

ORTHOPAEDIC

Physical Therapy Practice



APTA

American Physical Therapy Association
The Science of Healing. The Art of Caring.

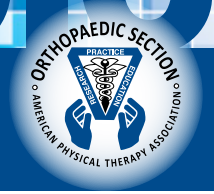
THE MAGAZINE OF THE
ORTHOPAEDIC SECTION, APTA



VOL. 25, NO. 2 2013

ORTHOPAEDIC

Physical Therapy Practice



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In this issue

- 64 | A Life of Service: APTA Board Member & Orthopaedic Section Member, Dave Pariser, PT, PhD
APTA President, Paul A. Rockar Jr, PT, DPT, MS
- 70 | Paris Distinguished Service Award Lecture: Opportunity from Importunity
Michael T. Cibulka, PT, DPT, MHS, OCS, FAPTA
- 73 | Pathological Cause of Low Back Pain in a Patient Seen Through Direct Access in a Physical Therapy Clinic: A Case Report
Margaret M. Gebhardt
- 78 | Intramuscular Manual Therapy After Failed Conservative Care: A Case Report
Brent A. Harper
- 87 | Supine Cervical Traction After Anterior Cervical Discectomy and Fusion: A Case Series
Jeremy J. McVay
- 91 | Relationship Between Plantar Flexor Weakness and Low Back Region Pain in People with Postpolio Syndrome: A Case Control Study
Carolyn Kelley
- 97 | Alteration in Corticospinal Excitability, Talocrural Joint Range of Motion, and Lower Extremity Function Following Manipulation in Non-disabled Individuals
Todd E. Davenport, Stephen F. Reischl, Somporn Sungkarat, Jason Cozby, Lisa Meyer, Beth E. Fisher

Regular features

- 65 | Final President's Message
- 67 | President's Corner: So Who Is This New President?
- 68 | Editor's Note: A Good Problem to Have
- 104 | Book Reviews
- 106 | CSM Award Winners
- 109 | CSM Meeting Minutes
- 119 | Occupational Health SIG Newsletter
- 124 | Pain SIG Newsletter
- 128 | Imaging SIG Newsletter
- 130 | Animal Rehabilitation SIG Newsletter
- 134 | Index to Advertisers

OPTP Mission

To serve as an advocate and resource for the practice of Orthopaedic Physical Therapy by fostering quality patient/client care and promoting professional growth.

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Publication Title: *Orthopaedic Physical Therapy Practice* Statement of Frequency: Quarterly; January, April, July, and October

Authorized Organization's Name and Address: Orthopaedic Section, APTA, Inc., 2920 East Avenue South, Suite 200, La Crosse, WI 54601-7202

Orthopaedic Physical Therapy Practice (ISSN 1532-0871) is the official magazine of the Orthopaedic Section, APTA, Inc. Copyright 2013 by the Orthopaedic Section, APTA. Nonmember subscriptions are available for \$50 per year (4 issues). Opinions expressed by the authors are their own and do not necessarily reflect the views of the Orthopaedic Section. The Editor reserves the right to edit manuscripts as necessary for publication. All requests for change of address should be directed to the Orthopaedic Section office in La Crosse.

All advertisements that appear in or accompany *Orthopaedic Physical Therapy Practice* are accepted on the basis of conformation to ethical physical therapy standards, but acceptance does not imply endorsement by the Orthopaedic Section.

Orthopaedic Physical Therapy Practice is indexed by Cumulative Index to Nursing & Allied Health Literature (CINAHL).

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A LIFE OF SERVICE: APTA BOARD MEMBER

&

ORTHOPAEDIC SECTION MEMBER

DAVE PARISER, PT, PHD

(1960 - 2013)

By APTA President, Paul A Rockar Jr, PT, DPT, MS

It is with a heavy heart that I share the news of the sudden passing of our friend and colleague, APTA Board Member Dave Pariser, PT, PhD, on January 14, 2013. Dave was an outstanding gentleman and professional whose friendship, devoted service, and leadership we will sorely miss.

A member of the American Physical Therapy Association (APTA) since 1981, Dave served in various capacities within APTA and the Kentucky Chapter (KPTA) and Louisiana Chapter (LPTA), including on APTA's Nominating Committee, as LPTA President, and as Chair of the legislative committees for both LPTA and KPTA. Most recently, Dave was elected in June 2011 by APTA's House of Delegates to serve on the Board of Directors. Dave received numerous awards in recognition of his service, including the Dave Warner Award for Distinguished Service (Physical Therapist of the Year) from LPTA (2001) and induction into the



LPTA "Hall of Fame" in 2006 for career achievement.

Dave received his BS in physical therapy from West Virginia University in 1983. He later moved to New Orleans and was a full-time faculty member at the Louisiana State University Health Sciences Center's Physical Therapy Program from 1988 to 2005. During that time Dave earned his PhD in education, curriculum, and instruction from the University of New Orleans. He and his wife,

Gina Pariser, PT, PhD, moved to Louisville in 2005 upon accepting faculty positions at Bellarmine. Dave's teaching, scholarship, and clinical work were mainly in the areas of orthopaedics/musculoskeletal problems, gerontology, and advocacy/public policy.

Always a warm and caring individual, Dave was also actively involved in his community. Among many things, he served as a coach on youth soccer and basketball leagues, was a director on the board of a youth camp, and even volunteered as a telephone counselor on a crisis hotline. Dave was also on the board of the high school marching band in which his daughters perform.

Dave is survived by his wife, Gina, and their twin daughters, Ada and Kayla. There really are no words for tragic moments like these. On behalf of the APTA community, I offer our deepest sympathies and condolences to Dave's family.

We are grateful to Dave for his work to support and promote our profession. Thank you Dave; we will miss you.

Final President's Message

James J. Irrgang,
PT, PhD, ATC, FAPTA



In writing my final message as President of the Orthopaedic Section, I would like to reflect on the accomplishments of the Section over the past 6 years and to comment on some of the issues and opportunities facing the Section in the future.

Over the last 6 years the Orthopaedic Section has seen a large growth in its membership and financial resources. Since 2007, Section membership has grown by 11.7% to its current number of approximately 18,500 members and the Section reserves have grown by 96%. The Orthopaedic Section is highly respected and perceived as a leader and innovator among other Sections and the American Physical Therapy Association Board of Directors and staff.

Additionally, the Section has undertaken many new and innovative initiatives. These initiatives were directed by the Section's Strategic Plan, which was most recently developed in 2010. The Strategic Plan is continually reviewed and used to direct the use of valuable Section resources.

Some of the major initiatives undertaken by the Orthopaedic Section over the past 6 years include:

- **Orthopaedic Section Clinical Practice Guidelines** – The Section has created and published 7 clinical practice guidelines that summarize the current evidence and make recommendations for optimal examination, diagnosis, classification, intervention, and assessment of outcome for common musculoskeletal conditions including plantar fasciitis/heel pain, hip osteoarthritis, neck pain, knee ligament sprain, knee meniscus and cartilage injuries, Achilles tendinopathy, and low back pain. These guidelines were written to be consistent with the terminology used by the International Classification of Functioning, Disability and Health (ICF) and have been used as a model for guideline development by APTA and other Sections. The guidelines have been published in the *Journal of Orthopaedic and Sports Physical Therapy*, accepted for placement on ClinicalGuidelines.gov and are available free on the Orthopaedic Section and JOSPT Web sites. Three new guidelines (adhesive capsulitis, non-arthritis intra-articular hip conditions, and lateral ankle sprains) are currently under review and the first guidelines that were published in 2008 are now undergoing revision. The success that the Section has had with the devel-

opment and dissemination of the clinical practice guidelines has largely been due to Joe Godges, ICF-based Clinical Practice Guidelines Project Coordinator, and a vast cadre of volunteers who served to develop and review the guidelines.

- **National Orthopaedic Physical Therapy Outcomes Database** – The purpose of the National Orthopaedic Physical Therapy Outcomes Database (NOPTOD) is to create a repository for clinical and process outcomes data for the most common conditions treated by orthopaedic physical therapists. Information in the NOPTOD can be used by clinicians to assess their clinical performance as well as to describe practice and the value of care provided by orthopaedic physical therapists. To demonstrate feasibility of the NOPTOD, this past year the Orthopaedic Section conducted a pilot project that was based on the Section's Neck Pain Clinical Practice Guidelines. Over a 6-month period, 38 physical therapists from 36 facilities submitted clinical outcomes and process of care information that summarized the care provided to approximately 200 patients. The results of the pilot project are currently being analyzed and a summary of clinical performance will be provided to those therapists who submitted data. Additionally, a survey will be done to determine the burden of data collection and usefulness of the information. The results of the project will be used to plan and determine the resources needed for development of an electronic data capture and analysis system for the NOPTOD. Ultimately, the NOPTOD will be a repository for clinical and process outcomes data for the most common conditions treated by orthopaedic physical therapists that will provide clinicians with a tool to evaluate and improve their clinical performance.
- **Education and Professional Development** – The Section has substantially expanded the educational offerings at the Combined Sections Meeting. At the most recent meeting in San Diego, CA, the Section sponsored 46 hours of regular programming and 56 hours of preconference programming. Since 2007, the Orthopaedic Section has published 16 Independent Study Courses that have been purchased by over 10,800 registrants. This year, the Orthopaedic Section will hold its first Annual Meeting for the master clinician

in Orlando, FL, May 2-4. The Annual Meeting will be a hands-on advanced continuing education event that will include lectures and breakout workshops related to physical therapist examination and treatment of the lumbosacral spine and lower extremity. The Section has undertaken a comprehensive analysis to enhance its educational offerings through increased use of technology to better meet the needs of Section members. To assist in this review, a consultant was hired to assess the current and future educational needs of members, evaluate new opportunities for the use of technology, and to make recommendations to improve the Section's educational offerings. To gather data for this analysis, over 1,200 Section members were surveyed and 15 members participated in a comprehensive telephone interview.

- **Research** – The Section has made substantial commitments to support research. Annually, the Section awards up to \$70,000 in small research grants on a competitive basis to Orthopaedic Section members. This includes a New Investigator category with up to three \$15,000 awards and a single unrestricted award of up to \$25,000 for established investigators. In 2007, the Section established the Orthopaedic Section Endowment Fund with the Foundation for Physical Therapy to provide support for research related to orthopaedic physical therapy. Starting in 2014, the Orthopaedic Endowment Fund will permit funding of a grant of up to \$30,000 every other year. Most recently, the Orthopaedic Section established a Clinical Research Network that was awarded on a competitive basis to Dr. Steven George from the University of Florida. The Clinical Research Network is funded for a total of \$300,000 over a 3-year period to create the Orthopaedic Physical Therapy – Investigative Network (OPT-IN) that will conduct a multi-center study entitled, Optimal Screening for Prediction of Referral and Outcome (OSPRO) Cohort Study. This Clinical Research Network will provide Section members from across the

country with an opportunity to participate in an important and highly relevant clinical research study and will establish a network that can support additional future research.

- **Practice and Advocacy** – In 2010, the Section began to award up to three \$5,000 advocacy grants per year to Chapters to support advocacy and legislative efforts that are important to the practice of orthopaedic physical therapy. To date, a total of 4 advocacy grants have been awarded to address issues related to defense of anti-referral for profit arrangement legislation and legislative efforts to remove restrictions for physical therapists from performing spinal manipulation. In 2009, the Section co-sponsored a Capitol Hill Day with the American Academy of Orthopaedic Manual Physical Therapy (AAOMPT) in which almost 200 physical therapists met with members of Congress to advocate for issues important to the practice of orthopaedic physical therapy.

The above accomplishments were not achieved by a single individual. Many dedicated individuals have contributed to the success of the Section over the last 6 years. These individuals include members of the Section Board of Directors, the Section staff, Committees and Special Interest Groups, as well as many Section members that volunteered their services whenever asked.

The Orthopaedic Section has been and needs to continue to be a strong leader for the many important issues that affect the profession and the practice of orthopaedic physical therapists. In the changing health care environment, the Orthopaedic Section needs to advocate for its members and profession as a whole, to be a viable, high quality, cost-effective option for the diagnosis and treatment of individuals with a variety of musculoskeletal injuries and conditions. Other opportunities and issues currently facing the Section include:

- **Section Governance** – To recognize the Section's content expertise in the area of orthopaedic physical therapy, the Section needs to provide leadership among other Sections and Chapters to advocate for voting rights proportional to component membership within the House of Delegates.
- **Joint Mobilization/Manipulation** – The Section needs to defend and promote the practice of joint mobilization and manipulation as an effective intervention performed by physical therapists. Additionally the Section needs to ensure that these treatment techniques are not assigned to individuals who do not have the necessary examination and evaluative skills to safely

and effectively perform these techniques.

- **Model of Practice** – The Section needs to seek new and innovative models of practice that will allow orthopaedic physical therapists to provide high-quality and cost-effective physical therapy services to meet the growing need of individuals with injury and dysfunction of the musculoskeletal system. This may include a critical evaluation of who is best qualified to deliver services under the direction of a physical therapist, delivery of care in different settings and in emerging practice areas, and investigation of innovative alternative payment models for physical therapy services.
- **Outcomes Measurement and Performance Improvement** – As described above, one of the Orthopaedic Section's objectives outlined in the Strategic Plan is to develop a National Orthopaedic Physical Therapy Outcomes Database. Further development of the NOPTOD will allow members to electronically submit clinical outcomes and process of care data for patients with a variety of musculoskeletal conditions. Physical therapists that submit data to the NOPTOD will be able to retrieve summaries of their outcomes data for comparison with all other physical therapists. Ultimately, the NOPTOD will provide physical therapists with a tool that they can use to assess their clinical performance as part of a continuous performance improvement process. Additionally information from the NOPTOD can be used to describe practice and the value of care provided by physical therapists.
- **Use of Technology to Enhance Educational Offerings and Member Experience** – Independent Study Courses (ISCs) offered by the Section have been a valuable source of continuing education and have generated substantial income for the Section. To further enhance educational offerings, the Section needs to expand its use of technology to better meet the varied needs of Section members. This should include making the ISCs available in electronic format, supplementing the ISCs with video and interactive content, providing easily searchable and navigable on-line resources, and providing on-line access of information provided at Section-sponsored educational meetings.
- **Efficient Use of Section Resources** – The Section is fortunate to have substantial resources including large financial reserves, positive cash flow, a modern debt-free office building, and a *great* staff. These resources enable the Section to provide many benefits to Section members. The Section needs to continue to protect and make efficient

use of these resources to address the issues and opportunities that face the Section with the ultimate goal of enhancing the benefits of Section membership.

I am confident that the Orthopaedic Section is in good hands under the leadership of the newly elected President, Stephen McDavitt. Together with the current Board members as well as the newly elected Director, Pam Duffy, and the newly appointed Committee Chairs, Tess Vaughn, Education Committee and Scott Davis, Research Committee, the Orthopaedic Section has an excellent leadership team with many talents that is ready and able to meet the opportunities and challenges described above.

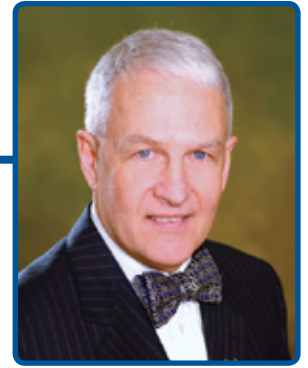
In closing, I have no Presidential Pardons or Executive Orders to issue! However, I would like to express my gratitude to the Section members for allowing me to serve as President of the Section over these past 6 years. Additionally, I would like to thank and personally recognize all of the Board Members that have worked with me during this time including: Thomas McPoil (Vice President and Director), Gerard Brennan (Vice President) Joe Godges (Treasurer), Steve Clark (Treasurer), William O'Grady (Director), Kornelia Kulig (Director), Ellen Hamilton (Education Committee Chair and Director), Beth Jones (Education Committee Chair), Robert Rowe (Practice Committee Chair), Joseph Donnelly (Practice Committee Chair), and Lori Michener (Research Committee Chair). I would also like to express my sincere gratitude to the staff in the Section Office including Terri DeFlorian (Executive Director), Tara Fredrickson (Executive Associate), Sharon Kliniski (Managing Editor for Journals & Newsletters), Kathy Olson (Managing Editor for Independent Study Courses), and Carol Denison (Independent Study Course Processor & Receptionist). Without the knowledge, support, and leadership of my Board colleagues and staff members, my tenure as Orthopaedic Section President would have been much more difficult and less productive.

Finally, I would like to recognize my family including my wife, Patty (who always makes me look good!), my daughter, Tricia Fawcett and her husband, James and 4 children (Caroline, Julia, James, & Anna) and my son Jamie, and his wife, Jannelle and 2 children (Isabella and James) for all of the love and support that they have provided over the years to me in my professional career.

President's Corner

So Who Is This New President?

Stephen McDavitt,
PT, DPT, MS, FAAOMPT



Traditionally in this section of OP, the President shares an update and/or some visionary thoughts for the members. I believe Dr. Irrgang in his post-President's concluding comments on achievements, future vision, and challenges will address that. I would like to sincerely thank Jay for his exceptional devotion, sacrifices, leadership, and commitments to the Section for all his years of service. Under his presidential leadership, the Section has attained and maintained financial stability and has been recognized as an exemplary leader in education, practice, and research for orthopaedic practice. Thanks also Jay for your generous mentorship you provided in my transition as the new Section President.

As your new President, it is evident to me some of you may know me from my involvement at various levels with the Orthopaedic Section, APTA, or AAOMPT, while some members may only know me from what little was available in my candidates statement, or not at all. Relatively very few members likely know of my involvement in leadership or leadership style. In appreciation for that and the theme of Dr. Irrgang's column, I felt as your new President I would take an untraditional approach by using this column to provide information to you about me in terms of my practice and leadership experience and style. I hope this will help you get to know me a little better and further enable you to better dialogue with me as your President throughout the course of this term.

I have been a practicing physical therapist for 37 years, witnessing and participating within initiatives related to clinical practice evolving from practice by prescription, to referral, and on through direct access. For more than two decades I have been very active within and outside APTA in advocating for our selective identity and value as the expert in managing movement and performance throughout the spectrum of our practice. I have adapted to this growth by expanding my physical therapist credentialing from BS to Advance Masters and later on to manual therapy certification and fellowship and DPT.

Throughout this process as a full-time clinician with a desire for full practice privileges, I developed a deep appreciation and

value for protecting our rights to practice. By engaging in such, I developed a futuristic view and passion for not only protecting what we practice but advancing our practice privileges to meet the movement and performance needs of society. As a component of my core values, I have always believed that action leads to solutions and inaction or apathy does nothing. This has led me to further believe, in physical therapist practice, we must maintain all we practice and attain all we should be. As a full-time clinician living these beliefs and witnessing the challenges in daily practice, I have found the best advocate for physical therapist practice is a practicing physical therapist. This has been the crux for my passion, sacrifices, and involvement for advocacy across the spectrum of physical therapist practice for over two decades.

From all this, I further believe our involvement in the foundation of our profession and membership is our practice and professional privilege. It is also our insurance. Those of you who know me have witnessed the level of passion I have brought not only to APTA and Sections, but also other PT focused organizations such as the American Academy of Orthopedic Manual Physical Therapists. Those of you who don't know me should know I have demonstrated this level of passionate advocacy in action through my involvement and leadership for 8 years as Practice Affairs Chair for AAOMPT, two years as AAOMPT Vice President, 6 years as Practice Chair for the Orthopedic Section, two years as Orthopedic Section Delegate, 5 years as APTA Manipulation Task Force Chair, and 6 years as a Director on the Board of Directors for APTA.

From the combination of my core beliefs and clinical and leadership experiences, I have developed a leadership style that is framed by outreach, appreciation, empathy, and collaboration. I mean what I say and act accordingly. As a leader I believe in reaching out to those I am responsible to. During deliberations I believe in recognizing and appreciating the opinions of others and then sharing my biases, opinions, and evidence for those views. I always provide my judgments and stay true to them; however, I am also always open to impressions and

opinions from others and upon appreciation of those opinions having better value. I am willing to change my mind. I believe a leader should listen to the crowd that they lead, value the crowd's opinions and needs, and make leadership decisions based on evidence for the best interest of the crowd, not based on their own personal biases.

As I alluded to in my candidates statement, from a practicing physical therapist perspective I believe we are now facing a new chapter in evolving physical therapist practice where physical therapists must be proactive, accountable, adaptable, and responsive to the new dynamic changes in society driven health care. Currently and throughout the immediate future, this will require physical therapists to:

1. attain *relative* practice identity and autonomy under conditions of collaboration,
2. adapt within integrated models of care,
3. define and adjust to alternative payment methods reconciling both severity and complexity,
4. reduce variance in practice,
5. validate physical therapist practice as a choice for added value in health care,
6. be recognized by society as a practitioner of choice as opposed to a service,
7. provide not only evidence-based care but cost-effective evidence, and
8. enhance solidification across the eclectic physical therapy profession and models of delivery with a futuristic view that will secure physical therapists identity and value.

As this malleable framing of health care evolves, I envision the Orthopaedic Section leading the advancement in clinical research, practice guidelines, and competency based education in orthopaedic practice. I am excited to be serving the Orthopaedic Section as your President during this next phase and look forward to working together as we continue to move the Orthopaedic Section and orthopaedic practice forward.



Well, they say when it rains it pours! At *Orthopaedic Practice* (OP), our submissions are at an all-time high. Don't misunderstand me. I am not complaining at all. This is a great problem to have. I am not sure why we have experienced such an uptick in submissions but I am hoping that interested authors feel that OP fits their needs and is a good place to share their physical therapy experiences. Past articles have been diverse and range from reviews to case reports. Also we have another upcoming faculty/student issue that will appear next issue. This will be our fourth faculty/student issue and we couldn't be more delighted. I think it is important to highlight this type of collaborative work at the university level. So if you are a faculty member, consider the possibility of taking over an issue to allow your students to see their hard work in print.

My message to authors who have submitted articles and are awaiting publication, please be patient. Unfortunately expanding the number of articles per issue and mailing beyond a quarterly period is cost prohibitive. Nonetheless please know that your work is valued, and we are doing our best to present it expeditiously and in a favorable light.

Our current issue has 5 interesting articles. In the first article, Gebhardt reminds us that signs and symptoms that appear to be of musculoskeletal origin may mask a more serious underlying pathology. This is

a timely article considering direct access and our emerging role in health care.

In the second article, Harper explains his use of intramuscular therapy (dry needling) for a 26-year-old male presenting with a chronic history of right lateral epicondylalgia. This topic, to say the least, does not lack for controversy.

McVay also gives us something to ponder as he offers examples of two patients who underwent anterior cervical discectomy and fusion and were treated with therapy that included the use of cervical traction. Well aware of the contraindications, he shares his experience and forces us to reexamine the validity of whether it is a risk or benefit.

Kelley investigates the link between plantar flexor weakness, chronic gait compensations, and low back pain in persons with Postpolio Syndrome. This is a somewhat different topic for OP, but I thought it was important since her sample size was substantial and she primarily sees this patient population.

Our final article reports the results of a study funded by the Orthopaedic Section. Davenport and colleagues present data from 6 subjects to determine the effect of ankle joint manipulation on corticospinal excitability, ankle dorsiflexion range of motion, and lower extremity function. This is an interesting article because it reminds orthopaedic therapists that the nervous system and skeletal system are not discrete entities.

As the editor I like articles that address both popular and controversial topics. I try to keep an open mind when deciding on whether the topic of an article should be considered. Debate on what appears in OP is ok. Sometimes physical therapists are so busy they don't really have time to just reflect on practice and banter with their colleagues or peers. Such reflection is an essential part of evidence-based practice. Physical therapists seem to be a very social bunch by nature. They like to compare notes, learn from each other and above all feel that what they are doing has both an art and science to it. I guess that is what makes the profession so unique! Patients comment on this all the time. The relationships that patients develop with their therapist are impressionable and most often long lasting.

My hope is that OP plays a small but important role in fulfilling your need to share and reflect on practice. So to those who have been authors, I express my sincere thanks for your decision to use OP as your vehicle of expression. For those who have never submitted, try it! The hardest part is writing the first sentence. After that, you are on your way.



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Paris Distinguished Service Award Lecture Opportunity from Imporunity

Michael T. Cibulka,
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The Paris Distinguished Service Award lecture was presented at the Combined Sections Meeting in San Diego, California, on January 23, 2013.

First thank you to all who helped in any way with my nomination packet for this award; I greatly appreciate it. Tonight I am going to talk about the many wonderful people I have had the chance to meet and become friends with and who have had a profound influence on my life and have shaped me into the therapist I am today. I am also going to share a bit of what I learned from them and from my patients in the last 35 years of my practice as a physical therapist.

I like to learn; one of my favorite things to learn is about new words and their origins and meanings. This peculiar interest of mine started with one of my professors at Washington University. The first day of class I heard two words I have never heard before; teleological and gestalt. Every day it seemed like I learned a new word in class. The class was my first ever measurement class that was taught by who else but Dr. Jules Rothstein. Jules' encyclopedic knowledge of words piqued my interest in learning etymology, not entomology (the study of insects). Etymology is the study of the derivation or origin of words. Like Jules I try to use etymology to stimulate my own students' learning where I teach at Maryville University in St. Louis. The first physical therapy class I teach in the program is Clinical Epidemiology. The class is taught in the first year of the Maryville program and nearly every student has no idea what Clinical Epidemiology even means. So I usually start off the class by explaining to my students how learning etymology can help them remember many of the anatomical names. For example, I ask them what clinical epidemiology means. "Clinical" comes from the Greek word "klinikos" meaning "bed," which implies that someone is not feeling well or is sick. "Epi," as used in the word epidermis, means

"upon." While "demos" is part of our politics with the word "democracy" that comes from Greek meaning "people" and finally "ology" as we all know means the "the study of." Thus Clinical Epidemiology means "the study of diseases upon people."

So why did I start with the quick etymology lesson? Because I am using this as a segue to my next word which is "eponymous." Eponymous comes from the Greek prefix "epi" that means "upon" and "onama," similar to the Latin word "nomen" meaning "name." When the two are put together, eponymous literally means "named after or name giver." The award I am receiving tonight is an eponymous award given in honor of the founder and first president of the Orthopaedic Section, Dr. Stanley V. Paris, PT, PhD, FAPTA. I think more than founding the Section, Stanley understood the need for specialization in orthopaedics within the broader field of physical therapy. Stanley, thank you for having the importunity and wisdom in starting the Orthopaedic Section nearly 40 years ago!

This great idea Dr. Paris had over 39 years ago, although an essential part of our professional success, was not likely a new idea. The medical profession had already started to split up their practices into clinical practice patterns like orthopaedics, obstetrics/gynecology, dermatology, and neurology along with an assortment of other specialties. Stanley's insight was that he saw the need (especially in manual therapy) as well as the opportunity and was wise enough to foresee the impact of specialization. Thus starting in 1967 and persisting until finally in 1974, the Orthopaedic Section was established. Physical therapists with an interest in Orthopaedics could now focus their practice, education, and research on the musculoskeletal system.

We have not stayed up with the pace of how medicine is practiced today. Today most orthopaedic surgeon's practice is divided up into regional body parts. Rarely do you see a "jack of all trades" orthopaedic surgeon any-

more; we now have hand surgeons, elbow and shoulder surgeons, spine surgeons, hip surgeons, and knee surgeons just to name a few examples. Should we as physical therapists follow this trend in medicine? One part of me says yes we should, the frequent phone calls I receive from hand surgeons asking if I am a certified hand therapist and then hearing that they will only refer their patient if I am a certified hand therapist substantiates this idea. We now already see some of the new physical therapy specialties with epithets like osteopractors, certified kinesiotapers, along with fill in the blank certified therapists. Are we losing our identity as physical therapists?

Much of the Orthopaedic Section's early growth occurred because of the many different regional groups around the country called Special Interest Groups. These small regional groups fostered and entertained continuing education courses on the weekend, had monthly meetings, and helped unify and gave the inchoate Orthopaedic Section the foundation it needed. In St. Louis we had the St. Louis Orthopaedic Special Interest Group. This group was led by a group of therapists many who worked for Al Amato. Al hired the best therapists he could find including a number of my mentors and later colleagues: Betty Sindelar, Gail Baudendistel, Mary Neimeyer, Judy Woehrl, Bernie Gruzka, and Nancy Potter. The St. Louis Orthopaedic Special Interest Group sponsored many weekend continuing clinical education courses in orthopaedics. Interestingly these regional special interest groups were an important component of the Section. These groups helped garner new members and provided a place to grow locally. That is where I got my start in becoming an orthopaedic physical therapist.

The first course I attended was a course on the sacroiliac (SI) joint given by "Rocky" Mariano Rocabado. He taught the classic SI scheme that was based mainly on the Michigan State osteopathic approach. This

included learning about such things as pubic dysfunctions (anterior and posterior shears), unilateral anterior and posterior innominate tilts, innominate inflares and outflares, and sacral torsions, flexions, extensions, and rotations. I immediately tried to incorporate the new ideas and techniques into my practice. However, I often felt unsure of my evaluations. Many of the exams overlapped and I often could not palpate differences in sacral sulcus depth. I often wondered how such a simple joint, that supposedly has only 1° to 2° of motion, could create all of these different problems.

It was also about this time that a brand new Masters of Physical Therapy program was starting up at Washington University in St. Louis. Also, a new program director was being introduced; his name was Steven J. Rose. Steve brought new faculty members and a group of his former NYU-Buffalo students with him including: Jules Rothstein, David Sinacore, Anthony Delitto, Ronna Kaiser, Marilyn Gossman, George Stephens, and later Tom Mayhew. This group along with the existing faculty of Shirley Sahrman, Barbara Norton, Susie and Bob Duesinger, Eddy Coyle, and Jim Hagberg was already quite an impressive group. Steve also invited an old colleague of his, who currently just happened to be in St. Louis going to school at the time; this was Richard "Dick" Erhard.

I needed no introduction to Richard "Dick" Erhard. I must have read his seminal publication that he co-wrote with Richard "Rick" Bowling in *Orthopaedic Physical Therapy Practice*¹ at least 20 or 30 times, maybe more. Dick taught the orthopaedic masters class at Washington University. Because of my own recurrent back pain, I became interested in the low back. I have had low back pain problems since high school; I never had it treated back then. I just lived with it like most people do. The pain was always on the left side, never the right. During class one day, Dick examined my back and found out that I had a left posteriorly rotated innominate. The left PSIS was lower than the right during sitting, the left leg appeared shorter when lying supine and elongated when I sat up. Besides the location of pain, those two tests were enough for Dick to make the diagnosis. But what really confirmed the diagnosis is that when Dick manipulated my sacroiliac joint (SIJ), my back pain always vanished. Dick was a magician!

I immersed myself into reading and doing everything I could to learn about this mysterious joint, and when I get interested

in something, I pour myself into learning all I can. In fact I was so intent on learning all that I could, one of my colleagues gave me a new sobriquet; he called me "the zealot" because of my persistence in learning all I could about the SIJ.

One day when I was having some significant left sided low back pain, Dick checked my pelvis and then tried to manipulate my recalcitrant left posterior innominate but was unsuccessful, so he walked around to the other side and manipulated my right SIJ. That did the trick, my pain immediately subsided and on rechecking all of my signs of SIJ dysfunction, they were all absent. But I wondered why? Rocky and the osteopaths taught me that the innominate bones only move unilaterally providing a unilateral anterior or posterior tilt. If my right innominate was posteriorly tilted, how could manipulating the right SIJ fix my left side? That was a seminal moment for me. My only conclusion was that the left and right SIJ must somehow move together and the two joints are not independent of each other as I first learned.

This important experience piqued my interest. I was excited to learn this; however, when I walked in to Dr. Rose's office, he discounted my idea by saying fine but you need to "show me the data." So with Steve's encouragement, I embarked on a study to try and test this hypothesis. So I came up with a study to try to test the hypothesis that the innominate bones in SIJ rotate unilaterally. I devised a caliper that would measure innominate bone tilt (anterior/posterior tilt) and then operationally define if the SIJ dysfunction was present or not. I used a stringent criterion of having 3 of 4 SIJ tests positive for sacroiliac joint dysfunction to be present. However, unlike some other studies performed later, each tests had to agree with each other. That only made sense to me, what good is a test where the results of each specific test don't agree with each other? For example at least 3 of the 4 tests must have suggested a left posterior innominate tilt, not just testing to see if each individual SIJ test was reliable or not like Nancy Potter and Jules did previously. That's not how a clinician thinks or practices.

After finding patients with SIJ dysfunction, they were randomly assigned into two groups, one where their SIJ was manipulated and one not manipulated. A blinded measurer took innominate tilt measurements before and after the treatment. Those in the non-manipulated group showed no change in innominate tilt; while all 10 patients in

the manipulated group, the innominate tilt changed. However the innominate tilt did not just occur on one side as I would have expected if only a unilateral dysfunction existed, but on both left and right sides. Both of the innominate bones lost half of their tilt--the anterior tilted one was now more posterior and the posterior more anterior, and both were now symmetrical. This phenomenon occurred in all 10 subjects! My conclusion is that in SIJ dysfunction the two innominate bones tilt in an equal yet opposite direction, one tilting posteriorly the other anteriorly. I thought maybe I was on to something.

Well it did not take me long to figure out that a manipulation would only give me temporary relief. Yes it would help relieve my back pain for a week maybe even a month, but it would always come back. I wondered why?

Serendipity is perhaps the greatest motor of inventions! At least that is what I believe. My seminal serendipitous experience happened when I casually noticed that I often crossed my left leg over my right when sitting, never the right over the left. I never really thought of it before then but by crossing my leg in this way, I place my left hip at the end range of hip external rotation. I thought how often do I do this? That prompted me to have one of my colleagues assess my hip range of motion. They were not at all equal. My left hip had much more external rotation than my right hip, and my left hip internal rotation was much less than my right hip. How often did I cross my leg? I soon had someone else keeping track of how often I crossed my left leg. Funny that the answer was, every time I sat down! I now knew I had an egregious habit. I wondered if this habit could in any way be related to my recurrent SIJ problem I was having. This provided the fuel for my next study.

