ORTHOPAEDIC

Physical Therapy Practice

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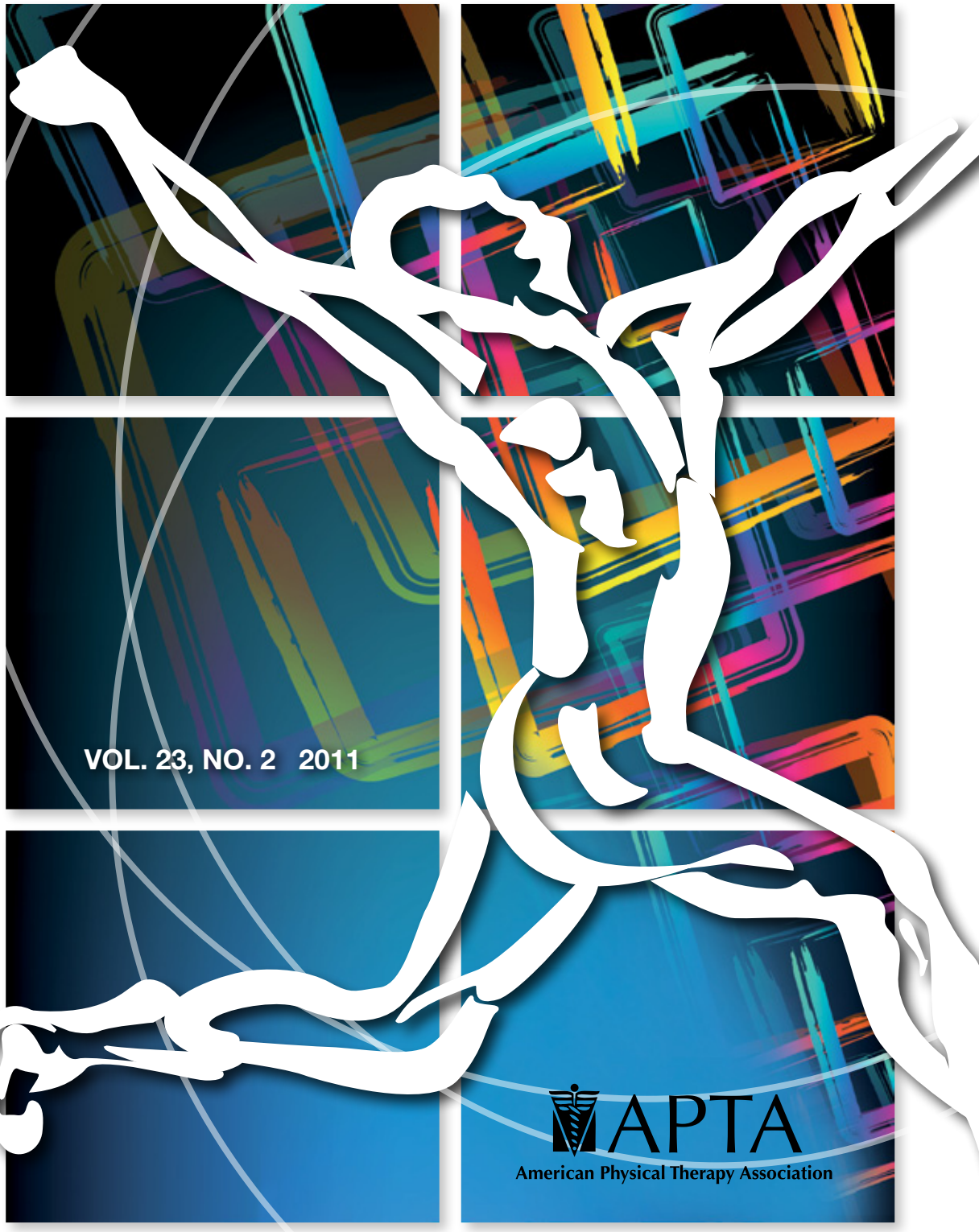

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Physical Therapy Practice

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In this issue

Regular features

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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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President's Corner

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

Happy Spring! I hope by now everyone has thawed out and all of the snow has melted from a long cold winter.

I want to begin this message by congratulating the Green Bay Packers fans, especially our office staff–Terri, Tara, Sharon, Kathy, and Carol–for their exciting Super Bowl win over the Pittsburgh Steelers. While I am from Pittsburgh, I learned a long time ago from Coach Johnny Majors not to talk about a victory before the victory is in hand. As you can see from the picture, some have not yet learned that lesson! I am sure the crow was a little tough to chew and swallow.

In the paragraphs that follow, I will update you on some exciting activities and announcements involving the Orthopaedic Section, but before I do that I want to recognize the outgoing Section officers and welcome the new officers.

Jennifer Gamboa, DPT, OCS, MTC, completed her term on the Nominating Committee, serving as the Chair over the last year. During her tenure, the Committee was able to put forth a well-qualified slate of candidates for each of the election cycles. Jennifer's vacancy will be filled by Bill Egan, PT, DPT, OCS, FAAOMPT, and during the upcoming year Josh Cleland will serve as Chair. This fall the 2012 election will be for Treasurer, one Director, and a Nominating Committee member. If you are interested in running for one of these offices, please contact a representative of the Nominating Committee by August 31st.

Chris Hughes, *OP* Editor, lost his Superbowl bet but was a great sport in accepting defeat.

Thomas McPoil, PT, PhD, FAPTA, completed two terms as Orthopaedic Section Vice President and agreed to extend his second term by a year to accommodate a bylaw change that staggered the terms of the President and Vice President. During his tenure, Tom assumed many responsibilities and contributed greatly to the success of the Board. On a weekly basis, Tom participated in an hour long call with our Executive Director, Terri DeFlorian and me to address Section business and to keep the Section moving forward. Some of Tom's contributions to the Section are:

- Chaired the Section's Awards Committee.
- Served as liaison to the Editor of the Independent Study Courses and *Orthopaedic Physical Therapy Practice*.
- Served as liaison to the Education Committee.
- Served as liaison to the Special Interest Groups (SIG) and Education Interest Groups (EIG). In this role, Tom consolidated the bylaws governing the Special Interest Groups into a unified SIG and EIG Policies and Rules of Order.
- Developed and implemented a monthly electronic newsletter, Osteo-BLAST. In this role, Tom generated and edited the content that was included in this blast to the membership.

Tom always provided excellent insight during Board discussions. He was able to see multiple sides of an issue and contributed greatly to building a consensus. While Tom completed his term as Vice President, he will continue to be involved in Section activities as he was recently elected to serve as Vice President/Education Chair of the Foot and Ankle Special Interest Group.

The incoming Vice President is Gerard Brennan, PT, PhD. Gerard has been a long time Section member. Most recently he has served the Section as a member of the Task Force for the National Orthopaedic Physical Therapy Outcomes Database. Currently Gerard serves as the Director of Clinical Quality and Outcomes Research at Intermountain Healthcare Physical Therapy in Salt Lake City, Utah. Gerard recently completed a term as Vice President for the Section on Research. We look forward to working with Gerard and his contributions for the betterment of the Section.

By all accounts, the 2011 Combined Sections Meeting in New Orleans this past February was a great success. Attendance topped 9,000, which is the largest ever attendance at CSM. Under the direction of Beth Jones, Chair and Tess Vaughn, Vice Chair, the Education Committee offered 3 preconference courses and sponsored or co-sponsored 28 educational sessions totaling 97.5 hours. Additionally, the Research Committee, under the direction of Lori Michener, Chair, selected 67 platforms and 106 posters for presentation at the meeting. Plans are already underway for the 2012 Combined Sections Meeting, which is planned for February 8-11 in Chicago, IL.

An Imaging Special Interest Group was created by unanimous vote of the Orthopaedic Section Board of Directors during their meeting at CSM. The scope of the Imaging SIG will encompass a wide range of imaging modalities that are used by physical therapists to guide treatment decisions and enhance interventions. As such, purposes of the Imaging SIG are to: (1) provide educational programming; (2) serve as an educational and practice resource; (3) develop and recommend practice standards and terminology; (4) identify changes in legislation, regulation, and reimbursement; (5) serve as a forum to share practice information; and (6) foster credible research related to the use of imaging modalities by physical therapists. Doug White and Deydre Teyhen both agreed to serve as the interim Presi-

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Guest Editorial

KISS Revisited!

Steven A. Hoffman, PT, ATC, SCS
North Hills Orthopedic and Sports Physical Therapy, Sewickley, PA

In the 32 years that I have been a practicing clinical physical therapist, I had the privilege of meeting with and treating tens of thousands of patients. I have also had the honor of collaborating with colleagues from around the country, learning much, and continue to be humbled by knowing that there is so much more yet to learn.

One of my mentors, Lynn Wallace taught me and his students the value of simplicity. He espoused the "KISS" (keep it simple) philosophy of practice and advised his students to practice in a way that took into account scientific innovation, current philosophies of thought, but not to be "bogged down" by bureaucracy. I was taught early on that we should always be open to new ideas; however, if a strategy is known to be effective and "works," complicating that strategy is unnecessary and can prove to be detrimental to patient care.

Throughout my career I have attended numerous continuing education seminars, learned new skills, and continue to remain current on new theories, research studies, and advanced technologies. The longer I practice, the more I realize the basic philosophies that helped to mold me professionally still have merit. I have found the need to "step back" and wonder whether we have lost perspective, requiring us all to evaluate the roles that new technology and innovation play versus the old fashioned ideals of "simplicity."

The physical therapy profession has provided us with advancements in data accumulation, synthesis, and application. We have expanded our educational programs to confer the DPT upon new graduates. We recognize clinical specialization, and have earned the privilege of direct access. Our journals enjoy world wide respect. We have embraced computer technology allowing us to communicate electronically via text messaging, E-mail, and video conferencing. Advanced degrees can be obtained "on line" and many of us are accruing our continuing education hours via on-line course work. Each day, new articles are published in the scientific literature questioning or substantiating the work that we do. Scientific evidence has improved the quality of patient care that we provide, and students of physical therapy are trained to embrace the evidence and support their decision making based on what has been "proven," and not theorized.

All of these aforementioned advancements in our profession have undoubtedly improved the reputation of physical therapy in the medical community and general community at large. I wonder, however, if we have all become bogged down by the rush to complicate what has been effective and if we have forgotten the basics

In Memory of James Beazell, PT, DPT, OCS, FAAOMPT, ATC

We are saddened by the passing of our friend and colleague, Jim Beazell, on Thursday, January 20, 2011.

Jim was the clinical coordinator/residency director at the Musculoskeletal Center at the University of Virginia-HealthSouth outpatient clinic in Charlottesville and had been a clinical educator of physical therapists for over 20 years. Jim received his MS in Physical Therapy from University of Southern California in 1981. He obtained his DPT from Virginia Commonwealth University in 2007. He was a Fellow in the American Academy of Orthopaedic Manual Physical Therapy (AAOMPT) and was board certified as an Orthopaedic Clinical Specialist by the APTA. Jim was an instructor and lecturer for many groups and events including the Institute of Physical Art, APTA National Conference, VPTA Annual Conference, the California Medical Academy, and the American Academy of Orthopedic Surgeons Clinical Update. Jim published a number of articles in the *Journal of Orthopaedic and Sports Physical Therapy, Journal of Manual and Manipulative Therapy, Manual Therapy, Spine, Research in Sports Medicine, Journal of Pain and Clinics in Sports Medicine*. He also authored chapters in *Decision Making in Spinal Care, Miller's Essential Orthopedics and Prevention of Musculoskeletal Disorders-Vol. 1: The Spine*. Jim presented research at CSM, AAOMPT meetings, the International Meeting of Advanced Spine Technology, and the National Pain Conference. Jim also received a grant from the Orthopaedic Section in 2007 to examine the mechanisms and effects of tibiofibular manipulation on patients with chronic ankle instability.

Jim was perhaps best known in Virginia for founding Orthopedic Manual Therapy Seminars (OMTS) in 2002 and teaching in the OMTS Long Term Orthopedic Manual Therapy Course from 2002 - 2010. In 2009, the OMTS long term course expanded with Jim's guidance into the University of Virginia-HealthSouth Orthopedic Residency, the first APTA accredited Orthopedic Residency Program in Virginia.

