Risk management strategies to prevent malpractice claims,* **Texas Chiropractic College, Houston, Texas**

Exercise Strength & Conditioning, *Understanding anatomy and physiology. Overview of exercise energy systems. Progressive resistance exercise methodologies. Aerobic/anerobic exercise training concepts. Rehabilitation exercise treatment protocols. Sport specific exercise strength training methods patient exercise program designs.* **Texas Chiropractic College, Houston, Texas**

Permanent Soft Tissue Injuries, *Understanding Dynamics of Accidents, Elasticity of Soft Tissue, Three Phases of Healing, Scar Tissue Formation, Altered Joint Function, Long Term Effects of Soft Tissue Injury,* **North Carolina Chiropractic Association, Raleigh, North Carolina**

SELECTED MEMBERSHIPS

American Academy of Medical Legal Professionals, 2009-Present

American Academy of Pain Management, 2009-Present

American Chiropractic Association, 2006, 2009-Present

North Carolina Chiropractic Association, 1997, 2001

International Chiropractic Pediatric Association, 2000