The next study I did provided the data that showed that patients with hip rotation asymmetry often, but not always, have SIJ dysfunction. Asymmetrical hip rotation, where external rotation exceeds internal rotation, also creates hip muscle length and strength asymmetry. In my case, the left external rotation muscles were shortened and the left internal rotation muscles lengthened. Kendall's classic book on Muscle Testing taught me long ago that short muscles can create a deformity and long muscles allow a deformity. Since muscles are vectors, they have magnitude and direction; my shorter left external rotation muscles were likely part of my problem for why I had a recurrent left posterior innominate tilt. By

avoiding excessive hip external rotation and working on balancing range, muscle length, and strength, I no longer have recurrent low back pain.

My college kinesiology class taught me the important relationship between the hip, knee, and the foot and this concept was again rekindled and advanced by two peripatetic and knowledgeable physical therapists--Tom McPoil and Gary Hunt. After taking their foot course, I started to take notice that patients with plantar fasciitis also often had an increase in unilateral hip external rotation on the same side. External rotation of the femur at the hip can create medial column loading of the leg and foot; of course, why shouldn't they be related?

I thought how could I call myself a spine physical therapist or SIJ specialist? I believe that we as physical therapists are in a unique position; we are trained to look at the body as a whole, not just its individual parts! Our greatest strength as a physical therapist is that we, more than any other health professional in the world, are taught to understand how movement of one part of our body can affect movement at adjacent parts of our body. This to me is the essence of our nature as physical therapists; our most important scope of practice is the understanding of the complex interdependent relationship of the individual body parts and how they contribute to the function of the body as a whole. This to me is what sets us apart from everyone else. I believe our *true genius lies not just in our ability to diagnose a torn ligament, skillfully manipulate a hypomobile joint, or detect a subtle weakness causing joint dysfunction; it is how we understand and solve the complex pathokinesiological interdependent problems that develop within our body and fix them not with drugs or surgery, but naturally through exercise.*

Before I finish I would like to thank some of my mentors, colleagues, and friends who have helped me so much along the way.

At the University of Missouri, I had a great faculty including: Gerry Browning, Marilyn Sanford, Jim Martin, Dave Horrell, Carmen Abbott, Connie Hayden, Ruth Clark, and many more. I also had wonderful classmates at the Zou; many that I still stay in touch with and consider them some of my closest friends.

I would like to thank my colleagues at Maryville: Chuck Gulas, Michelle Unterberg, Jack Bennett, Sandy Ross, Joni Barry, Patty Naylor, Konrad Diaz, Pradip Ghosh, Ann Fick, Rachel Rose, and Oladie Sangoseni.

I also would like to thank all of those who worked with me throughout the years and have served the Orthopaedic Section well including: Annette Iglarsh, (the first Orthopaedic Section President I served under), John Mederios, Dorothy Santi, my partner back then Elaine Rosen (we were co-directors in two new positions that took the place of the last Member-at-Large position--Stan Paris), Nancy White, Bill Boissonault, Joe Farrell, Ann Grove, Gary Smith, Lola Rosenbaum, Jay Irrgang, Tom McPoil, Joe Godges, Bill O'Grady, Steve Clark, Bob Rowe, Ellen Hamilton, Lori Michener, Kelly Fitzgerald, Susan Appling, Jonathan Cooperman, Chris Hughes, and many more.

Special thanks to my special consultant's Jim Dunleavy, Annette Iglarsh, Pam Duffy, and Bob and Jan Richardson.

And to the wonderful staff at the Orthopaedic Section's office: Terri DeFlorian, Tara Frederickson, Sharon Klinski, Kathy Olson, and Carol Denison, a small group of very dedicated employees that work very hard to serve all of us. Thank you!

In closing I would like to include one of my favorite sayings. I learned of this aphorism

because a copy of it always hung on Steve Rose's office wall. Every time I would visit Steve in his office I would read this and the words gave me encouragement, it was taken from President Calvin Coolidge.

The aphorism goes like this:

Nothing in the world can take the place of Persistence. Talent will not; nothing is more common than unsuccessful men with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent. The slogan 'Press On' has solved and always will solve the problems of the human race.

I look forward to Stephen McDavitt leading the Orthopaedic Section in "Pressing On" in search of excellence as we *move forward!*

Thank you and God bless.

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Pathological Cause of Low Back Pain in a Patient Seen through Direct Access in a Physical Therapy Clinic: A Case Report

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ABSTRACT

Background and Purpose: A 66-year-old male presented directly to a physical therapy clinic with complaints of low back pain (LBP). The purpose of this case report is to describe the clinical reasoning that led to a medical referral for a patient not responding to conservative treatment that ultimately led to the diagnosis of multiple myeloma.

Methods: Data was collected during the course of the patient's treatment in an outpatient orthopaedic setting. **Findings:** The patient's LBP was caused by a pathological vertebral fracture secondary to multiple myeloma.

Clinical Relevance: This case illustrates the need for physical therapists to be aware of signs and symptoms that appear to be of musculoskeletal origin, but mask a more serious underlying pathology.

Conclusion: Autonomous practice provides physical therapists with increased access to patients prior to being seen by a physician. Entry-level physical therapy and postprofessional education should continue to emphasize differential diagnosis and screening for medical conditions in which physical therapy may not be appropriate.

Key Words: medical screening, differential diagnosis, clinical decision making

INTRODUCTION

In the United States, low back pain (LBP) is the most common reason that patients are being treated in outpatient physical therapy settings.¹ In fact, more than a quarter of patients currently undergoing care in these settings are being treated for LBP.¹⁻³ Non-specific back pain has been ranked as the second leading cause of short-term disability in persons aged 45 to 65 years.^{3,4} In classifying LBP, Jarvik and Deyo⁵ created 3 differential diagnostic categories: (1) mechanical LBP (eg, degenerative disk disease and fracture), (2) nonmechanical spinal conditions (eg, neoplasia, infection, inflammatory arthritis), and (3) visceral disease (eg, prostatitis, endometriosis, pyelonephritis). Physi-

cal therapists primarily treat patients that fall into the mechanical LBP category, but need to be aware that although infrequent, 7% to 8% of LBP complaints are due to nonmechanical spinal conditions or visceral disease.⁵ Malignant neoplasms are the most common of the nonmechanical spinal conditions causing LBP, but comprise less than 1% of all total LBP conditions.⁶

In this era of autonomous practice, increasing numbers of physical therapists are treating patients through direct access. Currently, there are 47 states that allow some form of direct access in which the patient does not require a physician's referral to be evaluated or treated by a licensed physical therapist.⁷ Having not been screened for underlying medical pathologies, it is important for the physical therapist to be aware of signs and symptoms that would indicate further examination by a physician.⁸ Screening is defined by the Commission on Chronic Illness as "...the presumptive identification of unrecognized disease or defect by the application of tests, examinations, or other procedures which can be applied rapidly to sort out apparently well persons who probably have the disease from those who probably do not. A screening test is not intended to be diagnostic. Persons with positive or suspicious findings must be referred to their physicians for diagnosis and necessary treatment."⁸ In regards to LBP, screening should be used to identify the 7% to 8% of patients who are not suffering from the mechanical LBP as described by Jarvik and Deyo.⁵ Physical therapists are usually not privy to radiologic or laboratory testing and must base their screening on clinical presentation.⁸ It is of utmost importance that physical therapists know the signs and symptoms and the combinations of signs and symptoms that indicate a serious problem requiring referral.^{3,8}

Recognizing serious disease pathology is sometimes difficult due to the fact that the symptoms initially present as musculoskeletal dysfunction and are often vague and

sporadic.⁹ Deyo and Diehl⁶ found that the 4 clinical findings with the highest positive likelihood ratios for detecting the presence of cancer in LBP were: a previous history of cancer, failure to improve with conservative medical treatment in the past month, an age of at least 50 years or older, and unexplained weight loss of more than 4.5 kg in 6 months (Table 1).¹⁰ In Deyo and Diehl's⁶ study, they analyzed 1975 patients that presented with LBP and found 13 to have cancer. All 13 of those patients had at least one of the above clinical findings. They also found that the absence of all 4 of these clinical findings will confidently rule out neoplasms.¹⁰ It is important for physical therapists to be aware of these findings as they relate to malignant LBP, so that they are able to recognize the need for referral and further diagnostic medical testing.⁸⁻¹⁰ The purpose of this case report is to describe the clinical reasoning that led to a medical referral for a patient not responding to conservative treatment of his LBP that ultimately led to the diagnosis of multiple myeloma.

DIAGNOSIS

History

The patient was a 66-year-old male who presented with LBP that started insidiously one week prior to his evaluation while playing golf. The patient was not assessed by another medical practitioner prior to his seeking physical therapy treatment. Upon interview, the patient reported that he was relatively healthy with no report of previous or current illnesses. He did remark that he had a left rib fracture 3 years ago after reaching up to a shelf. The patient was not currently on any medications. The patient was a right-handed golfer who complained of nonradiating, right-sided low back pain that was activity dependent. The patient did not fill out a body diagram, but was able to point to the area of his right flank extending distally to the superior border of his right iliac crest as his pain area.

The patient is a successful businessman

Table 1. Diagnostic Accuracy of Findings from the History in Patients with Cancer Causing Low Back Pain (data provided by Deyo and Diehl⁴). Likelihood ratios were calculated from sensitivity and specificity values provided by Deyo and Diehl.⁴ Reprinted with permission from the *J Orthop Sports Phys Ther.*¹⁸

	Sensitivity	Specificity	Positive LR	Negative LR
Previous history of cancer	0.31	0.98	14.7	0.70
Failure to improve with a month of conservative therapy	0.31	0.90	3.0	0.77
Age > 50 y	0.77	0.71	2.7	0.32
Unexplained weight loss	0.15	0.94	2.7	0.90
Duration of pain > 1 mo	0.50	0.81	2.6	0.62
No relief with bed rest	>0.95	0.46	1.8	0.11
Insidious onset of symptoms	0.61	0.58	1.1	0.67
DOI: 10.2519/jospt.2005.2105				

who owns and operates his own company. He admittedly takes pride in his overall health and fitness.

Physical Examination

On initial evaluation, the patient ranked his pain as a 6/10. The pain at its best was a 4/10 and at its worst was an 8/10. Pain was only aggravated when playing golf. Due to the patient's acute pain complaints, a limited physical exam was performed. With lumbar spine active range of motion, the patient was noted to have 25% lumbar flexion with a reverse lordosis. His flexion was limited secondary to pain. Passive range of motion (PROM) of his hips revealed full flexion, extension, and external rotation. His right hip had 20° of internal rotation, while his left had 15°. He presented with an antalgic, and a pronated gait pattern associated with bilateral pes planus. His right quadratus lumborum (QL) and bilateral gluteus medius, gluteus maximus, and multifidus were found to be tender upon palpation. He tested negative on his performance of the straight leg raise, crossed straight leg raise, and slump tests.

Interpretation of the History and Physical Exam

Due to the patient's relatively unremarkable medical history and mechanism of injury, he was diagnosed with QL spasming secondary to incorrect motor control patterns in the golf swing resulting in over facilitation of this muscle. The referral pain pattern of the ipsilateral QL is almost identical to the patient's reported pain complaint.¹¹ It was determined that his pronated gait pattern and lack of gluteal strength were

contributing to this mechanical dysfunction at the lumbar spine. His dysfunction was determined to be primarily mechanical because his symptoms were activity-dependent and were precipitated by a specific event that is known to cause similar LBP complaints with comparable deficits in hip internal rotation.^{9,12,13} His prognosis was determined to be very good with a decrease in his pain complaints and return to function within two to 3 visits.

Physical Therapy Intervention

Table 2 provides the relative dates and course of physical therapy treatment. On the day of his initial evaluation, the patient consented to dry needling (DN) for treatment of active myofascial trigger points in his right QL. The QL was selected secondary to its referred pain pattern and the patient's right QL tenderness to palpation.¹¹ Dry needling has been found to be an effective modality for the treatment of active myofascial trigger points.^{14,15} At his second treatment session the patient reported decreased pain, but then he sneezed and his symptoms flared up again. At that time, he presented with significant increased pain and reported pain with transitions such as supine to sit or supine to sidelying. The patient was treated again with DN in his right QL and bilateral multifidus secondary to the fact that he reported good results after the first treatment. In his third treatment session, the patient reported that the DN only helped minimally and he was now having difficulty donning his shoes and socks. On exam, it was noted that he had a significant catch on returning from lumbar flexion, which was still limited to approximately 25%. Maitland¹⁶ has reported that

rotational mobilizations of the lumbar spine are effective in treating lumbar conditions with unilateral symptoms. This approach was applied to the patient and 3 bouts of grade 2 and 3 lumbar rotational mobilizations were applied to his right lumbar spine. McKenzie theorists propose that repeated directional movements will help to centralize symptoms that are discogenic in nature.¹⁷ Secondary to the patient's "catch" when returning from flexion, repeated extension and prone push-ups were performed. The patient reported decreased pain at the end of the session and was prescribed prone push-ups for home. The patient was also referred to an orthopaedist for pain management. Between the patient's third and fourth physical therapy visit, he was assessed by an orthopaedic physiatrist who specializes in spinal disorders. The patient was prescribed a Medrol (Methylprednisolone) dose pack for inflammatory pain relief. The doctor reported that the patient's pain was probably diskal and to report back for an MRI if the symptoms persisted or did not resolve. After starting on the medications, the patient came to his therapy session with reports of decreased pain. The therapy session focused on hip hinging with forward flexion to correct his reverse lordosis, and the patient was able to accomplish this with minimal pain by the end of the session. He did display a reverse Gower's sign (using his hands to assist) when going into flexion, but was able to get into full flexion. In treatments 5 through 8, the patient's pain continued to diminish, but complaints of pain when attaining supine and bending over to brush his teeth were still there. Pain was also present at approximately 10° to 20° of lumbar flexion, but he was able to achieve full flexion with corrected mechanics and the occasional reverse Gower's sign. The treatment sessions focused on getting him out of his lordotic posture, strengthening his gluteal muscles, and improving walking and hip flexion mechanics. He continued to report no change in pain with DN. Treatments included DN, mobilization with movement into flexion, gluteal re-education, Low-Dye taping, and lumbar mobilizations. The focus of treatment shifted from diskal in nature to facet joint impingement. The patient stopped responding to DN (which eliminated myofascial causes of pain) and repeated movements (which eliminated diskal origins). It was thought facet hypomobility was precipitating the patient's pain as it mimicked facet joint referral from L1-5.¹⁸ Treatment 9 occurred exactly one month

Table 2. Dates of the Patient's Visits and Interventions. Treatment Sessions Spanned Over the Course of One Month.

Date	Medical and Physical Therapy Visits	Physical Therapy Interventions
Day 1	Initial physical therapy visit.	R QL IMT secondary to referred pain pattern and R QL tenderness upon palpation.
Day 2	Second physical therapy visit.	R QL and bilateral multifidus DN secondary to positive response after the first treatment session.
Day 5	Third physical therapy visit and referral to orthopedic physiatrist.	Rotational lumbo-sacral mobilizations and repeated extension and prone-push-ups.
Day 6	Fourth physical therapy visit.	Neuromuscular re-education for hip hinging
Day 9 – Day 28	Fifth-ninth physical therapy visits.	Swayback postural corrections, gluteal strengthening, gait mechanics, IMT, mobilizations with movement, Lowe-Dye taping, and lumbar spine mobilizations.
Day 30	Tenth physical therapy visit and second referral to orthopedic physiatrist.	Referral to physiatrist.
Abbreviations: R, right; QL, quadratus lumborum; IMT, intramuscular manual therapy; DN, dry needling		

from the patient's initial evaluation and the physical exam findings from the initial visit had remained unchanged. Despite the interventions, the patient's condition gradually worsened. He was still having difficulty with transitions and reported he was having difficulty getting up off the floor. He was asked to attain quadruped and he had significant difficulty getting into this position. In quadruped, the patient was noted to be "shaking" in an effort to maintain this position. The patient demonstrated this shaking in previous visits, but never as pronounced as it was at that point. The patient commented on how the shaking had gotten so severe that he was unable to walk down a flight of stairs the previous day. He also made a comment that because of the pain he had been in over the last month, he had lost approximately 20 pounds. At this point the patient's overall lack of progress within a normal expected time frame for a musculoskeletal condition, as well as his severe weakness and shaking and extreme weight loss led the treating clinician to refer the patient back to the orthopaedist for further evaluation. Upon referral to the orthopaedist, a pathologic fracture of L4 was found. The patient was then referred to the hematology and oncology department who later diagnosed him with multiple myeloma.

DISCUSSION

This patient case offers an opportunity to discuss a LBP scenario that initially presented

with mechanical characteristics, but was in fact masking a more serious condition. This case also displays the necessary communication that needs to occur between the physician and the therapist. Multiple myeloma's first symptom is often musculoskeletal and so at first glance, this patient was misdiagnosed by the physician as well.¹⁹⁻²⁴ It was not until the second appointment with his physician, after speaking with the therapist, that the patient's condition was then considered more pathological than mechanical LBP.

Pathology

In 2000, 13,600 new cases of multiple myeloma were diagnosed and more than 11,200 registered deaths in the United States resulted from this disease.²³ This cancer occurs most commonly in patients between the ages of 50 to 70 with the median age being 65 years.^{20,21,23} Multiple myeloma is a cancer of the bone marrow in which the plasma cells proliferate uncontrollably.²² Osteoclast secreting factor is produced by the plasma cells, which then stimulates osteoclast activity.²²⁻²⁴ The increase in osteoclast activity contributes to the high rate of pathologic fractures seen with this disease.^{23,24} Bone pain, from pathologic fractures, is the most common (80%) and one of the first symptoms in persons diagnosed with this cancer.^{20,23,24} Due to the high content of bone marrow, the spine, pelvis, and skull are the most commonly affected.²¹ Bone destruction can become so severe that

vertebral fractures/collapse occur with possible spinal cord compression.²⁴ The bone pain associated with this cancer is aggravated with movement and eases with rest.^{20,24} However, rest does not completely relieve the patient of his symptoms as would be evident in a true musculoskeletal condition.²⁰ Most patients will report that their pain is diminished in the morning, but increases throughout the day.²⁴ There is significant renal involvement with this cancer and as a result, patients will suffer from weight loss and weakness.²³ In fact, the triad of weakness, fatigue, and bone pain are the hallmarks of a patient presenting with multiple myeloma.¹⁹ Even though this disease is incurable, early recognition is important as severe skeletal deformities can result if the rapid destruction of bone is not halted.²² Unfortunately, the prognosis for this disease is poor with remission in those receiving treatment lasting approximately 3 years and survival, 6 years from diagnosis.²¹ It is noted that 5,630 people die from this disease every year, accounting for 2% of all cancer deaths per year.²²

Low back pain is oftentimes considered an advancement of cancer, yet it is still imperative to diagnose the person as early as possible so that disease-specific interventions can be started.⁶ The physical therapist needs to be aware of the patient's signs and symptoms as well as their response to treatment over time as the patient progresses.¹⁰ As the patient in this case progressed, he became a nonresponder to treatments that have proven to be effective for the musculoskeletal conditions in which they were intended. He did not respond to (1) DN as a true myofascial pain patient would, (2) repeated movements as a diskal condition would, or (3) mobilizations as a facet limitation would.

It is thought that the patient's rib fracture 3 years prior to this most recent episode was actually the first pathologic fracture. The ribs and thoracic spine are one of the first areas in which pathologic fractures secondary to multiple myeloma are seen.²⁰ The patient initially sought treatment for what could have been muscle spasming. Those muscles were released on the first visit, and with the vertebrae strength already being diminished, their stability was now taken away and unable to withstand a forceful sneeze. The patient in this case did have focal pain with specific movements (secondary to the pathologic fracture), with the most aggravating being attaining a supine position. Once the patient was in supine, he did achieve some pain relief, but not significant. Over time,

the patient displayed the triad of weakness, bone pain, and fatigue as noted by Batsis and McDonald.¹⁹ Using the 4 clinical guidelines established by Deyo and Diehl,⁶ the patient fulfilled 3 of the 4, except for a previous history of cancer. The combination of these clusters of symptoms is what prompted the referral back to the physician. Having a good relationship with the referring physician was integral in having this patient diagnosed properly. The therapist was able to communicate with the doctor immediately and have the patient re-evaluated quickly. The patient discussed in this case underwent a year of treatment and has been in remission for the last two years. Other than adverse effects of the cancer treatment, he is asymptomatic. Being able to report significant findings to the physician in a collegial atmosphere did enable the patient to receive the most optimal care possible.

CONCLUSION

This case illustrates the importance of physical therapists correctly identifying the signs and symptoms of a serious pathology presenting as a mechanical musculoskeletal disorder. This case report provides an example of how signs and symptoms should guide the therapist to seek referral for the patient when further medical testing is warranted. With therapists having direct access to patients without prior medical referral, there is an increased responsibility to effectively screen patients for more serious pathology and promptly refer if warranted.

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1st Annual Orthopaedic Section Meeting

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PROGRAM OBJECTIVES

1. Meet, discuss, and learn with the experts in lumbosacral and lower quarter musculoskeletal function and rehabilitation.
2. Experience advanced hands-on clinical skill acquisition in small learning lab groups.

AT THE CONCLUSION OF THIS CONFERENCE, ATTENDEES WILL BE ABLE TO:

1. recognize and implement strategies and interventions for effective, standardized evidence-based treatment of the lumbar spine and lower extremity conditions using the treatment based classification system and the ICF model;
2. understand, recognize and implement a more standardized, quality-improvement based approach for the treatment of low back pain;
3. incorporate interviewing, counseling and patient education strategies to address the cognitive behavioral disorders commonly seen with LBP;
4. identify and incorporate appropriate thrust manipulation techniques and use of motor control training exercises for patients with LBP;
5. understand and perform treatment for the lumbar spine using the movement systems impairment approach;
6. recognize, assess and understand the psychosocial factors, compensation strategies and published guidelines that can influence rehab outcomes in LE conditions;
7. perform and interpret special tests, exam findings and guidelines for the hip and OA of the LE in order to implement an optimal treatment plan to include manual therapy and motor performance; and
8. clinically differentiate plantar and posterior heel pain and perform evidence-based interventions.

Program Information

THURSDAY, MAY 2, 2013

Opening Reception & Keynote Presentation: 6:00 PM – 9:00 PM

The Paradox of Autonomy: Demonstrating Value in a Post Health Care Reform World

Presenter: Justin Moore, PT, DPT, Vice President, APTA Public Policy, Practice, and Professional Affairs Dept.

FRIDAY, MAY 3, 2013

Daily Schedule: 8:00 AM – 5:00 PM

General Session 8:00 AM – 10:00 AM:

Implementing Evidence-based Standards in Low Back Pain Care

Presenters: Anthony Dolitto, PT, PhD, FAPTA; Julie Fritz, PT, PhD, ATC; James Irgang, PT, PhD, ATC, FAPTA

Concurrent Breakout Sessions:

** On Friday, four concurrent breakout sessions will be offered. The registrant will attend three out of four breakout sessions following the morning general session, based on order of preference indicated on the registration form. Note: space is limited, and therefore the attendee's breakout session assignments will be given on a first-come, first-serve basis.

Session 1: Education and Counseling Strategies for Patients with Low Back Pain and Related Anxiety, Depression, or Generalized Pain

Presenter: Joseph Godges, DPT, PT, MS, OCS

Session 2: Thrust Manipulation Skills for the Lumbar and Lumbosacral Spine

Presenter: William O'Grady, PT, DPT, OCS, FAAOMPT

*** This breakout session is for physical therapists with evidence in prior instruction in HVLA techniques.

Session 3: Lumbopelvic Motor Control: Moving Evidence into Action

Presenter: Deydre S. Teyhen, PT, PhD, OCS

Session 4: Assessment and Treatment of Movement System Impairments in People with Low Back Pain

Presenter: Linda Van Dillen, PT, PhD

SATURDAY, MAY 4, 2013

Daily Schedule: 8:00 AM – 5:00 PM

General Session: 8:00 AM – 10:00 AM
Factors Influencing Rehabilitation Outcomes in Lower Extremity Conditions

Presenters: Terese Chmielewski, PT, PhD, SCS; Marcie Harris Hayes, PT, DPT, MSCI, OCS; Bryan Heiderscheit, PT, PhD

Concurrent Breakout Sessions:

** On Saturday, four concurrent breakout sessions will be offered. The registrant will attend three out of four breakout sessions following the morning general session, based on order of preference indicated on the registration form. Note: space is limited, and therefore the attendee's breakout session assignments will be given on a first-come, first-serve basis.

Session 5: Hip Techniques

Presenter: Keolan Enseki, PT, SCS, OCS

Session 6: Evaluation and Treatment Considerations for Lower Extremity Osteoarthritis

Presenter: G. Kelley Fitzgerald, PT, PhD, FAPTA

Session 7: Plantar and Posterior Foot Pain: Focus on Plantar Fasciitis and Achilles Tendinopathy

Presenter: Deb Nawoczenski, PT, PhD

Session 8: Evidence-based Evaluation and Treatment of Anterior Cruciate Ligament Injury in Active Individuals

Presenter: Lynn Snyder-Mackler, PT, ScD, SCS, FAPTA

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Intramuscular Manual Therapy after Failed Conservative Care: A Case Report

Brent A. Harper, PT, DPT, DSc

Assistant Professor Radford University, Radford University, Roanoke, VA

Disclaimer: Before performing intramuscular manual therapy in the state in which you are licensed to practice physical therapy, be sure to check with and abide by your state board regulations and state practice acts regarding the implementation of intramuscular manual therapy/dry needling.

ABSTRACT

Background and Purpose: During intramuscular manual therapy (IMT), an acupuncture needle is inserted into the skin and muscle. The direct mechanical stimulation may interrupt the pathogenic mechanisms of myofascial trigger points (MTrPs). The purpose of this study was to demonstrate the application and efficacy of IMT on a patient suffering from right chronic elbow lateral epicondylalgia. **Methods:** A case study of a 26-year-old male presenting with a 6-month history of right elbow pain who failed 11 conservative physical therapy sessions and previous site-specific acupuncture. The patient received 5 IMT sessions over 4 weeks. **Findings:** The patient had full symptom resolution, range of motion and strength, and avoided surgical intervention. At 6-month follow-up, the patient remained symptom-free. **Clinical Relevance:** Current treatment for lateral epicondylalgia lacks clinical consensus. This case demonstrated the significant impact of IMT as an adjunct treatment and supports its initial implementation as part of conservative care.

Key Words: dry needling, myofascial trigger point

BACKGROUND AND PURPOSE

Intramuscular manual therapy (IMT), previously called trigger point dry needling, has been performed by health care practitioners across the world including in the United States. Intramuscular manual therapy is an invasive procedure in which an acupuncture needle is inserted into the skin and muscle. Intramuscular manual therapy is within the scope of physical therapy practice across parts of the world; however, it is not typically taught in the entry-level physical therapy curriculum.^{1,2} The American Physical Therapy Association supports the use of

IMT by physical therapists.³ The American Academy of Orthopaedic Manual Physical Therapists executive committee has also defined IMT implementation to be within the scope of physical therapy practice.⁴ The Federation of State Boards of Physical Therapy performed a review regarding IMT and concluded the following opinion, “there is a historical basis, available education and training as well as an educational foundation in the CAPTE criteria, and supportive scientific evidence for including intramuscular manual therapy in the scope of practice of physical therapists. The education, training, and assessment within the profession of physical therapy include the knowledge base and skill set required to perform the tasks and skill with sound judgment. It is also clear; however, that intramuscular manual therapy is not an entry level skill and should require additional training.”^{5(p10,11)} In the United States, each state board defines its scope of practice for the physical therapy profession. Several states specifically support IMT within their scope of practice, some states say it is not in their scope, but most states have not addressed this specific procedure.¹⁻⁵ Despite political disagreements, there is mounting empirical evidence supporting the efficacy of IMT and its implementation by physical therapy professionals.

There are numerous manual procedures employed by physical therapists. Those most commonly used in the orthopaedic setting include mobilization, manipulation, soft tissue massage, myofascial release, trigger point therapy, and just recently in the United States, IMT. The mechanisms of action for standard manual therapy techniques are still under debate, although many theories have been proposed.⁶ Manual therapy techniques for myofascial trigger points (MTrPs) include transverse friction massage, trigger point pressure release, ischemic pressure, spray and stretch, muscle energy techniques, strain and counterstrain, soft tissue mobilization, myofascial release, and IMT. However, these manual therapies lack efficacy with few randomized clinical trials lacking adequately controlled manual treatment techniques with no statistical benefit found beyond the placebo effect.⁷

Systematic reviews completed on the effectiveness for dry needling in the management of MTrPs demonstrated positive results;⁷⁻⁹ however, few studies have been performed in regards to needle therapy and lateral elbow pain.⁹ The knowledge base for the pathophysiology and mechanism of action of needling is growing.^{1,10-14} The efficacy of needling procedures for myofascial or musculoskeletal pain has been examined in the literature.^{8,15,16} Researchers must continue to develop better studies to examine the efficacy and treatment outcomes for IMT. However, double blind and randomized placebo-controlled studies are difficult to design and implement due to the invasive nature of IMT. There is mounting empirical evidence supporting the effectiveness of IMT.^{1,7-9,16,35,37} Adverse events from IMT are usually minor and range from local soreness, bruising, bleeding, and pain to the major adverse event of pneumothorax. Despite the potential for adverse effects, the literature supports the safety of this procedure especially when performed by a trained clinician.^{8,17}

A MTrP is a hyperirritable spot with a hard hypersensitive palpable nodule located in a taut band within the muscle and which, when compressed or spontaneously provoked, causes a predictable pattern of pain in a distal region, called a referred pain zone.^{2,18,19} Myofascial trigger point formation can be the result of many factors, including trauma, overstress, overuse, psychological stress, and joint dysfunction.⁷ Myofascial trigger points are either active (symptomatic) or latent (asymptomatic) trigger points (TrPs). Active TrPs can spontaneously produce local pain, referred pain, or paraesthesia. Latent TrPs only cause pain symptoms when stimulated. The hallmark characteristics of MTrPs include motor, sensory, autonomic phenomena, and hyperexcitability of the central nervous system (CNS).^{2,19,20} This may lead to similar conditions such as spinal segmental sensitization,¹⁸ peripheral and central sensitization,^{2,10-12,21} or segmental facilitation; however, this alteration of pain-processing phenomenon is beyond the scope of this case study. Myofascial trigger points can further be classified as primary or

secondary TrPs. Primary TrPs develop from either acute trauma or chronic overload (indirect trauma) of a muscle. Secondary, or satellite, TrPs are caused by mechanical stress and/or neurogenic inflammation due to an active primary TrP.^{2,20} The criteria for MTrP identification may include: an exquisitely tender taut band within a muscle that refers in a familiar, predictable pattern when palpated causing a range of motion limitation when the involved muscle is stretched actively or passively; palpation may result in a “jump sign” in which the patient quickly withdraws from the palpation or in a local twitch when palpated using a “snapping” motion.¹⁹ One study¹⁹ questioned the reliability and validity of such physical examination findings since there is no referenced standard in evaluating MTrPs.^{7,19} However, a study examining the interrater reliability of MTrP diagnosis conducted by Gerwin et al²² supported the validity of MTrPs as a clinical finding when the examiners were appropriately trained on MTrP identification. Of note, the authors suggested that even when symptom provocation is negative with manual palpations, a local twitch response, pain reproduction, and referred pain are often elicited by placing a needle into the MTrP.²²

Myofascial trigger points have spawned numerous etiological theories and models.^{1,2,10-13,18,20,23,24} The predominant theory is that IMT produces a biochemical effect on the neurophysiological system within the spinal cord and CNS.^{10-14,25} When injury occurs to the soft tissues, the result is a unique pro-inflammatory cascade of cytokine biochemicals resulting in hypernociception. Pain and inflammatory mediators communicate central processing nociceptive signals and also alter conditions at the local site of tissue damage. These biochemical substances can lead to increases in local tenderness and pain, increases in blood flow and pressure, and hyper-excitation of mechanoreceptors and nociceptors in the local area of injury. This biochemical inflammatory cascade forces primary afferent neurons to be more susceptible to abnormal depolarization activity by various means, thus lowering the pain threshold. This increases the likelihood of aberrant pain perception in the CNS, which outlasts the original noxious peripheral irritant, resulting in peripheral and central sensitization. The biochemicals associated with inflammation, intercellular signaling, and pain are elevated in the immediate area surrounding an active MTrPs as well as in distant, unaffected muscle regions

or secondary (satellite) areas.¹⁰⁻¹² Despite this recent information, the exact cause and nature of MTrPs remains unclear.²⁰ Despite etiological uncertainty, the direct mechanical stimulation (irritant) caused by IMT may result in connective tissue remodeling and plasticity that then interrupts the pathogenic mechanism of MTrPs,¹⁰⁻¹² thus making a positive clinical effect.

Lateral epicondylitis, also known as tennis elbow or lateral epicondylalgia (LE), is described as pain at the lateral humeral epicondylar region in association with gripping activities and resisted wrist extension motions.^{19,26-28} Lateral epicondylalgia involves the forearm musculature, MTrPs are typically present, often in the extensor carpi radialis brevis (ECRB), extensor carpi radialis longus, brachioradialis, and extensor digitorum musculature.^{29,30} The incidence of the LE varies from 3% in the general population to 15% in those who have jobs requiring repetitive gripping.^{26,27} Other factors that should prompt a clinician to include LE in provisional differential diagnoses are a history of pain during repetitive lifting tasks, dressing activities, and shaking hands, or direct palpation that reproduces the primary pain complaints, weakness during grip strength testing, stretching of the wrist extensors, and static contraction of the ECRB muscle or third digit extension test on exam.^{19,26-28,31}

Current treatment for LE lacks clinical consensus and efficacy, in part due to the multiple treatment approaches identified in the literature. In addition, the literature has not identified a specific intervention as the most efficacious.^{26,27,32-34} A recent case study³⁵ demonstrated the effectiveness of IMT and manual therapy (mobilization-with-movement technique [MWM]) on a female patient with a 6-year history of LE who received IMT to the ECRB muscle and manual therapy (MWM) to the elbow during a 4-week time period. At the completion of the treatment, the patient denied pain during physical examination of the elbow and demonstrated improved pain-free grip strength, decreased pain on a visual analogue scale (VAS), and improved palpation tolerance as measured by pressure-pain threshold algometer. Further studies are needed for examining the efficacy of IMT treatment for LE.

The purpose of this case study is to demonstrate the application and efficacy of IMT on a patient suffering from chronic right elbow LE who failed prior conservative physical therapy care.