Jim was an engaging and entertaining teacher. He shared his passion for patient care, clinical education, and research with untiring enthusiasm. He was a "walking PubMed." Through his teaching and publications, Jim helped many physical therapists become better clinicians. This is his legacy. We will never forget him.

No one accomplishes this volume of work without the support of his family and we thank Jim's wife, Lee and his children, Stewart and Ross.

of patient care and interaction that were instilled in us at the time of our training. I've had the privilege of teaching and mentoring many students throughout my career and have noticed a significant change in the way that students think, access information, and problem solve. The advent of the Internet has enhanced their ability to access information instantaneously and broadened our academic horizons. My recent experience, however, is that most students and practitioners are more inclined to go to the computer than to visit the library, physically search journals and textbooks, and draw independent conclusions based on what they have read versus accessing a video on YouTube and attempting to replicate that video without adequate scrutiny.

Recently I surveyed a group of first year physical therapy students and asked them as a class if one of their patients missed an appointment and later they found that the patient had a personal family tragedy, would they contact the patient offering support and condolences and how would they communicate with that patient. Virtually all students stated that they would contact the patient, but I was surprised to see that more than half would be satisfied just to send the patient a text message or E-mail as opposed to calling them on the phone or personally visiting.

This represents a disturbing trend to me. As we have all become more reliant on technology, interpersonal interaction has suffered. If we don't practice communication skills, then we will lose one of the unique characteristics of our profession…our ability to relate to the patient!

I've personally witnessed and have been told by patients who have gone to other physical therapy facilities that their therapist spent little or no time touching them. After an initial evaluation, the therapist instructed the patient to exercise or apply a passive modality, but did not lay their hands on that individual. This scenario has been recounted countless times to me, much to my chagrin. Although most students graduating from approved curricula are well trained, educated in numerous facets of patient care, research, and treatment strategies, it has been my impression that new graduates have not been conditioned to touch every single one of their patients on a daily basis. Touching one's patient establishes a bond between the therapist and that patient creating a deep trust that cannot be replicated by the handing out of home exercises and indirectly supervising a routine that can be replicated elsewhere.

I have been impressed by the innovation many therapists have shown in devising new exercises for the rehabilitation of a variety of maladies. These exercises are creative and are usually the result of supported research. On one hand, it is important that we keep things "interesting" for patients; however, I have wondered if some of these "creative" exercises are way too arduous, complicated, and unnecessary, especially if basic instruction will "do the trick." This is not to say that we shouldn't be open minded about new and creative techniques, but going back to the adage "keep it simple," most patients would prefer to perform a task with relative ease as long as it is done correctly.

I'm reminded of a statement Jenny McConnell made at one of her continuing education seminars on patellofemoral dysfunction. She told us that she encouraged her patients to do "a little bit often," and "quality is more important than quantity." It is worth asking, is it constantly necessary to reinvent the wheel, when in the end, the wheel will always be round?

As I think about the day to day interaction that I have with patients, I have begun to strategize my interventions using a simpler approach. Certainly experience and "hindsight" allow me to be discerning as to whether I need to apply a sophisticated approach or one that is un-encumbering. Being aware of the literature, and having the willingness to extend beyond the "basics" are important, but keeping things simple should be the rule. That isn't to say that we shouldn't keep our eyes and ears peeled for the outlier; however, if we continue to rely on impersonal ways of communicating and treating, and are continuously "reinventing the wheel," our treatment efficacy will be in doubt.

To summarize, I ask each and every one of those reading this editorial, students, instructors, and clinicians alike to consider the following:

1. Touch your patients every day. Remember this is a privilege, not a right.
2. Talk to your patients directly instead of relying on electronic communication.
3. Give patients simple yet effective home exercises to follow and be sure they are doing them correctly. Remember, "a little bit often" and "quality is more important than quantity."
4. Listen more and talk less.
5. Go to the library, search the stacks, and pull out a journal or book.
6. Rely less on passive modalities and more on exercise, manual therapy, and interpersonal interaction.

In my experience, physical therapists are some of the nicest, kindest, and most sincere people that I have had the privilege of meeting. I worry that if we become too reliant on technology, we run the risk of alienating our patients and losing the basic skills of treatment and interaction that have allowed us to stand apart in health care.

Fascial Anatomy in Manual Therapy: Introducing a New Biomechanical Model

Julie Ann Day, PT

Centro Socio Sanitario dei Colli, Physiotherapy, Padova, Italy

ABSTRACT

Background and Purpose: Fascial anatomy studies are influencing our understanding of musculoskeletal dysfunctions. However, evidenced-based models for manual therapists working with movement dysfunction and pain are still developing. This review presents a synthesis of one biomechanical model and discusses underlying hypotheses in reference to some current trends in musculoskeletal research. **Method:** The author conducted principally a search of the health sciences literature available on PubMed for the years 1995 to 2011, and consulted published texts concerning this model. **Findings:** Some of the hypotheses proposed by this model have been investigated via anatomical dissections that have addressed the connections between deep fascia and muscles, the histology of deep fascia, and its biomechanical characteristics. These dissections have led to new anatomical findings. This model may also present new challenges for research in fields such as peripheral motor control and proprioception. **Clinical Relevance:** This information could introduce new perspectives for clinicians involved in the manual treatment of musculoskeletal dysfunctions.

Key Words: deep fascia, fascial anatomy, manual therapy, myofascial unit

INTRODUCTION

One tissue gaining increasing attention in manual therapy is the connective tissue known as fascia. While there is still ongoing discussion about how to categorize and name the various fascial layers[1] it is, nevertheless, possible to distinguish 3 different types of human fasciae, namely, superficial, deep, and visceral fascia. Each of these has its own anatomical and biomechanical characteristics and specific relationships to surrounding structures. Most studies concerning fasciae focus on the anatomy and pathology of specific areas, such as the thoracolumbar fascia,[2] abdominal fascia,[3] the Achilles tendon enthesis organ,[4] plantar fascia,[5,6] and the iliotibial tract.[7] While detailed studies pertaining to specific areas of fascia are important, they do not provide a vision of the human fascial system as an interrelated, tensional network of connective tissue. A few authors consider its 3-dimensional (3D) continuity[8-10] but these holistic models do not always provide specific indications for treatment. A functional model for the entire human fascial system that correlates dysfunctional movement and pain is in its infancy with regards to evidence-based investigations and studies.

This paper will examine a 3D biomechanical model for the human fascial system that takes into account movement limitation, weakness, and pain distribution during the analysis of musculoskeletal dysfunctions. While the interaction between all fascial layers is contemplated within this model, this paper will focus on the part that addresses the deep fascia, which appears to be principally implicated in musculoskeletal activity.

The model is the result of 35 years of study and clinical practice by Luigi Stecco, an Italian physiotherapist.[11,12] Developed specifically for manual therapists working with movement dysfunction and pain, the chief focus of this model is the relationship between muscles, deep fascia, and its components (epimysium, perimysium, and endomysium). More recently, this work has been supported by a series of extensive anatomical dissections of unembalmed cadavers. Histological, biomechanical, and functional studies have also been undertaken to verify some of the underlying hypotheses concerning the architecture of the fascia, its innervation, its relationship with muscle fibers, and the possible mechanisms of action of the manual technique itself.

Deep Muscular Fascia

Studies of deep muscular fascia support its role in epimuscular myofascial force transmission[13,14] although the degree to which it is involved in in-vivo muscle movements is still not clear.[15] Deep fascia is implicated in deep venous return[16] and its possible role in proprioception has been suggested.[17] Deep fascia is a well-vascularized tissue often employed for plastic surgery flaps,[18] and it responds to mechanical traction induced by muscular activity in different regions.[19] It has an ectoskeletal role and can potentially store mechanical energy and distribute it in a uniform manner for harmonious movement. The mechanical properties of the fascial extracellular matrix itself can be altered by external mechanical stimuli that stimulate protein turnover and fibroblastic activity.[20,21] These characteristics and the reported abundant innervation of deep fascia indicate that it could have the capacity to perceive mechanosensitive signals.[22]

The correct embryonic development of the musculoskeletal system requires the coordinated morphogenesis of muscle, muscular fascia, tendon, and skeleton. In the embryo, muscle tissue and its fascia form as a differentiation of the paraxial mesoderm that divides into somites on either side of the neural tube and notochord. The cartilage and bone of the vertebral column and ribs develops from the ventral part of the somite, the sclerotome, whereas the dorsal part of the somite, the dermomyotome, gives rise to the overlying dermis of the back and to the skeletal muscles of the body and limbs.[23] It is now known that muscular connective tissue is critical for the form and function of the musculoskeletal system, muscle development, and muscle regeneration in general. For example, in mammals, fetal connective tissue fibroblasts express the transcription factor Tcf4, which is essential for proper muscle development. Studies indicate that Tcf4-expressing cells actually establish a pre-pattern in the limb mesoderm that determines the sites of myogenic differentiation, thereby shaping the basic pattern of vertebrate limb muscles.[24] Other studies demonstrate that the absence of specific transcription factors in muscle connective tissue disrupts muscle and tendon patterning in limbs, and that to understand the etiology of diseases affecting soft tissue formation a focus on connective tissue is required.[25]

As muscle cells differentiate within the mesoderm, each single muscle fiber is progressively surrounded by endomysium, groups of fibers by perimysium, whole muscles are enclosed by epimysium and deep fascia encloses groups of muscles. The connective tissue that accompanies the development of muscle fibers and nerve components facilitates the different innervations and functions of the muscle fibers within each muscle belly. Furthermore, the fascia unites all of the fibers of a single motor unit that are often distributed throughout a muscle in non-adjacent positions, allowing for synergy between recruited fibers and separation from nonrecruited fibers. Fascia can therefore adapt to variations in form and volume of each muscle according to muscular contraction and intramuscular modifications induced by joint movement.

This fascial-based organization allows each single muscle fiber to slide somewhat independently from its adjacent fibers. In addition, deep muscular fascia has significant characteristics that allow it to perceive muscle fiber tension. Many muscle fibers attach directly onto fascia,[26] and it also connects with muscle fibers via intermuscular septa, fascial compartments, and tendon sheaths. Histological studies of deep fascia in the limbs show that it consists of elastic fibers and undulated collagen fibers arranged in layers. Each collagen layer is aligned in a different direction and this permits a certain degree of stretch as well as a capacity to recoil.[27] Fascia can also be tensioned, as it connects with bone through periosteum.

Even though this strict relationship between muscle fibers and their surrounding fascia is characteristic of all muscles, the role of the fascia in musculoskeletal function has only received attention in the last decade. In fact, the number of studies about how muscles work is still significantly higher than studies investigating the possible functions of deep muscular fascia.

THE BIOMECHANICAL MODEL

In order to analyze the fascial system more effectively, Stecco[11(p 28)] divides the body into 14 functional segments: head, neck, thorax, lumbar, pelvis, scapula, humerus, elbow, carpus, digits, hip, knee, ankle, and foot (Figure 1). Each functional segment is comprised of a combination of portions of muscles, their fascia, and the joint components that move when these muscle fibers contract.

Myofascial Unit

Six myofascial units (MFU) are considered to govern the movement of the body segments on the 3 spatial planes. An MFU is described as a functional unit composed of motor units innervating monoarticular and biarticular muscle fibers, the joint that they move in one direction on one plane, the deep fascia that unites these fibers, and the nerve components involved in this movement. One example is the MFU for knee extension where fibers from medial and lateral vasti are the monoarticular components and fibers from the rectus femoris provide the biarticular component (Figure 2). Myofascial units are considered to be the functional building blocks of the myofascial system. In this model, it is postulated that deep fascia is a potentially active component in movement coordination and peripheral motor control and that, due to its innervation, the fascial component of each MFU is a possible source of directional afferents that could contribute to proprioceptive information.

Center of coordination

Within the deep muscular fascia of each MFU, a specific small area called the center of coordination (CC) is identified. A CC is defined as a focal point for vectorial forces produced by monoarticular and biarticular muscle fibers of an MFU acting on a body segment during a precise movement and are often situated within the deep fascia overlying a muscle belly. In reference to the MFU for knee extension mentioned previously, the CC is located between the vastus lateralis and rectus femoris, halfway on the thigh (see Figure 2).

Through clinical observation and studies comparing acupuncture points, myofascial trigger points, and the sum of the vectorial forces involved in the execution of each segmental movement, Stecco[12 (pp 325-326)] noted that impeded gliding of the deep fascia commonly occurs at these intersecting points of tension. The term center of coordination is used to infer the possible involvement of deep fascia in monitoring movement of a related segment via its connections to muscle spindles, Golgi tendon organs, and other mechanoreceptors.

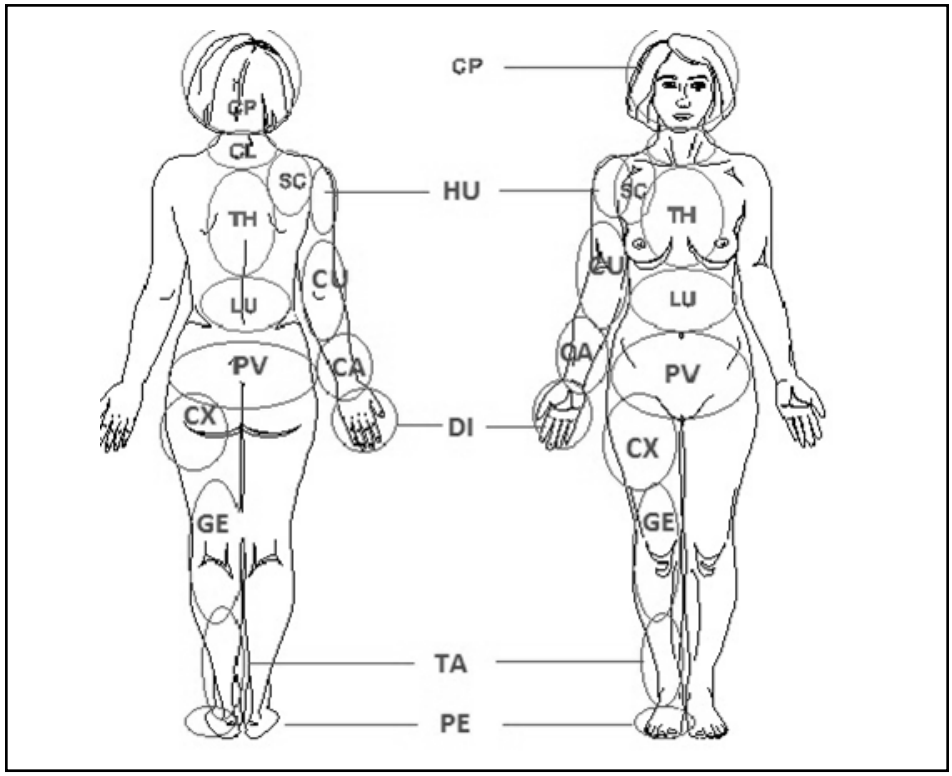

Figure 1. Fourteen body segments. CP: Caput, CL: Collum, TH: Thorax, LU: Lumbar, PV: Pelvis, SC:Scapula, HU: Humerus, CU: Cubitus, CA: Carpus, DI :Digits, CX: Coxa, GE: Genu, TA: Tarsus, PE: pes. Each segment comprises joint(s), portions of muscles that move the joint(s), the fascia surrounding these muscle fibers. Latin terms are used to distinguish these segments from simple joints.

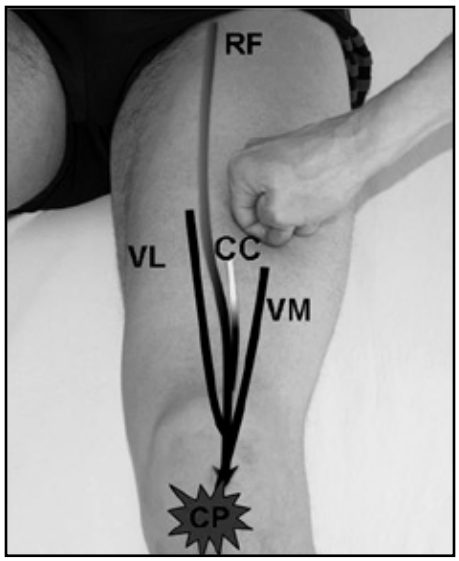

Figure 2. The MFU (Myofascial Unit) for knee extension comprises monoarticular components (vastus lateralis VL, medialis: VM, and intermedius), and biarticular components (rectus femoris: RL). The CC (center of coordination) for this MFU is situated midway on the thigh over the deep fascia between vastus lateralis and rectus femoris and the CP (center of perception) is located in the anterior knee joint.

Center of perception

For each MFU, a circumscribed area around the joint is described. This is where traction exerted during muscle fiber activity of this MFU is perceived on the joint capsule, tendons, and ligaments. This circumscribed area is called the center of perception (CP); and according to Stecco,[11 (p 23)] when any given MFU is malfunctioning, then pain is felt in its corresponding CP. For example, in the MFU for knee extension the CP is located in the anterior knee joint (see Figure 2).

Any impeded gliding between collagen fibers within the deep fascia of an MFU is thought to cause anomalous tension, resulting in firing of afferents from embedded mechanoreceptors within the fascial component of the MFU. Subsequently, disturbed motor unit recruitment could then produce incongruent joint movement, resulting in conflict, friction, inflammation of periarticular soft tissues, and sensations of pain or joint instability over time.

Fascial Mediation of Agonist-antagonist Interaction

This model also considers the interaction between agonist and antagonist MFUs that is important for myofascial force transmission and coordinated movement. In almost every MFU, a number of monoarticular fibers insert onto the intermuscular septum that separates two antagonist MFUs on the same plane. For example, in the MFU for elbow extension, the monoarticular fibers are situated in the lateral and medial heads of triceps and the anconeus muscle, and they collaborate with biarticular fibers from the long head of triceps to move the elbow joint into extension. The monoarticular components stabilize the joint during movement while the biarticular components synchronize movement between adjacent joints. In other words, the short vectors, created by the monoarticular fibers, and the long vectors from the biarticular fibers allow for precision and stability of each segment during movement. The MFU for elbow extension has its own antagonist myofascial unit that coordinates elbow flexion. When the elbow extends, the monoarticular fibers from the lateral and medial heads of triceps contract and the intermuscular septum where they insert will be stretched. The brachialis muscle inserts on the other side of this same septum. It is an elbow flexor and the monoarticular component of the MFU for elbow flexion. This connection means that during elbow extension brachialis is stretched a little too, causing its stretch receptors to fire. Thus, the deep fascia can be envisioned as a component in agonist and antagonist activity.

Myofascial Sequences

Biarticular muscle fibers (part of each MFU) link unidirectional MFUs positioned in a specific direction to form myofascial sequences.[11 (p 98)] This type of organization is said to guarantee the synchronization of single MFUs in order to develop forceful movements and to monitor upright posture in the 3 spatial planes.

A single myofascial sequence coordinates movement of several segments in one direction on one plane. Sequences on the same spatial plane (sagittal, frontal, or horizontal) can be considered as reciprocal antagonists. This means that areas of altered fascia can potentially produce recognizable patterns of extended tension that can develop along the same sequence, or be distributed on the same plane between antagonist sequences (Figure 3). This is thought to be possible because a part of the deep fascia slides freely over the muscle fibers, thereby transmitting tension along the length of the limb or trunk, yet another part is tensioned directly by muscle fibers that insert onto it and indirectly by its insertions onto bone. The combination of the biarticular muscle fibers found in each MFU and so-called myotendinous expansions (see Discussion section) forms the anatomical substratum of the myofascial sequences.

Myofascial Spirals and Centers of Fusion

Stecco also identifies small areas located principally over the retinacula that might monitor movements in intermediate directions between two planes, as well as movements of adjacent segments in different directions.[12 (p 208)] These small areas are called centers of fusion (CF) and combinations of these CF form myofascial spirals.

It is important to note here that studies have shown that retinacula are reinforced areas of the deep fascia itself, rather than separate bands as commonly illustrated in topographical anatomy texts.[28,29] Retinacula actually continue from one joint to the next via oblique collagen fibers within the deep fascia, creating macroscopically visible spiral formations. Stecco postulates[12 (p 213)] that during complex movements, such as walking or running, these spiral-form collagen fibers would progressively wind and unwind, and the ensuing tensioning of the retinacula could progressively activate, inactivate, and synchronize mechanore-

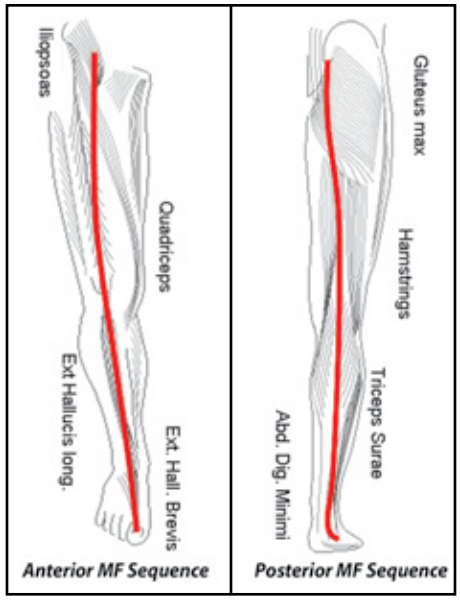

Figure 3. Myofascial sequences on the sagittal plane (anterior, posterior) in the lower limb. The fibers of the indicated biarticular muscles connect adjacent segments.

ceptors located within these periarticular structures.

MANUAL METHOD BASED ON THIS MODEL

A manual approach for treating the human fascial system, called the Fascial Manipulation© method, is based on the model described above. Once the initial obstacle of the new terminology is overcome, and the main principles are understood, clinicians apply this biomechanical model to interpret the spread of tensional compensations from one segment to another, and to trace back to initial disturbances. A fundamental concept for clinicians is the indication to go beyond treating the site of pain (CP) and to trace back to its fascial origin in corresponding key areas (CC and/or CF). As treatment is usually at a distance from the site of pain, or the inflamed area, this technique can be applied during the acute phase of a dysfunction.

A systematic evaluative process of movement using codified movement and palpatory tests guides therapists in selecting the combination of fascial alterations to be treated. Changes in range of movement, pain, and/or muscle recruitment are verified after treatment of each point.[30] In other words, therapists identify which CC and/or CF are involved in any given dysfunction of one or more MFUs. This method is applied in a wide variety of musculoskeletal dysfunctions, and treatment of segmental or multisegmental problems is approached through the analysis of chronological events involved in each individual case.

The manual technique itself is directed towards the deep muscular fascia. Therapists use their elbow, knuckle, or fingertips over the CC and/or CF, creating localized hyperemia through deep friction. Deep friction can apparently alter the ground substance of the deep fascia via mechanotransduction mechanisms[31] and this could restore gliding between collagen fibers. According to the Stecco model, it is important to apply friction precisely over the small areas where tension produced by muscle fiber contraction apparently converges.[32]

DISCUSSION

This biomechanical model shifts emphasis from muscles with origins and tendinous insertions moving bones, to motor units activating groups of muscle fibers united by fascia that bring about movement. Interpreting movement in terms of MFUs introduces a new paradigm to the current understanding of musculoskeletal function.

It does find some resonance in studies that examine motor unit activity, which are providing new understandings of movement[33] and muscle fatigue.[34] Motor unit activity determines movement and different movements require varying degrees of contractile force. This force depends on the number of motor units recruited, muscle fiber types, and motor neuron firing rates.[35 (p 20)] While humans appear to have an infinite number of combinations of motor-unit recruitment and discharge rates that can be used to vary muscle force, control strategies have reduced these options substantially. These strategies include definite patterns in the recruitment order of motor units and the use of discharge rate to grade muscle force, although motor-unit properties can apparently adapt within limited ranges when challenged. Motor unit recruitment is related to the mechanical function of the muscles, although many factors such as mechanics, sensory feedback, and central control can influence recruitment patterns.[36]

The possible relationship between alterations in fascia, pain, and motor unit recruitment clearly warrants further studies. Findings from studies of pain and motor unit recruitment do suggest that pain induces reorganization in motor unit recruitment. One study showed how injections of a saline solution into the infrapatellar pad caused anterior knee pain that reduced the coordination of motor units between the medial and lateral vasti muscles as compared to subjects without knee pain.[37] In another study, the authors indicate how pain induces a reorganization of motor unit recruitment strategy, involving changes in recruitment order and changes in the population of units recruited, favoring those with a slightly different force direction.[38] Furthermore, injections of inflammatory agents (Freund Adjuvans solution) into rat lumbar muscles have evidenced an increase in the proportion of dorsal horn neurons with input from the posterior lumbar fascia, demonstrating a correlation between deep muscles and areas of deep fascia at a distance.[39 (p 251)]

Stecco's hypothesis of deep fascia's role in proprioception and motor coordination[12 (p 15,16)] definitely pivots on demonstrating the afferent innervation of deep fascia. Different studies do suggest that fascia is richly innervated. The presence of abundant free and encapsulated nerve endings have been described in various regions such as the thoracolumbar fascia,[40] the brachial fascia,[41] fascia lata, crural fascia, and various retinacula.[42] While some of the nerve fibers found in fascia are probably involved in local blood flow control due to their adrenergic nature,[43] others do appear to be proprioceptors. Encapsulated mechanoreceptors and proprioceptors such as Pacini and Ruffini corpuscles and Golgi tendon organs are embedded in deep muscular fascia, with their connective tissue capsules in direct continuity with endomysium and perimysium.[44] This means that whenever a muscle fiber contracts, it inevitably stretches the fascia enclosing it and this may stimulate nearby embedded receptors.