METHODS

Case Description

The patient was a 26-year-old male currently working as a tire technician with a 6-month history of right elbow pain and dysfunction from an initial injury of forced elbow flexion while lifting weights. The patient described his injury as being reported that he “tore his tendon around his lateral elbow.” Previous therapies rendered were chiropractic care and acupuncture with no benefit noted. Now, 6 months later, he presented with constant right lateral elbow pain ranging from 3-9 on a 10-point verbally reported numeric pain rating scale (NPRS) with complaints of wide-spread pain from his lateral elbow to the dorsum of his right wrist. The primary aggravating activities were gripping, lifting, twisting or screwing motions of the right elbow/forearm, primarily when using various standard wrenches and torque wrenches while at work.

Examination

Active range of motion or right wrist flexion was 70° with right elbow end-range-pain while left wrist flexion was 78°; right wrist extension was 58° with right elbow end-range-pain while left wrist extension was 66°. Significant widespread hyperalgesia was identified with palpation revealing symptom provocation at the right common extensor tendon (CET) attachment and the right ECRB muscle belly. Palpation revealed active trigger points in the ECRB, the brachioradialis, and the supinator resulting in the patient's right lateral elbow pain and an associated distal radiating pain. Palpation procedures implemented were flat palpation, pincer palpation, and finger pressure palpation, which revealed taut bands and multiple tender points in these muscles. These palpation procedures also resulted in a temporary exacerbation of the patient's primary local pain complaint and reproduced the patient's radiating symptoms in the right forearm. Passive stretch to the right CET (Mill's test) reproduced the right lateral elbow symptoms. Special tests included Cozen's test (lateral epicondylitis test) and the third digit extension test (lateral epicondylitis test) that both reproduced the patient's primary complaint of right lateral elbow pain. Grip testing of the left hand demonstrated strength of 90 lbs and the right hand of 55 lbs with severe pain reported in the right lateral elbow. Grip strength was assessed using a JAMAR hand held dynamometer (J.A. Preston Corp, Jackson, MI) and performed with the elbow kept at 90° with the forearm in

mid-supination/pronation position. Assessment of the radiohumeral and ulnohumeral joints did not provoke the patient's symptoms, but did result in grade 2 hypomobility when assessed for distraction. The patient had widespread pain and hypersensitivity complaints in the right elbow and forearm. This hyperalgesia presentation suggested a peripheral or central sensitization component in the patient's clinical presentation.^{21,36}

Intervention

The physical examination ruled out the cervical spine as a primary source of continued right lateral elbow symptoms since symptoms were not provoked with scanning assessment and the cervical-thoracic spine mobility testing was normal. The patient had a 6-month history of right lateral elbow pain, was seen by two other health care providers during that time without success, the symptoms were progressively worsening, and the orthopaedic physician was considering surgery if his condition did not improve. Previous lateral elbow injections by the orthopaedic physician were unsuccessful. The physician orders requested ultrasound, iontophoresis, and gentle stretching and strengthening exercise. The physical therapist requested from the physician the inclusion of manual therapy to the right lateral elbow. Manual therapy treatment focused on soft tissue mobilization to the CET musculature and humeral-ulnar and radial-humeral distraction at varied angles of elbow flexion, grade I to III.

The conservative physical therapy sessions, including ultrasound, iontophoresis, gentle stretching and strengthening exercises, and manual therapy to the right lateral elbow, were performed for the initial 11 treatment sessions. Despite improvement, the patient continued to report symptoms that increased with the level of physical activity at work and continued to limit his ability to perform his job and daily tasks using the right hand/forearm. Because of the unsatisfactory improvements, IMT, or dry needling, was added to the plan of care for the referring physician's signed approval, which was provided. The patient received a total of 5 IMT sessions. After the MTrPs were manually identified, the practitioner donned gloves and glove-covered hands were cleansed with antimicrobial hand sanitizer; the skin over the treatment area was cleansed with alcohol; a single use sterile acupuncture needle 50 mm (about 2 in) in length and 0.30 mm width was removed from the packaging; the needle was positioned over

the taut band of the trigger point and was inserted until a local twitch response was provoked; the needle was then pistoned up and down approximately 6 times before being removed (Figure 1). This process was repeated one to 3 times per identified MTrP per session (Table).

FINDINGS

Outcomes

The patient was seen a total of 20 times over a 3-month time frame. In order to evaluate treatment efficacy, the first 3 treatment sessions consisted of gentle stretching and strengthening exercises to the right elbow musculature in conjunction with ultrasound to the CET/ECRB. The patient's pain was now intermittent but consistently aggravated when at work where he had to change tires, and was exposed to very strenuous activity the majority of the day. The patient subjectively reported feeling 40% better out of a 100% scale, had negative signs on Mill's and Cozen tests, and had grip strength increase to 93 lbs before first reporting pain. However, the patient remained symptomatic with third digit extension test. Due to the chronicity of the patient's right elbow pain, the physically strenuous nature of his work, and the threat of surgical intervention, iontophoresis with dexamethasone was added to the treatment program. The patient received a total of 8 iontophoresis treatments to the right CET/ECRB region during which time exercises were continued. After 11 treatment sessions, approximately one month of treatment, the patient had made good progress with subjective reports of feeling 50% better out of 100% scale, intermittent pain rang-

ing from 0-4/10 NPRS, right grip strength at 104 lbs and left grip strength at 110 lbs, and now fluctuating negative/positive physical assessment findings of Mills' stretch test and Cozen's muscle test depending on his level of physical activity at work. Despite these gains, the patient still had a positive third digit extension test, positive trigger points remained in the right brachioradialis, CET/ECRB, and a significant amount of pain complaints while at work. The gains made in therapy were not significant enough to the patient to eliminate the possibility of surgical intervention and tended to fluctuate based on the level of physical activity required at work.

The physician was asked to approve the addition of IMT, or dry needling. Once physician approval was obtained approximately 5 weeks from starting therapy, written and verbal informed consent was acquired from the patient. Intramuscular manual therapy was added to the patient's plan of care on the twelfth treatment visit, which at this point, included ultrasound, therapeutic exercise, and manual therapy. The patient responded well immediately with no pain at rest, no pain with stretch (Mills' test), and no pain with the Cozen's test. These results mirrored those previously achieved using other treatment methods but occurred immediately following the first IMT session. The third digit test remained provocative, but less intense.

The patient received 5 sessions of IMT over a 4-week time period (see Table) and was administered to the following musculature: ECRB, brachioradialis, and supinator musculature. After the first two IMT treatment sessions, the patient reported feeling 65% to 75% better out of 100% scale, had no pain reports at rest or with his exercise routine, demonstrated negative physical exam tests with Mills' stretch test, Cozen's test, and third digit extension test, with right grip test at 135 lbs and left grip test at 110 lbs. However, positive MTrPs remained in the right ECRB and brachioradialis musculature. After 4 IMT treatment sessions (2 weeks), the patient presented with no pain and negative physical exam findings on Mills' stretch, Cozen's resistive test, and third digit extension test. Upon returning to the clinic 5 days later, he reported straining his right bicep while pulling a tire at work where he was using his entire body weight. This increased the aggravation to his right elbow mildly, but not significantly according to the patient. The fifth, and final, IMT treatment was then performed to the right brachiora-



Figure 1. Dry needle technique to the extensor carpi radialis brevis.

Table. Summary of Services Provided per Week

Treatment Week	Intervention
1st	Conservative Care
2nd	Conservative Care
3rd	Conservative Care
4th	Conservative Care
5th	Conservative Care & IMT IMT (Thur): ECRB & Brachioradialis
6th	Conservative Care & IMT IMT (Tue): ECRB & Brachioradialis
7th	Conservative Care & IMT IMT (Tue): Brachioradialis IMT (Thur): ECRB & Supinator
8th	Conservative Care & IMT IMT (Tue): Brachioradialis
9th	Conservative Care
10th	No Services Provided (16 days between treatment sessions)
11th	Conservative Care
12th	No Services Provided (12 days between treatment sessions)
13th	Discharge

dialis musculature, which resulted in mild and short lasting increased soreness to the region and an elevated sympathetic response of sweating. The patient returned one week later and despite reporting generalized right elbow soreness he again had a symptom-free physical exam. He did have hyperirritability to light touch in his right forearm and was given desensitizing exercises to address this symptom. When the patient returned two weeks later, he reported feeling much better despite working 65+ hours a week at work. Physical exam revealed negative testing for Mills' stretch test, Cozen's muscle test, and third digit extension test. No further IMT therapy was provided at this visit but the patient was encouraged to continue his home exercise program and continue gradual return to his gym exercises. The patient again returned after two weeks for final follow up assessment and discharge. At discharge the patient subjectively reported he felt 95% better out of a 100% scale, pain (Figure 2) was abolished with all work tasks or activities of daily living, he had returned to the gym, exercising without symptom exacerbation, but reported being out of shape since he had been unable to exercise for the past 9 months. Objectively, the patient's grip strength (Figure 3) on the right was 125 lbs without symptoms while the left was 105 lbs, passive stretch to the right CET/ECRB was full without symptom provocation and

no symptoms were noted with passive over pressure. Palpation was void of any trigger point provocation in the right forearm musculature, Cozen's test was without symptom provocation, and third digit extension test was without symptom provocation. Strength as determined by MMT was 5/5 without symptoms with all right elbow/wrist motions especially with right wrist extension and with right forearm supination concentrically and eccentrically. The patient achieved all goals, had full symptom resolution, and avoided any surgical intervention.

DISCUSSION

Current treatment for LE lacks clinical consensus and efficacy, in part due to the multiple treatment approaches identified in the literature. The literature has also not identified a specific intervention as most efficacious.^{26,32-34} The patient in this case report received a total of 20 physical therapy visits over a 3-month time period. Eleven conservative treatment sessions were implemented based on some evidence for efficacy found in the literature.^{26,32-34} However, minimal progress was made from this treatment approach, so the therapist decided to request approval for the addition of IMT (dry needling). The current literature cites IMT as a valid treatment approach for myofascial or musculoskeletal pain.^{8,15,16,35} Intramuscular manual therapy can be applied to the site

of involved region (MTrPs in muscles) and to the more proximal regions where shared nerve root innervation²⁹ is present. This leads to the hypothetical spinal cord mechanism of action regarding a decrease in symptoms.^{1,2,10-14,18,20,23-25} Despite evidence in the literature^{29-31,37,38} citing improvements with needling more proximal musculature with shared innervation, the IMT performed in this case study was only performed to the identified local MTrPs. It is unclear if the patient would have improved more readily had IMT been performed to more proximal structures,^{30,31,38} namely the C5-6 and C6-7 segmental multifidi of the cervical spine. The patient received IMT on only 5 of the remaining 9 treatment sessions until discharge. There were significant and dramatic changes in his physical exam and subjective reports immediately upon IMT application. These objective improvements progressed and were maintained over the 7-week time period after the final date IMT was performed. This progress allowed the patient to return to a symptom-free work status and avoid surgical intervention despite having a 6-month history of chronic LE with prior failure of chiropractic and acupuncture services.

The heightened pain response to the mechanical stimulation of palpation, ROM, and special testing was evident initially. After the IMT sessions, there was an apparent hypoalgesia effect that occurred and was verified by decreased pain complaints and decreased symptoms with palpation, stretch, and muscle contraction to the right wrist extensors. This may indicate that the direct mechanical stimulation (irritant) caused by IMT may have influenced the decreased sensitivity of mechanoreceptors and nociceptors that were previously heightened.^{10-12,21} Despite uncertainty on how IMT works at a biochemical and mechanical level,¹⁰⁻¹² it has been proposed that the clinical improvements may result in connective tissue remodeling and plasticity. This then interrupts the pathogenic mechanism of MTrPs,¹⁰⁻¹² thus having a positive clinical effect in pain, strength, ROM, and function.

Grip strength using a JAMAR hand held dynamometer is useful in identifying grip strength in patients with LE.³⁹⁻⁴¹ Pain related grip strength was used to monitor patient progress because it is considered the most sensitive outcome measure demonstrating progress in those with LE.²⁶ Multiple physical examination procedures, which may include pain assessments, grip strength tests, and manual evaluation tests, may be helpful

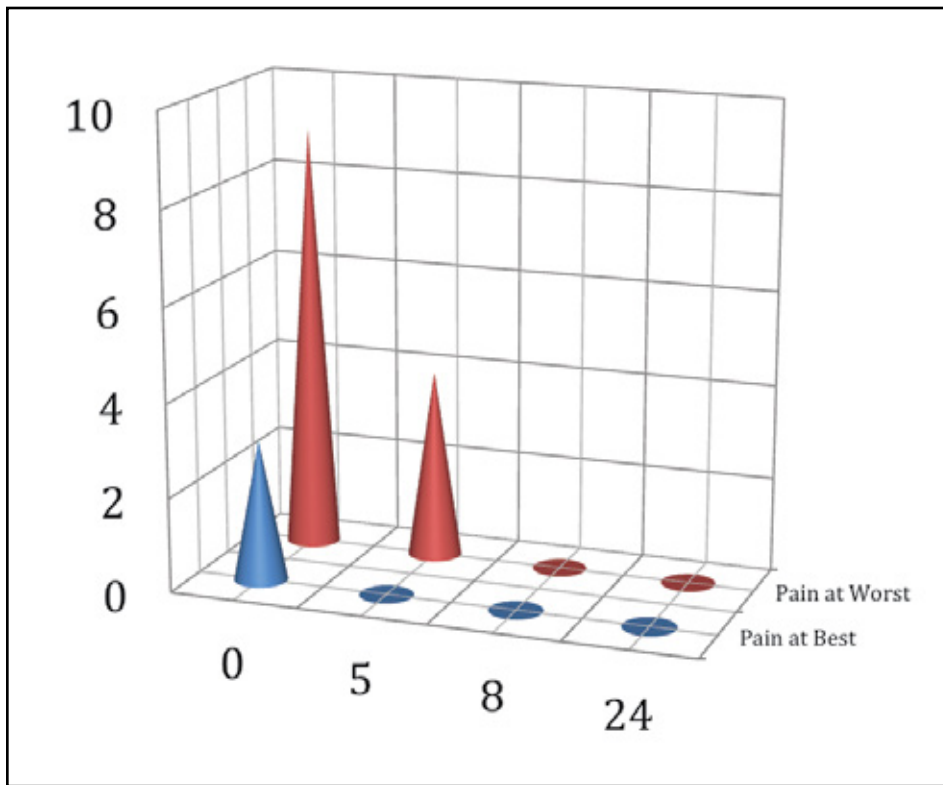


Figure 2. Pain (vertical axis) assess by Numeric Pain Rating Scale over weeks (horizontal axis). Intramuscular manual therapy added to plan of care between week 5 and week 6.

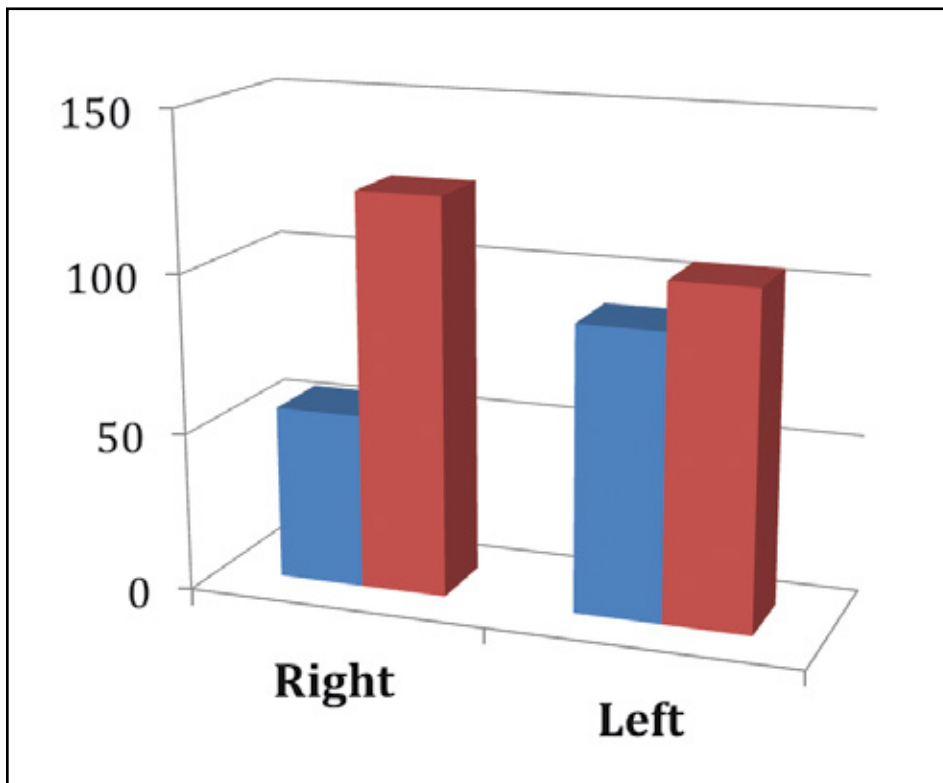


Figure 3. Hand dynamometer grip strength in pounds at initial assessment (blue) and at discharge (red).

in identifying LE. A physical therapist can use manual evaluation procedures to gather clinically useful information on those with chronic LE both for diagnosis and progress evaluation. These procedures may include palpation, Mills' stretch test (passive stretching of wrist extensors), resisted wrist extension, or Cozen's test or third digit extension test, and grip strength.^{19,31,35,30,42} Myofascial trigger points, in the literature,^{1,2,7,19} are identified by the palpation of exquisitely hypersensitive spots in a taut band of muscle that results in a predictable referred pain pattern and typically result in a local twitch response. Myofascial trigger points tend to result in ROM limitation for the joints that the involved muscles are associated with when the muscle is stretched actively or passively. A verbally reported NPRS is a useful alternative to the VAS⁴³ and has been shown to have adequate reliability and validity^{43,44} where a two-point change in the NPRS is clinically significant and not due to measurement error.^{44,45} The NPRS scores range from 0 (no pain) to 10 (worst pain possible).⁴⁵ Unfortunately, this has not been specifically measured in patients with LE. The patient was asked to assign a percentage to his perceived improvement. The use of this numerical scale ranging from 0% to 100% (where 0% is no better and 100% is complete resolution of symptoms) has been supported as a statistically significant marker for measuring improvement in patients with lumbar stenosis both at initial exam and throughout treatment until discharge.⁴⁶

CLINICAL RELEVANCE

This study is relevant to the field of physical therapy because IMT is in its infancy in the United States. Intramuscular manual therapy training is also relevant to the profession, as this technique is not typically being taught in our entry-level programs. The key to any technique, whether manipulation or IMT, is not the actual procedure itself, which is quite simple; but rather, the clinical reasoning behind implementation of such a procedure. Various physical therapy professional associations, many state licensing boards, and the Federation of State Boards have released positive position statements supporting the use of intramuscular manual therapy by physical therapists and specify the practice as within the scope of practice¹⁻⁵ for physical therapy. As such, it should be discussed within academic entry-level programs so graduates can seek the appropriate training per their state's governing body as applicable.

This study contributes to the literature by describing efficacious treatment options for LE in a patient suffering from chronic symptoms and facing potentially serious impairments as a result of surgical intervention. This study is similar to other studies^{7,9,35} because it investigated the potential impact of IMT, but different from other studies on 3 primary points. First, this case study examined the efficacy of IMT after conservative therapy had failed. Second, it used readily available physical examination procedures and resources commonly used in the clinic. The impact of IMT was immediate for this patient suffering from chronic LE after failing prior conservative treatments with significant changes in grip strength, NPRS, reported patient perceived percent improvement, and a nonsymptomatic physical examination. Third, because the patient had previously received acupuncture needle therapy, the likelihood of a placebo effect from IMT is unlikely and therefore IMT is more likely responsible for the dramatic resolution of symptoms.

The results of this case study cannot be applied across the patient spectrum, but provides a case study supporting the significance of the use of IMT as an adjunct to the management of musculoskeletal pain and conservative care. This study may also add support for initiating IMT sooner in the plan of care, when it is indicated, due to the dramatic improvements by this patient following treatment.

One of the major limitations of a case study is its inability to draw statistical support for a cause-and-effect relationship. Therefore, although the outcome following IMT treatment for this case study was dramatic, cause-and-effect cannot be statistically verified. As previously discussed, the inherent use of needle application is difficult to blind across treatment groups or combine with a placebo control. Future randomized clinical trials comparing IMT with other treatments using sufficient sample size are required to determine the efficacy of IMT as a treatment option for LE. Future studies should also investigate IMT as a primary treatment approach when developing the initial plan of care. Pressure algometer may provide more objective data for further follow up studies^{28,35} as it has been proposed to be able to distinguish between normal muscle and myogenic pain hyperalgesia. Lower pressure pain thresholds can be assessed by these hand held algometers that can help determine the pain thresholds for primary and secondary hyperalgesia.^{21,28,35}

This case report provides an example of an effective outcome using IMT procedures after failed conservative care for chronic LE and builds the clinical knowledge base regarding IMT and LE. The clinical changes recorded after implementation of IMT are, in this author's opinion, too dramatic to have occurred by random chance. It is unlikely the patient experienced the placebo effect related to needle insertion ("needle effect"¹⁵) since prior to physical therapy treatment the patient had received acupuncture treatments from an acupuncturist with no significant change in his condition. Based on the results obtained with intramuscular manual therapy in this case report, IMT should be considered as a possible treatment choice for LE.

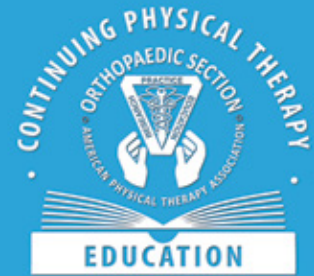
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Supine Cervical Traction After Anterior Cervical Discectomy and Fusion: A Case Series

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ABSTRACT

Background and Purpose: Cervical traction has been used for more than 50 years for the treatment of cervical disk pathology. However, there is a paucity of research in regard to the use of postoperative traction following surgery. The purpose of this case series is to describe evidence-based treatment using cervical traction for herniated nucleus pulposus (HNP) after anterior cervical discectomy and fusion (ACDF) in the cervical spine. **Methods:** This case series includes two patients with discogenic symptoms, including radicular symptoms and pathology in an area adjacent to an ACDF. In both cases, treatment was performed more than one year post ACDF and consisted of continuous cervical traction in supine using 15 to 17 pounds at a 12° or 20° angle for 10 to 20 minutes. **Findings:** After treatment with supine cervical traction, two patients with discogenic pathology and radicular symptoms had a significant reduction in symptoms and at least partial resolution of myopathy/radicular symptoms, including numbness and weakness. **Clinical Relevance:** Clinicians may be hesitant to use cervical traction after a patient has had ACDF surgery. This article offers examples of two cases in which patients status post ACDF improved with therapy, including the use of cervical traction. **Conclusion:** Caution should be taken when using cervical traction on the postoperative patient. However, in patients at least one year post ACDF, cervical traction may be a viable treatment for indicated pathology.

Key Words: radiculopathy, myopathy, herniated disk, herniated nucleus pulposus

INTRODUCTION

Traction is the application of a mechanical force applied to the body to separate joint surfaces and elongate soft tissue.¹ James Cyriax popularized traction for the lumbar spine in the 1950s and 1960s. Cervical traction has been used ever since that time.^{2,3} Traction can be performed by multiple methods, including inversion, manual,

or mechanical force. This force can be self applied by the patient, manually by a clinician, or through the use of a mechanical device. Research shows that cervical traction outcomes are superior in the supine versus the seated position.^{2,4-6} Inversion tables have been used for traction, but are not as effective.⁷ The exact amount of pressure exerted on the spine at different angles is not quantifiable, hyperextension of the cervical spine is a concern, and patients often have difficulty relaxing in the inverted position.

The force necessary to distract the cervical spine has been reported to be approximately 7% of the patient's body weight.⁴ Akinbo⁸ found that 10% of body weight was ideal to relieve pain and restore mobility. Other authors^{2,9,10} found that 11.34 kg to 20.41 kg (25 to 45 lbs) of force is necessary to produce separation of the cervical spine. Damage to cervical structures has been documented when a traction force of 54.43 kg (120 lbs) was used.¹¹

Variations in the angle of applied force has been studied by Colachis and Strohm,² and Saunders and Saunders⁶ reports that the ideal cervical traction angle is 25° to 30°. Hseuh et al¹² found that traction at 30° was most effective for C4-5 and C5-6, and that 35° was most effective for C6-7. Vaughn et al¹³ studied cervical traction, noting more intervertebral separation at 0° than at 30°.

The effectiveness of cervical traction is still being debated and there continues to be a dearth of research on treatment for a cervical herniated nucleus pulposus (HNP).⁶ Imaging before, during, and after traction have demonstrated a change or movement of the HNP away from nervous structures in certain cases.⁶

Eck et al¹⁴ demonstrated that after a fusion is performed, there is increased intradiscal pressure on levels adjacent to the fusion. This may lead to disk degeneration and herniation over time. There is evidence to support adjacent-level herniation or degeneration following fusion.^{15,16} A PubMed search for relevant research in the interest of evidence-based practice supporting the application of cervical traction after anterior cervical

discectomy and fusion (ACDF) was futile. This led the author to perform a review of the literature to provide justification for the treatment and improve patient confidence in the safety of the treatment.

Contraindications of cervical traction include: application to areas where motion is contraindicated, acute injury or inflammation, joint hypermobility or instability, peripheralization of symptoms with traction, and uncontrolled hypertension.^{1,7,17}

Although not a contraindication, ADCF is a significant precaution. Loosening of the surgical implants, cervical instability, and failure of the surgical implants are concerns but have not been well researched. The use of cervical traction postoperatively is also not well documented, and no guidelines were found for evidence-based treatment protocols.

When considering the application of traction after a fusion, it is important to allow proper healing to help insure that no instability is present. Healing after ACDF follows the 3 phases of healing for bone and connective tissue. "Healing may be divided into stages of inflammatory response, fibroblastic repair, and maturation/remodeling. The time frames for these phases overlap one another and therefore cannot be thought of as discrete phases."¹⁸ However, approximate healing times should be reviewed to help the practitioner make educated decisions.

In adults, ligamentous tissue (most similar to disk material) may take up to 12 months for full maturation, and bone may take 4 to 16 weeks for mineralization.¹⁸ Solid healing of vertebral fractures occurs at 16 weeks, but remodeling can take years to complete.^{18,19} Therefore, radiographic evidence of healing is necessary before traction should be considered.²⁰ As a precaution against instability and/or surgical fracture, in this study, traction was not used on patients with surgeries less than 12 months old.

The cases used in this study included patient treatment following ACDF procedures after more than one year postoperatively. Both patients had follow-up appointments with their surgeons, and

were presented radiographic evidence of healing by the surgeon. Both patients had at least some symptoms consistent with clinical indications for spinal traction. These included: disk bulge or herniation, nerve root impingement, joint hypomobility, subacute joint inflammation, and paraspinal muscle spasm.^{1,6} Both patients signed an authorization to release medical information and gave verbal consent to be included in this study.

Two types of supine cervical traction are used by the author, the Saunders Cervical Hometrac (The Saunders Group, Chaska, MN) and the Care Rehab Starr Cervical Traction (Care Rehab, McLean, VA) device.

All treatments of cervical traction should begin with an explanation of the procedure to the patient as well as the risks and possible benefits. To minimize adverse responses, traction should be applied with a small amount of force at first, while paying close attention to the patient's response. One must also make sure there is no peripheralization of symptoms. The author uses diaphragmatic breathing and visual imagery techniques with patients to aid in their relaxation, which minimizes or inhibits muscle guarding.

Correction of disk protrusion by traction alone may not be sufficient for long term relief of symptoms. Therefore, as part of their treatment, patients in this study also received posture education and correction, cervical stabilization, and stretching. They were advised to return to their activities gradually.^{21,22}

CASE DESCRIPTIONS

Patient Evaluation

Patient A

This patient was a 45-year-old right-hand dominant male who presented status post ACDF at C5-6 performed 8 years prior. He presented with pain rated a 6 out of 10 at best and 9 out of 10 at worst on a visual analogue scale. The patient was taking Feldene and Percocet to control his symptoms as well as Glucophage, glyburide, and Accupril. His pertinent medical history included diabetes mellitus type II and 20 years of smoking.

He complained of difficulty lifting with the left upper extremity, pushing the left upper extremity into abduction, and difficulty sleeping. He complained of pain that radiated from the left parascapular region to the shoulder, into the third through fifth digits, and included numbness, tingling, and a "bad toothache" feeling. The patient was an avid and skilled golfer (5 handicap).

His occupation as a sales manager included desk work, driving, and computer work.

A postoperative MRI (performed 6 days before physical therapy started) demonstrated a C6-7 leftward HNP with fragment extending both superior and inferior to the interspace with cord deformity and moderate central narrowing (a small protrusion towards the right was also noted at C4-5).

Range of motion estimates were as follows—flexion: within normal limits; extension: 25% with symptoms reproduced; side bending: within normal limits bilaterally; rotation—left: 75%, right: within normal limits. Reflexes were grade two at the biceps, triceps, and brachioradialis bilaterally. Triceps and wrist flexion weakness and atrophy in the triceps muscle mass were noted. The patient was unable to perform a push-up.

Patient Treatment

The patient was treated with a "whole body" approach, including cervical stabilization, posture correction, ergonomic education, cervical and shoulder girdle stretches, moist heat, and supine traction. Keeping the spine neutral after traction was reinforced every visit (especially while transferring to sitting after traction) in order to avoid anterior disk pressure. This consisted of a total of 22 physical therapy visits.

Traction using the Saunders Cervical Hometrac at the only angle available (12°) was performed 3 times per week. The force of distraction was set to 6.80 kg (15 lbs) for 10 minutes and was increased to 7.71 kg (17 lbs) for 20 minutes. The patient's exercise program included posture correction, cervical isometrics, and stretching for the scalenes and mid-rhomboids. Progressive resistive exercises for the affected triceps, wrist flexors, and hand intrinsic were also included.

OUTCOME

The patient was discharged with a zero out of 10 pain rating on a visual analog scale (pain free), and the patient's range of motion was within normal limits in all planes. The patient denied any paresthesias or radiating pain into the upper extremities. Triceps and wrist extensor strength was improved, with the patient able to perform a full push-up with some compensation. Some weakness was still noted in the triceps as compared to the contralateral side.

Patient Evaluation

Patient B

This patient was a 36-year-old right-hand dominant male presenting status post

ACDF at C5-6 performed 14 years prior to therapy. His cervical and right arm pain ranged from one out of 10 at best to 6 out of 10 at worst on a visual analog scale. The patient was taking Aleve (Naproxen) to control symptoms. Pertinent medical history included a fusion and partial right rotator cuff tear.

The patient complained of cervical pain as well as pain radiating between the right elbow and fingertips, including the dorsal forearm and hand. These symptoms were aggravated while performing physical therapy for a partial right rotator cuff tear that occurred 7 months prior. The patient also complained of cervical stiffness, upper trapezius pain bilaterally, and a generalized "ache" in the cervical spine.

Subjective range of motion was as follows—flexion: within normal limits; extension: 75%; side bending: 25% bilaterally; rotation: within normal limits bilaterally. Reflexes were grade two at the biceps, triceps, and brachioradialis bilaterally. An upper-quarter strength screen demonstrated no significant weakness using manual muscle test grading procedures.

A postoperative MRI (performed 6 days before physical therapy started) demonstrated a C6-7 mild broad-based disk protrusion extending slightly more to the right of midline. The patient was very active: swimming the crawl for two-thirds of a mile twice per week, running 3 to 4 times per week for 3 to 4 miles at an 8-minute mile pace, and performing two sets of 25 push-ups daily. The patient worked as a corrections officer.

Patient Treatment

The patient was also treated with a "whole body" approach, including cervical stabilization, posture correction, ergonomic education, cervical and shoulder girdle stretches, moist heat, and supine traction. Keeping a neutral spine after traction was reinforced every visit (especially while transferring to sitting after traction) to avoid anterior disk compression.

Continuous cervical traction treatments started at 6.35 kg (14 lbs) for 15 minutes and were increased to 7.71 kg (17 lbs) for 15 minutes with the Starr ComfortTrac. The device was set at the largest angle, due to its targeted effect on the lower cervical spine (20°). The patient was seen a total of 20 visits with 20 treatments performed.

Outcome

The patient was discharged noting a zero out of 10 pain level on a visual analog scale

(pain free). Range of motion was within normal limits in all categories and the patient denied any paresthesias or radiating pain into the upper extremities.

DISCUSSION

The limitations of this case study approach include small sample size, no randomization, and the lack of a control group and no blinding to treatment. The fact that each patient was treated with a different device may also influence outcome. Constant traction was used, although some authors feel that intermittent traction may have produced better outcomes.^{2,3} The angle of pull was also different on the two devices, although the herniations were at the same level in each case studied. It is possible that using a larger angle would achieve better results according to the research performed.^{2,6,12,24} The amount of pressure used was conservative compared to previous studies.^{2,4,8-11}

Evidence-based treatment for this case included a review for previous studies. Since direct studies were found, previous related research was cited to support the hypothesis that cervical traction may be of use in these cases. Outcomes would have been better controlled using a more standardized and previously validated outcome measure such as the Oswestry Disability Index or the Northwick Park Neck Pain Questionnaire.

Despite the shortcomings, these two case reports present the details of a treatment protocol not yet described in the literature, and document treatment procedures with follow-up to 12 months posttreatment. The results may be useful in the clinical determination of rehabilitation techniques for patients with well-healed ACDF surgeries who present with co-existent pathologies, such as degenerative disk disease and disk herniations.

Caution should be taken when one considers applying this knowledge to other surgeries or to other areas of the spine, as no research was found in these areas. More study is needed to determine long-term effects of traction following ACDF. It should be noted that patient A was followed for up to 12 months after treatment with no relapse. The patient even reported continued improvement in symptoms and function. Patient B was discharged just prior to the completion of this paper, and therefore, no long-term data exists for this patient.

CONCLUSION

Cervical traction is a treatment that has been used for decades with positive effects for many conditions, including HNP. These case reports show that supine cervical traction may be helpful in reducing symptoms, including radicular and myopathy symptoms, in patients status post ACDF with HNP.

Caution must be used to ensure proper healing has occurred. It is also recommended that the primary care physician and/or surgeon are in agreement with the treatment. A thorough evaluation should be performed to determine that no contraindications are present before deciding to use traction.