Interestingly, as mentioned before, the histological studies have shown that collagen fiber distribution within deep fascia is well organized and not irregular, as generally reported, and it does correspond to precise motor directions. More specifically, in the limbs, two to 3 layers of parallel collagen fiber bundles form the deep fascia and adjacent layers are oriented in different directions.[45] The angle between the fibers of adjacent layers of the crural fascia has been measured and was found to be approximately 78°.[46] Loose connective tissue separates each layer permitting the collagen fiber layers to slide and to respond to tension (Figure 4). The deep fascia of the trunk has quite a different histological structure, as compared to limb fascia, as it is formed of a single layer of undulated collagen fibers adhering to the underlying muscles.[47] One study of the pectoral fascia indicates how tensioning of a particular area of this fascia

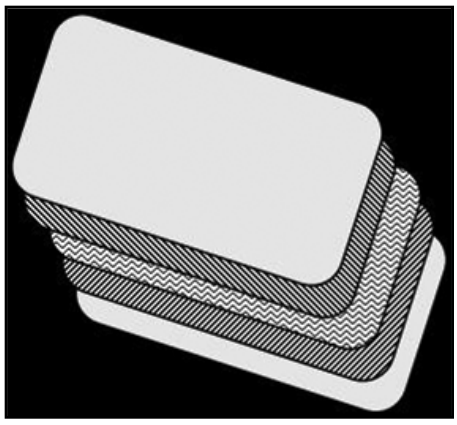

Figure 4. Layers of collagen fibers within deep fascia have different orientations. Note: Mechanoreceptors are embedded within these layers.

could activate specific patterns of proprioceptors, potentially providing directional and spatial afferent information.[48]

While the Stecco model focuses on the role that deep fascia could play in peripheral motor control, collaboration and integration with the central nervous system is duly recognized.[11 (p 164)] Nevertheless, the interrelationship that exists between muscle fiber contractions, mechanoreceptors embedded in deep muscular fascia and peripheral motor control is a rather controversial aspect of this model. Muscle spindles lie in parallel to muscle fibers and they do have a thin connective tissue capsule that is continuous with either the endomysium or the perimysium of the surrounding muscle fibers. Stecco proposes[12 (p 20)] that when gamma fiber stimulation causes intrafusal spindle fibers to contract a minimal stretch could be propagated throughout the entire fascial continuum, including tensioning the deep fascia at the CC. If this fascial continuum is elastic, then it could adapt to this stretch permitting muscle spindles to contract normally with subsequent correct activation of alpha motor fibers and muscular contraction. On the other hand, if there is excessive stiffness within the system, then particular small areas on the deep fascia (the CC/CF) will not be elastic and muscle spindle contraction could be less than perfect, distorting afferent information to the central nervous system and thereby interfering with correct motor unit activation (Figure 5). Incongruent motor unit activation could then result in uncoordinated movement, producing joint instability or pain.[49]

Studies addressing sensory processing do point to the muscle spindles as prime players in position and movement sense.[50] There is evidence that muscle spindles contribute to both the sense of limb position and limb movement, and that there is continuous interaction between the contraction of limb muscles and centrally generated motor command signals; however, the role of the fascia in this interplay does require further studies.

The Stecco model also suggests that if the fascia is in a physiologic state, sliding and tending appropriately, it could contribute to simultaneous adaptation between agonist and antagonist according to the inclination of the muscle fibers and the segment involved. Studies of myofascial force transmission mechanisms[51,52] do suggest some evidence for this hypothesis of deep fascia's role in agonist and antagonist interaction but this is another area requiring further investigation.

As part of the fascial anatomy studies carried out on unembalmed human cadavers, numerous myotendinous expansions linking adjacent body segments have been identified.[53] These myotendinous expansions are well documented in anatomical texts, yet no clear functional significance has ever been assigned to these structures. Some authors have suggested these expansions have a role in stabilizing tendons,[54] and the term tensegrity has been used to describe this type of connection existing between body segments.[55] These expansions extend well beyond any bony insertion of the muscle, forming a continuum with the deep fascia in adjacent segments. For example, in the upper limb, the lacertus fibrosus of biceps brachialis can be considered as a myotendinous expansion, yet pectoralis major, palmaris longus, latissimus dorsi, deltoid, triceps brachialis, and extensor carpi ulnaris all present myotendinous expansions of their deep fascia. A study of the functional relationship between shoulder stabilizers and hand-grip suggests that, in agreement with the Stecco model, this myofascial organization could be a means for transmission of tension along a myofascial sequence, permitting the coordination between stabilization of a proximal joint or joints while distal joints are involved in forceful movement.[56]

Fascial anatomy studies have also added to the growing consensus among anatomists that retinacula, in particular the ankle retinacula, may play an important role in proprioception and should not be considered merely as passive elements of stabilization, but a type of specialization of the fasciae for movement perception.[57] Ankle retinacula are thickenings of the deep fascia formed by 2 to 3 layers of parallel collagen fiber bundles, densely packed with a little loose connective tissue, and they present virtually no elastic fibers but many nerve fibers and corpuscles. In fact, the histological features of retinacula appear to be more suggestive of a perceptive function, whereas tendons and ligaments mainly play a mechanical role. Dissections have shown that the retinacula have specific muscular and bone connections that allow them to be sensitive to the tonus of the muscles. Given their continuity with deep fascia, and the fact that tendons typically pass beneath retinacula, any impediment in gliding of the retinacula would interfere with correct functioning of the tendons themselves. This could potentially lead to problems such as tenosynovitis, or dysfunction of the associated muscles, as well as altering the function of adjacent segments via disturbed proprioceptive afferents.

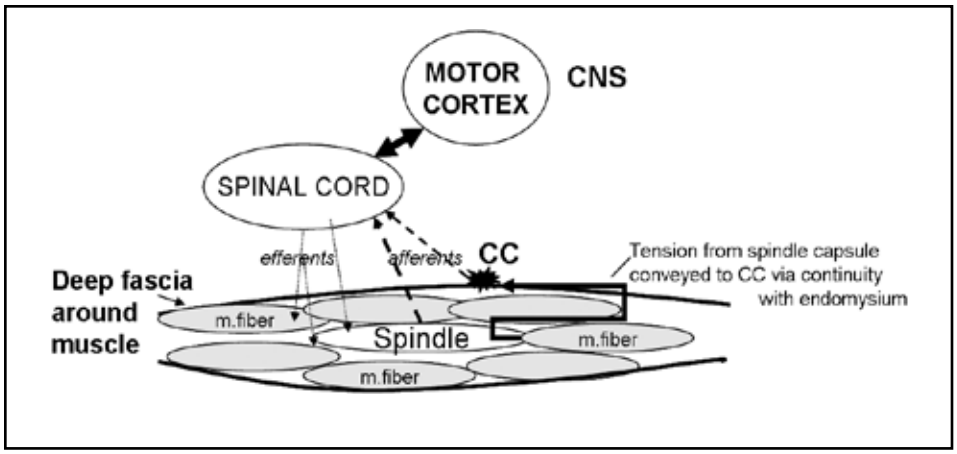

Figure 5. Schematic diagram illustrating possible mechanism of interaction between spindles, fascia, and CNS as suggested by Stecco.

CONCLUSION

The architecture of deep muscular fascia and its precise relationship to the muscles it surrounds forms the basis of an innovative biomechanical model for the human myofascial system. It suggests that deep muscular fascia could act as a coordinating component for motor units grouped together into functional units and that this connective tissue layer unites these functional units to form myofascial sequences. This holistic vision of the human fascial system is partially supported by ongoing evidence-based research into fascial anatomy. Clinically it is

common to find patients with regional pain syndromes and some of the aspects presented in this biomechanical model could provide indications for comprehending the possible connection between different areas of pain. The Stecco model does employ an unusual terminology and numerous new abbreviations that can present an initial obstacle to comprehension. Nonetheless, this model introduces interesting perspectives for clinicians involved in the manual treatment of musculoskeletal dysfunctions but further well-conducted clinical studies to test its validity are necessary.

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The Diagnostic Accuracy of Joint Line Tenderness for Assessing Meniscal Tears: A Systematic Review with Meta-analysis

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ABSTRACT

Background and Purpose: The purpose of this systematic review was to determine the appropriateness of joint line tenderness (JLT) as a diagnostic indicator of meniscal tears. **Methods:** A literature search of MEDLINE, CINAHL, and Science Direct was performed to identify potential studies (published through April 2010). A qualitative analysis of included articles was performed using the QUADAS tool, while meta-analysis was performed on a combined populace. **Findings:** Fourteen studies met inclusion criteria. Pooled sensitivity and specificity were 44% (95% CI: 43-46) and 65% (95% CI: 65-67) respectively. Positive likelihood ratio and negative likelihood ratio were 1.28 (95% CI: 1.22-1.35) and .85 (95% CI: 0.82-0.88), respectively, indicating that JLT is likely a poor predictor of meniscal tear in this population. **Clinical Relevance:** Knee pain will affect 50% of Americans; therefore, it is important to assess the efficacy of clinical examination procedures used by clinicians to direct treatment of undiagnosed knee pain.

Key Words: diagnosis, joint line tenderness, meniscal tear, primary care, tibiofemoral joint

INTRODUCTION

Knee pain causes functional deficits in nearly half of the population and 31% of sufferers will seek guidance from primary care providers.[1] Practitioners must differentiate the cause prior to the administration of an effective intervention. Symptom presentation is not always diagnostic, leaving practitioners to hands on examination and diagnostic imaging to differentiate the cause. In particular, meniscal tears are one of many causes of knee pain and can be difficult to diagnose.[1,2] Primary care physicians are often implicated in the unnecessary ordering of imaging and lab studies, and specific to meniscal tears, ordering magnetic resonance imaging (MRI). Unfortunately, an MRI is an expensive and ineffective diagnostic tool for distinguishing meniscal tears with reports of false-positive incidence as high as 65%.[3] Physical examination is reported to be more accurate than MRI for diagnostic indication of meniscal tear.[4] Therefore, it is cost effective to differentiate which clinical physical examination procedures provide the highest accuracy for screening of meniscal tears for primary practitioners.

Many special tests have been designed to detect meniscal tears; however, clinical trials have yet to clarify which tests are most accurate in detecting pathology. There are more than 17 special tests that are used in the clinic to determine the presence of a meniscal tear.[5] The most commonly researched special tests include joint line tenderness (JLT), Apley's Compression Test, McMurray's Test, and the Thessaly test.[1,6-14]

One of the simplest tests, JLT, has been previously reported as an effective indicator of meniscal injury; however, current research has called into question the accuracy of this test.[15] Five systematic reviews have been published regarding the accuracy of JLT in assessing meniscal injury.[1,16-19] The two most recent were published by Hegedus et al[1] and Meserve and colleagues.[16] Hegedus et al[1] concluded that JLT was 63% sensitive and 77% specific, with positive and negative likelihood ratios of 2.74 and 0.48, respectively. Meserve and colleagues[16] reported JLT to be 76% sensitive and 77% specific, with positive and negative likelihood ratios of 3.30 and 0.31, respectively. A positive likelihood ratio between 2-5 and a negative likelihood ratio between 0.2-0.5 usually indicates a small, but sometimes important shift in the probability that a condition is present.[20] As a result, these likelihood ratios indicate that JLT may possibly be a useful clinical test in determining the presence of a meniscal tear.[20]

With two current systematic reviews depicting JLT as a relatively important clinical test, it seems unnecessary to review JLT any further. However, a 2009 publication by Shelbourne and Benner[15] analyzing JLT and meniscal tears in patients suffering subacute and chronic anterior cruciate ligament (ACL) injuries, has introduced significantly more subjects into the potential pool for meta-analysis of JLT. Therefore, the purpose of this review is to summarize the available literature on the effectiveness of JLT as a clinical predictor of meniscal tears and to perform a meta-analysis in order to determine overall sensitivity, specificity, and likelihood ratios of this test.