Treatment Protocol Generalizations for Cervical Traction following Anterior Cervical Discectomy and Fusion

1. Thorough evaluation includes securing that no contraindications exist:
 - a. where motion is contraindicated,
 - b. when there is an acute injury or inflammation,
 - c. joint hypermobility or instability,
 - d. peripheralization of symptoms with traction, and
 - e. uncontrolled hypertension.
2. Possibly contacting the surgeon or referring physician to discuss treatment rationale and secure agreement in care.
3. Explanation of risks and benefits to the patient.
4. Starting supine traction with gentle pressure. Ensuring comfort of the patient and no peripheralization of symptoms (recognizing that some discomfort may occur).

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Relationship Between Plantar Flexor Weakness and Low Back Region Pain in People with Postpolio Syndrome: A Case Control Study

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ABSTRACT

Study Design: Case control study. **Objective:** The purpose was to determine if ankle plantar flexor weakness contributes to low back (LB) region pain, including the lumbar or sacroiliac (SI) regions or both, in people with postpolio syndrome (PPS). **Background:** Muscle or joint pain is commonly seen in people with PPS due to years of compensating for weak muscles during gait and other functions. **Methods:** Files were reviewed of 946 patients with PPS from an outpatient clinic for inclusion. Data collected included age, gender, presence or absence of LB region pain, manual muscle test (MMT) strength for the plantar flexor muscle group, and calculated total lower extremity motor scores. One hundred fifteen patient cases of those with LB region pain were compared with 70 patient controls with no pain. A logistic regression was performed with gender and plantar flexor grades entered as predictive variables, pain as the dependent variable. The odds ratio was calculated. **Results:** Gender between the groups was significantly different at $P = 0.049$, as determined by a one-way analysis of variance. Plantar flexion strength was a significant predictor, with people with plantar flexion weakness being twice as likely to report LB region pain. **Conclusions:** Plantar flexor weakness and resultant chronic gait compensations significantly contributed to the likelihood of LB region pain. Treatment of pain in these areas may be limited in effectiveness in cases where the plantar flexors are weak, if interventions do not address the primary impairments of chronic weakness or resultant compensations.

Key Words: postpoliomyelitis syndrome, muscle weakness, pain, mobility limitation

INTRODUCTION

Postpolio syndrome (PPS) presents with a cluster of symptoms that includes new muscle weakness and a combination of these additional symptoms: excessive fatigue,

muscle pain, joint pain, new swallowing difficulties, new breathing difficulties, cold intolerance, or new muscle atrophy. Four criteria have to be met for the diagnosis of PPS: (1) known history of poliomyelitis, (2) occurrence of some level of muscle recovery following the initial illness, (3) period of neurological stability for at least 10 to 20 years, (4) no other medical condition that could cause the symptoms consistent with PPS. It is, therefore, a diagnosis of exclusion. Twenty to 50% of polio survivors may develop PPS, rather than just living with the sequellae.¹

In addition to new muscle weakness, one of the most commonly reported symptoms of PPS is muscle or joint pain. Chronic muscle overuse to compensate for weakness in other areas, long-term abnormal biomechanical alignment in postures and locomotion, and injury due to falls are just a few of the causes of pain in individuals with PPS.¹⁻³ Muscle pain has been reported in 58% to 86% of polio survivors, with and without PPS, with 34% reporting muscle pain while at rest. Joint pain was similarly reported in 58% to 78% of polio survivors.⁴⁻⁸ More than 50% of people with PPS report pain occurring every day.⁴ They have rated pain intensity on a visual analogue scale with means from 46 to 58 out of 100 and reported means of 5-17 different pain sites.^{4,9,10} Low back (LB) pain is one of the most frequently reported pain sites, with 53% to 86% of individuals with PPS and pain, reporting LB pain.^{5,11} Incidence of sacroiliac (SI) joint pain in polio survivors has not been reported in the literature; however, the frequency of "hip area" pain has been reported to be 44%.¹¹

Often persons with PPS complain of LB pain during gait, and abnormal gait deviations are commonly seen in this patient population.² The ankle plantar flexors are often overlooked in their importance in indirectly stabilizing the knee as the person's body weight translates forward over a "tethered" tibia. This muscle activity allows the quadriceps to relax briefly. If the plantar flexors

do not have sufficient strength to control tibial advancement during mid to terminal stance, the quadriceps must remain active to support the knee. Other compensations to achieve knee stability include excessive hip extensor activity and plantar flexor contracture.^{12,13} Perry et al¹²⁻¹⁴ determined ankle plantar flexor weakness to be a significant cause of lower extremity (LE) muscle pain and fatigue, and plantar flexor strength to be the best predictor of walking speed in individuals with PPS.

Various studies^{4,7,10,15,16} have explored the relationships between pain, muscle strength, walking and functional capacity, and disability in people with PPS. However, of these studies, only Willen et al¹⁵ and Gylfadottir et al¹⁶ included the plantar flexors in LE strength testing, and both of these studies combined plantar flexor strength with other LE muscle strength values for cumulative LE strength. Plantar flexor strength was assessed with use of a dynamometer for one maximum contraction, after either two submaximal practice trials¹⁶ or 5 minutes of pedaling on a bicycle ergometer.¹⁵ Neither study addressed potential difficulties in stabilizing the limb for muscle testing with the dynamometer. Reliability of dynamometers is dependent upon the examiner's ability to stabilize the limb and sometimes the examiner's own strength, particularly when testing stronger or larger muscle groups.^{17,18}

Clinically, multiple heel raises are required for testing of plantar flexors for grades of 3 out of 5 or higher, with 20 required for a muscle grade of 5 out of 5, or normal muscle strength.^{13,19,20} Individuals with PPS tend to have difficulty with repetitive muscle activation due to use of weak muscles at higher than normal levels of functional capacity, thus leading to quicker muscle fatigue than healthy adults and polio survivors without PPS.^{2,15,21} The 20 heel raises, therefore, should give a realistic assessment of plantar flexion strength, particularly in this patient population.

Vasiliadis and colleagues⁷ completed

a correlational study that identified variables that might predict for the presence of muscle and joint pain in 126 patients with PPS. For both types of pain, female gender ($P = 0.0006$) and lower scores on the Medical Outcomes Study 36-Item Short-Form Health Survey general health scale ($P = 0.009$) were predictors. Additionally, longer duration of general fatigue ($P = 0.008$) was a predictor for muscle pain. Longer duration of neurological stability ($P = 0.008$), younger age at interview ($P < 0.002$), greater weakness at acute onset of polio ($P < 0.07$), and greater LE weakness at the time of the study ($P < 0.04$) were predictors for joint pain.⁷

Numerous gait deviations are seen in polio survivors with and without PPS due to their muscle weakness patterns, leg length discrepancies, or joint hypo- or hypermobility. Muscle weakness requires compensatory strategies that consume excessive energy and can cause increased mechanical strain on other muscles and joints. Excessive lateral trunk flexion during weight acceptance, overall forward lean of trunk from hips, and excessive pelvic rotation are common deviations that can contribute to LB or SI pain, originating in the muscles, joints, or both. A forward lean is used to bring the center of gravity anterior to the knee joint, thereby providing more of an extension moment at the knee. Excessive pelvic downward and posterior rotation occurs when excessive dorsiflexion, due to plantar flexor weakness, is present in terminal stance and pre-swing.^{2,12,13} Many health care providers do not consider LE orthoses unless the person has insufficient foot clearance or knee stability. If plantar flexion weakness is determined to be a significant predictor of LB or SI pain, management of this source of the pain through an orthosis or other interventions should improve the long term outcome of effective pain management. Although the investigator has observed a possible link between plantar flexor weakness and LB regional pain, no empirical evidence is currently available. Therefore, the purpose of this study was to determine the strength of the relationship between ankle plantar flexor weakness and LB region pain in individuals with PPS. The null hypothesis for this study was that there is no relationship between ankle plantar flexor weakness and pain in the LB or SI joint in people with PPS.

METHODS

This case control study used retrospective data collected from initial physical therapy

examinations by the principal investigator of patients seen in the postpolio outpatient clinic of TIRR - Memorial Hermann Rehabilitation and Research from 2000 to 2007. The Internal Review Boards of Texas Woman's University, University of Alabama at Birmingham, and University of Texas Health Science Center at Houston approved this study.

Nine hundred forty-six patient files were reviewed for inclusion as cases or controls. Study inclusion criteria were confirmed medical diagnosis of PPS, between 45 and 75 years of age, and ability to ambulate independently without a LE orthosis. Patients of either gender, any race, or who used assistive devices in the upper extremities were included. Exclusion criteria were ankle joint fusion, tendon transfers related to plantar flexors, any type of lumbar spine or pelvic bone surgery, plantar flexion contractures greater than 10°, diagnosis of another neurological or rheumatic condition, or trauma-induced LB or SI pain. Patients were also excluded if they were unable to participate fully in the unilateral heel raise test due to LE pain or an inability to balance on one LE with minimal support of one hand on a wall.

Data collected from the patient files were: age, gender, presence or absence (but not intensity) of LB region (lumbar or SI) pain, and manual muscle test (MMT) strength for the weaker of the right and left plantar flexor muscle groups. Total motor scores were calculated from the MMT of bilateral hip flexors, extensors, and abductors; knee extensors and flexors; and ankle dorsiflexors and plantar flexors. The total motor score yielded a maximum possible score of 70, with MMT grades of 0 to 5 for each muscle group tested. Total motor scores have been used to quantify LE muscle strength in people with PPS^{9,21} and spinal cord injury.²² Plantar flexion strength grades of 3, 4, and 5 required the ability to perform unilateral heel raises with patient's minimal use of one upper extremity to balance self only. The grade of 0 denoted complete absence of palpable muscle contraction in the gastrocnemius, soleus, or both. The grade of 1 represented a contraction, but no observable movement. The grade of 2 represented movement throughout the entire available passive range of motion, with gravity eliminated. The grade of 3 required 1 to 9 unilateral heel raises through full range of motion. The grade of 4 required 10 to 19 unilateral heel raises, and a grade of 5 required 20 heel raises.¹⁹ Testing was discontinued with onset of muscle cramping, other

types of pain, or loss of heel height during raises. If a patient was unable to complete the movement to satisfy a certain grade, the next lowest grade was assigned. No pluses or minuses were used.¹⁹ The same physical therapist performed initial MMT and documentation of each of the patients screened and included in this study. According to Sharrard,²³ a grade of 4 out of 5 represents a loss of at least 60% of the anterior horn cells that innervate the tested muscle in polio survivors; therefore, even a grade of 4 indicates significant strength loss.

Patients who had LB region pain were cases, and those who did not report pain in this area became controls. Controls were matched to cases by age within 3 years.

Data Analysis

A logistic regression was performed using gender and plantar flexor muscle grades as the predictive variables and gender entered first into the hierarchical regression, using SPSS version 15.0. Pain was the dependent variable. A one-way analysis of variance (ANOVA) was performed to determine if differences existed between the cases and controls in terms of age, gender, and total bilateral LE motor score.^{24,25} The odds ratio of which polio survivors were more likely to have LB region pain, was calculated using Microsoft Excel 2007.

RESULTS

One hundred fifteen patient cases with PPS and LB region pain were compared with 70 patient controls with PPS and no pain in the LB region. There were insufficient numbers of controls in this population that met the inclusion criteria to attain a one-to-one or one-to-two match of cases to controls.²⁴

There were no significant differences in age ($P = 0.774$) or total LE motor score ($P = 0.118$) with a one-way ANOVA between the case and control groups. However, gender was significantly different at $P = 0.049$. See Table 1 for demographic information of the two groups. Of the cases, 62 (53.9%) reported pain in the LB, 22 (19.1%) in the SI joint, and 31 (27.0%) in both areas.

When controlling for gender, plantar flexion strength of the weakest side was a significant predictor ($P = 0.003$) for determination of which patients with PPS report pain in the LB region. See Table 2 for results of the logistic regression analysis. See Figure 1 for frequencies of MMT grades of the weakest plantar flexor muscle groups for both case and control patients. The odds ratio was

Table 1. Demographic Information of Individuals with Postpolio Syndrome

	Cases with pain	Controls without pain
N Total	115	70
Females	82	40
Males	33	30
Age (years)		
Mean (± SD)	58.28 (± 6.97)	58.59 (7.21)
Female range	46-75	45-75
Male range	46-73	45-72
Strength		
Weakest PF	1.97 (± 1.15)	2.57 (± 1.51)
Total B LE motor	51.35 (± 8.41)	53.64 (± 11.39)

Abbreviations: PF, plantar flexor muscle group; B LE, bilateral lower extremity

Table 2. Logistic Regression Analysis of Pain in Patients with Postpolio Syndrome by Gender and Plantar Flexor Strength

		Predicted		
		No pain	Pain	% Correct
Observed	No pain	15	55	21.4
	Pain	8	107	93.0
Overall % correct: 122/185 = 65.9%				
		β	p value	Exp (β)
Gender		-0.658	0.044	0.518
PF strength		-0.364	0.003*	0.695
Constant		1.554	0.000	4.731
*E ^{0.695} = 2.00 odds ratio				

calculated to be 2.00. Therefore, individuals with PPS and plantar flexion weakness were twice as likely to have LB region pain.

DISCUSSION

Plantar flexion weakness is a frequently observed impairment in polio survivors with and without PPS.^{2,3} Most case and control participants in this study displayed MMT grades of 2 or less in their weaker plantar flexion muscle group. Individuals with PPS who had experienced trauma or developed unrelated disease processes that can lead to LB or SI pain were excluded from this study to decrease confounding factors. A large number were also excluded in which traditional and consistent MMT was not possible due to pain in other areas, inability to balance on one LE, or presence of significant deformity.

Gender was entered first into the hierarchical logistic regression analysis due to previous literature reporting it to be a signif-

icant predictor of pain in patients with PPS.⁷ In this study, twice as many females were noted to be cases than controls, whereas approximately half the males were cases, and half were controls. The difference in gender between cases and controls was significant. Plantar flexion strength was singled out for study due to this muscle group's importance in meeting the highest torque demands in normal gait and in gait velocity of patients with PPS.^{12,14}

Pain in the LB, SI joint, or both areas can interfere with the polio survivor's ability to walk, work, sleep, and participate in many other activities. Many treatment modalities exist that aim to reduce pain. However, treatment effectiveness can be quite limited if a significant cause of that pain is not remediated. If plantar flexor weakness leads to previously described gait and postural deviations, these deviations can cause excessive and abnormal biomechanical stresses on the joints, muscles, or both, leading to pain. If

this weakness is new, as in cases with spinal cord injury or stroke, aggressive strengthening can ensue to improve strength, gait, and other functions. However, in the case of chronic weakness as seen in ambulatory individuals with PPS, the plantar flexors are likely working to near their maximum functional capacity, with very little to no muscle function left in reserve.²¹ Exercise of the plantar flexors and other polio-affected muscles, particularly muscles that test at a 3 or less, must be cautious to avoid overuse and further weakening.¹⁻³ Limited evidence exists that suggests strengthening benefits and lack of harmful side effects from supervised exercise.²⁶⁻²⁸

Accurate examination of plantar flexion strength can be challenging for the clinician. However, testing in a unilateral standing position is essential, whenever possible, when trying to determine the presence of weakness in a muscle that is primarily important when the LE is in single limb support sub-phases of gait. Since repetitive muscle activity is typically disrupted in individuals with PPS, the required minimum of 20 repetitions for a MMT grade of 5 is a clinically relevant measure of strength and gives the clinician an idea of the polio survivor's muscle strength and endurance. The 20 repetitions should not be thought of as excessive when considering the number of contractions required of the plantar flexors for typical household and community ambulation.¹⁹⁻²¹

Careful assessment of gait, posture, pain, and falling history, in addition to MMT, is necessary in attaining sufficient information to make sound clinical recommendations. An orthosis may be necessary to adequately support the foot and ankle when long-standing weakness is present, and the muscles are not able to effectively control the limb. When the orthosis provides a rigid anterior (dorsiflexion) stop, it can compensate for the inability of the plantar flexors to adequately tether or control the tibia during forward progression in gait. If the orthosis can improve the biomechanical alignment of the limb in gait and reduce weakened muscle overuse and gait deviations, then pain that is more proximal in the kinetic chain can be diminished or eliminated. In this study, ambulatory patients who wore orthoses on one or both LEs were excluded due to the number of types of orthoses and shoe combinations available and the various biomechanical effects they have on the limb supported and entire body.^{2,29-31}

A limitation of this study is that it is a ret-

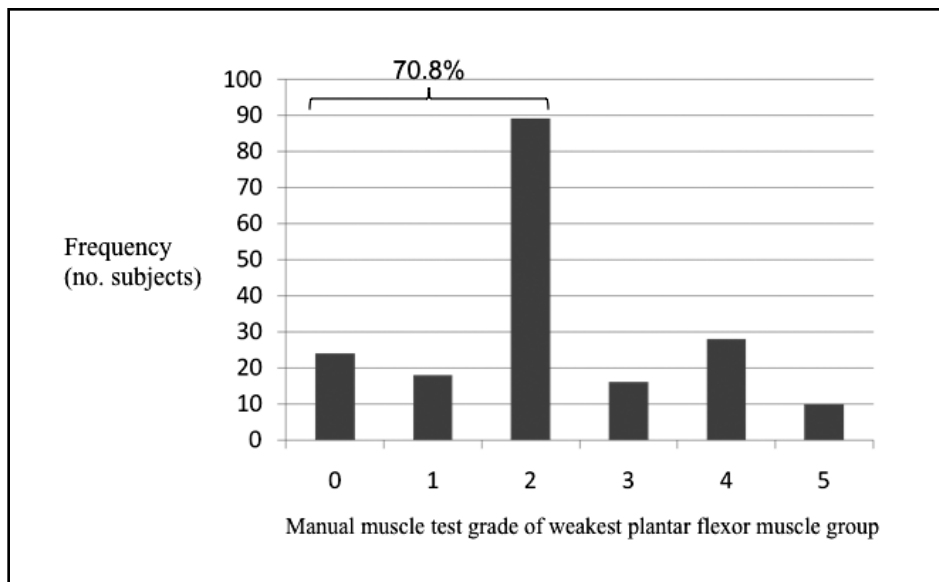


Figure 1. Frequency of plantar flexor muscle grades for total sample.

respective analysis of data collected during previous physical therapy examinations in an outpatient clinic. Additional information, such as presence of leg length discrepancies, previous history of orthotic use, time duration between examination and onset of polio, and age onset at polio, could have been helpful to consider. Another limitation is that there were insufficient numbers of control participants to be able to achieve the desired one-to-one or one-to-two case-to-control ratio for a case control study.²⁴ However, the investigator attempted to eliminate as many confounding factors as possible.

A threat to the validity of this study is the issue of selection bias. The cases were selected according to the inclusion and exclusion criteria previously reported. However, the participant's report of pain, its presence or absence, and not differential diagnosis, intensity, duration, or pattern, was used for case selection. More information about pain was not collected since this was not an interventional study addressing pain management. Also, because the same physical therapist performed all the patient examinations and recorded data into and extracted data from the patient files, observation or interviewer bias is possible. Additionally, all reviewed examinations were obtained from the same clinic serving patients with PPS.²⁵

In summary, an accurate functional assessment of plantar flexion strength in patients with PPS is an important component of the comprehensive assessment process. Treatment of pain in the LB region may be limited in effectiveness in cases where the plantar flexors are weak. Orthotic interven-

tion or cautious muscle strengthening must be considered when attempting to facilitate the patient's management of pain symptoms.

Knowledge of the relationship between plantar flexor weakness and LB region pain may assist therapists working with patients with other neurological conditions, such as radiculopathy or peripheral neuropathy. Future research is needed to address how orthoses can impact pain levels in individuals with PPS and to determine if plantar flexor weakness in patients with other neurological conditions is significantly related to LB region pain.

ACKNOWLEDGEMENT

This study was completed in partial completion of degree requirements for the Doctor of Science in Physical Therapy at the University of Alabama at Birmingham.

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Alteration in Corticospinal Excitability, Talocrural Joint Range of Motion, and Lower Extremity Function Following Manipulation in Non-disabled Individuals

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ABSTRACT

Background: Clinical outcomes of manual therapy procedures, including manipulation, have been studied. However, mechanisms underlying observed improvements remain unclear. **Objective:** To determine the effect of ankle joint manipulation on corticospinal excitability, ankle dorsiflexion range of motion (DF ROM), and lower extremity functional behavior in nondisabled individuals. **Method:** Six nondisabled individuals (age range: 31-50 years) received the main outcomes measurements of this study, before and after long axis distraction manipulation of the talocrural joint. Main outcomes measures were motor evoked potential (MEP) amplitude of gastrocnemius (GN) and tibialis anterior (TA) using transcranial magnetic stimulation, ankle DF ROM with the knee flexed and extended using standard goniometric techniques, and unilateral anterior squat reach (ASR) distance. All subjects received the main outcomes measures. **Results:** Significant increase in GN MEP amplitude ($P < .05$), but not TA MEP amplitude, were documented following intervention. Significant improvements also were noted in ankle DF ROM with knee extended and flexed ($P < .001$) and ASR distance ($P < .05$). Significant correlations were found between standardized change in GN MEP amplitude and ankle dorsiflexion with knee flexed ($\rho = .582$, $\rho^2 = .339$, $P < .01$), and standardized changes in GN MEP amplitude and ASR distance ($\rho = .601$, $\rho^2 = .361$, $P < .01$). **Conclusions:** Increased corticospinal excitability appears to mediate improvements in ankle DF ROM and lower extremity function following long axis distraction manipulation

to the talocrural joint in nondisabled individuals. These results establish comparative values with which to compare the corticospinal responses to manual therapy intervention in individuals with pathology.

Key Words: ankle, manipulation, transcranial magnetic stimulation, functional testing

INTRODUCTION

Ankle sprains are the most common injury to the ankle joint, affecting up to 2 million people and approximately 53 per 10,000 individuals per year.^{1,2} Ankle sprains are common in younger and active individuals.³⁻⁸ Certain sports and work activities may result in an even higher incidence and risk for injury.⁹⁻¹⁵ Ankle sprains are a clinically important problem because they result in a substantial number of missed work days⁸ and participation in sports activity,^{3,5} as well as lead to potential early arthritic changes in the talocrural joint.¹⁶ The prognosis for functional recovery following ankle sprain typically includes a rapid clinical improvement within the first two weeks after injury.¹⁷ However, a series of recent studies indicate a subgroup of individuals appears predisposed to continued pain, functional deficits, and prolonged risk for additional reinjury between 6 weeks and 3 years postinjury.¹⁷⁻²⁵ The prolonged disability associated with ankle sprains represents the possibility of increased direct and indirect health care costs associated with ankle sprains, and may be reduced through identification of optimal approaches to clinical management.

One reason for continued pain and elevated risk for reinjury may be limited ankle

joint mobility, which may occur as either a cause or consequence of ankle sprain. Limited ankle dorsiflexion has been documented as a major short-term sequel to ankle sprain.^{26,27} In addition, several studies have identified limited talocrural joint dorsiflexion range of motion (DF ROM) as an important predisposing factor to ankle sprains.²⁸⁻³⁰ Limited ankle DF ROM will position the talocrural joint in plantar flexion during weight bearing activities. This position is notable because the most common mechanism of injury for ankle sprains involves plantar flexion and inversion of the ankle and foot. The injury mechanism places excessive load on the anterior talofibular ligament (ATFL). With failure of ATFL, secondary restraint to inversion occurs by way of the calcaneofibular and posterior talofibular ligaments, placing them at similar risk for injury. Thus, limited ankle DF ROM may result in injury and consequent structural and functional compromise of the ankle lateral collateral ligaments.

Physical therapists use mobilization and manipulation to improve ankle DF ROM following ankle sprains. Despite the intuitive appeal of applying these procedures to promote parallel improvements in talocrural DF ROM and functioning in individuals following ankle sprains, this notion has been the focus of relatively few prospective studies.³¹ Pellow and Brantingham³² were among the first to report reduced pain and improved function in individuals with ankle sprains receiving an ankle mortise distraction technique. Whitman and colleagues³³ reported rapid functional improvement after talocrural manipulation in a competitive volleyball player with a mild unilateral

ankle sprain. More recently, Whitman and coworkers³⁴ documented favorable clinical outcomes in approximately 75% of their sample with post-acute ankle sprains following two sessions of mobilization and manipulation directed at joints distal to the knee. Although initial results are promising, mechanisms underlying the clinical effects of manual therapy in individuals with ankle sprains remain unclear.

Through further study of the potential role for neuroplasticity to mediate the relationship between brain activity and behavior in people with ankle sprains, it may be possible to better understand those mechanisms that result in a symptomatic and behavioral benefit. Various central and spinal sensorimotor mechanisms of manual therapy procedures recently have been investigated. Inhibition of the Hoffman reflex following spinal manipulation and increased lower extremity muscle strength have been observed following manual therapy directed to the lumbopelvic.³⁵⁻³⁹ Manual therapy procedures may facilitate descending inhibitory inputs to local spinal circuits that cause the observed H-reflex depression, suggesting a broader effect on the central nervous system (CNS).⁴⁰ Dishman and colleagues⁴¹ identified a short-term increase in motor evoked potential (MEP) amplitude for the lumbar paraspinals in healthy volunteers following manipulation of the lumbar spine, using single-pulse transcranial magnetic stimulation (TMS) directed to contralateral motor cortex. Haavik-Taylor and Murphy⁴² also documented a significant muscle-specific pattern of effects following cervical spine manipulation on short interval intracortical facilitation, short interval intracortical inhibition, and cortical silent period of abductor pollicis brevis and extensor indicis without significant change in F wave in asymptomatic individuals with a history of recurrent neck pain. These results suggest a potentially broad effect of manual therapy on the neuromotor processing of functional behavior by the CNS.

Our collective understanding of the role for neuroplasticity to explain short-term symptomatic and behavioral changes in response to ankle manipulation is hampered by shortcomings in the current literature. For example, the study of manual therapy directed to the spine potentially jeopardizes the specificity of conclusions that can be drawn, since spinal manipulation is poorly localized even in skilled and experienced practitioners.⁴³ In addition, no correlation has been made between neuromotor changes

and potential alteration in functional behavior using valid and reliable measurements. The purpose of this pilot study was to determine the effect of talocrural manipulation on gastrocnemius and tibialis anterior MEP, ankle DF ROM, and unilateral anterior squat reach (ASR) distance in nondisabled individuals.

METHOD

Subjects

Participants

Six nondisabled individuals (2 females, 4 males) ranging in age from 30-51 years participated in this study. Subjects were excluded if they experienced a lower extremity injury in the past 12 months, a history of lower extremity or low back surgery, lower extremity neuropathy, vestibular dysfunction, diabetes or active arthritis, or if there were any contraindications to undergoing talocrural joint manipulation (ie, gross mechanical instability, history of connective tissue disease). Based on the TMS safety guidelines,⁴⁴ other exclusion criteria include neurological disorders; psychological problems; history of significant head trauma; any electrical, magnetic, or metal device implanted in the body (ie, cardiac pacemakers or intracerebral vascular clip); pregnancy; history of seizures or unexplained loss of consciousness; immediate family member with epilepsy; use of seizure threshold lowering medication; current use of alcohol or drugs; history of schizophrenia; or history of hallucinations.

Procedure

The Institutional Review Board of the University of Southern California Health Sciences Campus approved the study protocol. The protocol is described in detail elsewhere.⁴⁵ The following paragraphs include a brief description of the protocol. After an intake screening interview and informed consent was obtained, all subjects then received preintervention measurements, intervention, and postintervention measurements. Pre- and postintervention measurements included corticospinal excitability, ankle DF ROM, and anterior reaching distance achieved during a single leg squat (ASR distance). The right lower extremity was tested in all subjects. After postintervention testing, all subjects were discharged from the study. Completion of all study took up to two hours per subject during one day.

Transcranial magnetic stimulation measurement

All the TMS assessments were carried out with a single-pulse magnetic stimulator (Magstim 200²). A Double Cone 110 mm coil was used to generate the TMS pulse. This pulse provides stimuli of sufficient depth of penetration to activate the cortical representational areas of lower extremity muscles. The skin over the designated muscles of the right lower extremity was prepared with cleansing gel and alcohol to decrease impedance for applying surface electromyography (EMG) electrodes. Surface EMG electrodes (Ag-AgCl, 12 mm diameter, interelectrode distance: 17 mm) were attached over the muscle belly of TA and GN, and the ground electrodes were placed over the medial and lateral femoral epicondyle, respectively for each muscle. The electrodes remained in place between the two TMS test sessions. The EMG signals were filtered with 1-1000 Hz bandwidth filter, amplified, and digitized at 2000 Hz. The data were displayed and stored with customized MATLAB module (dwaq; dataWizard acquisition, ADW) in 600-ms samples beginning 100 ms before TMS stimulus.

To determine the optimal TMS stimulus point ("hotspot"), the participants were required to wear a swim cap with 1 cm × 1 cm grid. The coil was initially placed on a potential spot for the target muscle, and then systematically moved in 1 cm increments in each direction to find the point that induced the most consistent and prominent motor evoked potentials (MEPs) with the shortest latency.⁴⁶ To control TMS coil positioning variability, a stereotactic image guidance system (Brainsight™ Frameless) was used. The hotspot of each muscle was marked on a 3D reconstruction of a standard magnetic resonance image of the brain in the first test session, and the same point of stimulation was used for the postintervention test session. For TMS data collection, pulses were delivered as participants actively contracted TA and GN by performing ankle dorsiflexion and plantar flexion, respectively, through a small, consistent amount of range. Ten TMS pulses at 100% of MT were delivered with an inter-stimulus interval of approximately 5 to 10 seconds, also during closed chain active ankle plantar flexion (ie, "seated heel raise") to mid-range.

Ankle dorsiflexion range of motion measurement

Following the TMS hotspot location and MT measurement, all subjects received

ankle DF ROM measurements. In the first measurement, subjects laid prone on a padded table. A single blinded and standardized examiner measured ankle DF ROM with the knee fully extended using a 15.24 cm goniometer in a standard manner.⁴⁷ The measurement was repeated with the knee fully flexed. This measurement of ankle DF ROM demonstrates strong test-retest reliability with knee both flexed (ICC = .97) and extended (ICC = .98).⁴⁷

Anterior squat reach test

Following the ankle DF ROM measurement, all subjects completed the ASR measurement. This test is a component of the star balance excursion test, which has been described as a clinical test of dynamic balance.⁴⁸ Subjects assumed unilateral stance on the right lower extremity in the center of a grid marked circumferentially in 45° increments. Subjects then assumed a single leg squat and reached with the left lower extremity, tapping the heel on the ground anterior to the stance limb as far as possible. After a brief learning period consisting of 6 trials,⁴⁹ subjects completed 3 repetitions of ASR standing on the right lower extremity. Repetitions were excluded if the subject (1) was unable to maintain weight bearing during the trial, (2) lifted the stance foot, (3) lost balance, or (4) did not maintain the hold or start positions for one second. The mean of the 3 trials was taken as the ASR measurement. This test demonstrates good test-retest reliability (ICC = .67-.97).^{48,50}

Intervention

With the subject in a seated position on a treatment table and the lower extremity of interest stabilized to the table with a belt, a standardized licensed physical therapist grasped the foot of interest with the thenar eminences on the plantar surface of the subject's foot. A thrust was delivered parallel to the long axis of the subject's lower leg after the treating therapist induced passive ankle dorsiflexion to end range (Figure).^{45,51}

Data Analysis

Transcranial magnetic stimulation data were analyzed off-line with a customized MATLAB (Mathworks, Natick, MA) software, dataWizard (version 08.11, A.D.W., USC) by the same rater.⁵² The average of 10 trials for each stimulus intensity was calculated and used for data analysis. Percent change in GN MEP, TA MEP, ankle DF ROM, and ASR test performance were calculated according to the formula: $(\text{post-intervention value} - \text{preintervention value}) / \text{preintervention value} \times 100$. These calculations were completed in order to standardize the data to the starting value for each subject.

Distribution of the data was then summarized by visual inspection of histograms and the Shapiro Wilk test of data normality. Nonparametric statistical tests were used for analysis, because the data was non-normally distributed. For analysis of unstandardized measurements, the Wilcoxon signed-rank test was used to assess the significance of pairwise between-group median differences, and the Kruskal-Wallis test was used for comparison of group medians among multiple independent variables. Spearman's rho (ρ) and explained variance (ρ^2) were calculated for bivariate correlations among standardized changes in MEP amplitude, ankle DF ROM, and ASR performance. Strength of the association among the variables was interpreted using Munro's⁵³ criteria: very low = .15-.24, low = .25-.49, moderate = .50-.69, high = .70-.89, and very high = .90-1.00.

RESULTS

No significant differences were observed in median MEP amplitude for GN or TA across the 4 TMS intensities, so MEP data was pooled for analysis. Following intervention, median GN MEP increased 23.8% from .504 μ V (interquartile range [IQR]: .488) to .624 μ V (IQR: .375; Table). Median ankle DF ROM with knee extended increased 130.8% from -6.5° (IQR: 7.0) to 2.0° (IQR: 4.5) and median ankle DF ROM with knee flexed increased from 5.0° (IQR: 9.0) to 14.0° (IQR: 6.3) following intervention. Median ASR distance also increased 7.2% from 32.1 cm (IQR: 7.4) to 34.4 cm (IQR: 4.8). No significant change in TA MEP was noted after intervention. Percent change in GN MEP amplitude demonstrated significant moderate correlations with percent change in ankle DF ROM with knee flexed ($\rho = .582$, $\rho^2 = .339$, $P < .01$) and ASR distance ($\rho = .601$, $\rho^2 = .361$, $P < .01$), and percent change in ankle DF ROM with knee flexed showed significant high correlation with percent change in ASR distance ($\rho = .700$, $\rho^2 = .490$, $P = .001$).