METHODS

Search

A literature search of MEDLINE, CINAHL, and Science Direct was performed to identify studies (published through April 2010) that reported the diagnostic accuracy of JLT for meniscal tears. The search terms used were "menisc*" (an "*" allows for search of multiple root word endings) AND "joint line." The following limits were set: peer-reviewed, research article (CINAHL); English (MEDLINE and CINAHL); humans (MEDLINE); abstract, title, and keywords (Science Direct). Hand searching of systematic reviews and meta-analyses yielded additional records.

Inclusion Criteria

Diagnostic accuracy studies available in English were selected for this review. Records were included if they used arthroscopy as a reference standard and reported results in a way that raw data could be calculated. All studies reported, or reviewers were able to calculate, the sensitivity and specificity of JLT as a diagnostic test for meniscal tears. One reviewer assessed the abstracts of the studies identified according to the inclusion criteria. The second reviewer independently confirmed the selection.

Exclusion Criteria

The main exclusion criterion for this review was that the results were not able to be replicated given the information provided in the study. Studies were also excluded if they were a review of the literature or used MRI exclusively as a reference standard.

Quality Assessment

The Quality Assessment of Diagnostic Accuracy Studies (QUADAS) tool was used for the quality assessment of this review.[21] The QUADAS, developed by Whiting et al,[21] is a 14-item tool designed to specifically assess the quality of studies of diagnostic accuracy included in systematic reviews. The specific criteria can be found elsewhere.[1,21-23] Each of the 14 questions is scored as *yes, no,* or *unclear*. Standards for assessing each item have been published. This tool has not yet been formally validated for use in systematic reviews; however, several systematic reviews have been published using the QUADAS.[1,22] Whiting et al[22,23] do not encourage use of a combined score as an indicator of high or low quality studies; instead, they encourage using each item individually. However, the meta-analysis by Hegedus et al[1] considered scores of 10 out of 14 to be high quality. The quality of each study was determined unmasked by one examiner. A second examiner independently confirmed the assessment. No studies were excluded based on QUADAS score.

Meta-Analysis

Articles that met inclusion criteria were evaluated based on population statistics. Based on published materials, each study's patient population results were recreated by any means necessary. Some studies appropriately listed their population statistics including true-positives, false-positives, false-negatives, and true-negatives, while others required retrospective data analysis to recreate their populace. In certain instances, population statistics were recreated using sensitivity and specificity results listed; however, due to rounding for publication some results required additional extrapolation to recreate their populace. In instances in which data was not in whole numbers, a subject was added or removed and sensitivity and specificity were tested to confirm appropriate recreation based on published statistics.

Once populace statistics were recreated, our meta-analysis was simply a combined populace. All true-positives were summed, as were all other categories to form a meta-analysis populace. Sensitivity, specificity, positive predictive value, and negative predictive value were then deciphered based on this cumulative populace. For medial and lateral cumulative populaces, only studies that specified populaces in medial and lateral distinctions could be included. Therefore, some studies could not be included in the medial and lateral cumulative populace statistics as listed in Table 1.[8,10-14,24] Confidence intervals were calculated using CATmaker version 1.1 available from the Centre for Evidence Based Medicine Web site.[25]

It is important to note that based on this statistical procedure, the results of the study by Shelbourne and Benner[15] account for a majority of the meta-population. Statistical analyses previously performed have weighted studies according to power, to account for variability in sample sizes. However, Hegedus et al[1] previously concluded that the average power of small sampled research skews results in which weighted accumulation is performed. Therefore, to discount study power, we decided to simplify our statistical analysis and let each subject represent an equal quantity in the tested populace. This simplification allows Shelbourne and Benner[15] results to represent a majority of our results, but this method also allows each subject tested for meniscal tear to represent the same proportion in our final statistical results.

RESULTS

Study Selection

The search of MEDLINE, CINAHL, and Science Direct identified 169 articles, and the hand search identified 8 additional articles for review. Of these abstracts, 17 were retrieved for further evaluation. After detailed review, 14 articles fulfilled the inclusion criteria, had replicable data, and were included in this review (Figure 1).[2,6-15,24,26,27]

Study Description

All studies included the use of JLT as a diagnostic indicator of meniscal lesion. Studies reported various testing positions for JLT. Three studies reported that the test was performed with the patient supine and the knee flexed to 90°.[10,13,24] Three studies stated that the knee was flexed to 90°, but did not state if the patient was supine or seated.[2,7,8] The remaining 8 studies did not specify the testing procedure.[6,8,10,12,14,15,26,27] All studies used arthroscopy as a gold standard for determining whether a meniscal lesion was actually present. Sample sizes ranged from 44 to 3531. Between all studies the majority of subjects were male (3414 males/1739

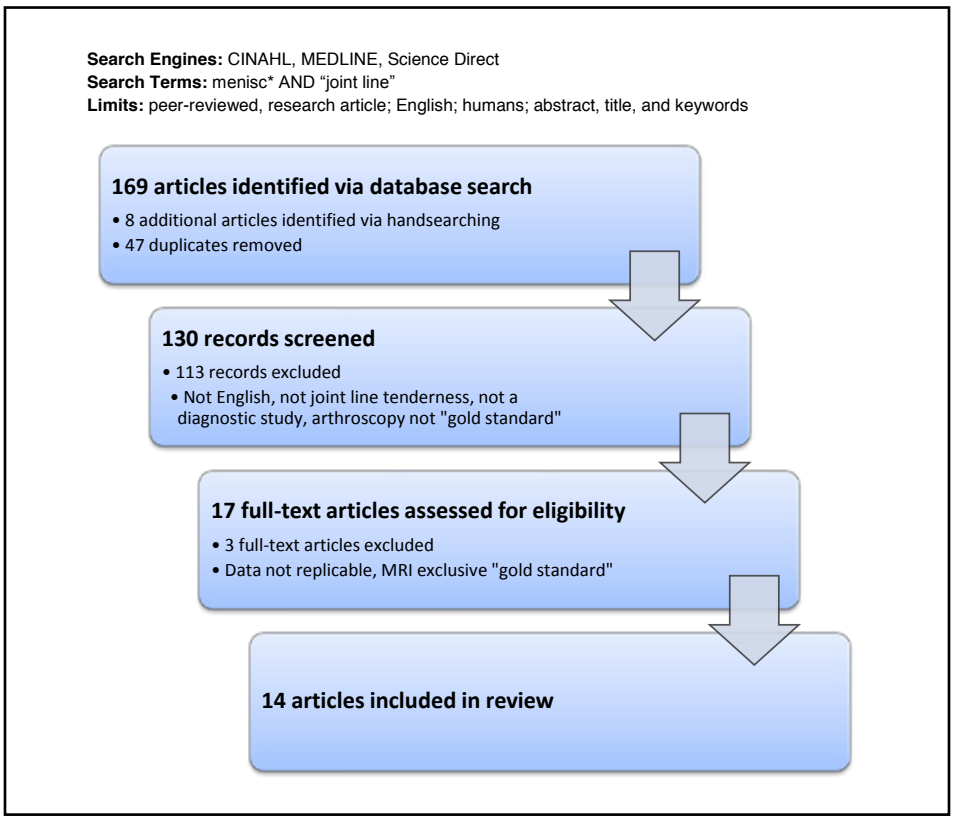

Figure 1. PRISMA Flow Diagram.

Table 1. Summary of Articles

	Subjects (Male/Female)	Region	Sensitivity/Specificity (%[95%CI])	+LR (95% CI)	-LR (95% CI)
Abdon et al (1990)	N=145 (110/35)	Medial	59(49-69)/ 56(43-69)	1.35(0.96-1.90)	0.73(0.52-1.02)
		Lateral	22(13-30)/ 95(89-100)	4.10(1.27-13.23)	0.83(0.73-0.94)
Akseki et al (2004)	N=150 (110/40)	Medial	88(82-95)/ 68(52-83)	2.73(1.67-4.47)	0.17(0.09-0.31)
		Lateral	67(53-80)/ 90(84-95)	6.42(3.54-11.66)	0.37(0.24-0.57)
Barry et al (1983)	N=44 (37/7)	Combined	86(75-98)/ 43(6-80)	1.51(0.79-2.91)	0.32(0.10-1.03)
Eren (2003)	N=104 (104/0)	Medial	86(75-98) / 67(56-78)	2.63(1.83-3.80)	0.20(0.09-0.46)
		Lateral	93(83-100)/ 97(94-100)	35.65(9.04-140.56)	0.08(0.02-0.29)
Fowler et al (1989)	N=161 (106/55)	Combined	85(77-93)/ 30(20-40)	1.21(1.02-1.43)	0.51(0.27-0.94)
Konan et al (2009)	N=109 (80/29)	Medial	83(73-92)/ 76(58-94)	3.47(1.60-7.51)	0.23(0.13-0.41)
		Lateral	68(48-89)/ 97(93-100)	22.24(5.49-90.01)	0.33(0.17-0.63)
Kurosaka et al (1999)	N=156 (83/73)	Combined	55(46-63)/ 67(50-84)	1.64(0.96-2.78)	0.68(0.50-0.93)
Mirzatolooei et al (2010)	N=80 (76/4)	Combined	92(84-100) / 63(49-78)	2.52(1.67-3.81)	0.12(0.04-0.37)
Noble et al (1980)	N=200 (176/24)	Combined	73(66-80)/ 13(4-22)	0.84(0.73-0.97)	2.08(0.99-4.38)
Pookarnjanamorakot et al (2004)	N=100 (95/5)	Combined	27(17-37) / 96(88-100)	6.67(0.94-47.17)	0.76(0.65-0.89)
Rose (2006)	N=129 (98/31)	Medial	92(84-100)/ 78(69-88)	4.28(2.78-6.57)	0.10(0.04-0.26)
		Lateral	95(89-100) / 93(88-98)	13.95(6.42-30.30)	0.05(0.01-0.20)
Shelbourne et al (1995)	N=173 (118/55)	Medial	58(46-70)/ 53(43-62)	1.23(0.92-1.64)	0.79(0.57-1.11)
		Lateral	38(28-48)/ 71(61-81)	0.99(0.86-2.01)	0.87(0.70-1.08)
Shelbourne et al (2009)	N=3531 (2176/1355)	Medial	37(35-40) / 64(62-66)	1.04(0.95-1.13)	0.97(0.93-1.03)
		Lateral	36(34-38) / 64(62-66)	0.99(0.91-1.09)	1.00(0.95-1.05)
Wadey et al (2007)	N=71 (45/26)	Combined	85(73-96)/ 31(15-47)	1.23(0.94-1.61)	0.49(0.20-1.21)
Meta-Analysis Totals	**N=5153 (3414/1739)**	**Combined**	**44(43-46)/ 65(64-67)**	**1.28(1.22-1.35)**	**0.85(0.82-0.88)**
Meta-Analysis Medial		**Medial**	**45(43-47)/ 64(62-66)**	**1.25(1.16-1.35)**	**0.86(0.82-0.90)**
Meta-Analysis Lateral		**Lateral**	**38(36-40)/ 70(68-71)**	**1.25(1.15-1.36)**	**0.89(0.85-0.93)**

CI= confidence internal; LR= likelihood ratio

females). All studies mentioned time delay between injury and arthroscopy ranging between immediately preoperatively and 12 years preoperatively.[2,6,7,9,12,15,26,27] However, in groups that waited between injury and surgery there were occasions in which spontaneous recovery occurred and some patients did not undergo arthroscopy.[12] Testing populations varied greatly between suspected symptomatic patients to MRI confirmed ACL deficient knees. Three of the studies reported JLT as a less efficient clinical predictor of meniscal lesions when compared to other clinical examinations (Table 1, Table 2).[6,10,11]

DISCUSSION

The purpose of this review was to summarize the available literature on the effectiveness of JLT as a clinical predictor of meniscal tear and to perform a meta-analysis in order to determine overall sensitivity, specificity, and likelihood ratios of the test. Five meta-analyses have been previously published on the diagnostic accuracy of JLT in diagnosing meniscal tears (Table 3). Some of the previous meta-analyses have used a low quantity of studies, so it is possible that their results are not reflective of actual diagnostic accuracy. Jackson et al[17] analyzed 3 articles on the diagnostic accuracy of JLT, and Solomon and colleagues[19] assessed 4 articles, with specificity calculated in only two of the articles. It is important to base results on the largest pooled population possible to give the most accurate analysis. This review includes 14 studies, 5 of which were not included in any previous review.[2,9,11,15,24] The sensitivity calculated in this review is much lower than the sensitivity reported in any other meta-analysis; however, the specificity found in this review is in the middle range of specificity values reported in previous analyses. Our likelihood ratios of 1.28 (95% CI: 1.22-1.35) and 0.85 (95% CI: 0.82-0.88) fall within the ranges of 1-2 for positive likelihood ratios and 0.5-1 for negative likelihood ratios. Values within these ranges often indicate that the shift in probability of determining the presence of meniscal tears between pretest and posttest is most likely negligible.[20] These values are much lower than the values reported in the two most recent systematic reviews (Table 3).[1,16] Given the likelihood ratios of this meta-analysis as well as the sensitivity and

specificity of 44% (95% CI: 43-46) and 65% (95% CI: 64-67), respectively, we have found JLT to be a poorer predictor of the presence of meniscal tears than was previously reported.