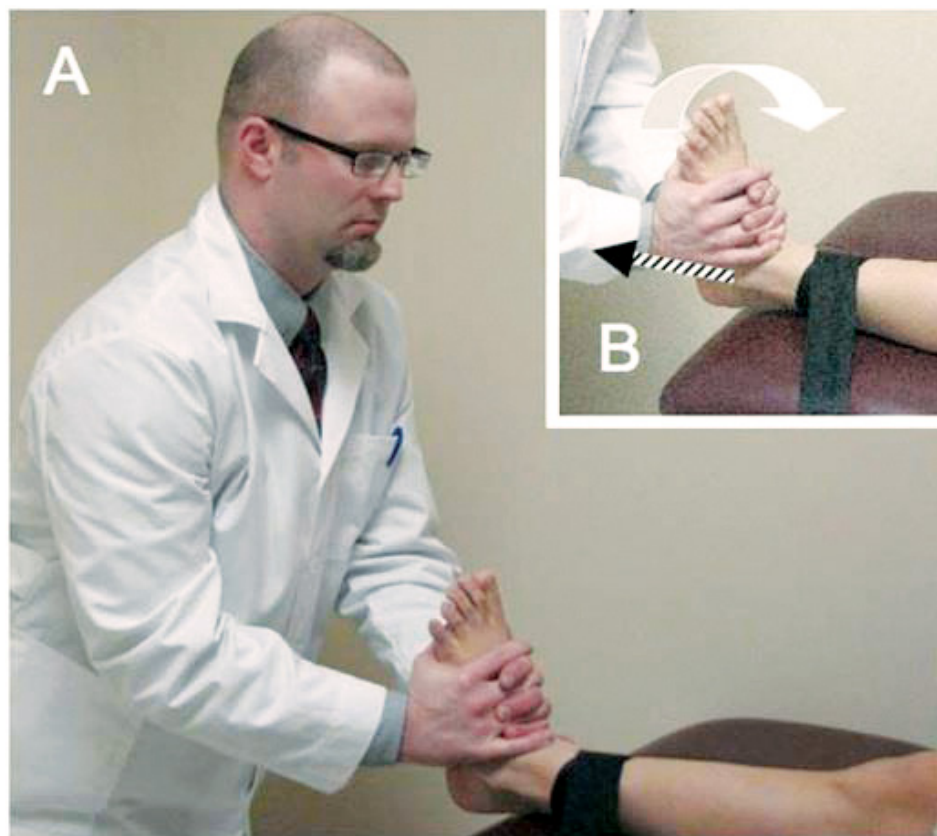


Figure. Intervention under study: long axis talocrural joint traction manipulation. (A) With the subject in a seated position on a treatment table and the lower extremity stabilized to the table with a belt, the treating investigator grasped the foot of interest with the thenar eminences on the foot's plantar surface. (B) After inducing passive ankle dorsiflexion (open arrow), a thrust was then delivered parallel to the long axis of the subject's lower leg (hatched arrow).

Table. Effect of Talocrural Joint Manipulation on MEP Amplitude, Ankle DF ROM, and ASR Measurements

	Preintervention measurement*	Postintervention measurement	Percent change change	P-value
GN MEP (μ V)	.504 (.488)	.624 (.375)	23.8%	.037 [†]
TA MEP (μ V)	.771 (1.05)	.767 (1.04)	-0.5%	.695
Ankle DF ROM, knee extended ($^{\circ}$)	-6.5 (7.0)	2.0 (4.5)	130.8%	<.001 [§]
Ankle DF ROM, knee flexed ($^{\circ}$)	5.0 (9.0)	14.0 (6.3)	180.0%	<.001 [§]
ASR distance (cm)	32.1 (24.7 – 39.5)	34.4 (29.6 – 39.2)	7.2%	.047 [†]

* - Values expressed as median (interquartile range)
[†] - Statistically significant, $P < .05$
[§] - Statistically significant, $P < .001$

Abbreviations: GN, gastrocnemius; TA, tibialis anterior; MEP, motor evoked potential; DF ROM, dorsiflexion range of motion; ASR, anterior squat reach

DISCUSSION

The talocrural joint long-axis traction manipulation has been described as a procedure to improve ankle DF ROM following ankle sprain.^{32,33,45,51} This study documented the effect of talocrural joint long-axis traction manipulation on corticospinal excitability and lower extremity functional behavior in nondisabled individuals. To date, the literature regarding neuromotor effects of manual therapy has involved procedures directed to the spine.^{41,42} However, spinal manipulation is poorly localized even in the hands of skilled and experienced practitioners.⁴³ Thus, the emphasis on spinal manual therapy procedures in research designs of studies to date potentially inhibits the specificity of conclusions that can be drawn from these studies about the effect of manual treatment procedures.

This study provides support for using the talocrural joint to study the neuromotor effects of manipulation in individuals with lower extremity pathology. The talocrural joint is a promising body region to elucidate the potential neuromotor effects of manual therapy for a number of reasons.⁴⁵ The talocrural joint is relatively large, so intervention may be more specifically localized to the talocrural joint than smaller joints of the spine. Muscle groups crossing the talocrural joint are relatively large, which provide for reliable placement of EMG electrodes with minimal cross-talk. Valid and reliable behavioral measurements for talocrural joint range of motion and lower extremity functional behavior already exist, making possi-

ble empirical examination of the relationship between short-term CNS neuroplasticity and the changes in functional behavior that have been elucidated by clinical studies.

In this study, GN MEP amplitude was observed to increase significantly following talocrural long-axis traction manipulation, which indicates increased corticospinal tract excitability involving this muscle group. Treatment effects seem unique to GN, because significant increases in TA MEP amplitude were not observed. Studies to date using TMS methodology to determine the effect of manual therapy procedures on corticospinal excitability have not measured the effect of intervention on opposing muscle groups. Thus, the discrepant effect of manipulation on antagonist muscle groups observed in this study represents a new finding in the literature that requires additional replication in studies of the spine and upper extremity. This finding also indicates the need to assess the potential for differential effects of treatment on antagonist muscle groups in the ankles of individuals with symptoms.

In addition to significant increase of GN MEP amplitude, parallel significant improvements in ankle DF ROM and ASR distance were observed following long-axis traction talocrural joint manipulation. These findings confirm observations from prior studies and clinical experience with manual therapy of relatively rapid improvement in symptoms and ankle DF ROM following manipulation. Collins and colleagues⁵⁴ found an increase in ankle DF

ROM in response to manual therapy without corresponding change in pressure or thermal pain thresholds. A follow-up study by this group found a significant association between improvement in a clinical measure of talocrural posterior glide and improvement in talocrural DF ROM.⁵⁵ Overall these findings suggest a primarily mechanical effect of treatment. However, the magnitude, time, and speed of loading that characterize manipulation seem inadequate to reverse maladaptive fibrosis that has been hypothesized to result in arthrokinematic and osteokinematic ankle mobility limitations following sprains.^{49,56} Significant moderate to high correlations between changes in GN MEP amplitude, ankle DF ROM, and ASR distance that were identified in this study suggest the potential mechanistic importance of short-term neuromotor adaptation to promote improvements in ankle DF ROM and lower extremity functional behavior. Additional work is necessary to elucidate the nature and time course of these neuromotor changes in individuals with lower extremity disablement.

ACKNOWLEDGEMENT

This work was supported by a grant to Todd E. Davenport from the Orthopaedic Section, APTA, Inc.

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Book reviews are coordinated in collaboration with Doody Enterprises, Inc.

Quick Reference Dictionary for Physical Therapy, 3rd Edition, Slack Incorporated, 2013, \$19.95
ISBN: 9781617110702, 661 pages, Soft Cover

Editor: Bottomley, Jennifer, PhD, MS, PT

Description: The title does not do this book justice -- it has much more information than just a list of definitions. Multiple appendixes provide a wide variety of useful information on physical therapy topics and this new edition includes 400 newly defined words and 100 new abbreviations among other updates. The previous edition was published in 2003. **Purpose:** The purpose is to define commonly used medical terms encountered in the field of physical therapy, but another objective is to provide an easy-to-use reference tool that is more than just a dictionary. This book clearly meets these objectives and provides clinicians with a wealth of information that is not only easy to look up, but easy to understand. **Audience:** This is a great reference for physical therapy students and even experienced clinicians. The author's intent was to provide a convenient resource to help practitioners retrieve information quickly that isn't always easy to recall. The author has extensive experience in physical therapy and in education. **Features:** The first section is in the format of a standard dictionary. Following that are the 41 appendixes, which constitute the strong point of the book. They include an alphabetical listing of acronyms and abbreviations and reprints from the APTA's *Guide to Physical Therapist Practice* on ethics, professional conduct, standards of practice, and documentation, to name a few. They also include information on the history of the profession, state regulations, direct access regulations, frequently used tests and measures, normal range of motion guidelines, medication charts, etc. Despite all the information in this book, it is well organized and specific information remains easy to find. Topics are not covered in great detail, but the material is well referenced. **Assessment:** This is an excellent book that can be useful in the classroom or the clinic, and in a variety of physical therapy practice settings. This edition has been updated and includes two new appendixes: one on state to state information on direct access regulations and one on abbreviations regarding drug prescribing and elimination.

*Daniel Higgins, DPT, OCS, ATC
Orthopedic & Sports Physical Therapy Associates*

Physical Therapy Clinical Handbook for PTAs, 2nd Edition, Jones & Bartlett Learning, 2013, \$68.95
ISBN: 9781449647582, 532 pages, Soft Cover

Author: Dreeben-Irimia, Olga, PT, PhD, MPT

Description: This update to a 2007 book provides practicing physical therapist assistants (PTAs) with a convenient, useful tool

for various environments, and encompasses an array of treatment information in one portable reference. **Purpose:** The author more than satisfies the goal of providing busy practicing PTAs and PTA students with a quick, evidence-based reference guide for treating patients in any environment. **Audience:** Practicing PTAs and PTA students are the target audiences for this book, which provides convenient reference information that facilitates treatment decisions. It may be useful to practicing physical therapists, but it is not meant to serve as a comprehensive reference for constructing treatment plans. **Features:** Using a table format, the book covers diagnosis and interventions for all specialties in physical therapy including cardiac, musculoskeletal, acute care, neurology, geriatrics, and pediatrics. The strength of each section is the clear review of special tests, terminology, anatomy, and clinical implications. Each section then reviews functional limitations of medical conditions before discussing common intervention practice patterns. The most areas covered most comprehensively are musculoskeletal and neurology. The musculoskeletal section includes a review of manual muscle testing and goniometry including pictures; muscular anatomy with innervations; and modality use with treatment parameters, implications, and contraindications. The intervention chapter in the neurology section is particularly noteworthy as a review of useful therapeutic interventions. Also notable is the book's emphasis on the role of the PTA in specialized patient education, e.g. foot care for the patient with diabetes. **Assessment:** This second edition is updated with the newest evidence-based treatment practices and HIPAA guidelines for physical therapy. The condensed nature of the book, combined with its detailed index, enables easy use for quick inquiries, making it essential for busy PTAs or PTA students.

*Jennifer C. Hoffman, PT, DPT, OCS
Private Practice*

General Pathology and Internal Medicine for Physical Therapists, Thieme Medical Publishers, Inc., 2012, \$59.99
ISBN: 9783131543219, 316 pages, Soft Cover

Editors: Steffers, Gabriele, MD; Credner, Susanne, MD

Description: This book outlines the basic principles of general pathology and medicine relevant to the practice of physical therapy. **Purpose:** The authors' objective is to provide physical therapy practitioners the knowledge to identify underlying medical conditions, develop treatment plans which account for these factors, and refer patients when necessary. **Audience:** Both physical therapy students and seasoned practitioners are the intended target audience. For students, this could serve as a required text during academic training, while physical therapists and physical therapist assistants in practice would benefit from having this as an accessible reference. **Features:** The first of the book's two sections, on general pathology, describes basic principles, types of diseases, symptoms, diagnostics, and therapies. The second section, on internal medicine, is organized by systems. This section covers all systems relevant to physical therapy with the exception of the neural and musculoskeletal systems, which

are extensively covered in other books and courses during physical therapy education. The nearly 300 illustrations that effectively support the content are the book's most valuable feature. Assessment: A broad knowledge of general pathology and internal medicine is essential for physical therapists. With the growing acceptance and prevalence of direct access care, there is a need for a book of this type. Although this book has many positive qualities, in order to more effectively meet the authors' objective, it should more clearly delineate the clinical considerations for each pathology. Overall, however, it will be a great reference to have when questions arise about the need to refer patients to other practitioners.

*Justin G Schaedle, PT, DPT, OCS
Butler County Physical Therapy*

Orthopaedic Practice (OP) is interested in having readers serve as book reviewers. Previous experience is recommended but not required. Invitation is only open to Orthopaedic Section members. Successful completion of each review results in the reviewer retaining a free copy of the textbook.

If you are interested, please contact Michael Wooden, Book Review Editor for OP at: michael.wooden@physiocorp.com



James J. Irrgang, PT, PhD, ATC, FAPTA, receives a thank you for his years of dedicated service as Orthopaedic Section President from APTA Board Liaison, Nicole Stout, PT, MPT, CLT-LANA.

2013 CSM Award Winners

The Orthopaedic Section awards ceremony was at CSM in San Diego, California this past January. Congratulations to all of this year's award winners.

PARIS DISTINGUISHED SERVICE AWARD

The Paris Distinguished Service Award is awarded by the Orthopaedic Section to acknowledge and honor an Orthopaedic Section member whose contributions to the Section are of exceptional and enduring value. The recipient of this award is provided an opportunity to share his or her achievements and ideas with the membership through a lecture presented at this evening's Awards Ceremony.



The 2013 Paris Award for Distinguished Service is presented to Michael T. Cibulka, PT DPT, MHS, OCS, FAPTA. Dr. Cibulka has demonstrated a long history of prominent leadership that has advanced the interests and objectives of the Section and he has notable talents in publication, teaching, research, administration, and clinical practice. Dr. Cibulka has a long-standing history of continuous service to the Orthopaedic Section beginning in 1986 when he served as Chair of the Standards Committee for the Orthopaedic Specialty Council. In 1994, he was elected to serve as Director to the Orthopaedic Section Board of Directors. At the completion of his term as Director, Dr. Cibulka served on a Task Force to revise the Description of Specialized Practice for the Orthopaedic Specialty Council. In 2001, Dr. Cibulka was elected President of the Orthopaedic Section and he served two terms in this position from 2001 to 2007. As President of the Section, Dr. Cibulka challenged Board members to think about the future of the Section and what the Section could do to impact orthopaedic

physical therapy practice. It was during one of these "brain storming" sessions in 2005 when the idea of using the newly published World Health Organization's International Classification of Functioning, Disability and Health (ICF) to describe practice and the evidence for orthopaedic physical therapy was first discussed. This discussion led to the Section's efforts to create evidence-based clinical practice guidelines that were consistent with the ICF model of functioning and disability. Not only did Dr. Cibulka spur and foster the idea of creating evidence-based clinical practice guidelines, but he subsequently co-chaired the workgroup that developed clinical practice guidelines for hip osteoarthritis that were published in 2009 and guidelines for non-arthritic intra-articular hip pain that will be published in the near future.

As an owner of a successful outpatient orthopaedic physical therapy private practice, Dr. Cibulka strongly embraces the concepts of evidence-based practice that were instilled in him by Dr. Stephen Rose, PT, PhD. As a clinician, Dr. Cibulka was strongly influenced by his mentors including the late Richard Erhard, PT, DC, and Richard Bowling, PT, MS, as well as by Anthony Delitto, PT, PhD, FAPTA. Largely due to the influence of his mentors, Dr. Cibulka has made significant contributions to clinical research that has resulted in 23 peer-reviewed publications. The excellence of his clinical research has been recognized twice by the APTA through presentation of the Jack Walker Award for the best clinical research article published in *Physical Therapy*. For all of his accomplishments related to clinical practice, Dr. Cibulka was awarded the Orthopaedic Section's Bowling-Erhard Clinical Practice Award, which is presented to a Section member that has made outstanding and lasting contributions to the clinical practice of orthopaedic physical therapy.

Since 2005, Dr. Cibulka has served as a full-time faculty member in the Department of Physical Therapy at Maryville University where he is responsible for teaching musculoskeletal examination and treatment, diagnostic imaging and evidence-based practice. As an educator, Dr. Cibulka

is recognized by the administration, faculty, and students for his commitment to teaching excellence in terms of contemporary subject knowledge, energetic classroom presence, and rapport with his students. Dr. Cibulka has also presented numerous continuing education lectures and workshops throughout the United States that are both "stimulating and thought provoking." Based on Dr. Cibulka's exceptional service to the Orthopaedic Section and his notable talents in publication, teaching, research, administration, and clinical practice, it is only fitting that he be recognized as the 2013 recipient of the Orthopaedic Section's most distinguished award, the Paris Distinguished Service Award.

ROSE EXCELLENCE IN RESEARCH AWARD

The purpose of this award is to recognize and reward a physical therapist who has made a significant contribution to the literature dealing with the science, theory, or practice of orthopaedic physical therapy. The submitted article must be a report of research but may deal with basic science, applied science, or clinical research.



The recipient of the 2013 Rose Excellence in Research Award is Dr. Emilio J. Puentedura, PT, DPT, PhD, and his colleagues for the manuscript Development of a Clinical Prediction Rule to Identify Patients with Neck Pain Likely to Benefit from Thrust Joint Manipulation to the Cervical Spine. *J Orthop Sports Phys Ther* 2012;42(7):577-592 by Emilio J. Puentedura, Joshua A. Cleland, Merrill R. Landers, Paul Mintken, Adriaan Louw, César Fernández-de-las Peñas.

Dr. Emilio "Louie" Puentedura is currently an Assistant Professor at the Univer-

sity of Nevada Las Vegas, Department of Physical Therapy. He teaches Gross Human Anatomy to first-year DPT graduate students, as well as Spine Examination and Interventions, and Diagnostic Imaging to the second-year DPT graduate students. He is also an active researcher investigating the clinical effectiveness and underlying mechanisms of spinal manipulation. Louie is also working on research into Neurodynamics and Therapeutic Neuroscience Education in managing and preventing chronicity in patients with spinal pain.

Louie received his Bachelor's degree in Physical Therapy from La Trobe University in Melbourne, Australia in 1980 and a Post-Graduate Diploma in Manipulative Therapy in 1983. Following this he worked in outpatient clinical practice specializing in spinal pain before moving to the USA in 1995. He completed a Post-professional DPT at Northern Arizona University in 2005 and then his PhD in Physical Therapy at Nova Southeastern University. Louie left full time clinical practice in 2007 to join the faculty at UNLV and completed his PhD in 2011. Louie is an active member of the APTA, a Board certified specialist in Orthopaedic Physical Therapy and a fellow of the American Academy of Orthopedic Manual Physical Therapists. He will continue to pursue his clinical research agenda to develop evidence-based guidelines for the use of thrust joint manipulation in patients with neck and back pain.

JAMES A GOULD EXCELLENCE IN TEACHING ORTHOPAEDIC PHYSICAL THERAPY AWARD

This award is given to recognize and support excellence in instructing orthopaedic physical therapy principles and techniques through the acknowledgement of an individual with exemplary teaching skills. The instructor nominated for this award must devote the majority of his/her professional career to student education, serving as a mentor and role model with evidence of strong student rapport. The instructor's techniques must be intellectually challenging and promote necessary knowledge and skills.

Mark Donald Bishop, PT, PhD, an Associate Professor in the Department of Physical Therapy at the University of Florida in Gainesville, Florida, is the 2013 recipient of the James A. Gould III Excellence in Teaching Orthopaedic Physical Therapy Award.

Mark is known for a dynamic teaching approach continually developing and



reworking his methodologies based upon students' needs. For example, Mark incorporates anatomical models built from spare parts in his garage to assist students in comprehending more difficult biomechanical concepts (such as the extensor mechanism of the fingers). Students frequently mock these models during end of the year skits; however, many years later acknowledge their benefit in providing clarity for specific concepts.

Mark influences student education beyond the classroom. He oversaw the development of a pro bono equal access clinic and regularly serves as a faculty supervisor allowing students to translate classroom knowledge into a clinical setting while serving the community.

Additionally, Mark was instrumental in developing the Shands Rehabilitation-University of Florida Orthopaedic and, Sports Physical Therapy Residency Programs. He works closely with the residents for advanced study related to Orthopaedic Practice.

Finally, Mark teaches others to become better instructors of Orthopaedic Physical Therapy Practice. The PhD students and local clinicians serving as teacher's assistants laud his methods and report modeling their own teaching approaches after his. Furthermore, Mark has led entry level physical therapy students on teaching outreach missions to Nicaragua presenting week long courses related to Orthopedic Physical Therapy Practice. The Nicaraguan physical therapists were grateful for these presentations and the accompanying students came away with an appreciation for Mark's teaching ability. As one of the students commented, "These approaches are what made learning fun for me, and I have found them to be incredibly successful when teaching students of my own."

In summary, Mark Bishop exemplifies excellence in teaching Orthopedic Physical Therapy. He distinguishes himself through his passion, enthusiasm, knowledge, and commitment to teaching.

OUTSTANDING PT STUDENT AWARD

The purpose of this award is to identify a student physical therapist with exceptional scholastic ability and potential for contribution to orthopaedic physical therapy. The eligible student shall excel in academic performance in both the professional and pre-requisite phases of their educational program, as well as be involved in professional organizations and activities that provide for potential growth and contributions to the profession and orthopaedic physical therapy.



The 2013 Orthopaedic Section Outstanding Physical Therapy Student Award is presented to Eric Lehman, who is a second year Doctor of Physical Therapy Student at the University of Pittsburgh. Mr. Lehman received his undergraduate education from Baldwin-Wallace College, where he graduated Summa Cum Laude with a double major in pre-physical therapy and exercise science and a double minor in biology and orthopaedic assessment and treatment. Through the first four semesters in the Doctor of Physical Therapy Program at the University of Pittsburgh, the 2013 Orthopaedic Section Outstanding Physical Therapy Student Award is presented to Eric Lehman, who is a second year Doctor of Physical Therapy Student at the University of Pittsburgh. Mr. Lehman received his undergraduate education from Baldwin-Wallace College, where he graduated Summa Cum Laude with a double major in pre-physical therapy and exercise science and a double minor in biology and orthopaedic assessment and treatment. Through the first four semesters in the Doctor of Physical Therapy Program at the University of Pittsburgh, Mr. Lehman is ranked at the top of his class and he stands out from among his peers for his exceptional orthopaedic knowledge and skill. Based upon his academic achievement, performance on

musculoskeletal written and practical examinations and performance during his orthopaedic clinical internships, Mr. Lehman was selected as one of four students to run the Student Health Services Physical Therapy Clinic. In the clinic, Mr. Lehman has demonstrated exceptional clinical knowledge and skills for examination, evaluation, diagnosis, prognosis, intervention, and assessment of outcome for a wide variety of musculoskeletal conditions, including very good patient handling and manual therapy skills when performing both non-thrust and thrust joint mobilization.

During his education at the University of Pittsburgh Mr. Lehman has participated in a wide variety of extra-curricular learning opportunities, including weekly attendance at the Sports Medicine Teaching Conference and Orthopaedic Grand Rounds, both of which are sponsored by the Department of Orthopaedic Surgery. Mr. Lehman has also participated in several clinical research projects conducted by faculty in the Department of Physical Therapy, including projects related to movement re-education for individuals with lower extremity movement dysfunction and development of a clinical prediction rule to identify risk factors for running-related injuries.

Mr. Lehman has demonstrated initiative, leadership, and creativity throughout his tenure in the Doctor of Physical Therapy Program at the University of Pittsburgh. Soon after he matriculated into the program, Mr. Lehman was elected to serve on the student-run committee for the Pittsburgh-Marquette Challenge. Under Mr. Lehman's leadership, students from his class have taken the Challenge to a new level in an attempt to engage a greater number of physical therapy programs by creating a "log and blog" enterprise that engages students to log miles in any manner (bike, swimming, running etc.) and finding sponsors to donate based on the number of miles logged. Mr. Lehman developed a business plan that he presented to the Foundation for Physical Therapy Board of Trustees to get support for the program that will be launched at the 2013 Combined Sections Meeting in San Diego. In devising this plan, it is clear that Mr. Lehman demonstrated exceptional innovation and leadership skills. To quote Dr. Delitto, the Chair of the Department of Physical Therapy at the University of Pittsburgh, "Eric has demonstrated leadership skills that are rare in an entry-level student including the ability to confront a rather 'strong-minded' Chair and let him know

that there was a better idea and then to lead an effort that will likely result in a new standard in student-led fund raising."

Based on Mr. Lehman's academic achievements and exceptional initiative, leadership, and creativity as a student in the Doctor of Physical Therapy Program at the University of Pittsburgh, it is only fitting that he receives the 2013 Orthopaedic Section's Outstanding Physical Therapy Student Award. Given his performance to date, it is likely that Mr. Lehman will continue to strive for professional excellence and is destined to become an important leader in the field of orthopaedic physical therapy.

OUTSTANDING PTA STUDENT AWARD

The purpose of this award is to identify a student physical therapist assistant with exceptional scholastic ability and potential for contribution to orthopaedic physical therapy. The eligible student shall excel in academic performance in both the pre-requisite and didactic phases of their educational program, and be involved in professional organizations and activities that provide the potential growth and contributions to the profession and orthopaedic physical therapy.



Bethany E. Smahaj of Winchester, Kentucky is currently a second-year PTA student at Somerset Community College. She holds a Bachelor Degree in Environmental Science from Georgetown College. She is a member of SCC's Physical Therapy Student Organization and Martial Arts Club and has been highly visible on SCC's campus. She is employed as a physical therapy technician at the Drayer Physical Therapy Institute.

Active in her community, Smahaj has participated in many charitable projects. She has volunteered in assisting with free health screenings at the Kentucky Special Olympics State Games, has delivered meals to families through the Operation Happiness Program and sponsors a child through Compassion International. She serves as a

peer mentor and tutor and has assisted with laboratory experiences for first-year physical therapist assistant students. She is also active in her church, where she serves as Director of the Vacation Bible School program and recently organized efforts to provide relief to victims of a tornado.

Smahaj has been active within the American Physical Therapy Association. In addition to holding membership in the Orthopaedic Section, she has participated in an educational brochure design competition hosted by the Section on Geriatrics. She recently attended the APTA's National Student Conclave and has raised funds for physical therapy research through participating in fundraising events for the Foundation for Physical Therapy's Pittsburgh-Marquette Challenge.

Orthopaedic Section, APTA, Inc.

CSM MEETING MINUTES

CSM BOARD OF DIRECTORS MEETING MINUTES

James Irrgang, President, called a regular meeting of the Board of Directors of the Orthopaedic Section, APTA, Inc. to order at 5:30 PM on Monday, January 21, 2013. The Board meeting continued on Tuesday, January 22 at 10:00 PM.

Present:

James Irrgang, President
Gerard Brennan, Vice President
Steve Clark, Treasurer
Bill O'Grady, Director
Tom McPoil, Director
Lori Michener, Research Chair
Joe Donnelly, Practice Chair
Beth Jones, Education Chair

Guests:

Steve McDavitt, Incoming President
Pam Duffy, Incoming Director
Duane Scott Davis, Incoming Research Chair
Tess Vaughn, Incoming Education Chair
Tara Fredrickson, Executive Associate
Terri DeFlorian, Executive Director
Nicole Stout, APTA Board Liaison

The meeting agenda was approved with one addition.

Bill Boissonnault, Foundation President, and Barbara Malin, Foundation Executive Director, attended to give an update on the Foundation. The Foundation is launching a campaign to create a Center of Excellence for Health Services Research. The aim of the campaign is to achieve commitments during 2013 for combined gifts totaling more than \$3 million. Funding for the Center of Excellence will be directed to the institution best qualified to house the nation's first health services research training program specific to physical therapy. The Foundation is asking the Section for a contribution. The Board will discuss this request within the next 2 months and get back to the Foundation with a decision.

The January 14, 2012 Board of Directors Conference Call Meeting minutes were approved as printed.

James Irrgang, President, reviewed the CSM meeting dates, times, and room locations with the Board.

The schedule for future Board of Directors conference calls were approved for the second Monday of the month at 8:00 PM EST on the following dates:

- February 11
- March 11
- April 8

The following motions on the consent calendar were adopted –

=MOTION 1= Beth Jones, Education Chair, moved that the Orthopaedic Section Board of Directors approve the revised Education Policies and Cover Page as discussed on the December 10, 2012, Board Conference Call.

Fiscal Implication: None

=MOTION 2= Joe Donnelly, Practice Chair, moved that the Orthopaedic Section Board of Directors approve the attached Practice Policies and Cover Page.

Fiscal Implication: None

=MOTION 3= Chris Hughes, OP Editor, moved that the Orthopaedic Section Board of Directors approve the attached Journal and Newsletter policies.

Fiscal Implication: None

There were no motions sent out for a vote via e-mail.

Steve Clark, Treasurer, reported that the Section currently has 74% of its operating expense in reserves. This is down from 84% last month mainly due to the increase in funding 2013 initiatives. Section policy is to hold 60% of operating expenses in reserves. The Section continues to be in a good financial position.

James Irrgang, President, reported that the APTA Board of Directors approved developing a steering committee for CSM. A call for nominations was sent out. There will be 9 individuals selected from Sections; 2 representatives from each small, medium, and large Section that were represented in the CSM review process. This group will then select 3 additional representatives; 1 each from a small, medium, and large Section. From this group a leader will be selected.

James Irrgang, President, updated the Board on the Governance Review status. Discussion of the Sections having a vote in the House of Delegates took place at the Component Leaders Meeting. The discussion revolved around votes being assigned proportionately based on Section size with a maximum of 5 votes for each Section having over 5,000 members. There was overall consensus that Sections should have a vote in the House. Continued discussion will occur at the Section President's Meeting at CSM 2013.

James Irrgang, President, reported that a meeting was held at CSM 2013 between James Irrgang, Paul Rockar, Janet Bezner, Shawne Soper, and Steve McDavitt to discuss the PTA Advanced Proficiency Pathways. It was stated that the Orthopaedic Section could not support the initiative as it is currently designed; however, the Section would be supportive of the program if there was valid methodology to determine the scope of advanced proficiency for PTAs working in a musculoskeletal setting. Based upon the discussion, it was agreed that the Section would work with APTA to create a survey that would go to all PTs and PTAs who are Orthopaedic Section members. The group wanted clear operational definitions included in the survey. APTA will get back to the Section with a plan on how to integrate the next step. Someone will then be assigned to work with Marc Goldstein to develop the survey questions.

Gerard Brennan, Vice President, presented the following technology update on the Educational Delivery Assessment. The purpose of the survey was to assess the accessibility and effectiveness of the educational needs of the membership, evaluate opportunities for new technologies, and prioritize implementation of changes. An online survey was sent to all Section members, in-depth phone interviews were conducted with members who had taken an ISC, and an evaluation of our competitor's offerings was done. Of the 1,243 respondents to the survey, 98% were physical therapists and 2% were physical therapy assistants. Respondents preferred attending off-site meetings, having material in print form, and participating in online webinars. Member recommendations included having easily searchable and navigable online resources, availability of videos or other interactive content that would enhance the use of ISCs, and the ability to access information presented at annual meetings. The next step is for PCG to conduct additional phone interviews concentrating on a more diverse age population. An update will be brought back to the Board on their February conference call meeting.

=MOTION 4= Tom McPoil, Director, moved that the Orthopaedic Section Board of Directors approve selecting the Hyatt Regency at the Arch for the 2014 Annual Orthopaedic Section Meeting property in St. Louis, MO, May 15-18, pending it does not conflict with the MO State Chapter meeting. ADOPTED (unanimous)

Fiscal Implication: None

=**MOTION 5**= Lori Michener, Research Chair, moved that the Orthopaedic Section Board of Directors approve the following research grants -

New investigator:

“Neurosensory Responses to Thrust Mobilization and Eccentric Exercise in People with Rotator Cuff Tendinopathy”

PI: Stephanie Muth, PT, PhD, NCS

Co-PI: Philip McClure, PT, PhD; Scott Stackhouse, PT, PhD

Funding Request: \$15,000.00

Funding Category: NEW INVESTIGATOR

“The Effectiveness of Targeted Neuromuscular Training on the Functional Outcomes of Athletes with Femoroacetabular Impingement”

PI: Stephanie L. Di Stasi, PT, PhD, OCS

Co-PI: Thomas Ellis, MD; Timothy Hewett, PhD

Funding Request: \$15,000

Funding Category: New investigator

ADOPTED (unanimous)

Fiscal Implication: \$30,000

=**MOTION 6**= Lori Michener, Research Chair, moved that the Orthopaedic Section Board of Directors approve the following research grant -

Unrestricted:

“Using fMRI to determine if Cerebral Hemodynamic Responses to Pain Change following Thoracic Spine Thrust Manipulation in Patients with Neck Pain”

PI: Cheryl L. Sparks, PT, DPT

Co-PI: Joshua A. Cleland, PT, PhD; James M. Elliott, PT, PhD; Wen-Ching Liu, PhD

Funding Request: \$23,057.40

Funding Category: UNRESTRICTED

ADOPTED (unanimous)

Fiscal Implication: \$23,057.40

=**MOTION 7**= Lori Michener, Research Chair, moved that the Orthopaedic Section Board of Directors approve the following research grant -

Foot and Ankle:

“Comparison of Usual Podiatric Care and Early Physical Therapy for Plantar Heel Pain”

PI: Shane McClinton, PT, DPT, OCS, FAAOMPT

Co-PI: Timothy Flynn, PT, PhD, OCS, FAAOMPT; Bryan Heiderscheit, PT, PhD

Funding Request: \$15,000.00

Funding Category: FOOT & ANKLE

ADOPTED (unanimous)

Fiscal Implication: \$15,000

James Irrgang, President, announced the APTA Public Service Award Nominations and the APTA Federal Government Affairs Leadership Award Nominations for 2013 are due February 11, 2013.

=**MOTION 8**= Bill O’Grady, Director, moved that the Orthopaedic Section Board of Directors approve nominating both of the individuals listed below for the APTA Public Service Award.

- Tammy Duckworth (IL)
- Gabriel Gifford (AR)

ADOPTED (unanimous)

Fiscal Implication: None

James Irrgang, President, noted that there were no nominations put forth at this time for the APTA Federal Government Affairs Leadership Award.

=**MOTION 9**= Gerard Brennan, Vice President, moved that the Orthopaedic Section Board of Directors appoint James Irrgang, PT, PhD, ATC, FAPTA, to continue as Chairperson of the National Orthopaedic Physical Therapy Outcomes Database (NOPTOD) tracking project for a

period of three years.

ADOPTED (unanimous)

Fiscal Implication: None

=**MOTION 10**= Tom McPoil, Director, moved that the Orthopaedic Section Board of Directors assist James Irrgang in finding someone to appoint as Vice Chair of the National Orthopaedic Physical Therapy Outcomes Database project for the purpose of transitioning this person into the position of Chair at the end of 3 years (2016). ADOPTED (unanimous)

Fiscal Implication: None

=**MOTION 12**= James Irrgang, President, moved that the Orthopaedic Section Board of Directors approve making a donation to a charity in memory of Dave Pariser in the amount of \$250.

ADOPTED (unanimous)

Fiscal Implication: \$250

=**MOTION 13**= Steve Clark, Treasurer, moved that the Orthopaedic Section Board of Directors support the following proposed amendments to the APTA bylaws and standing rules as proposed by the APTA Board of Directors for the 2013 House of Delegates that specifically support voting rights of Sections in the House of Delegates as follows: and, that the Section communicate with the Board the desire to co-sponsor these motions to the 2013 House of Delegates.

ADOPTED (unanimous)

Fiscal Implication: None

MOTION 1

That Bylaws of the American Physical Therapy Association, Article IV. Membership, Section 2: Rights and Privileges of Members, B., (2) To vote, a., be amended by inserting the words “and section delegates” after the word “delegates” so that it would read:

Section 2: Rights and Privileges of Members

* * *

B. Only members in certain categories have the following privileges (subject to restriction as otherwise provided in Association bylaws):

* * *

(2) To vote.

a. At House of Delegates meetings: Chapter delegates and section delegates, 1 vote.

MOTION 2

That Bylaws of the American Physical Therapy Association, Article IV. Membership, Section 2: Rights and Privileges of Members, B., (4) To serve as a delegate to the House of Delegates, b., be amended by striking out the words “and Physical Therapist Assistant” so that it would read:

Section 2: Rights and Privileges of Members

* * *

B. Only members in certain categories have the following privileges (subject to restriction as otherwise provided in Association bylaws):

* * *

(4) To serve as a delegate to the House of Delegates.

a. As chapter delegate: Physical Therapist.

b. As section delegate: Physical Therapist ~~and Physical Therapist Assistant~~.

c. As PTA Caucus delegate: Physical Therapist Assistant, subject to qualifications identified in Article VIII., Section 4., of these bylaws.

d. As assembly delegate: Assembly member, subject to additional eligibility requirements in the assembly bylaws.

MOTION 3

That Bylaws of the American Physical Therapy Association, Article VII. Meetings, Section 3: Notice of Sessions, A. Annual Session, be amended by striking out the word “chapter” after the words “to each” so that it would read:

Section 3: Notice of Sessions

A. Annual Session

The time and place of the annual session shall be announced in the official journal of the Association, and notice shall be sent to each component president or chair and to each chapter chief delegate at least six weeks before the session is scheduled to convene. This notice may be made by mail or any telecommunications method including, but not limited to, fax and e-mail transmissions which must ensure the timely receipt of the notice and may ensure verifiable receipt of the notice by the intended recipients.

MOTION 4

That Bylaws of the American Physical Therapy Association, Article VIII. House of Delegates of the American Physical Therapy Association, Section 3: Voting Delegates, be amended by substitution:

Section 3: Voting Delegates

The voting delegates of the House of Delegates shall be the chapter delegates and the section delegates.

A. Qualifications of Voting Delegates

MOTION 1

That Bylaws of the American Physical Therapy Association, Article IV. Membership, Section 2: Rights and Privileges of Members, B., (2) To vote, a., be amended by inserting the words “and section delegates” after the word “delegates” so that it would read:

Section 2: Rights and Privileges of Members

* * *

B. Only members in certain categories have the following privileges (subject to restriction as otherwise provided in Association bylaws):

* * *

(2) To vote.

a. At House of Delegates meetings: Chapter delegates ~~and section delegates~~, 1 vote.

MOTION 2

That Bylaws of the American Physical Therapy Association, Article IV. Membership, Section 2: Rights and Privileges of Members, B., (4) To serve as a delegate to the House of Delegates, b., be amended by striking out the words “and Physical Therapist Assistant” so that it would read:

Section 2: Rights and Privileges of Members

* * *

B. Only members in certain categories have the following privileges (subject to restriction as otherwise provided in Association bylaws):

* * *

(4) To serve as a delegate to the House of Delegates.

a. As chapter delegate: Physical Therapist.

b. As section delegate: Physical Therapist ~~and Physical Therapist Assistant~~.

c. As PTA Caucus delegate: Physical Therapist Assistant, subject to qualifications identified in Article VIII., Section 4., of these bylaws.

d. As assembly delegate: Assembly member, subject to additional eligibility requirements in the assembly bylaws.

MOTION 3

That Bylaws of the American Physical Therapy Association, Article VII. Meetings, Section 3: Notice of Sessions, A. Annual Session, be amended by striking out the word “chapter” after the words “to each” so that it would read:

Section 3: Notice of Sessions

A. Annual Session

The time and place of the annual session shall be announced in the official journal of the Association, and notice shall be sent to each component president or chair and to each chapter chief delegate at least six weeks before the session is scheduled to convene. This notice may be made by mail or any telecommunications method including, but not limited to, fax and e-mail transmissions which must ensure the timely receipt of the notice and may ensure verifiable receipt of the notice by the intended recipients.

MOTION 4

That Bylaws of the American Physical Therapy Association, Article VIII. House of Delegates of the American Physical Therapy Association, Section 3: Voting Delegates, be amended by substitution:

Section 3: Voting Delegates

The voting delegates of the House of Delegates shall be the chapter delegates and the section delegates.

A. Qualifications of Voting Delegates

(1) Chapter delegates and section delegates: Only Physical Therapist members may serve as chapter delegates or section delegates. Only Physical Therapist members who have been Association members in good standing in any category of membership for no fewer than the 2 years immediately preceding the start of the House session may serve as chapter delegates or section delegates.

(2) Members of the Board of Directors may not serve as chapter delegates or section delegates.

(3) A delegate of any one component may not serve concurrently as a delegate of another component.

B. Number of Voting Delegates

The number of chapter delegates shall be based on, but not limited to, 400; which shall be apportioned among the chapters on the basis of the number of Physical Therapist, Retired Physical Therapist, Life Physical Therapist, Physical Therapist Assistant, Retired Physical Therapist Assistant, and Life Physical Therapist Assistant members in each chapter according to membership records in the Association headquarters and as described in the standing rules. The number of each section's delegates shall be based on its member count as determined according to the standing rules. The number of chapter delegates shall be based on, but not limited to, a target number equal to 420 minus the number of section delegates. The number of each chapter's delegates shall be based on its member count as determined according to the standing rules. No chapter or section shall have fewer than 2 delegates.

C. Selection of Voting Delegates

Each chapter and section shall select the delegates who will represent it at the annual session. Each chapter and section shall designate 1 delegate as its chief delegate.

D. Credentials

Credentials shall be issued by the Association. Delegates shall register and file credentials before the first meeting of the House of Delegates and at such other times as designated by the Officers of the House of Delegates.

E. Voting Body

Each chapter delegate and section delegate shall have 1 vote, except that if any of the delegates to which a chapter or section is entitled does not attend a meeting of the House of Delegates, the vote(s) may be transferred to the remaining member(s) of the delegation who are present.

MOTION 5

That Bylaws of the American Physical Therapy Association, Article VIII. House of Delegates of the American Physical Therapy Association, Section 4: Nonvoting Delegates, be amended by substitution:

Section 4: Nonvoting Delegates

The nonvoting delegates of the House of Delegates shall be the ~~section delegates~~, PTA Caucus delegates, Student Assembly delegates, and the members of the Board of Directors.

A. Qualifications of Nonvoting Delegates

~~(1) Section delegates: Only Physical Therapist and Physical Therapist Assistant members may serve as section delegates. Only Physical Therapist and Physical Therapist Assistant members who have been Association members in good standing in any category of membership for no fewer than the 2 years immediately preceding the start of the House session may serve as section delegates.~~

~~(2) PTA Caucus delegates: Only Physical Therapist Assistant members who have been Association members in good standing for no fewer than 2 years immediately preceding the start of the House session may serve as PTA Caucus delegates.~~

~~(3) Student Assembly delegates: Only Student Physical Therapist and Student Physical Therapist Assistant members who have been Association members in good standing for the 4 months immediately preceding the start of the House session may serve as Student Assembly delegates.~~

~~(4) Members of the Board of Directors may not serve as section or assembly delegates.~~

~~(5) A section delegate or Student Assembly delegate may not serve concurrently as a delegate of another component. A PTA Caucus delegate may not serve concurrently as a section delegate.~~

B. Number of Nonvoting Delegates

~~(1) Section delegates: Each section shall be entitled to 1 delegate.~~

~~(2) PTA Caucus delegates: The PTA Caucus shall be entitled to 5 delegates.~~

~~(3) Student Assembly delegates: The Student Assembly shall be entitled to 2 delegates.~~

C. Selection of Nonvoting Delegates

Each section, the Each of the PTA Caucus, and the Student Assembly shall select the delegate(s) who will represent it at the House session.

D. Credentials

Credentials shall be issued by the Association. Delegates shall register and file credentials before the first meeting of the House of Delegates and at such other times as designated by the Officers of the House of Delegates.

E. Rights and privileges of nonvoting delegates

~~Section delegates~~, PTA Caucus delegates, Student Assembly delegates, and members of the Board of Directors may speak, debate, and make and second motions.

MOTION 6

That Bylaws of the American Physical Therapy Association, Article VIII. House of Delegates of the American Physical Therapy Association, Section 5: Conduct of Business, be amended by substitution:

Section 5: Conduct of Business

A. Officers of the House of Delegates

(1) The officers shall be the Speaker of the House of Delegates, the Vice Speaker of the House of Delegates, and the Secretary.

(2) The officers shall be responsible for registering delegates, transferring voting privileges, preparing rules of order and an agenda for the consideration of the House of Delegates, recording and reporting the proceedings, appointing the Committee to Approve the Minutes, making appointments to the Reference Committee, conducting elections, making editorial changes to the bylaws and standing rules, and performing other duties as determined by these bylaws or the standing rules.

B. Quorum

Delegates representing one-third of the chapters and one-third of the sections and numbering one-third of the total number of chapter votes and section votes that could be cast if all delegates from all chapters and sections were present shall constitute a quorum.

C. Voting

(1) Voting on motions and resolutions in the House may be by voice, show of hands, standing, roll call, or use of electronic equipment.

(2) If a decision must be made during the interval between annual sessions, a majority vote of the Board of Directors may determine that the chapter delegates and section delegates be polled by mail. These delegates shall be those registered at the immediately preceding session of the House of Delegates. If the delegate is no longer a member of the chapter or section or holds membership in a category other than that held when the delegate registered at the immediately preceding session of the House of Delegates or for any other reason no longer meets the qualifications for delegate, an alternate delegate shall be named by that chapter or section. At least 50 percent of the ballots of the eligible delegates must be returned to validate the vote.

(3) Election of officers, directors, and members of the Nominating Committee shall be by ballot or use of electronic equipment. Officers shall be elected by a majority of the votes cast. Directors and members of the Nominating Committee shall be elected by a plurality of the votes cast. If the vote fails to determine election, re balloting shall be conducted under procedures determined by the Officers of the House of Delegates.

D. Memorials and Resolutions

Only memorials or resolutions adopted by the House of Delegates can be issued validly in the name of the Association.

ARTICLE XIV. AMENDMENTS

These bylaws may be amended at the Annual Session of the House of Delegates in years ending in 0 and 5 by the affirmative vote of at least two-thirds of the chapter delegates present and voting, or at any special session of the House of Delegates or the Annual Session of the House of Delegates during years not ending in 0 or 5 by the consent to consider, without debate, of two-thirds of the ~~chapter voting~~ delegates present and voting and by the affirmative vote of at least two-thirds of the ~~chapter voting~~ delegates present and voting, providing the following:

A. Any proposed amendment has been submitted in writing to the Association's headquarters by a date set by the Speaker of the House of Delegates, which shall be at least 4 months but no more than 5 months before the session of the House of Delegates.

B. Copies of all proposed amendments have been printed in an Association publication or distributed to all Association members at least 2 months before the session of the House of Delegates. This distribution may be made by mail or any telecommunications method including, but not limited to, fax and e-mail transmissions, which must ensure the timely receipt of the notice and may ensure verifiable receipt of the notice by the intended recipients.

Bylaw amendments pertaining to Article X: Finance, Section 3: Dues, may be amended at any Annual Session or special session of the House of Delegates by the affirmative vote of at least two-thirds of the ~~chapter voting~~ delegates present and voting, provided that the conditions of subparagraphs A and B above are satisfied.

MOTION 11

That Standing Rules of the American Physical Therapy Association, Standing Rule 9. Component Delegates, be amended by substitution:

9. COMPONENT DELEGATES

All components and the PTA Caucus shall provide Association headquarters with the names, postal addresses, telephone numbers, all addresses for electronic telecommunications, and terms of its delegates, chief delegate,

and alternate delegates no later than ~~January 1~~ August 30 of each year, with additions and changes sent within 2 weeks of their selection no later than 30 days prior to the start of the House of Delegates. Those components whose delegates have terms of office greater than 1 year shall confirm the information on file at Association headquarters no later than ~~January 1~~ August 30 each year.

MOTION 12

That Standing Rules of the American Physical Therapy Association, Standing Rule 10. Delegate Credentials, be amended by substitution:

10. DELEGATE CREDENTIALS

Component Delegates: Chapter ~~or section~~ delegate credentials shall be signed by the chapter ~~or section~~ president or the chapter ~~or section~~ chief delegate. The designation of chief delegate shall be indicated on the appropriate chapter ~~or section~~ credential. ~~Section or a~~ Assembly delegate credentials shall be signed by the ~~section or~~ assembly president.

MOTION 13

That Standing Rules of the American Physical Therapy Association, Standing Rule 11. Mail Ballot, be amended by substitution:

11. MAIL BALLOT

When the Board of Directors determines to conduct a mail ballot, according to Article VIII, Section 5., C., (2) of the bylaws, a ballot shall be prepared and distributed as follows:

- A. The question to be decided and appropriate supporting information shall be provided with the ballot.
- B. Instructions for completing and returning the ballot shall be printed on the ballot.
- C. The deadline for receipt of ballots at the Association's headquarters shall be printed on the ballot, and this deadline shall be no fewer than 30 days after the date mailed to the delegates to all voting delegates.
- D. An addressed envelope (to the Association's headquarters) and a plain envelope shall be included in the mailing.
- E. The ballots shall be mailed by first class mail to each chapter voting delegate.
- F. The voting delegate shall place the completed ballot in the plain envelope, place the plain envelope in the envelope addressed to the Association's headquarters, sign the outside envelope, and mail it to Association headquarters.
- G. The Officers of the House of Delegates shall be responsible for opening and counting the returned ballots and preparing a report of the results of the vote.

MOTION 15

That Standing Rules of the American Physical Therapy Association, 17. Formula for Determining the Size of the House of Delegates, be retitled and amended by substitution:

17. FORMULA FOR DETERMINING THE SIZE OF THE THE NUMBER OF VOTING DELEGATES TO THE HOUSE OF DELEGATES

- ~~(1) Add the number of Physical Therapist, Retired Physical Therapist, and Life Physical Therapist members and one-half of the number of Physical Therapist Assistant, Retired Physical Therapist Assistant, and Life Physical Therapist Assistant members of the Association who are assigned to chapters as of June 30 of the year preceding the House of Delegates in which they will serve.~~
- ~~(2) Divide the total found in Step 1 by 400. This shall be the apportionment number.~~
- ~~(3) Divide the total number of Physical Therapist, Retired Physical Ther-~~

~~apist, and Life Physical Therapist members and one-half of the number of Physical Therapist Assistant, Retired Physical Therapist Assistant, and Life Physical Therapist Assistant members for each chapter by the apportionment number.~~

~~(4) Chapters shall be allowed one delegate for each whole number and one additional delegate for any remainder equaling or exceeding 50 percent of the apportionment number.~~

~~(5) Any chapter that would be entitled to fewer than 2 delegates according to the above shall be allowed 2 delegates.~~

A. For each year the number of voting delegates in the House of Delegates shall be the sum of the section delegates and the chapter delegates, as determined in accordance with this Standing Rule.

B. For the purpose of determining the size of the House of Delegates for any year, the member count of each chapter and section shall be determined by adding the number of its Physical Therapist, Retired Physical Therapist, and Life Physical Therapist members and one-half of the number of its Physical Therapist Assistant, Retired Physical Therapist Assistant, and Life Physical Therapist Assistant members as of June 30 of the preceding year.

C. Each section shall be entitled to 2 or more delegates on the basis of its member count, as follows:

§ Member count 1-999.5 = 2 delegates

§ Member count 1,000-1,999.5 = 3 delegates

§ Member count 2,000-2,999.5 = 4 delegates

§ Member count 3,000 or more = 5 delegates

D. The chapter delegate target shall be the difference between 420 and the number of section delegates.

E. The number of delegates to which each chapter is entitled shall be determined as follows:

(1) Add the member counts of all chapters and divide the sum by the chapter delegate target. This quotient shall be the chapter apportionment number.

(2) For each chapter, divide its member count by the chapter apportionment number. The chapter shall be allowed the number of delegates obtained by rounding this quotient to the nearest whole number, except that each chapter shall be allowed at least 2 delegates.

MOTION 16

That Standing Rules of the American Physical Therapy Association, Standing Rule 18. Consent Calendar, D., be amended by striking out the word "section" after the word "chief," so that it would read:

18. CONSENT CALENDAR

A. The officers of the House of Delegates shall prepare a list of recommended motions that are routine, standard, non-controversial, or self-explanatory and where general approval is anticipated, for placement on a consent calendar.

B. The preliminary consent calendar will be distributed 3 weeks prior to the start of the first meeting of the House of Delegates.

C. Prior to the first meeting of the House of Delegates motions may be removed from the consent calendar by the officers of the House of Delegates or at the request of 5 chief delegates.

D. The revised consent calendar will be prepared by the officers of the House of Delegates for presentation to chief, section, and assembly delegates prior to the first meeting of the House of Delegates.

E. Following the opening of the House of Delegates motions may be removed from the consent calendar by an affirmative vote of one-third of the voting body of the House of Delegates.

F. If a motion is removed from the consent calendar, it shall be placed appropriately in the order of business previously assigned by the Speaker of the House and the chair of the Reference Committee.

G. The consent calendar shall be presented for adoption in a single motion.

=**MOTION 14**= Tom McPoil, Director, moved that the Orthopaedic Section Board of Directors rescind the following motion adopted at the 2012 Fall Board of Directors meeting in Albuquerque, NM

=**MOTION 16**= Tom McPoil, Director, moved that the Orthopaedic Section Board of Directors bring a proposed bylaw amendment to the membership meeting at CSM 2013 to add 2 new voting members to the Board of Directors. ADOPTED (James – Yes; Gerard – Yes; Steve – No; Bill – Yes; Tom – Yes)

Fiscal Implication: None

Fiscal Implication: None

DEFEATED (unanimous) Therefore this means we move forward with bringing the motion to the membership.

=**MOTION 15**= Steve Clark, Treasurer, moved that the Orthopaedic Section Board of Directors approve the following 2 proposed bylaw amendments for presentation to the membership of the Orthopaedic Section, APTA at CSM 2013 –

That Article VII, Section 1, A. Composition be amended by striking “two” and inserting “four” on line 16, and inserting Non-officer Director #3, and Non-officer Director #4 on lines 18 and 19, so that it reads:

ARTICLE VII: BOARD OF DIRECTORS AND OFFICERS

Section 1: Board of Directors

A. Composition

The Board of Directors shall consist of (i) the three principal officers of the Section (the “Principal Officers”), that is, the President, Vice President, and Treasurer, each of whom is a Director, and (ii) ~~two~~ four other Directors (the “Non-officer Directors”), referred to herein as Non-officer Director #1, Non-officer Director #2, Non-officer Director #3, and Non-officer Director #4. Each Director shall have one vote.

Support Statement: At the 10/11-12/2012 the Orthopaedic Section Fall Board of Directors meeting, a motion was adopted to bring a proposed bylaw amendment to the membership meeting at CSM 2013 to add two new voting members to the Board of Directors. The rationale for expanding the board is to increase member representation in decision-making by the Board of Directors on behalf of the section membership.

That Article XI, Section 2, Election Cycle, be amended by adding the words “and #3” on line 17 after “#1” in paragraph B.; and adding the words “and #4” after “#2” on line 20 of paragraph C.; and, by adding a proviso on lines 23 through 26 that reads “Proviso: The election of Non-officer Director #3 shall be in 2014, and the election of Non-officer Director #4 shall be elected in 2015 for a 4 year term, so that in future election cycles Non-Officer Director #4 will be elected in the same year as the Vice-President.

Section 2: Election Cycle

Section 2: Election Cycle

The members of the Board of Directors shall be elected as follows:

- A. *The President and Vice President shall be elected on a staggered basis with the Vice President being elected the year following the election of the President. The respective elections shall take place every three years.*
- B. *In the next year the Treasurer and Non-officer Directors #1 and #3 shall be elected.*
- C. *In the next year Non-officer Directors #2 and #4 shall be elected.*

Proviso: The election of Non-officer Director #3 shall be in 2014, and the election of Non-officer Director #4 shall be elected in 2015 for a 4 year term, so that in future election cycles Non-Officer Director #4 will be elected in the same year as the Vice President.

Support Statement: This bylaw amendment allows for the election of two additional Non-Officer Directors beginning in 2014 should the bylaws be amended to expand the Section Non-Officer Directors on the Board of Directors from two to four. This amendment is out of order if the first amendment fails.

ADOPTED (unanimous)

Fiscal Implication: Increased expenses for face to face and conference call meetings.

=**MOTION 16**= Bill O’Grady, Director, moved that the Orthopaedic Section Board of Directors accept the following policies as revised –

- Conflict of Interest
- Whistleblower
- Form 990 Governance
- Records Retention

(Attached)

ADOPTED (unanimous)

Fiscal Implication: None

ADJOURNMENT 7:06 PM. The meeting resumed Tuesday, January 22 at 10:00 PM and adjourned at 10:40 PM.

Submitted by Terri DeFlorian, Executive Director

CSM BOARD OF DIRECTORS/COMMITTEE CHAIRS/ SPECIAL INTEREST GROUP PRESIDENTS/ICF COORDINATOR/RFE COORDINATOR MEETING MINUTES

James Irrgang, President, called a regular meeting of the Board of Directors, Committee Chair, Special Interest Group Presidents, ICF Coordinator and RFE Coordinator of the Orthopaedic Section, APTA, Inc. to order at 6:30 PM on Tuesday, January 22, 2013.

Present:

James Irrgang, President
Gerard Brennan, Vice President
Steve Clark, Treasurer
Bill O’Grady, Director
Tom McPoil, Director
Lori Michener, Research Chair
Joe Donnelly, Practice Chair
Beth Jones, Education Chair
James Spencer, Membership Chair
Chris Hughes, OP/ISC Editor
Eric Robertson, Public Relations/
Marketing Chair
Robert DuVall, Nominations Chair
Joe Godges, ICF Coordinator
Jason Tonley, RFE Coordinator
Margot Miller, OHSIG President
Clarke Brown, FASIG President
Julie O’Connell, PASIG President
John Garziona, PMSIG President
Amie Hesbach, ARSIG President

Guests:

Steve McDavitt, Incoming President
Pam Duffy, Incoming Director
Duane Scott Davis,
Incoming Research Chair
Tess Vaughn, Incoming
Education Chair
Renata Salvatori, Membership
Vice Chair
Carrie Adrian, ARSIG Vice
President/Education Chair
Tara Fredrickson,
Executive Associate
Terri DeFlorian, Executive Director
Nicole Stout, APTA Board Liaison

The meeting agenda was approved with one addition.

Jennifer Gamboa requested time to present information on the APTA’s work group on developing the Annual Physical Therapy Evaluation in response to a charge from the 2012 House of Delegates. Lisa Culver, APTA, will be sending out a request for feedback in the next couple of months. The Board will need to determine who will review the document.

James Irrgang, President, announced that Peter Tooley is the APTA Stu-

dent Assembly Board of Director Liaison to the Section. Peter was not in attendance.

Tara Jo Manal, Co-Chair of PTNow Portal, gave an update on the portal and presented ideas on how the Section could utilize it as a way to reach more members. The portal is still in beta form.

James Irrgang, President, gave an update on the National Orthopaedic Physical Therapy Outcomes Database Neck Pain Pilot Project progress to date –

- developed paper-based data collection forms & Manual of Operations and Procedures,
- call for participants distributed to Section members in Feb & March 2012,
- Webinar held in April to review procedures,
- data collection began May 1st and was completed on Oct 31, 2012,
- 38 PTs from 36 clinics contributed data for 197 patients, and
- data entry completed in January 2013.

Gerard Brennan, Vice President, presented the following technology update on the Educational Delivery Assessment. The purpose of the study was to assess the accessibility and effectiveness of the educational needs of the membership, evaluate opportunities for new technologies and prioritize implementation of changes. An online survey was sent to all Section members, individuals who had taken an independent study course from the Section, in-depth phone interviews were conducted with individuals who had taken an independent study course from the Section, and an evaluation of our competitor's offerings was done. Of the 1,243 respondents to the survey, 98% were physical therapists and 2% were physical therapy assistants. Respondents preferred attending off-site meetings, having material in print form, and participating in online webinars. Member recommendations included having easily searchable and navigable online resources, availability of videos or other interactive content that would enhance the use of ISCs, and the ability to access information presented at annual meetings. The next step is for PCG to conduct additional phone interviews concentrating on a more diverse age population. An update will be brought back to the Board on their February conference call meeting.

Jason Tonley, Residency and Fellowship Education Coordinator, reported he will be discussing with ABPTRFE the need for residencies to be required to disclose they are not copying our ISCs after they purchase the initial package. Joe Donnelly, Practice Chair, will be brought into this discussion as the residency committee duties now fall under the Practice Committee responsibilities.

One of the items presented by Ginger Nichols, Leadership Training Consultant, at the Fall Board of Directors meeting in October 2012 was the 12 characteristics of high performing boards. The Board agreed these characteristics made a lot of sense and should be a part of the Section's Board culture. It was agreed these would be available as reminders at each face-to-face Board meeting. The Committees and SIGs were also instructed to use this to orient their executive boards and committees on how they should function. A reminder was given that a leadership training session will be conducted for all committee chairs and SIG presidents the day prior to the 2014 strategic planning meeting in La Crosse.

The following ground rules for Board meetings were presented by James Irrgang, President, and there was consensus to incorporate these into the agenda of each Board meeting –

- Share the air – we want to hear everyone's opinion, even if it is a descending one
- Silence implies agreement
- Agree to disagree without being disagreeable
- Honor confidentiality
- Respect all participants and all differences of opinion
- Listen to the person who is talking
- Work to build consensus

James Irrgang, President, informed everyone of the Governance Review status. Discussion of the Sections having a vote in the House of Delegates took place at the Component Leaders Meeting. There appeared to be a consensus among those attending the Component Leaders Meeting that Sections should have a vote in the House. The APTA Board of Directors is

bringing forth a motion to the House of Delegates that provides the Sections with a minimum of 2 votes each up to a maximum of 5 votes each based on membership with any Section having over 5,000 members getting 5 votes.

James Irrgang, President, informed everyone that a work group has been formed that will merge with the APTA manipulation task force that will address the CAPTE position stating that it is no longer inappropriate to train PTAs to perform joint mobilization.

James Irrgang, President, reported that the APTA has asked the Sections to develop a curriculum for Advanced Proficiency for PTAs working in a musculoskeletal setting. The Section responded letting APTA know we disagreed with the methodology to identify the curricular content for this program and presented an alternative methodology. APTA has agreed with this methodology that includes conducting a survey to PT and PTA members of the Orthopaedic Section. APTA will be contacting us for our input into this survey.

Beth Jones, Education Chair, gave an update on the 2013 Annual Orthopaedic Section Meeting. The date will be May 2-4. The brochures were mailed the beginning of January. We are waiting now to receive outlines. To date we have 40 registrants.

Lori Michener, Research Chair, reported on the research grants approved by the Board at their meeting this week.

Joe Donnelly, Practice Chair, reported the committee has been monitoring legislative and practice concerns in orthopaedic physical therapy as well as gave a legislative update on manipulation and mobilization in various states. One advocacy grant was approved for Washington State to assist in the removal of the prohibition of spinal manipulation from their practice act.

James Irrgang, President, stated that each committee and SIG is to submit one or two highlights from their report that can be included in an Osteo-BLAST to the membership. The highlights will be published in the Osteo-BLAST on a rotating basis each month.

James Spencer, Membership Chair, reported that Section membership has steadily increased over the last few years. A new mentorship program was kicked off at the First Timer's Breakfast with 6 mentors and 6 mentees. Finding mentors was difficult due to the need to match locations with who was attending CSM. The Section was asked to consider sending out a notice in Osteo-BLAST asking for participation. This program is a one-year pilot and an assessment will be done in 6 months to determine if the program should continue. The Board of Directors will discuss the program at their July 2013 face-to-face Board meeting in La Crosse.

=MOTION 1= James Spencer, Membership Chair, moves that the Orthopaedic Section Board of Directors approves increasing the number of mentor/protege pairs in the Section's Mentorship Pilot Program from 5 to 6. **ADOPTED** (unanimous)

Fiscal Implication: One additional 3-monograph ISC would be needed to thank the 6th mentor for his/her service (\$100 for an Orthopaedic Section member).

Chris Hughes, OPTP Editor, the submission rate is at an all-time high. Six articles have been accepted for print with an additional 19 in various stages of review. Advertising saw gross sales of \$37,585 in 2012 and to date for 2013, sales total \$30,325. A recent survey conducted by Publishers Communication Group (PCG) indicated that of 1,235 respondents, 42% responded that they read OPTP somewhat or very frequently.

Chris Hughes, ISC Editor, presented the following potential topics for 2015 –

- Orthopaedic Management of the Wheelchair Athlete
- ICF Clinical Guidelines App
- Therapeutic Modalities in Orthopaedics
- Automobile-induced Orthopaedic Injuries (Trauma)
- Skiing Injuries (Prevention and Management)
- Golf Injuries (Prevention and Management)

Future directions for use of different technology platforms for delivering ISC content will be reviewed by the Board at future meetings. One recommendation is to offer the ICF guidelines on an app. 2015 courses will be presented for a vote at a future meeting.

Eric Robertson, Public Relations/Marketing Chair, reported he is moderating the Section's Facebook page. The Section should consider funneling more information to the Facebook page after meetings. Jason Belamy, APTA PR Department, came to the Section's First Timer's Breakfast to do a video stream of the event that will be included on Facebook.

Gerard Brennan, Vice President, announced the 2013 award winners. The Awards Committee is looking for 2 more members. An announcement will be sent in Osteo-BLAST.

Bob DuVall, Nominations Chair, stated the individuals who were slated to run for the positions of President, Director, and Nominating Committee Chair and announced the winners.

Joe Godges, ICF Coordinator, listed the stages of clinical practice guideline development, guidelines that have been completed and guidelines that are under review. Guidelines that are under construction as well as those that are planned were also presented. Joe announced that Christine McDonough, Revisions Coordinator, has worked closely with the Foot and Ankle Workgroup, JOSPT staff, and the ICF Coordinator in creating the methods for the CPG revision process. Christine has also initiated work with the Cervicothoracic Workgroup leaders for revision of the Neck Pain CPG and plans to meet with the Hip and Knee Workgroup leaders at CSM to introduce the work flow and timelines for revision of the Hip OA and Knee Ligament Strain CPGs. Other activities include Joe Godges and Sandra Kaplan to again facilitate an APTA workshop in 2013 entitled, *Developing Clinical Practice Guidelines: Organization, Methodology, and Strategies*.

Margot Miller, OHSIG President, reported the SIG membership agreed to do a third re-write on their petition for specialization. The OHSIG will be publishing an ISC that will be available in 2014 titled, *"The Injured Worker."*

Clarke Brown, FASIG President, reported that a 40-page document explaining what entry-level clinical education should be for the foot and ankle was developed by the Curriculum Task Force in November 2012. The Board of Directors will discuss next steps at a future meeting.

John Garzzone, PMSIG President, reported he will contact the publisher of Kathleen Sluka's book (International Association for the Study of Pain) and investigate offering CEUs to Section members who purchase the book. John will bring a proposal regarding a read for credit exam to obtain CEUs back to the Board for consideration.

Julie O'Connell, PASIG President, reported on the SIG election results as well as their monthly citation blast to their membership.

Amie Hesbach, ARSIG President, reported that the SIG's first pre-conference course was a great success. The SIG's practice analysis survey was not complete due to missing information and not including key experts in the field. The Board of Directors recommended they contact Derek Stepp at the ABPTS certification department and Marc Goldstein, Senior Advisor, APTA Clinical Practice and Research, for assistance with developing another survey.

Doug White, Imaging SIG President, reported that a steering committee headed by Bill Boissonnault have been working on a survey to submit to PT education programs pertaining to imaging content addressed within curricula. The survey is developed and will be sent out soon.

Jason Tonley, Residency and Fellowship Education Coordinator, reported that all of the supplements for *Current Concepts in Orthopaedic Physical Therapy, 3rd Edition*, have been completed along with revisions for each of the 12 monographs. The testing database is on hold pending the Board's decision on the direction to take on the recommendations from the Technology Task Force. The mission of the Residency and Fellowship Education Committee has been met so it has been sunset. Ongoing duties have been moved under the Practice Committee. Jason will be added to the Practice Committee as a new member and mentor another individual to take over this role. It was agreed that the Orthopaedic Clinical Residency or Fellowship Program Grant will be announced at the annual membership meeting at CSM each year.

ADJOURNMENT 10:45 PM

Submitted by Terri DeFlorian, Executive Director

CSM 2013 ANNUAL MEMBERSHIP MEETING MINUTES

I. CALL TO ORDER AND WELCOME

- A. James Irrgang, PT, PhD, ATC, FAPTA, President, called the meeting to order at 4:00 PM.
- B. Section Board of Directors and staff were recognized.
- C. Past Orthopaedic Section Presidents, newly certified orthopaedic specialists, all certified orthopaedic specialists, Orthopaedic Section mentors, and the Student Assembly liaison were recognized.
- D. A moment of silence was held for Orthopaedic Section members that have passed away in the last year.
- E. The agenda was approved as printed.
- F. The Annual Membership Meeting minutes from CSM in Chicago, Illinois on February 10, 2012, were approved as printed.
- G. Orthopaedic Section Election Results were presented by President James Irrgang, PT, PhD, ATC, FAPTA. For the 2013 election there were 906 ballots cast. The number of valid ballots was 906 and the number of invalid ballots was 0. The following individuals were elected: President, Stephen McDavitt, PT, DPT, MS, FAAOMPT; Director, Pamela Duffy, PT, PhD, OCS, CPC, RP; and Nominating Committee Member, Rob Roy Martin, PT.