Many authors suggest that using multiple tests increases the diagnostic accuracy of the physical assessment. Straus et al[28] state that as long as tests are independent of one another (ie, one test's accuracy is not based on the other test), the tests can be used in combination to produce a greater diagnostic accuracy. Konan et al[9] illustrated this procedure in their study. For JLT of the medial meniscus, they found an overall sensitivity of 83% and specificity of 76%. When JLT was combined with the McMurray test, overall sensitivity and specificity increased to 91%. When JLT was combined with the Thessaly test, sensitivity increased to 93% and specificity increased to 92%. Therefore, it appears that when JLT is used in combination with other tests, it remains an essential tool for diagnosing the presence of a meniscal tear.

Anterior cruciate ligament and meniscal tears commonly occur simultaneously, so some authors believe it is important to analyze JLT in patients with known ACL tears. Six studies analyzed JLT in patients with ACL tears. Kurosaka et al[10] found that the presence of an ACL tear does not affect the sensitivity and specificity of JLT. In two separate studies, Shelbourne et al1[5,27] found that in patients with acute, subacute, and chronic ACL tears, JLT was a poor predictor of meniscal pathology. Konan et al[9] reported that sensitivity of JLT greatly increased in the presence of an associated ACL tear, but specificity was similar to those without an ACL tear. Pookarnjanamorakot et al[13] reported very low sensitivity and very high specificity in patients with associated ACL tears, but Mirzatolooei et al[11] reported very high sensitivity and lower specificity. As a result of these variable reports, the effect of an ACL tear on sensitivity and specificity of JLT is unknown.

In conducting a detailed assessment of both articles by Shelbourne et al,[15,27] there was some concern over the numbers for sensitivity and specificity that the authors reported in the studies. When using the raw data reported, we calculated different values for sensitivity and specificity. Two previous reviews[1,18] also included an article by Shelbourne et al.[15] They reported the same values that we calculated from the extrapolated data. We contacted one of the authors, and we believe that our methods were correct.

A major limitation of this review is that the studies included did not apply the same operational definition of JLT. Some studies defined it as tenderness at the joint line,[12,14,15,24,26] others as pain at the joint line,[8,13,15] and others did not define it at all.[2,6,7,9-11,27] When using different operational definitions of JLT, a positive test is also defined differently. For example, someone with joint line pain may have been considered to have a positive test according to Fowler and Lubliner,[8] but had the subject participated in the study by Barry and colleagues,[14] the result would have been negative. This can lead to errors in calculation of diagnostic accuracy of JLT between studies and creates unnecessary variability in comparable data.

In addition to the lack of an operational definition of JLT, the studies reported various testing positions for the JLT test. Three studies reported that the test was performed with the patient supine and the knee flexed to 90°.[10,12,24] Three studies stated that the knee was flexed to 90°, but did not state if the patient was supine or seated.[2,7,8] The remaining 8 studies did not specify the testing procedure.[6,9,11,12,14,15,26,27] Without a standard testing procedure, it is possible that results may have varied across the studies and caused heterogeneity in the results.

A major limitation of this review is the quality of the studies included. These articles presented varied patient demographics. Many studies included patients of all ages. In older patients, knee pain is most likely due to age-related changes, such as osteoarthritis.[29] It would be ideal for studies to include only patients who are representative of the spectrum of patients expected to be seen for meniscal tears. Also in 13 of the studies, male participants greatly outnumbered female participants.[2,6-9,11-15,24,26,27]

Other limitations of this review include the use of studies published only in English. We are aware of two studies published in German[30,31] on the diagnostic accuracy of JLT that were included in two of the previous systematic reviews.[1,18] We are also aware of two studies that used MRI as the reference standard instead of arthroscopy and were not included in this review.[32,33] Inclusion of these 4 studies would have added 1,026 subjects to the meta-analysis. However, we did not include these studies because they did not meet the inclusion criteria, and this could have resulted in a limitation for our meta-analysis. Previous research has reported that the accuracy of MRI when compared to arthroscopy ranges from 52% to 97%.[3,34-37] Ben-Galim et al[3] reported that the percentage of false positive results when MRI is used to diagnose medial and lateral meniscal tears is 65% and 43%, respectively. Based on the extreme variability in reported accuracy of MRI, we did not feel that it was appropriate to include articles that used MRI as the reference standard.

Previous systematic reviews[1,16,18] have reported that a major limitation is the sample size of the studies included in those reviews. This limitation was partially corrected in this review because the article by Shelbourne and Benner[15] contained 3,571 patients; the largest sample size contained in a previous systematic review was 410 subjects in an article by Karachalios et al.[33] However, this sample size is much larger than the sample size of any other article contained in this review and contains 68.5% of this review's patient population. As a result, the pooled sensitivity and specificity values are biased much more toward the results obtained by Shelbourne and Benner.[15] It is necessary for more articles that use a large sample size to be published in order to develop an accurate analysis of the diagnostic accuracy of JLT.

Two of the previous systematic reviews[1,18] assessed a study by Saengnipanthkul et al[38] to determine sensitivity and specificity of JLT. After detailed assessment, it was discovered that this study reports neither the sensitivity and specificity nor the raw data obtained for the JLT test. These previously published systematic reviews have made assumptions about the data included in this study and have attempted to calculate sensitivity and specificity despite the fact that not all participants of the study were accounted for (results for 73/190 participants were reported). We felt that inclusion of this study would lead to misrepresentation of the data, and it was therefore excluded.

CONCLUSION

Joint line tenderness appears to be a poor clinical examination for diagnosing meniscal tears when compared to arthroscopy and is not as accurate as previously reported. With higher specificity than sensitivity, JLT is more effective at ruling in the presence of a meniscal tear with a positive test result than ruling out with a negative test result. Joint line tenderness may be useful clini-

Table 2. Study Description

Article	Patient Population	Tests	JLT Test Procedure/Determination of positive findings	JLT Results (Sens/Spec)
Shelbourne, 2009	3,531 patients with subacute or chronic (>30 days postinjury) ACL-deficient knees and underwent reconstruction	JLT	Medial and lateral joint lines were palpated from anterior to posterior, but patient position was not specified Pain or tenderness indicated a positive test	Medial: 37%/64% Lateral: 36%/64%
Konan, 2009	109 patients with history or symptoms suggestive of meniscal tears (with and without associated ACL tear)	JLT, McMurray, Thessaly	Testing procedure not specified Determination of positive findings not specified	Medial: 83%/76% Lateral: 69%/97% Medial + ACL: 56%/89% Lateral + ACL: 57%/94%
Mirzatolooei, 2009	80 patients with a primary diagnosis of ACL tear	JLT, McMurray, Thessaly	Testing procedure not specified Determination of positive findings not specified	92%/63%
Wadey, 2007	71 consecutive patients who presented for arthroscopic surgery	JLT	Patient supine with knee passively flexed to 90°; joint line palpated from anterior to posterior Point of maximal tenderness of posterior joint line (true positive only if point of maximal tenderness corresponded to site of meniscal tear)	85%/31%
Rose, 2006	129 patients who underwent arthroscopy for suspected meniscal tears	JLT	Knee flexed to 90° Determination of positive findings not specified	Medial: 92%/78% Lateral: 95%/93%
Akseki, 2004	150 consecutive patients with symptoms related to intra-articular knee pathology	JLT, McMurray, Ege's	Testing procedure not specified Determination of positive findings not specified	Medial: 88%/44% Lateral: 67%/80%
Pookarnjanamorakot, 2004	100 consecutive patients with ACL insufficiency who were scheduled for surgery	Apley, Childress' sign, McMurray, Steinmann I sign, JLT, Merke's sign	Patient lies supine while bending the knee and hip; examiner grasps around the knee with one hand while pressing on the joint line with the thumb Pain at the joint line upon palpation indicated a positive test	27%/96%
Eren, 2003	104 male patients with suspected meniscal lesions who underwent arthroscopy (patients with + Lachman and varus and valgus stress tests were excluded)	JLT	Knee flexed to 90° Determination of positive findings not specified	Medial: 86%/67% Lateral: 92%/97%
Kurosaka, 1999	156 patients who underwent arthroscopy to assess meniscal lesions (>8 weeks post injury); 69% had associated ACL deficiency	JLT, pain on forced extension, McMurray, Apley, modified pivot shift test	Supine, knee flexed to 90° Determination of positive result not specified	55%/67% With ACL tears: 54%/67%
Shelbourne, 1995	173 patients with acute ACL rupture	JLT	Testing procedure not specified Determination of positive result not specified	Medial: 58%/53% Lateral: 39%/71%
Abdon, 1990	145 patients undergoing arthroscopy for suspected meniscal tears	Symptoms of meniscal tears (including JLT)	Testing procedure not specified Tenderness upon palpation of the joint line (anterior, middle, and posterior parts) indicated a positive test	Medial: 59%/56% Lateral: 22%/95%
Fowler, 1989	161 consecutive patients undergoing arthroscopic procedures of the knee (symptoms for >1 year)	JLT, pain on forced flexion of the knee, McMurray, Apley	Knee flexed to 90° Positive result if moderate or extreme pain at the joint line	85%/30%
Barry, 1983	44 patients with initial diagnosis of meniscal tear	Symptoms of meniscal tears (including JLT)	Testing procedure not specified Tenderness over the affected joint line indicated a positive test	87%/43%
Noble, 1980	200 patients diagnosed preoperatively as having meniscal tears and scheduled for menisectomy	Symptoms of meniscal tears (including JLT)	Testing procedure not specified Tenderness over the affected joint line indicated a positive test	73%/13%

JLT-joint line tenderness; QUADAS-Quality Assessment of Diagnostic Accuracy Studies; ACL-anterior cruciate ligament

	Conclusion	QUADAS Score
	JLT is a poor predictor of meniscus pathology in patients with subacute and chronic ACL tears; JLT is not sensitive, specific, or accurate, and should not be used alone as an indication of meniscus pathology in ACL-deficient knees	11
	Physical diagnostic tests do not reliably detect all meniscal tears; JLT is a reliable sign of meniscal tear, but presence of other knee pathologies can lead to false positive results; JLT is more predictive than other tests; combining physical diagnostic tests increases diagnostic accuracy	10
	JLT has the highest accuracy of the three tests in patients with ACL deficient knees	9
	JLT is predictive of meniscal tears 60% of the time; high false positive rate may be due to presence of confounding pathology	10
	JLT is more accurate, sensitive, and specific for lateral tears than for medial tears; chondromalacia patella correlates poorly with presence of JLT	11
	JLT is the most accurate and least specific of the tests; all tests were more accurate at diagnosing lateral tears	9
	JLT had very low sens. (only higher than Apley), and very high spec. (only lower than Apley and Steinmann I sign); a single symptom or sign from the special tests does not indicate whether or not the patient has a meniscal tear; Childress' and Merke's signs are most useful in examination	10
	JLT is accurate, sensitive, and specific for lateral meniscus lesions; high false-positive rate may be due to army recruits (subjects of the study) hoping to have arthroscopy and get sick leave	9
	Clinical examination remains essential in the evaluation of patients with chronic knee symptoms; overall accuracy of axially loaded pivot shift test was significantly higher than other tests; tests performed in combination increase diagnostic accuracy	9
	The presence or absence of JLT in patients with an acute ACL tear is not a reliable way to predict the likelihood of an associated meniscal tear	10
	JLT may help to predict the presence of a meniscal tear; arthroscopy remains an essential diagnostic technique	9
	Patients with meniscal tear are likely to have JLT, but JLT can be common among other knee pathologies; JLT, McMurray, and pain on forced flexion are predictive of meniscal pathology in patients with ACL intact knees; Apley is a poor predictor of meniscal pathology	10
	Combination of acute onset related to injury, initial pain in the involved compartment, swelling of the knee, and joint line pain are highly indicative of meniscal tears	8
	The decision to excise a meniscus should not be based on clinical features; symptoms are often unreliable and transient	9

cally when used in combination with other tests. The available research articles on JLT report varying sample sizes, definitions of a positive JLT test, and conclusions about the diagnostic accuracy of JLT. The studies that concluded that JLT was an important clinical examination had small sample sizes and low power. Statistical errors found in previously published literature could have been avoided if patient populaces were reported appropriately. Future research should focus on using larger sample sizes and providing a consistent operational definition of JLT.