There was a call for nominations from the floor for the 2014 election for the positions of Vice President and Nominating Committee member. The following individual was nominated for Vice President – Gerard Brennan. No nominations were brought forth for the position of Nominating Committee member.

The deadline for accepting nominations for the 2014 election is September 1, 2013.

II. INVITED GUESTS

- A. JOSPT Editor-in-Chief, Guy Simoneau, PT, PhD, ATC, reported the number of new submissions to JOSPT continues to go up. The impact factor went from 2.538 in 2010 to 3.000 in 2011. Currently JOSPT is ranked number 8 of 58 among rehabilitation publications, number 7 of 63 in orthopaedic publications, and 9 of 84 in the area of sports sciences. The number of international partners continue to increase. A joint publication is being worked on with the *Journal of Bone and Joint Surgery (JBJS)*. A new Web site will be coming in March or April 2013. Priorities for 2013 are to maintain the number of papers published at 7-9 per month, develop 1 or 2 special issues for 2014, and potentially develop podcast features.
- B. Tim Thorsen, PT, OCS, updated the membership on the PT-PAC. Of the congressional candidates supported by the PT-PAC, 92% were elected to office.
- C. William (Bill) Boissonnault, President, Foundation for Physical Therapy, announced that the first award from the Orthopaedic Endowment Fund will be given out in 2014. Since 1979 a total of 671 Orthopaedic Section members have been funded through grants, scholarships, and fellowships or have been given an award through the Foundation. The total monetary value awarded to Orthopaedic Section members has been \$3,146,601. Bill thanked the Orthopaedic Section for their long standing support of the Foundation.

Bill announced a new Foundation initiative to create a Center of Excellence for Health Services Research that will focus on health services and health policy research. They hope to achieve com-

mitments during 2013 of combined gifts totaling more than \$3 million. Recently the APTA Board of Directors passed a motion to provide \$1 million in leadership funding for the campaign. Funding for the Center of Excellence will be directed to the institution best qualified to house the nation's first health services research training program specific to physical therapy. The Foundation gave a presentation to the Orthopaedic Section Board of Directors asking them to consider a pledge commitment to this campaign, which the Board will discuss at a future Orthopaedic Section Board of Directors Meeting.

III. FINANCE REPORT – STEVE CLARK, PT, MHS, OCS

The year-end 2011 audit of the Orthopaedic Section's finances showed total assets of \$4,325,950 which is a 5.0% gain over 2010. The 2011 audited income was \$1,778,968 and audited expenses were \$1,383,645 resulting in a profit of \$395,323. The unaudited income and expense figures for 2012 results in a profit of \$421,064. The total amount in the Section reserve fund (checking, savings, LPL investment fund) as of December 31, 2012, was \$1,594,993. The Section's encumbered fund, including SIG funds and the restricted capital expenses, was \$112,734. These encumbered funds are part of the total reserve fund amount. The 2013 operating budget is balanced with income and expenses both at \$1,925,172. Operating expenses were 74% of the reserve fund at 2012 year-end. The Section's policy requires 40% to 60% of total operating expenses in the reserve fund. As of December 31, 2012, the total amount in the Practice, Research, and Education Endowment Fund was \$1,889,707. This is a total increase of 21% from the fund's inception in 2007. There was an 11.9% gain on the LPL building fund value. The Section also still retains some land for the building of a footprint addition should this become a viable option. Currently the real estate market in La Crosse does not support expansion.

IV. SECTION INITIATIVES

2010-2014 Strategic Plan – James Irrgang, President

- Dr. Irrgang summarized the Neck Pain Pilot project for the National Orthopaedic Physical Therapy Outcomes Database. The purpose of this pilot program was to collect and analyze outcomes data based on the Neck Pain Clinical Practice Guidelines. Progress on the Pilot project to date is as follows:
 - ✓ paper-based data collection forms and Manual of Operations and Procedures were developed;
 - ✓ a call for physical therapist Section members to participate in the pilot project was distributed to Section members in February and March 2012;
 - ✓ a webinar was held in April to review the procedures for collection and submission of data for the pilot project;
 - ✓ data collection began May 1st and was completed on October 31st;
 - ✓ 38 PTs from 36 clinics contributed data for 197 patients; and
 - ✓ data entry was completed in January 2013.
- Next steps are to:
 - ✓ finalize analysis for all patients;
 - ✓ create reports summarizing performance for each PT that submitted data;
 - ✓ survey individuals regarding burden of data collection and usefulness of information; and
 - ✓ use results to plan computerized data collection and analysis system.
- The 1st Annual Orthopaedic Section Meeting will be May 2-4, 2013 in Orlando, FL.
- The 2014 Orthopaedic Section Meeting will be held May 15-18 in St. Louis, MO.

- Educational Delivery Assessment membership survey was conducted to assess the educational needs of the membership in terms of accessibility and effectiveness, evaluate opportunities for new technologies, and prioritize implementation of changes. An online survey generated 1,234 respondents. In-depth phone interviews with members who took the Section's ISCs were conducted. An evaluation of the Section's competitor offerings were investigated. Results showed the majority of members prefer face-to-face instruction and educational materials in print form. Adding videos to supplement printed material as well as being able to access annual meeting information online were viewed as benefits to some members who were interviewed.

- Lori Michener, Research Chair, announced Steve George, PhD, PT, from the University of Florida, as the recipient and Principal Investigator, of the Orthopaedic Section Clinical Research Network (CRN) grant. The primary purpose of the grant is to perform multi-center clinical project(s) delivered by physical therapists for patients with MSK conditions commonly managed by physical therapists, using the CRN. The second purpose is to develop a CRN that is sustainable for future use by Orthopaedic Section members to conduct multi-center clinical projects. The grant was approved for \$300,000 over 3 years. The title of the network is, *Creation of the Orthopaedic Physical Therapy – Investigative Network (OPT-IN) for the Optimal Screening for Prediction of Referral and Outcome (OSPRO) Cohort Study*. The first goals include:

- ✓ create OPT-IN (Orthopaedic Physical Therapy – Investigative Network);
- ✓ OPT-IN will facilitate collaborative clinical research; and
- ✓ OPT-IN will start with dedicated clinical sites in Florida, and then grow to a national network representing all US regions.

Second goals include:

- ✓ complete the OSPRO (Optimal Screening for Prediction of Referral and Outcome) cohort study and
- ✓ OSPRO will provide orthopaedic physical therapists with validated screening tools for rapid identification of yellow (psychological distress) and red (systemic involvement) flags to enhance patient decision making.

- ICF-based Clinical Practice Guidelines for Common Musculoskeletal Conditions – Joe Godges, Coordinator, presented the following aims of the guidelines:

- ✓ describe diagnostic classifications based upon ICF terminology,
- ✓ describe best outcome measures to use, and
- ✓ describe best intervention strategies that are matched to the classification, in other words, reduce unwarranted variation and do the right thing at the right time for the right patient.

Published Clinical Practice Guidelines –

- ✓ Heel Pain/Plantar Fasciitis (2008)
- ✓ Neck Pain (2008)
- ✓ Hip Osteoarthritis (2009)
- ✓ Knee Ligament Sprain (2010)
- ✓ Knee Meniscal Disorders (2010)
- ✓ Ankle Tendinitis (2010)
- ✓ Low Back Pain (2012)

Clinical Practice Guidelines in Review –

- ✓ Shoulder Adhesive Capsulitis
- ✓ Lateral Ankle Sprain
- ✓ Non-arthritic Hip Joint Pain

Future Clinical Practice Guidelines – Revisions Coordinator, Christine McDonough

- ✓ Shoulder Rotator Cuff Syndrome
- ✓ Shoulder Instability
- ✓ Patellofemoral Pain

- ✓ Carpal Tunnel Syndrome
 - ✓ Elbow Epicondylitis
 - ✓ Medical Screening
- Existing Clinical Practice Guidelines under Revision – Revisions Coordinator, Christine McDonough
- ✓ Heel Pain/Plantar Fasciitis (2008)
 - ✓ Neck Pain (2008)

V. PROPOSED BYLAW AMENDMENTS

Proposed bylaw amendments for presentation to the membership of the Orthopaedic Section, APTA at CSM 2013

That Article VII, Section 1, A. Composition be amended by striking “two” and inserting “four” on line 16, and inserting Non-officer Director #3, and Non-officer Director #4 on lines 18 and 19, so that it reads:

ARTICLE VII: BOARD OF DIRECTORS AND OFFICERS

Section 1: Board of Directors

A. Composition

The Board of Directors shall consist of (i) the three principal officers of the Section (the “Principal Officers”), that is, the President, Vice President, and Treasurer, each of whom is a Director, and (ii) **two four** other Directors (the “Non-officer Directors”), referred to herein as Non-officer Director #1, Non-officer Director #2, **Non-officer Director #3, and Non-officer Director #4**. Each Director shall have one vote.

Support Statement: At the 10/11-12/2012 Fall Orthopaedic Section Board of Directors Meeting, a motion was adopted to bring a proposed bylaw amendment to the membership meeting at CSM 2013 to add two new voting members to the Board of Directors. The rationale for expanding the board is to increase member representation in decision-making by the Board of Directors on behalf of the Section membership.

That Article XI, Section 2, Election Cycle, be amended by adding the words “and #3” on line 16 after “#1” in paragraph B.; and adding the words “and #4” after “#2” on line 19 of paragraph C.; and, by adding a proviso on lines 21 through 24 that reads “Proviso: The election of Non-officer Director #3 shall be in 2014, and the election of Non-officer Director #4 shall be elected in 2015 for a 4-year term, so that in future election cycles Non-Officer Director #4 will be elected in the same year as the Vice President.

Section 2: Election Cycle

The members of the Board of Directors shall be elected as follows:

- A. The President and Vice President shall be elected on a staggered basis with the Vice President being elected the year following the election of the President. The respective elections shall take place every three years.
- B. In the next year the Treasurer and Non-officer Directors #1 **and #3** shall be elected.
- C. In the next year Non-officer Directors # 2 **and #4** shall be elected.

Proviso: The election of Non-officer Director #3 shall be in 2014, and the election of Non-officer Director #4 shall be elected in 2015 for a 4-year term, so that in future election cycles Non-Officer Director #4 will be elected in the same year as the Vice President.

Support Statement: This bylaw amendment allows for the election of two additional Non-Officer Directors from two to four. The Proviso is written so the election of these two new Non-officer Directors can be incorporated in the three-year election cycle with staggered terms. This motion is out of order if the first motion to add two Non-officer Directors fails.

VI. RECOGNITION

The following outgoing officers and committee chairs were recognized for their service to the Section as their terms end at the close of the 2013 CSM Membership Meeting –

- Jason Tonley, PT, DPT, OCS - Residency and Fellowship Education Coordinator
- James Spencer, PT, DPT, OCS, CSCS – Membership Chair
- Robert DuVall, PT, OCS, SCS, FAAOMPT – Nominating Chair
- Lori Michener, PT, PhD, ATC, SCS – Research Chair
- Beth Jones, PT, DPT, MS, OCS – Education Chair
- William O’Grady, PT, DPT, OCS, FAAOMPT – Director
- James Irrgang, PT, PhD, ATC, FAPTA - President

VII. NEW BUSINESS MOTIONS

=MOTION 1= Ken Olson, PT, DHSc, OCS, FAAOMPT, moved that the Orthopaedic Section support the development and implementation of a plan to work in collaboration with APTA, AAOMPT, and other APTA Sections to assure that APTA HOD P06-00-30-06 (Position) Procedural Interventions Exclusively Performed by Physical Therapists is upheld and followed in all aspects of the physical therapy profession including education, regulation, legislation, and practice. ADOPTED (unanimous)

Fiscal Implication: None

Rationale:

With the recent announcements and changes in policies by the Federation of State Boards of Physical Therapy and CAPTE, this APTA position statement has come into question. The Orthopaedic Section believes in the maintenance and implementation of this position in all aspects of the physical therapy profession because of concerns with patient safety and clinical outcomes (ie, efficacy) when clinical procedures such as mobilization/manipulation are delegated to PTAs, who lack the foundational knowledge and training to properly perform interventions such as mobilization/manipulation that require ongoing examination and evaluation of the patient throughout the procedure.

2.) PROCEDURAL INTERVENTIONS EXCLUSIVELY PERFORMED BY PHYSICAL THERAPISTS HOD P06-00-30-36 (Program 32) [Position]

The physical therapist’s scope of practice as defined by the American Physical Therapy Association *Guide to Physical Therapist Practice* includes interventions performed by physical therapists. These interventions include procedures performed exclusively by physical therapists and selected interventions that can be performed by the physical therapist assistant under the direction and supervision of the physical therapist. Interventions that require immediate and continuous examination and evaluation throughout the intervention are performed exclusively by the physical therapist. Such procedural interventions within the scope of physical therapist practice that are performed exclusively by the physical therapist include, but are not limited to, spinal and peripheral joint mobilization/manipulation, which are components of manual therapy, and sharp selective debridement, which is a component of wound management.

Board of Director, Committee, ICF, Residency and Fellowship Education, SIG and EIG reports are located on the Orthopaedic Section Web site (www.orthopt.org).

ADJOURNMENT 5:40 PM

PRESIDENT'S MESSAGE

Lorena Pettet Payne, PT, OCS

Thank you to Margot Miller, PT, our OHSIG Past President. Margot Miller retired from her position as OHSIG President during the 2013 Combined Sections Meeting. During her 6-year term, members have benefited from her journalistic talents and deep knowledge of occupational health physical therapy. Margot has been instrumental in providing greater access to informative, educational articles, serving to advance knowledge and skills in occupational health. She facilitated communication with federal agencies and trade organizations, increasing the visibility of occupational health physical therapy. Her guidance has been invaluable to our specialty practice. We would like to publicly thank her for her hard work and look forward to her continued involvement as an active, contributing member of the special interest group.

The OHSIG will continue to serve as a resource to members and the world of work, advocating for partnerships that lead to productive, healthy, work environments. The OHSIG Board of Directors and members carry on the work to define the unique body of knowledge that we bring to the table. A simple survey will be in your mail box soon to assess the depth of interest for physical therapists in advancing occupational health physical therapy practice as a specialty. You are urged to respond as this will give needed information to continue the SIG's mission.

It is with some trepidation that I assume the position of Occupational Health Special Interest Group President. There is much to be done! Our single, most important goal is to be a resource for all things related to a healthy work force. You are always welcome to contact officers as listed on the Orthopaedic Section Web site under Special Interest Groups.

HOLISTIC EMPHASIS Part 2: Pain Management Epidemic

Chris Juneau PT, DPT, ATC, EMBA

Holistic Emphasis was printed in Orthopaedic Physical Therapy Practice 2012;24(1):37-38.

Since last year's publication of *Holistic Emphasis Part 1* much has changed in health care and workers' compensation. In 2012, the Affordable Health Care Act was passed (often referred to as Obama Care and/or Health Care Reform). In addition the legalization of medicinal cannabis in Colorado and Washington, with other states following closely behind occurred. The industry of occupational medicine and the very nature of workers' compensation continue to evolve and reform. Many states are adopting Official Disability Guidelines, and are becoming more focused on outcomes. Identifying and addressing the sources of dysfunction, with the intentions of achieving overall functional improvement are a priority. We are moving away from patient pain management, although it is a component to

address in fostering positive patient experiences and improving overall medical outcomes. Too often patients that experience an injury at work say their pain is improved, but they show no remarkable improvement in performing the activities of daily living or returning to work with pain management alone. More often than not, they are being prescribed medications, prescription after prescription, without notable functional improvement. If opioids aren't providing functional improvement, then they are providing more harm than good.

Pain management is common to physical therapy and specifically in the workers' compensation sector of occupational medicine. As clinicians, we strive to primarily address the source of pain and ultimately the dysfunction it creates. Pain subsequently needs to be managed. Pharmacology and pain management are addressed in physical therapy programs in order to prepare clinicians for the health care field. Although prescribing medications is outside of our scope of practice, an understanding of the effects of medication on the patient is essential for complete patient care. Like many of Occupational Health Special Interest Group's (OHSIG) subscribers and readers, I have personally experienced workers' compensation patients that have become dependent on opioids, and I failed to recognize the triggers and black flags at the time. Following the inspiring presentation by Scott Goold during the Workers' Compensation Association of New Mexico meeting this fall, I felt obliged to research this topic. We have a dual advocacy to holistically influence our patients and providers, improving the quality of life through patient education, therapeutic exercise, palliative and corrective care, as well as appropriately addressing medication and nutrition. Dorland's Medical Dictionary defines Holistic as pertaining to totality, or to the whole. Holistic health includes the physical, mental, social and spiritual aspect of a person's life as an integrated whole.¹

José Ortega, a prolific and distinguished philosopher once quoted, "An unemployed existence is a worse negation of life than death itself. Because to live means to have something definite to do, a mission to fulfill, and in the measure in which we avoid setting our life to something, we make it empty... Human life, by its very nature, has to be dedicated to something."² This quote summarizes the perceptions, psychosomatic issues, and social experiences encountered by many individuals who experience a musculoskeletal injury at work. Prior to the injury, this person was often the "bread winner" and "go to" person in his/her family. Now the individual is experiencing dependency or need for others to help. More-than-likely, this patient is earning significantly less than prior to the injury, yet their bills and responsibilities remain. Top this scenario off with pain, which influences behavior, potentially leading to the need to "take the edge off." Lower back pain is the most frequent condition for patients seeking care from Physical Therapists in occupational medicine and/or urgent care outpatient settings.² According to the American Medical Association, 80% of all people will experience back pain during their life.

According to the American Medical Association, “There presently is a DISABILITY epidemic in the United States.” Disability is so rampant and the psychosocial implications so pervasive, that disability has been termed a disease in and of itself. The number of workers on disability or “light duty” is growing faster than the population. Despite MILLIONS of dollars spent on research and ergonomic improvement in the work place, disability from back “injuries” has continued to increase, not decrease, as would be expected if bad ergonomics were simply the primary cause.² Here are some statistics and insights regarding the disability picture:

- US Social Security Data: 2008
 - Since 1978, America’s population increased 35%
 - American’s on government funded disability increased by 236%
- These “disabled” American’s are primarily middle-aged with common health conditions
- Primarily involve musculoskeletal dysfunction
- Thus the majority of this disability would seem to be preventable.³

Is this significant? Is there any correlation with disability, psychosocial aspects and pain management? At a glance, prescription medicines accounted for 1.3 million Emergency Room visits in 2010, whereas, ER admits concerning illegal drugs, accounted for 1.2 million in 2010.⁴ According to the U.S. Centers for Disease Control and Prevention, one person dies from a drug overdose every 19 minutes. About 37,000 Americans died after accidentally overdosing on legal or illegal drugs in 2009, according to the CDC; about half of those deaths involved prescription pain medication. Over 27,000 unintentional drug overdoses constituted death, including 12000 opioid analgesics.^{4,5} These numbers are significant enough to make prescription drugs the leading cause of accidental death in this county. Substance abuse is a major health concern in the United States, with annual treatment costs in the billions of dollars. It also contributes to family problems, lost productivity, and crime.⁷ It is a statistic that has led some experts to call prescription drug abuse an epidemic.⁴

In occupational medicine and workers’ compensation, it’s not uncommon to meet someone or have a patient referred to you whom has suffered an injury or illness and then becomes dependent on the drugs prescribed to deal with the pain.⁴ As much attention as we dedicate to eradicating illicit drugs, such as cocaine or heroin, the truth is prescription medications kill more people in this country than all of these illicit drugs combined. Perhaps it is a perception issue: “It came from a pharmacy, therefore, it must be safe.” They certainly can be safe, but they can also be incredibly addictive, with more than 1.9 million Americans hooked on prescription pain medications alone.^{4,5} Opioids and other prescription pain medications are particularly dangerous because they depress the central nervous system, slowing down breathing and the brain stem’s responsiveness to CO₂ to the point where someone abusing these medications can simply stop breathing, leading to morbidity.⁵

I would suggest that most physical therapists acknowledge the importance of psychosocial factors and many would assert that they recognize them as part of their clinical practice. However, common knowledge of such factors does not lead to a change in focus or style of patient management. Yet, there

is persuasive evidence for the influence of a patient’s beliefs, emotional responses, and pain behavior on response to pain, treatment participation, and outcome. We refer primarily to the inclusion of a specific focus on psychological factors (both clinical and occupational), as these factors are used for determining risk and potential focal points for intervention by the clinician. The broader spectrum of social factors are considered “black flags,” which, although possibly amenable to change by public health or workplace interventions, and to that extent could fall within the definition, are not a focus for Intervention at the level of physical therapist practice.⁶

The goal of the “flag” method and classification is to draw clinical attention to the psychosocial and workplace factors contributing to back disability after pain onset.⁷ While medical red flags (eg, fever, widespread neurological symptoms, violent trauma, caudal equina syndrome, structural deformity) are familiar to clinicians as possible signs of more serious spinal pathology (eg, spinal tumor and infection, inflammatory disease), yellow flags were conceived as important prognostic factors among patients with typical, nonspecific episodes of lower back pain. The original list of yellow flags encompassed many domains, including attitudes and beliefs about back pain, behaviors, compensation issues, diagnosis and treatment, emotions, family, and work.⁷

In recent years, this system has been refined in scope and concept, and workplace factors that were previously included as yellow flags now occupy two separate categories: “black flags,” actual workplace conditions that can affect disability; and ‘blue flags,’ individual perceptions about work, whether accurate or inaccurate, that can affect disability. As noted in the research by Shaw et al, blue flags have been conceptualized as worker perceptions of a stressful, unsupportive, unfulfilling, or highly demanding work environment. Black flags include employer and insurance system characteristics (Category I), as well as objective measures of physical demands and job characteristics (Category II).⁷

Transitioning from flags to medications, the latest research demonstrates how the dependence on drugs or alcohol can change the brain chemistry, altering pain and reward centers. As a result of this latest science, the idea of therapy alone to treat addiction is waning. Dr. Sanjay Gupta states that millions of patients use prescription pain medications, such as opioids, every year safely without becoming addicted, and certainly without dying. For nearly 30,000 people a year though, they pay the price with their lives, either by overdosing with an individual prescription or overmedicating with multiple prescriptions as the prescribed dosages.⁵

Common Opiate Medications include⁴:

- Buprenorphine
- Codeine (1: 0.15 ME*)
- Fentanyl (1:100)
- Hydrocodone (1:1)
- Lortab (hydrocodone)
- Methadone (1:9)
- Morphine (1:1)
- OxyContin (1: 1.5)
- Percocet (oxycodone)
- Tramadol (Ultram)
- Vicodin (hydrocodone)
 - ME: Morphine Equivalence

Cross reference and avoid benzodiazepines (in conjunction with Opiates) during medical history and medications review.⁴

- Alprazolam (Xanax, Paxal)
- Diazepam (Valium, Paxal)
- Flurazepam (Dalmadorm)
- Lorazepam (Temesra)
- Prazepam (Centrax)

Unhappy Triad or deadly combination of opiate and/or benzodiazepine medications⁴:

- Hydrocodone, Alprazolam, Soma
- Oxycodone, Xanibar, Soma

Opioids are any synthetic narcotic not derived from opium, indicating substances such as enkephalins or endorphins that occur naturally in the body, which act on the brain to decrease the sensation of pain. Morphine is derived from Morpheus (god of dreams or sleep), which is the principal alkaloid found in opium, an analgesic and sedative.⁶ Addiction of opiates can occur in as little as two weeks. Side effects or symptoms of withdrawal include tachycardia, hypertension, abdominal cramps, non-volitional tremors, vomiting, diarrhea, insomnia, depression, muscle aches, and/or bone pain.⁴ Opiate poisoning, also referred to as over dose, is the toxic reaction to an opium-derived drug with symptoms including euphoria, flushing, itching of the skin, drowsiness, bradycardia, decreased respiratory depth and rate, hypotension, and a decrease in body temperature. If the condition is untreated, death may be the outcome.⁷ As physical therapists and clinicians, it is important to recognize these side effects and/or withdrawal symptoms, early.

Taber's Dictionary defines pains as an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of damage.⁸ Because pain is a subjective, multifactorial experience, and not an objective finding, clinicians must establish a tangible past medical history that includes past and current medications. Opiates elicit their powerful effects by activating opiate receptors that are widely distributed throughout the brain and body. Once an opiate reaches the brain, it quickly activates the opiate receptors that are found in many brain regions and produces an effect that correlates with the area of the brain involved. Two important effects produced by opiates, such as morphine, are pleasure (or reward) and pain relief. The brain itself also produces substances known as endorphins that activate the opiate receptors. Research indicates that endorphins are involved in many things, including respiration, nausea, vomiting, pain modulation, and hormonal regulation.⁹

Feelings of pain are produced when specialized nerves are activated by trauma to some part of the body, either through injury or illness, located throughout the body; carry the pain message to the spinal cord. After reaching the spinal cord, the message is relayed to other neurons, some of which carry it to the brain. Opiates help to relieve pain by acting in both the spinal cord and brain. At the level of the spinal cord, opiates interfere with the transmission of the pain messages between neurons and therefore prevent them from reaching the brain. This blockade of pain messages protects a person from experiencing too much pain. This is known as analgesia. Opiates also act in the brain to help relieve pain, but the way in which they accomplish this is different than in the spinal cord.⁹

There are several areas in the brain that are involved in interpreting pain messages and subjective responses to pain. These

brain regions are what allow a person to know he is experiencing pain and that it is unpleasant. Opiates also act in these brain regions, but they don't block the pain messages themselves. Rather, they change the subjective experience of the pain. This is why a person receiving morphine for pain may say that they still feel the pain but that it doesn't bother them anymore.⁹

Patients are not "addicts" in the stereotypical sense, but people with real medical conditions who find themselves in the same situation as drug addicts. The re-education of patients and of society as a whole is critical since an effective treatment is now available. Recognizing signs of opiate addiction and/or dependency and understanding the consequences will hopefully motivate patients to seek early treatment before the downward spiraling takes away their jobs, their families, their self-esteem, and ultimately, their lives.⁹

The relief of pain has been described as a universal human right and often considered an entitlement, but pain relief is not always easily achieved. Opioid analgesics are effective, but have troublesome and potentially dangerous side-effects, and their potential for abuse may lead to regulatory and logistical difficulties. Nonsteroidal anti-inflammatory drugs (NSAIDs) have fewer regulatory restrictions, but they too have important adverse effects that are more likely at higher dose or with longer courses. Acetaminophen is widely used and is very safe at the recommended dose of 4 g per day, but does not always provide adequate pain relief on its own. Combining analgesics offers the possibility of increasing effectiveness without increasing dose (and therefore risk). The NSAIDs are often combined with acetaminophen, particularly for treating postoperative pain. There has been a recent prescription strength formulation of acetaminophen 500 mg and ibuprofen 150 mg that can be a better alternative to assist with postoperative pain management.¹⁰

An article published in the *British Journal of Anesthesia*, found that patients using the combination of acetaminophen and ibuprofen experienced less pain during the first 48 hours after oral surgery than those using the same daily dosage of either agent alone and believe the difference was clinically relevant. "There was no evidence of any pharmacokinetic interaction between acetaminophen and ibuprofen."¹⁰ Patients receiving ibuprofen alone reported the lowest frequency of adverse events, but the numbers are too small for meaningful comparisons between the groups, and we saw no cause for concern in any group. The data is consistent with previous evidence showing that a combination of ibuprofen and acetaminophen provides better analgesia than acetaminophen alone.¹⁰

There are limitations to this study. The results are limited to adults, and to the doses and models of pain studied. The authors state "We think our conclusions are likely to apply to other age groups and other types of pain, but this will require confirmation. We have not explored the optimal dosage of the combination drug, but the dosage used is consistent with current clinical practice. The inclusion of patients who underwent both general and local anesthesia implies that our findings are likely to apply in either case. It is not possible to draw firm conclusions on the safety of any drug from a study of only 40 participants per group, but acetaminophen and ibuprofen are well established, widely used, and considered very safe in appropriate doses."¹⁰

Conventional nonsteroidal anti-inflammatory drugs (relatively nonselective in their inhibition of cyclo-oxygenase [COX]-1 and COX-2) are widely used for the treatment of

pain and inflammation. However, the gastrointestinal effects potentially associated with their use can be a cause for concern, accounting for approximately 21% of adverse drug reactions reported in the United States.¹¹ In clinical practice, patients who require NSAID or COX-2 inhibitor therapy most frequently are those at the highest risk for cardiovascular events and are also likely to be taking prophylactic low dose aspirin. Balancing the potential risks and side effects of prescribed medications such as NSAIDs, COX-2 inhibitors, and aspirin, can be challenging. Sound judgement is warranted with regards to treatment decisions, specifically with patients that have been prescribed NSAIDs, COX-2 inhibitors, and aspirin due to the potential risks that involve the GI tract and cardiovascular system.

It is important to note that in comparative trials, no differences in efficacy were observed between the COX-2 selective agents and the NSAID comparators. These data indicate that COX-2 inhibitors should not be viewed as more efficacious replacements for traditional NSAIDs; instead, following a careful risk/benefit analysis they should be considered appropriate in some patients at high risk for gastrointestinal adverse effects or in patients who require anti-inflammatory therapy for arthritis who do not tolerate the gastrointestinal effects of nonselective NSAIDs.¹¹

Research by Borer and Simon concludes that the data summarized here suggest that the risks and benefits of conventional NSAIDs and COX-2 inhibitors must be carefully weighed before making therapeutic decisions. In clinical practice, the majority of patients with moderate to severe arthritis who might benefit from NSAID or COX-2 inhibitor therapy is likely to be elderly, and therefore is at a relatively higher risk for gastrointestinal and cardiovascular adverse events than would younger individuals. These patients are also more likely to be taking low-dose aspirin and using over-the-counter NSAIDs for pain relief.¹¹

Nearly one in 12 injured workers who were prescribed narcotic painkillers still were on the drugs 3 to 6 months later, according to a new report on worker's compensation claims. Too often workers say their pain is improved, but they show no improvement in performing the activities of daily living or returning to work. "A lot of times we see opioid script after opioid script after opioid script without function improvement. We want people getting better. If opioids aren't providing functional improvement, then they are providing more harm than good."¹¹

Workers' compensation claims that include prescriptions for certain opioid painkillers are nearly 4 times more likely to develop into catastrophic claims, according to a recent report in the *Journal of Occupational & Environmental Medicine*. The study titled, "The Effect of Opioid Use on Workers' Compensation Claim Cost in the State of Michigan," was published in the journal's August 2012 edition. The research was based on data from more than 12,000 workers' compensation claims processed by a Lansing, Michigan-based Accident Fund Holdings Inc. between January 2006 and February 2010. The study noted that claims involving long-acting opioids were 3.94 times as likely to have a total cost of \$100,000 or more compared with claims without any prescriptions. Claims with short-acting opioids were 1.76 times as likely to have a cost of \$100,000 or more. Claims that included long-acting opioids were 9.3 times more costly than claims that did not have such prescriptions,

while claims with short-acting opioids were 2.8 times more expensive.¹³ In addition; injured workers with chronic pain often suffer from comorbid health conditions, such as anxiety, that can make them more prone to abusing opioid prescriptions. While injury severity, attorney representation, and other factors contributed to higher medical and indemnity payments, the study said that opioid use was an "independent predictor" of whether a compensation claim would generate catastrophic costs.¹³

In an in-depth European research project of 46,394 respondents, Breivik and colleagues explored the prevalence, severity, treatment, and impact of chronic pain in 15 European countries and Israel. They determined that chronic pain sufferers' opinion of the impact of chronic pain on quality of life, that approximately one-third of the persons with chronic pain are in severe pain and approximately half had constant pain. Many people with chronic pain are less able or unable to do a range of daily activities.

Perhaps the most notable results were that around two-thirds of people were less able or unable to sleep because of their pain, and about half found walking and household chores difficult because of pain. Approximately two-fifths of people have difficulty with sexual relations, one-third said that they were less able or unable to maintain an independent lifestyle and two-fifths of people said that their pain made them feel helpless and they could not function normally. One-fifth felt inadequate as a spouse or partner and a similar proportion of people said that they had been diagnosed with depression as a result of their pain.¹⁴

Low self-esteem is engendered by the serious impact of chronic pain on peoples' lives. This was vividly documented by the chronic pain sufferers' opinion of the attitudes and beliefs of their doctors, colleagues, friends, and families about their pain. These findings illustrate important aspects of the immense burden of chronic pain on the individual sufferers. These aspects of long-lasting pain have not been well documented, prior to Breivik's published research.¹⁴

Implications for the economy of the individual and of society include approximately 60% of people who said that they were less able or unable to work outside of home and around one-fifth had lost their job because of pain. Around one-third of people who were not retired said that their current employment status or hours that they worked was affected by their pain. The effect of chronic pain on the ability to work has implications for the economy of society. As well as the cost related to the loss of productivity due to time off work and reduced work effectiveness, there is also the cost in loss of skills if people are forced to reduce their hours or stop working altogether. Moreover, it is well-known that social security compensations, retirement pensions, and other so-called indirect costs represent a burden to the economy that is much higher than direct health care costs.¹⁴

According to this study, 70% of the chronic pain sufferers were being treated with various non-drug treatments, most often physical therapy, massage (form of physical therapy), and acupuncture. Multidisciplinary and cognitive-behavioral approaches to management of chronic pain conditions are well documented to have significant and lasting effects. It is therefore an important finding that very few respondents in our survey reported having been exposed to these effective pain management strategies.¹⁴

Related to drug treatment of chronic pain, nearly 80% of chronic pain sufferers reported that they experience breakthrough pain from activity. Sixty four percent of those currently using prescription pain medications reported that their pain medications were inadequate at times to control their pain. The very marked differences in the use of nonprescription and prescription drugs of the weak and strong opioid classes of analgesics between the 16 countries clearly indicate that guidelines for appropriate use of these drugs in Europe are needed. The chronic pain sufferers' opinion in Breivik's research¹⁴ and adequacy of pain management did not seem to correlate to the drug usage-profiles of the countries surveyed. They stress that these analgesics should be used with the utmost care, but that appropriate and responsible use of strong opioids should be considered when NSAIDs, paracetamol and weak opioids, as well as available non-drug treatments, have failed to provide relief and improve quality of life.¹⁴

Related to the types of prescription medication currently used for chronic pain. The most common prescription medicines that were currently being taken by respondents were NSAIDs (44%), weak opioid analgesics (23%), and paracetamol (18%). Five percent were taking a strong opioid analgesic. When the data is categorized by country, it is clear that use of strong opioids varied widely from 0% in certain South-European countries to 12% to 13% in the UK and Ireland. Weak opioids varied even more: from 50% in UK and Norway, 36% in Sweden, 28% in Poland, between 18% and 22% in Switzerland, Ireland, France, Germany, and Finland to between 5% and 13% in Israel, Denmark, Italy, and Spain. The percentage of respondents taking COX-2 inhibitors ranged from 1% to 16%, except in Israel, where they were taken by 36% of respondents.¹⁴

All analgesics have side effects, including the recent focus on cardiovascular and gastrointestinal adverse effects of coxibs and traditional NSAIDs and the risks of hepatotoxicity of paracetamol in accidental or intentional overdose. All must be balanced against the well-known side effects of opioids. Most physical side effects of opioids decrease over time and those that do not can usually be managed. As Breivik illustrates,¹⁴ the risk of opioid drug abuse is a reality. The challenge is to find best practice, a sensible, middle ground, between opiophobia and opiophilia with appropriate and responsible use of potent as well as weak opioid analgesics when the non-opioid analgesics do not suffice and alternative pain management is not available or fail to help the patient to better quality of life.

From a physical therapy perspective and plan of care, physical therapy also varied from a high utilization of 55% in Sweden, 52% in the Netherlands, and 47% in Norway, to as little as 2% in France and 6% in Spain. Massage, may be a form of physical therapy: Austrians, Germans, and Poles try massage more often (47%, 46%, and 41%) than the British (15%) and the Irish (14%) pain sufferers.

In conclusion, this research has documented that complaints of chronic pain are prevalent in Europe, as well as in the United States. Pain is a personal, multifaceted experience or perspective that affects behavior and in many aspects, may negatively impact the quality of life. Patients with long lasting pain experience a multitude of negative attitudes and distrust from health care providers, colleagues, families, and acquaintances. Chronic pain of moderate to severe intensity, seriously affects their daily activities, social and working lives. This needs

to be taken more seriously by health care providers and those responsible for health care policies and allocations of resources. Furthermore, continued research needs to be done in respect to disability and pain management. As physical therapists we play a vital role in the plan of care, and have a responsibility to foster positive experiences and improved medical outcomes. According to Hippocrates, the father of physical therapy, the first rule of medicine is "Primum non nocere," above all, do no harm.¹⁵

ACKNOWLEDGEMENTS

The author would like to acknowledge other members of the Occupational Health Special Interest Group for their contributions in our organization. Special thanks to Scott Goold, facilitating an inspiring presentation at the WCA of NM Fall meeting, as well as his continued support in the publication of this article. Also, special appreciation for the guidance and contributions of our Concentra colleagues, and physical therapy program professors, that took the time to assist in the publication process of this article.

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PAIN MANAGEMENT

SPECIAL INTEREST GROUP

PRESIDENT'S MESSAGE

This year's CSM venue was a bit different than year's past. Programming, as always, was excellent and there was less of a hurry to get from one program to another. My continued thanks go to outgoing Education Chair, Beth Jones, and a welcome to incoming chair, Tess Vaughn. I would also like to take this opportunity to thank outgoing Orthopaedic Section President, Jay Irrgang for his support and to welcome Steve McDavitt as incoming Section President. Welcome Pam Duffy to the BOD who is replacing our Board Liaison, Bill O'Grady. Last and certainly not least, my continued thanks and admiration go to Terri DeFlorian and Tara Fredrickson as well as the Orthopaedic Section BOD who always go above and beyond to continue to make this meeting a huge success.

The first PMSIG program was entitled "Taijiquan in Rehabilitation: Ancient Tradition, Modern Evidence." Michael Costello, from the Orthopaedic Physical Therapy Residency Program, Cayuga Medical Center, Ithaca, NY presented the use of Taijiquan (also known as Tai Chi Chuan) as a rehabilitation modality with research evidence of its effects on pain, disability, self-efficacy, strength, balance, density, and cardiovascular effects.

The second presentation was "Essential Pain Knowledge for Physical Therapists: Recommendations from the International Association for the Study of Pain" presented by Marie Hoeger Bement from Marquette University, Kathleen Sluka and Mary Beth Geiser from the University of Iowa. Topics were the nature of pain, pain assessment and measurement, management, and clinical conditions with innovative strategies for patient and student education.

Both programs were informative and well presented. Congratulations to all presenters for their good work.

TAKING CARE OF US

A few weeks ago, while observing a reverse total shoulder replacement, the orthopaedic surgeon and I got into a discussion of his health. The surgeon told me that he was hospitalized every month for the first 6 months during 2012. My admonishment to him was that we do our best for our patients while ignoring our own health until we get into trouble. Health care workers are not immune to illnesses. In fact, health care worker deaths are higher than the national average when compared to number of employees/total deaths. Higher death rates have been reported only in high risk occupations such as military personnel, construction workers, police officers, etc.¹ We instruct our patients on wellness, stress reduction, and healthy lifestyles while we slowly burn out. We tend to work long hours, eat poorly, and exercise less in order to take care of others. Mindfulness of our own wellness can lead to empathy of our patients, allowing us to give more compassionate care, and produce better outcomes. We all struggle with stress, and disclosing this to our patients can result with better patient compliance. This echoes the statement of Balint who said that "the most

frequent (and important) drug used in general practice was the doctor himself."² If we practice what we preach to our patients, we have a win-win situation.

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2013 MEETING MINUTES PMSIG SAN DIEGO

Wednesday January 23, 2013

The meeting was called to order at 12:10 AM by John Garzzone, President.

Last years' minutes were published in OPTP and approved.

All involved with SIG activities were thanked for their participation over the past year. Continued thanks go to Joel Bialosky, Research Chair, for his contributions to the quarterly E-mail blasts.

We still need more articles for the OP newsletter that can be E-mailed to johngarzzone@frontiernet.net for submission. The SIG must have at least two articles a year published in OPTP.

OLD BUSINESS

1. The PMSIG Web site has been updated to find a Pain Management PT. Unfortunately the Web site will only allow us to search by last name and location.
2. The PMSIG Task Force has formulated topics and authors for an ISP. Some of the potential authors have expressed trepidation about the time involved with writing different modules since many of them have contributed chapters to Kathleen Sluka's book through the International Association for the Study of Pain. The PMSIG requested the Orthopaedic Section's BOD to consider sponsoring a CEU exam based on Kathleen's book. The authors would not mind formulating an exam for CEUs rather than writing new modules. Hopefully, something could be worked out with the International Association for the Study of Pain to share profits with the Orthopaedic Section from members who purchased the book through them. The PMSIG and Orthopaedic Section would split profits made from the CEU exam. The PMSIG could also add to the ISP by producing one or two additional modules on brain imaging and brain chemistry written by professionals who were not involved in Kathleen's book.
3. A conference call will be held in February or March to discuss a "Read for Credit" CEU examination.

NEW BUSINESS

1. Congratulations go to Neena Sharma, and Laura Frey- Law our newly elected members of the Nominating Committee. The office of President will be elected next year.

2. The PMSIG would like to sponsor a preconference course for next CSM.
3. A research retreat on pain was discussed.

The meeting was adjourned at 12:40
Respectfully submitted,
John Garzione, President

INTEGRATIVE OUTPATIENT PHYSICAL THERAPY TREATMENT FOR PEDIATRIC CHRONIC PAIN: A CASE STUDY OF A 13-YEAR-OLD BOY

Jamie Nelson, PT, DPT, OCS

ADAM'S STORY

Adam, a bright and active 13-year-old boy, injured his right shoulder while playing basketball in November 2010. He felt that his pain and soreness were similar to a typical sprain or strain, one that any active 13-year-old might endure. In a few days, there were no residual symptoms or functional limitations.

After Christmas, Adam contracted a virus that lasted several weeks. In January 2011, his painful shoulder symptoms returned with a vengeance. From January until May 2011, Adam developed severe arm pain leading to significantly decreased shoulder range of motion (ROM) and strength. Radiological tests were interpreted as normal. He tried acupuncture and massage with only limited relief. He was referred to physical therapy with a diagnosis of Shoulder Pain and was treated for a total of 21 visits from May through December 2011.

In August, Adam was given clearance to attend soccer camp. A few hours into camp it became obvious to Adam that the running was too much and was causing him to have intense shoulder pain. He became very scared and frustrated, and stopped all recreational activity.

In September, he began to experience extreme burning in his right arm and hand of non-dermatomal, non-radicular origin. His pain and fear of activity became exponentially high leaving him limited in his abilities to perform even simple daily tasks that eventually restricted his ability to participate in school.

CHRONIC PAIN

Chronic pain syndromes with complex presentations such as Adams are becoming more recognized in the pediatric population. A cross-sectional study done in Spain in 2008 found that out of 561 children between the ages of 8-16, 37.3% had chronic pain disorders with 5.1% being moderate to severe chronic pain.¹ A more recent systematic review from 2011 consisting of 41 studies performed between the years of 1991 and 2009 showed that the prevalence of musculoskeletal chronic pain ranges from 4% to 40%.² The wide range seen above suggests a high variability in the classifications regarding the severity and disability associated with chronic pain disorders.

Adam had been suffering with right arm and hand pain for 4 months before he was referred to a pain specialist and eventually to me 5 months after onset (he had already had 21 prior PT visits for his shoulder pain only). Unfortunately, this

is a common occurrence with chronic pain patients, especially in the pediatric population. A study in 2008 from the *Journal of Pediatrics International* showed that of 14 pediatric patients eventually diagnosed with CRPS, the median time to referral to a pain clinic was 24.51 weeks.³ Among most articles that I reviewed, this appears to be an average timeframe. Although early diagnosis and treatment is crucial to minimize disability, there is evidence that suggests children with complex regional pain syndrome (CRPS) are more resilient and have a much higher full recovery rate than adults with CRPS, even in cases of late diagnosis.³

Adam's severe hyperalgesia with a negative neurological and radiological workup suggested that he was possibly developing CRPS. The International Association of the Study of Pain (IASP) developed specific criteria for the diagnosis of CRPS: (1) the presence of an initiating noxious event, (2) the continuation of pain, allodynia, or hyperalgesia in which the pain is disproportionate to an inciting event, (3) evidence of edema, changes in blood flow, or abnormal pseudomotor activity, and/or (4) the diagnosis is excluded by the existence of conditions that would otherwise account for the degree of pain and dysfunction.⁴ It is very common that patients, including Adam, present with 3 of the 4 criteria. I treat these patients the same as if they fit all 4 criteria. In my opinion, patients who do not fit the IASP criteria perfectly often spend more time finding a diagnosis instead of starting treatment.

TREATMENT

Initial assessment begins when a patient and his parent walks into the evaluation room. Evaluating the individual personality and family dynamic prior to making any measurements is often one of the most important parts of therapy.

It has been well-documented that there is a large psychosocial component in both pediatric and adult chronic pain. What this really means is there are most likely certain individuals that are genetically predisposed to developing chronic pain. While the scope of this article/editorial is not to describe the proposed mechanisms of central sensitization, predisposing factors might include types of genetically influenced neuro-hormonal dysregulation.⁴ The other half of the psychosocial equation is the environment and how it has shaped or influenced ones response to certain stimuli such as pain that cognitive behavioral therapists address. It is also the area that I feel physical therapists need to influence more often. According to a recent review done by the *Journal of Pediatric Rheumatology* in 2012, children with chronic pain have generally been found to have ineffective coping strategies, a heightened sense of a lack of control (which often couples with anxiety), perceived lower competence, are perfectionists who set exceedingly high goals, and often portray catastrophizing behavior.⁴

When I met Adam for the first time in January 2012, I noticed immediately that he was an extremely bright, motivated, and self-reflective 13-year-old male. It had been noted by his pediatrician that Adam had a tendency to be more anxious than other children. Although this had the potential to affect Adam's progress, the fact that Adam did not display any signs of catastrophizing behavior suggested that he would progress more quickly through his program.

Adam had appropriate levels of support from his mom throughout the entire rehabilitation process. This component is

crucial for recovery as it has been shown that children who have parents who offer more concerned responses to pain behaviors have greater pain and functional disability.⁴

After assessing the patient and family dynamics, I find it important to educate patients by providing a definition of pain. It is important to the pediatric pain population to make sure that the patient understands what pain is. Deciphering between pain, function, and fear early on will help direct treatment more effectively. While Adam's exceptional understanding of the pain scale was one of the components that allowed our treatment plan to progress at an ideal pace, this is not always the case.

The next step in my assessment is to discuss and measure function. I use two to 3 functional outcome measures to direct my treatment and measure progress including the Patient Specific Functional Scale (PSFS), the Functional Disability Inventory (FDI), and the Fear Avoidance Beliefs Questionnaire (FABQ). While each provides beneficial information, it is important to note that the only outcome measure validated for the pediatric population is the FDI.

Since control has been identified as a crucial component for treatment in an anxious child, the PSFS is my preferred outcome measure as it allows the child to self-select activities. Adam identified 7 activities that were limited as a result of his dysfunction. He chose to work on writing, buttoning shirts, pushing buttons, opening doors, fastening seat belts, typing and brushing his teeth. He rated his ability to perform the activity 0-10, 0 not being able to perform at all, 10 being fully able to perform the activity at the preinjury level. He then rated his pain levels with each activity 0-10, 0 being no pain at all, 10 being the worst imaginable pain ever, as indicated in the following chart.

Activity	Score	VAS
Writing	0	8
Buttoning shirts	1	6
Pushing Buttons	0	6
Opening Doors	0	6
Fastening Seat belts	0	6
Typing	1	6
Brushing teeth	0	6
Average total	.285	8
*(Taken 1/5/12 visit 1 of 8 during patients second course of physical therapy with J. Nelson)		
MDC (90% CI) for average score: 2 points		
MDC (90% CI) for single activity score: 3 points ⁵		

After taking a patient history, discussing pain and function, performing sensory test and measures (which include tolerance to light touch, pressure, scratching, joint approximation, temperature, vibration, stretch, and muscle contraction), it is time to start treatment beginning with **step one: Building the foundation of trust and patient control**. This can sometimes be especially difficult with the pediatric population. Building trust includes letting the patient get comfortable with you as a therapist. Getting down to the patient's level, making eye contact with the patient, not the parent, and allowing the patient to try techniques on you first are all ways to build trust and allow control. The more a child understands the type of pain they are

experiencing, the more control he has, and the more willing he will be to try the activity. I often will work on explaining central sensitization and how our brain influences pain. Adam responded well to this concept and started to understand that he wasn't necessarily going to get progressively worse.

Step two for treatment is to make frequent and measurable goals for each session. This is important for *functional reassurance* and *reduction of fears*. I generally create a spreadsheet to track activities in the clinic and at home. Adam's initial activity consisted of wall circles for a timed period with each hand. We then focused on squeezing a towel, tendon glides, supination/pronation, leg press, squats on a BOSU balance trainer and standing on the BOSU with finger curls. Each week we reassessed his ability to perform the activities, added new activities, and revised his goals, if appropriate.

Step three: Learn how to distract. I often find with pediatric patients that if you keep them distracted while moving a body part or testing sensation they are able to tolerate more stimuli. With Adam, we counted backwards, performed multiple tasks at one time, and used storytelling as a means for distraction. This often helped Adam forget he was using his arms for an activity and reach his time or repetition goals more rapidly. The more often Adam met his goals the more control he felt he had and the less fearful he became.

Step four: Stop talking about pain, start talking about function. All of Adam's goals for treatment were based on function. The first question at the beginning of each session was not "How is your pain today?" but "How much have you been able to do this week?" Adam became excited to report that he could now do 40 seconds of repetitive window washing. Such an achievable goal gave Adam a sense of trust and control, allowing him to conquer more of the tasks that he was initially scared of trying.

Step five: Initiate the sensitive desensitization process. I start specific desensitization treatments only when a patient feels comfortable enough to understand that pain is not the enemy. In other words, "This is going to hurt, but it's not going to hurt you." Depending on the patient, this can sometimes be the hardest part. On day one, Adam and I started with timed periods of light touch with varying textures. We quickly progressed to pressure, scratching, stretching with combined nerve glides and vibration. All activities were done at home also. We then modified these activities to match his functional goals (ie, holding an electric toothbrush for longer periods of time).

Finally, **Step six: you've got to do all of the scary stuff.** The common vicious cycle had set in for Adam as it does for many who have chronic pain. The fear of pain keeps one from trying an activity, which in turn makes it more difficult to perform later on. If treatment can start prior to severe fear setting in, outcomes are generally more favorable. Eventually it becomes time to just start doing the things that you used to not be able to do. For some this is appropriate in their first session, for others their tenth. One of the many things that Adam had stopped doing was using his right hand to open doors. On our first visit, based on his tolerance to the tests we performed, I decided we needed to pick one task a week. The task for week one was to ALWAYS use your right hand to open a door. Tasks for week two included pushing the buttons on the treadmill with the right hand only.

It should also be understood that physical therapy in itself

might not be enough for some patients. Cognitive Behavioral Therapy (CBT) can be very useful and sometimes needs to be combined with pharmaceutical management. Adam had two sessions of CBT and started a low dose of a selective serotonin re-uptake inhibitor (SSRI) mid-treatment. I have found this triple therapy of medication, CBT, and physical therapy to be very effective in more difficult cases.

After 8 weeks of one time per week with 30-minute sessions, we revisited Adam's PSFS scores to obtain final scores:

Activity	Score	VAS
Writing	10	1
Buttoning shirts	10	0
Pushing Buttons	10	1
Opening Doors	8.5	1
Fastening Seat belts	10	1
Typing	10	1
Brushing teeth	9	1
Average total	9.64	.857
*(Taken 3/7/12 final visit 8 of 8 during second course of physical therapy with J. Nelson)		
MDC (90% CI) for average score: 2 points		
MDC (90% CI) for single activity score: 3 points ⁵		

The improvements in both pain and function were significant. He progressed from an average of 3% max function and 80% max pain to 96% max function and 8% max pain. Adam's success was mostly due to his compliance and motivation to return to school and sports.

Although there are a multitude of chronic pain conditions, most in the pediatric population, appear to improve with early intervention. For cases that do not improve with outpatient treatment, there are exceptional inpatient programs that involve a large multidisciplinary team consisting of pain management, anesthesiology, physical and occupational therapy, psychiatry, and behavioral management. These programs have been shown to be very successful in reducing pain and improving function.⁶⁻⁸

It is crucial for parents and pediatricians to recognize that even children can suffer from complex chronic pain conditions. Early recognition and intervention can often times stop the progression of a disorder and facilitate a more rapid recovery. A therapist who can focus on gaining trust and allowing patient control, making measurable and frequent goals, using distraction, focusing on function versus pain, being sensitive to the desensitization process, and encouraging the scary stuff will most likely find success at the end of such a long and painful journey.

DISCLAIMER

In order to protect the identity of the patient, some of the above information has been modified.

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Jamie Nelson currently practices as a physical therapist at the University of California, San Francisco. She received her doctorate of physical therapy in January 2007 from MGH Institute of Health Professions. She obtained her OCS in June of 2011 and remains an active member of both the APTA and orthopaedic clinical specialty groups. She treats a large variety of both orthopaedic/sports and neurological patients with special interests in hip impingement syndromes, shoulder and knee rehabilitation for return to high level sports, run analysis in athletes, and adult and pediatric chronic pain syndromes.

IMAGING

SPECIAL INTEREST GROUP

President's Message

Doug White, DPT, OCS

After CSM I find myself invigorated by the growing interest in imaging. We experienced high caliber imaging programming, a productive business ISIG meeting, many other meetings but still had some time for warm, if not sunny, San Diego. Below you will find the minutes of our business meeting. I want to highlight a couple of items of interest.

A Mendeley account has been established for the ISIG. Mendeley is a collaborative reference manager. The group is open to all. Follow the link below to join. Sign in and share your imaging reference library. See: <http://www.mendeley.com/groups/2881911/imaging-sig-orthopaedic-section-apta/overview/>

The American Registry of Diagnostic Medical Sonographers has credentialed the first group of Registered in Musculoskeletal sonography practitioners. This credential is open to all appropriate disciplines. At least two physical therapists were among this first group.

The ISIG leadership is also considering establishing a publication committee to generate items of interest for this publication and other section platforms. In the meantime if you have newsworthy or noteworthy items of interest you would like to submit for publication, please forward to me.

Imaging Special Interest Group – Orthopaedic Section Business Meeting– CSM 2013

Agenda

Welcome & Introduction
Recognition of Outgoing Leadership
SIG Functions
SIG Activities in 2012
Report of Imaging in PT Education Project
New Business
Discussion, Q&A

ISIG Leadership

Douglas M. White, DPT, OCS - President
Deydre Teyhen, PT, PhD, OCS – VP
Nominating Committee
James “Jim” Elliot, PT, PhD
Wayne Smith, DPT, Med, ATCr, SCS, RMSK
Judith “Judy” A. Woehrle, PT, PhD, OCS
Richard Souza, PT, PhD, ATC, CSCS (newly elected)

Research Committee

Paul Beattie, PT, PhD 2012-2015

Gerard Brennan, PT, PhD - Orthopaedic Section Board Liaison

Recognition of:

Judith “Judy” A. Woehrle, PT, PhD, OCS

Nominating Committee Chair

SIG Purpose

Provide educational programming.

Educational & practice resource.

Develop and recommend practice standards & terminology.

Identify changes in legislation, regulation, & reimbursement issues at state and national levels.

Identify and provide resource people & materials to accurately share practice information and address areas of concern.

Foster credible research within the SIG domain in conjunction with the Orthopaedic Section Research Committee to promote both scientific foundation and interdisciplinary study.

2012 Activities

Networked with delegates to amend APTA position:

...When indicated, physical therapists order appropriate tests, including but not limited to imaging and other studies, that are performed and interpreted by other health professionals. Physical therapists may also perform or interpret selected imaging or other studies...

ISIG Education Activities

Programing for CSM

American Institute of Ultrasound in Medicine (AIUM)

President appointed to the AIUM for the development of Point-of-Care US Guidelines. These guidelines are still in draft form.

Promote standardized imaging terminology

Ultrasound

Not RUSI

Research Committee

Paul Beattie appointed Chair of newly formed ISIG Research Committee.

Assist APTA with development of practice guidance for ultrasound

Worked with APTA staff on language for practice guidance and for revision of the *Guide to Physical Therapist Practice*.

Curriculum guidance for imaging in PT education

Dr. Bill Boissonnault: Survey of imaging in PT programs has IRB approval and will be sent to all programs in the next few weeks.

Recruit Members

We are growing!

166+ members

Implementation of social media

Mendeley site set up for literature exchange. Open to all. See: <http://www.mendeley.com/groups/2881911/imaging-sig-orthopaedic-section-apta/overview/>

Content added to ISIG area of Section Web site
 SIG Member Directory and SIG listing are up.

New Business

Noteworthy: American Registry of Diagnostic Medical Sonography has new credential for musculoskeletal ultrasound. This is open to physical therapists.

2013 Activities

- Recruit Members to ISIG.
- Add content to ISIG area of Section Web site.
- Promote standardized imaging terminology.
- Research Committee:
 - Appoint members, and
 - Develop Research Committee agenda.
- Develop strategic plan for ISIG
- ISIG Education Activities
 - Recruit high quality submissions for CSM.
- Curriculum guidance for imaging in PT education:
 - Complete survey and analysis,
 - Develop paper on Imaging in PT Education with recommendations.
- 2013 Activities adopted by general consent.



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ANIMAL REHABILITATION

SPECIAL INTEREST GROUP

LETTER FROM THE PRESIDENT

Kirk Peck, PT, PhD, CSCS, CCRT

MEET THE PRESIDENT

It is my pleasure to formally introduce myself as the newly elected President of the ARSIG. But first I would like to express gratitude to Amie Hesbach for her many years of service to the profession and especially to the ARSIG. Amie's energy and passion for improving the lives of our animal companions was evident during her 6-year tenure as ARSIG President. Amie will remain active with the SIG on many levels so I will continue to benefit from her wisdom and experience as I muddle through the murky waters of a new leadership role.

Since you might be interested in learning a little more about my background, here is a brief synopsis. In the early 1990s I initiated a new PTA program and served as Director for 8 years. For the past 12 years, I have been a full-time faculty member and clinical education coordinator in the Department of Physical Therapy at Creighton University in Omaha, Nebraska. I teach a variety of topics including political advocacy, professionalism, and clinical exercise physiology and therapeutic exercise. I provide part-time outpatient physical therapy services to a non-reservation based Native American medical clinic governed by the Ponca Indian Tribe of Nebraska. I am also currently serving my second term as President of the Nebraska Chapter Physical Therapy Association.

ANIMAL ENCOUNTERS

During my undergraduate years in the 1980s, I worked in a zoo where I glove trained "downed" birds of prey (owls, hawks, and eagles) to perform at various educational shows. While in physical therapy school I worked at an all-night emergency veterinary clinic, and also assisted a sports-medicine veterinarian conduct research on greyhound dogs. After moving to Omaha in 1991, I became a zoo docent at the Henry Doorly Zoo but it required too much personal time so I terminated the relationship. In 2011, I became certified in animal rehab through the Canine Rehabilitation Institute. Since that time I have continued to treat both humans as mentioned and dogs via consultation with a couple of veterinarians in Omaha. Oh yes, I did spend about 7 years negotiating statutory and regulatory language to legalize animal rehab by non-veterinarians in Nebraska. So that's my life in a nutshell. Oh, one more thing...I have two kids (one in college and the other is a Jr. in High School), one wife, and one dog named Bella--a Shih Tzu/Jack Russell hybrid. She is very smart but full of relentless energy.

ARSIG IN 2013

The ARSIG business meeting held at the APTA Combined Sections meeting in San Diego was very productive and exciting. Many issues were discussed including the practice analysis survey, independent study courses, SIG member involvement in the association, enhancing the SIG Web site, the need for more research in animal rehab, and strategizing new ideas to offer

more educational opportunities for SIG members that may also lead to the recruitment of "new" members. Finally, one of the most important topics covered was the need to update the SIG legislative liaison list. That, I am happy to report, is being done now by 3 SIG members.

ARSIG LEGISLATIVE LIAISON CONTACTS

The SIG legislative liaisons serve as key individuals in each state who are poised to address any legislative or regulatory matter related to the practice of animal rehabilitation. There is a simple truth about clinical practice that I tell students frequently, "PTs and PTAs practice 'by law.' We are granted that privilege by those who actively engage in the political process. Therefore, if you want the freedom to practice what you have been educated to safely do with animal care, then you need to know the laws that pertain to your state (PT and Vet), and you may need to change those laws to improve your ability to practice if they are deemed inadequate." It is that simple...we ALL have a duty to be political advocates. That is why the SIG leaders are going to devote a great deal of time to regroup SIG members so that we know who can be contacted in each state to address issues that may be of concern to PTs and PTAs who practice on animals. Finally, being a SIG legislative liaison is a great service. Trust me, it can be very enlightening, and once you get involved, you may actually get hooked!

Contact: Kirk Peck: (402) 280-5633 Office; Email: kpeck@creighton.edu

ARSIG PROGRAMMING AT CSM

We had a wonderful first preconference course on "Manual Therapy for Mechanical Dysfunctions of the Canine Lumbar Spine," presented by Cindy McGregor, PT, PhD, OCS, and Laurie Edge-Hughes, BScPT, MANimSt, CAFCI, CCRT. In attendance were both physical therapists and veterinarians, and a local therapy dog group provided "demo dogs" for all the participants to practice their palpation skills and manual techniques on. We are looking forward to this becoming an annual offering, so please support future courses!

In addition, our regular programming this year was on "Measuring Change in Canine Rehabilitation," presented by Cindy McGregor, PT, PhD, OCS, and Amie Hesbach, MSPT, CCRP, CCRT. The lecture encompassed some of the basic components of research, including validity, reliability, sensitivity and specificity, and responsiveness. Information was also given on subjective scales, such as the Visual Analog Scale and numerical rating scales; objective measurements such as goniometry, girth, algometer, force plates, and the Canine Timed Up and Go Test. The second part of the lecture focused on the clinician's "outcomes toolbox" and why it is important to gather valid objective measures at the time of the initial exam. In this way, specific and timely goals can be made, and outcomes measured. This will give validation for the treatments being provided, if positive outcomes can be shown.

Immediately following our programming, we had our annual

business meeting. Some of the major topics discussed were the practice analysis. There were problems with some of the data analysis and several sections of the analysis are now several years old and data may not still be reliable. It will probably require gathering new data from SIG members and starting over, so stay tuned for developments in this area. Other topics included the transition of presidency from Amie Hesbach to Kirk Peck, whom we welcome to his new post; the Vice President's position (currently occupied by Carrie Adrian) will be vacant next year. If anyone is interested in the position, please contact one of the Nominating Committee members. As always, we are looking for volunteers to help on many of our committees and projects, so if you have some free time, please consider assisting us!

CASE STUDY: THE USE OF PULSED ELECTROMAGNETIC FIELD THERAPY IN SMALL ANIMAL REHABILITATION

Tanya Doman Yousry, PT, DPT, CSCS, CCRP

The use of pulsed electromagnetic field therapy (PEMF) started decades ago in human practice as a modality to aid in fracture healing. Many of these dinosaur-like contraptions featured exposed coils attached to a main, and rather large, control box. The coils were wrapped around the dysfunctional limb (ie, non-union fractures) and set for hours a day. Like most modalities, this method of treatment has been modernized and subsequently researched for the benefit of all.

While the modality has changed, the principles have stayed the same. In 1979, the FDA approved the use of PEMF devices to stimulate bone growth in non-union (delayed healing) fractures. The FDA subsequently expanded its use for the treatment of pain and edema in soft tissues in 1982.

First off, these are not the 'magnets' we perhaps played with as kids. Many veterinarians have reservations regarding the use of magnets in the industry; these are the same providers that refer for magnetic resonance imaging (MRI), however. Pulsed electromagnetic field therapy is more appropriately compared to MRI than to static magnets.

The body's cells contain electrically charged ions. When the properties of the cells are activated or changed, a pump action can be simulated that improves the cells' metabolism by moving nutrients and metabolite end-products. Alternating frequency also reduces accommodation by the body.

"It has been shown that this coherent vibration of electric charge is able to irregularly gate electrosensitive channels on the plasma membrane and thus cause disruption of the cell's electrochemical balance and function."

Pulsed electromagnetic field therapy is not to be equaled to the static magnets that are sometimes placed inside leg wraps for equines; this resulting magnetic field is one-way, or one-dimensional, and the area affected is small. A thorough description of the electrical engineering is beyond the scope of this report. However, those who wish to read further about the low frequency, non-thermal actions stimulated by PEMF may read further in Markov¹ and Liboff.²

Many authors have highlighted the effects of PEMF on tissue repair.³ Pulsed electromagnetic field therapy stimulates osteo-

genesis and increased bone mineral density leading to increased bone strength. The anabolic effects on osteoblasts and other cellular growth factors are combined with modulated effects on cytokines. Anti-inflammatory benefits occur to the treatment's effect on adenosine receptors of cells.³ To date, the treatment has not been associated with any negative side effects.³

SUGGESTED USES

Ideally, this is a great adjunct for our small animal clients with fractures or degenerative joint disease. This modality can be also used in the early postoperative period in the absence of UWTM use or other 'high activity' rehabilitation techniques.

Besides facilitating bone and tissue healing as described in the literature for both humans and animals, there is a pain management application for our animals with arthritic degenerative conditions.^{4,5} Authors of PEMF-related studies have described faster recovery from exertion (or physiological "fatigue").⁶ For our neurological cases (eg, Degenerative Myelopathies and similar), this author (TDY) points to the human studies on multiple sclerosis as well as immune-deficiency diseases and arthritis such as SLE and fibromyalgia.^{6,7} Preliminary research exists to suggest a decrease in spasticity following PEMF use.⁸

In a double-blind study by Dallari et al,⁹ human patients with prostheses experienced decreased pain and significant increases in hip motion that correlated to better function. Several studies have been published in which authors describe chondrocyte proliferation in humans and animals with PEMF stimulation.¹⁰ In a study described in Zhong et al on the effects of PEMF on osteochondral autografts in the knees of sheep:³

"Significantly lower levels of interleukin-1 and tumor necrosis factor- α or alpha were observed in PEMF-treated knees while levels of tumor growth factor-beta1 were higher."

The authors of a recent 2012 study described the beneficial use of PEMF on human plantar fasciitis. In addition, the authors preferred the use of electromagnetic energy in this format to extracorporeal shockwave therapy (EST) due to "conflicting results" from the latter.¹¹ Extracorporeal shockwave therapy is also used in veterinary rehabilitation but can be extremely uncomfortable and require anesthesia during the session.

HOW TO USE PEMF

The preferred method of application is having the animal rest or lay on the towel-covered mat for 20 to 30 minutes at the conclusion of their rehabilitation session. (See Figures 1 & 2) The position of the animal does not affect dosage or effectiveness. The pet should be under supervision by trained rehabilitation staff to prevent damage to the bed and materials. Staff or owners attending rehabilitation sessions may sit in proximity of the mat as long as there are no pacemakers or other contraindications.

CONCLUSION

The majority of research available for PEMF has been done in vivo on humans, which may be considered as a limitation for its validity in direct applications to veterinary rehabilitation. Also, the treatment parameters vary wildly from session durations of 16 minutes to a few hours and use frequency from a few times a week to daily use.



Figure 1. 12-year-old Border Collie mix with arthritis.



Figure 2. 11-month-old Golden Retriever post-op.

Dr. Oz featured PEMF as a helpful pain management tool in a television episode in November 2011. The headlining of the modality by a celebrity physician should not translate directly to its application in clinical practice, but it represents the dissemination of information to a public that will, in turn, find useful. If nothing else, we have a duty to explore the techniques that are being discussed to the public—our clients.

Pulsed electromagnetic field therapy is a useful, noninvasive, nonpharmacologic, low-unit cost device for veterinary rehabilitation use.

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