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Table 3. Comparison of Meta-Analyses

Joint Line Tenderness	Blorstad et al	Meserve et al	Hegedus et al	Scholten et al	Solomon et al	Jackson et al
Sensitivity	44	76	63	77	79	76
Specificity	65	77	77	41	15	29
+ LR	1.28	3.30	2.74	1.31	0.93	1.07
- LR	0.85	0.31	0.48	0.56	1.4	0.83

LR =likelihood ratio

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Effective Treatment of Bilateral Carpal Tunnel Symptoms Using Cervicothoracic Thrust Manipulations, Neural Glides, and Periscapular Strengthening: A Case Report

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ABSTRACT

To date, there has been little research to look at the effects of treating the cervicothoracic spine for decreasing symptoms distally to the carpal tunnel. This case report documents the treatment of a 39-year-old female who was referred to our clinic with bilateral carpal tunnel symptoms, forward head posture, and decreased cervical range of motion (ROM). It was believed following the physical examination that mobility deficits of the upper thoracic spine were contributing to distal symptoms at the wrist. Treatment was directed at increasing mobility in the cervicothoracic junction (CTJ) and upper thoracic spine, along with decreasing neural tension that resulted in a decrease of this patient's symptoms at the carpal tunnel. Further research needs to be conducted to identify if a regional interdependent relationship exists between these areas.

Key Words: carpal tunnel, manipulation, thrust, neural glides

BACKGROUND

Carpal tunnel syndrome (CTS) is a commonly seen diagnosis within the realms of outpatient physical therapy. Approximately 1% to 3% of individuals are diagnosed with CTS with a higher documented prevalence in women than men.[1,2] Carpal tunnel syndrome occurs from a compression of the median nerve as it passes from the forearm, through the carpal tunnel, and into the wrist. Patients often present with complaints of paresthesia, pain, numbness, and tingling into the first three digits, and sleep disturbances.[2,3] Currently, there is varying evidence for the effective nonoperative treatments for CTS with limited research suggesting the use of nonsteroidal anti-inflammatory medications, corticosteroid injections, neutral wrist splinting, nerve/tendon gliding exercises, ultrasound, and laser.[2-5] Alternative methodologies such as yoga have been said to be effective with some lower level evidence to support its use.[6]

De-La-Llave-Rincon et al recently published a case control study that examined the relationship between CTS and a forward head posture (FHP)/decreased cervical range of motion (ROM).[7] This study demonstrated a proximal-distal relationship may exist between the wrist and cervical spine and suggests addressing mobility deficits of cervical ROM when treating CTS. Although there is supported evidence for thrust manipulations to improve cervical ROM[8-11] and reduce symptoms as distal as the lateral epicondyle,[12] little evidence exists for the use of these in the management of signs and symptoms typically associated with carpal tunnel syndrome.

Double crush and T4 syndromes must also be considered when differentially diagnosing and treating pain that is occurring in both the cervicothoracic spine and distal structures such as the carpal tunnel.[13] Double crush syndrome is defined as a proximal lesion along an axon that predisposes it to injury at a more distal site along its course.[14] In 1973, Upton and Mccomas[15] described this syndrome in patients who presented with carpal tunnel syndrome or ulnar nerve lesions at the elbow with associated neural lesions in the neck. They believed the result of this was due to a restraint of axoplasmic flow in nerve fibers.[15] A case series study was also performed involving 1,000 cases of carpal tunnel syndrome and the authors determined that there was a statistically significant correlation between bilateral features and cervical arthritis and that this may be a demonstration of a double crush syndrome.[16] Similar to double crush syndrome, T4 syndrome can cause an individual to experience proximal and distal disturbances. This disorder is predominately found in women between the ages of 30 to 50 who present objectively with FHP/decreased cervical ROM, reversed thoracic kyphosis, local tenderness, positive bilateral ULTT, and hypomobility with reproduction of symptoms upon posterior to anterior springing of the thoracic vertebrae. Although its termed T4 syndrome, it can involve any segment from T2-7 with T4 most often involved given the relationship and proximity of the sympathetic trunks lying on or just lateral to the costovertebral joints.[9,17,18]

This case report is to present the effective, short-term treatment of an individual who presented to our facility with localized symptoms at the base of the neck, FHP, and sensation disturbances, described as pins and needles, over bilateral carpal tunnels. Treatment consisted of thrust manipulations of the cervicothoracic and thoracic spine, neural mobilizations of the median nerve, periscapular strengthening, and the use of neutral wrist splints nocturnally. Her case was unique because she demonstrated an immediate decrease in symptoms to the carpal tunnel following thrust manipulation techniques to the cervicothoracic and thoracic spine. Recent literature has described "regional interdependence," which refers to a concept that seemingly unrelated impairments in one anatomical region may be contributing to, or be associated with, the patient's chief complaint.[19-22]

PATIENT CHARACTERISTCS

This case study involves a 39-year-old female referred to physical therapy with a medical diagnosis of bilateral carpal tunnel syndrome, cervicalgia, and skin sensation disturbances. She signed an informed consent form to document her case and treatment.

Subjective Examination

Prior to the initial examination, the patient filled out a pain diagram and visual pain rating scale. On this scale, she indicated her symptoms were occurring at the cervicothoracic junction (CTJ), described subjectively as deep ache, as well as the palmar aspect of bilateral wrists and described subjectively as pins and needles. She rated her pain as 1/10 currently, 3/10 at worst, and 1/10 at best over the last 24 hours on a numerical rating scale that has been pre-

viously shown to be valid and reliable.[23] She also completed a neck disability index (NDI) that indicated a 20% disability with most noticeable deficits involving activities such sleeping and reading. The NDI has fair to moderate test-retest reliability in patients who present with mechanical neck pain[24] and moderately reliable for patients with mechanical neck pain with upper extremity referred symptoms.[25]

The patient reported that she had noticed an insidious onset of stiffness into the base of her neck with bilateral palmar wrist sensation changes approximately 3 weeks prior to seeking physical therapy care. She described these symptoms as occurring in the morning, decreasing into early afternoon, and returning later in the day. She reported she was a "side sleeper" and would often assume a fetal position in bed (which worsened symptoms to wrists by morning), demonstrating a protracted scapula, flexed elbow and wrist position. She worked part-time as a homecare occupational therapist and had been working more than usual on chart reviews and also using the computer, which would make her pins and needles worse at the wrists and increase pain at the base of her neck. This pain led to a decrease in her ability to participate in activities such as reading for enjoyment in a pain-free manner.

The patient also reported a history of migraines but stated she had not experienced any within the last year. She reported taking Celexa, an antidepressant, and a multivitamin. She was given bilateral neutral wrist splints by her primary care physician that she had been wearing to bed for a couple of days prior to coming to therapy, but were unsuccessful in controlling symptoms.

Objective Examination

The examination began with postural visual assessment. The patient had a forward head and rounded shoulders posture in an unsupported seated position with decreased lumbar lordosis. Cervical active range of motion (AROM) measurements were taken in a seated position with the patient's lumbar posture corrected via tactile cues. An inclinometer was used to assess flexion, extension, and side bending; a standard goniometer was used for rotation. The measurements were as follows: flexion 45°, extension 45°, bilateral sidebending 25°, left rotation 70°, and right rotation 60°. Cervical AROM in flexion and extension reproduced the patient's chief complaint of pain at the CTJ. Wrist AROM measurements were assessed with a standard goniometer and were measured as: wrist extension (with elbow extended to 0°) Right 60° Left 65°. She had decreased flexibility noted in bilateral upper trapezius and wrist flexor muscles and weakness of bilateral middle/lower trapezius 4-/5 and serratus anterior 4-/5 as determined by standard manual muscle test positions. Deep neck flexor endurance testing was assessed in supine and demonstrated < 10 sec of hold before losing position from fatigue.[26] Bilateral grip strength was measured at 60 lbs of force using a standard grip dynamometer set on the 2nd position. Palpation testing was positive for latent myofascial trigger points at bilateral upper trapezius muscles with mild radiating features into the cranium.[27]

Because active cervical flexion and extension reproduced symptoms at the CTJ, passive accessory intervertebral movements (PAIVMs) were performed from T1 to T7 with the patient in a prone position. The patient had positive PAIVMs for reproduction of chief complaint over the right unilateral segments of T2-3. Symptoms were also reproduced with PAIVMs over T1 through T4 with P/A glides. Since reproduction of the patient's chief complaint was confirmed with cervical active flexion/extension and PAIVMs over T1 through T4, manual treatment interventions were justified for these areas.

A neural tension screen was then performed that revealed positive upper limb tension (ULTT) for the median nerve and reproduction of her chief complaints of pins and needling at the wrists. Right elbow extension range was limited to -70° and the left elbow at -75° for reproduction of symptoms. A positive ULTT was determined by the appropriate test position described in the literature and reproduction of the chief complaint by contralateral sidebending of the cervical spine.[28]

A neurological examination was performed to rule out any upper motor neuron pathology or sensory disturbances to warrant referral for further diagnostics or contraindications for thrust manipulations. Deep tendon reflexes of C5/6/7 and L4/S1 were measured at 2+ with a standard reflex hammer. She also demonstrated a negative Hoffmann's test and negative clonus with brisk ankle dorsiflexion (DF) from a seated position. A positive Hoffmann's sign has been shown to indicate an isolated upper motor neuron lesion of the cervical spine and when combined with increased deep tendon reflexes, has high diagnostic value for cervical myelopathy.[29,30] She did not present with dermatomal patterns or sensory loss with cutaneous nerve distributions and had negative Phalen's and Tinel's signs. Abductor pollicis brevis manual muscle testing for recurrent median nerve motor innervation was 5/5 and painless bilateral. A systematic review to determine the best diagnostic criteria for CTS concluded that hypalgesia in the median nerve dermatome, hand diagram results and weak thumb abductor strength had positive likelihood ratios for individuals found to have CTS electrodiagnostically. Phalen and Tinel signs have been found to be of little diagnostic value for CTS.[31]

Clinical Impression

Following the examination, the clinician believed the patient presented with an indefinite clinical presentation of CTS with double crush and T4 syndrome features.

Interventions

Following the initial evaluation, the treating therapist educated the patient in modifying her sleeping position from side sleeping to "pseudo side sleeping." This position was defined as lying on a 45°angle to decrease the amount of scapular protraction. She was also directed to continue nighttime use of the wrist splints to limit curling wrists/shoulders into the fetal position. The clinician then applied moist heat to the cervical spine with TENs on bilateral upper trapezius muscles. This was done to decrease overactive myofascial trigger points in the upper trapezius that may have restricted her cervical ROM[32] and/or has contributed to the upper limb tension bilaterally.[33]

Following the initial education and modalities, the patient was educated in and consented to using manual therapy techniques to address mobility deficits of the CTJ and thoracic spine. Thrust manipulation techniques were applied to the CTJ and midthoracic spine with the patient seated. The patient was then instructed to perform the following movement activities:

Wing arm breathing: Patient seated with an erect/upright posture and palms supinated. She then performed active glenohumeral (GH) external rotation while breathing inward, holding 1 second and exhaling with a return

of GH internal rotation. This was performed 30x. *Performed sessions 1-5.*

Cervical Retraction: Patient seated with an erect/upright posture with her shoulders relaxed. She was instructed to retract the cervical spine until she felt a mild stretch at the cervicothoracic junction. This was held 10 sec x 10. *Performed sessions 1-5.*

Three finger flexion: Patient seated with an erect/upright posture and instructed to flex her cervical spine to 3 fingers length from chin to chest. From this amount position, the patient performed 30 rotations to the left and right. *Performed sessions 1-5.*

Wrist flexor stretch: Standing arms length away from the wall, the patient held her forearm supinated with wrist in an extended position and palm of hand against the wall. She then slid her hand up the wall to get a stretch at the wrist flexor/pronator group. This was held 10 sec x 10. *Performed session 1-5.*

The program was progressed the following sessions with a focus on restoration of cervical ROM as well as neural mobilizations of the median nerve. The following activities were performed in sessions 2-5 as follows along with moist heat/TENs and manual thrusts as previously described:

Right sidebending: Patient seated with an erect/upright posture, and left hand grasping onto the bottom of her chair. She then sidebent her cervical spine to right until feeling a mild pull in the left upper trapezius region. This was held 10 sec x10. *Performed sessions 2-5.*

Middle and Lower Trapezius strengthening: The patient was prone with her shoulders off the front of the table. She then performed a "T" for activation of middle trapezius and "Y" for lower trapezius activation. Shoulders were externally rotated for each with thumb pointing up. She performed 2x10 during the 2nd session and progressed to 3x10 during each additional session. *Performed sessions 2-5.*

Median Nerve Flossing: These were performed with the patient standing with shoulder abduction and external rotation, elbow extension to 0°, full forearm supination, full wrist and digit extension with the palmar aspect of the hand against the wall. The patient was instructed to sidebend her neck away from the upper extremity in which the mobilization was being performed. (Note: The shoulder was abducted to the point in which she felt tension and was started in a scapular plane and externally rotated until a gentle pull was felt). *Performed sessions 3-5.*

OUTCOMES

The patient in this study was treated for 5 sessions. Upon reassessment after the first session, the patient reported a significant decrease of symptoms into bilateral wrists. She reported no numbness or tingling at the wrists and only "pulling" at the base of her neck with end-range motion. She also demonstrated an immediate improvement of 17° of total sagittal plane motion (flexion+extension) following the thrust manipulations.

Following the second session, the patient stated she had no symptoms associated with cervical pain or discomfort into bilateral carpal tunnels. She did present however with positive ULTT bilaterally for reproduction of her chief complaint to the carpal tunnel and her program was progressed to increase mobility of the median nerve.

By the fifth session, over a 13-day period, the patient reported an overall subjective improvement of 95% with decreased pain to 0-1/10 with mild stiffness in the base of the neck and shoulder blades. The patient had no numbness or tingling into her hands. She reported an 8% on the NDI. She demonstrated on a second pain diagram and rating scale that she only had a 1/10 pain in the upper thoracic spine when initiating stretching to perform her home exercise program consisting of the described exercises performed during the first two sessions.

Upon discharge, the patient demonstrated improved cervical sagittal ROM to 120° (55° of flexion; 65° of extension; improved 40° from initial evaluation) and improved mobility of CTJ and upper thoracic segments with Posterior to Anterior glides (P/A) and unilateral PAIVMs. Her strength improved to 4+/5 in the middle trapezius and 4/5 in her lower trapezius bilaterally. She still exhibited a positive ULTT bilaterally but was improved to -30° on each upper extremity versus -75° and -70° on initial evaluation.

DISCUSSION

This case report was unique in which cervical ROM was restored dramatically following the initial cervicothoracic and midthoracic thrust manipulations that also appeared to have reduced symptoms at the wrist. This outcome, in addition to other recently published literature, reinforces the idea that thrust manipulations of one area may result in gains of another.[11,19,22,34] Research indicates the positive effects of thrust manipulations in reducing pain but the physiological mechanism in which they work continues to be poorly understood.[8-12,35,36] It has been proposed that there may be biomechanical, muscular reflexogenic, and/or neurophysiological effects that work in reducing pain.[35] One study in particular, found a relationship between performing manipulations to the cervical spine that allowed for increased pain-free resisted gripping on the affected limb in patients with symptoms down to the lateral epicondyle.[36] It is believed that this result likely demonstrates that thrust manipulations stimulate descending inhibitory pain systems that induces mechanical hypoaglesic effects[35,37] and may have been why this patient's distal features decreased with proximally biased treatment. Because the median nerve has motor and sensory contributions derived from nerve roots C6-T1 that can become compressed in the CTJ and the wrist,[14] it is likely that there could have been proximal and distal compression features to this case and that proximal decompression with thrust manipulations decreased symptoms distally almost immediately. It is important to note that in the authors' opinion the thrust manipulations may have provided improved outcomes for performing the median nerve mobilizations in this case.

Although the medical diagnosis of this patient was bilateral CTS, she did not present clinically with typical signs and symptoms related to CTS. We believe the successful reduction of her distal symptoms with proximal treatment indicate that she likely presented with a double crush syndrome. We support this contention based on the effective outcome of treatment proximally, which decreased symptoms distally. A T4 syndrome may also have existed due to location of symptoms as well as her positive ULTT, which improved with the thrust manipulations, median nerve mobilizations, and postural training/stretching.

The over-activity of the upper trapezius muscle could have also contributed to increased tissue resistance with the ULTT.[33] Sterling et al[38] found hyperalgesic responses

bilaterally to upper limb tension testing in individuals with chronic whiplash associated disorder (WAD). This supports the contention that the central nervous system may be hyperexcitable in individuals with WAD and although our subject did not have the history of WAD, she may have had central nervous system involvement due to the positive bilateral ULTT signs.[38]

Bialosky et al[4] published a recent study looking at the effects of neurodynamic techniques (NDT) in the treatment of CTS. In this study, the authors compared neurodynamic mobilizations of the median nerve with sham interventions and found that there were short term improvements in both groups in term of pain and disability which indicates, like other recent studies, that positive clinical outcomes are likely due to manual interventions versus the true setup of intervention.[4,13,39] Bialosky did note an inhibition of temporal summation that was specific to the NDT of the median nerve of individuals with CTS.[4] In this case, we used a combination of manual interventions with the NDT as described by Bialosky. The difference in our intervention of NDT was that we had the patient perform self mobilizations instead of manual neural gliding. With mobilizations of the proximal segments of the cervical/upper thoracic spine, the NDT may have further contributed to decreasing temporal summation of symptoms.

A major limitation of this case report was that this patient's CTS was not diagnosed using electrodiagnostic testing. A clinical prediction rule (CPR) has recently been established to differentially diagnose CTS,[1] but several of the measures used in this rule were not used in this study. When describing what the patient stated subjectively, we must take into account the fact that the patient had a history of depression that may have had an effect on her perception of pain. We did not give the patient any form of pain perception questionnaire, such as the McGill Pain Questionnaire, which has been proven to be sensitive in detecting variable types of pain.[40] Future research could be performed to compare the effects of the thrust manipulations in patients with positive bilateral ULTT through the use of 3 groups: manipulation only, exercise only, and manipulation plus exercise.

Overall, the patient reported her symptoms improved following 5 sessions with treatments focused to the cervicothoracic spine and supporting musculature. We attribute these improvements to the association we believe that exists between the cervicothoracic spine and increased neural tension bilaterally at the carpal tunnel.

CONCLUSION

In conclusion, the results of this study demonstrated that a combination of thrust manipulations, neural mobilizations, neuromuscular re-education of periscapular musculature, and nocturnal wrist splints were effective in the short-term outcomes of decreasing pain at the base of the neck and resolving neural tension signs in the carpal tunnel. Future research needs to be performed to identify the physiological treatment/EMG response at the carpal tunnel following more proximal treatments consisting of cervicothoracic thrust manipulations, postural exercise, and neurodynamic techniques. This could be conducted to identify if a true regional interdependence phenomenon exists between the cervicothoracic spine and the carpal tunnel.

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PRESIDENT'S CORNER

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dent and Vice President/Education Chair, respectively for 2011 – 2012. Elections will be held this fall to fill these positions for 2012 – 2015. Please contact the Orthopaedic Section to express your interest in becoming a member of the Imaging SIG.

At the CSM Annual Membership Meeting, the Foundation for Physical Therapy announced that the Orthopaedic Section was selected to receive the 2011 Premier Partner in Research Award. This award recognizes the Orthopaedic Section for its generous and long-standing contributions that have made a substantial difference by supporting the Foundation and its mission of funding physical therapy research. Since the Foundation's inception in 1979, the Orthopaedic Section has donated nearly $1 million to the Foundation. In 2007, the Orthopaedic Section made a $500,000 pledge toward the establishment of an endowment fund to support orthopaedic physical therapy research. The Premier Partner in Research Award will be presented to the Orthopaedic Section at the Foundation's Annual Dinner and Dance during the APTA Annual Meeting and Exposition in National Harbor, MD on June 9th. To recognize the past contributions that prior Section Boards have made in support of the Foundation, all prior Orthopaedic Section Presidents will be invited to attend the award presentation.

In 2010 the Orthopaedic Section established Advocacy Grants to support APTA Chapters in advocacy efforts that are of importance to the practice of orthopaedic physical therapy. In the past year, 2 grants, totaling $10,000 were provided to the South Carolina Physical Therapy Association in support of legislation related to referral for profit and to the Physical Therapy Association of Washington in support of legislation to remove the prohibition on spinal manipulation. For more information on Advocacy Grants that are available in 2011, contact the Orthopaedic Section office at 1-800-444-3982 or by E-mail at tdeflorian@orthopt.org.

An objective of the 2010 – 2014 Orthopaedic Section Strategic Plan is to develop a National Orthopaedic Physical Therapy Outcomes Database (NOPTOD). The NOPTOD will allow Orthopaedic Section members to contribute process and clinical outcomes data that is collected during the course of care provided by physical

therapists to patients. Once entered in the database, the information will be analyzed and made available to individuals who submitted the data for the purpose of evaluating and improving the individual's clinical performance. Additionally, data in the NOPTOD will be available for future research to demonstrate the effectiveness of orthopaedic physical therapy.

To begin the process for planning and development of the NOPTOD, a Task Force was established and met at APTA Headquarters in Alexandria, VA, October 20-21, 2010 Members of the Task Force include James Irrgang, Gerard Brennan, Chad Cook, Tony Delitto, Lori Michener, Joe Godges, and Michael Reed. Representatives from APTA included Marc Goldstein, MaryFran Deluane, and Ken Harwood.

An outcome of the Task Force meeting was the development of a pilot project to collect and analyze clinical and process outcomes data that are based on the Orthopaedic Section's Neck Pain Clinical Practice Guidelines. Paper-based data collection forms will be developed that include information related to patient characteristics, symptoms, examination findings, classification, interventions, and outcomes of care. Later this year, the Orthopaedic Section will send out a call for physical therapists to participate in the pilot project. Participation in the project will require physical therapists to collect outcomes data for a minimum of 10 patients with neck pain over a 6-month period. The paper-based data collection forms will be submitted to the Orthopaedic Section office for data entry and analysis. A webinar will be developed to provide training regarding the data collection process. A summary of clinical performance will be provided to those physical therapists that submitted data. A follow-up survey will be conducted to determine the burden of data collection and the usefulness of the information to the physical therapists. The results of this pilot project will be used to plan and develop a computerized outcomes data collection and analysis system. Please contact the Orthopaedic Section office if you are interested in participating in this pilot project or if you have questions about the Section's efforts to develop the National Orthopaedic Physical Therapy Outcomes Database.

Best wishes for a successful summer.
James J. Irrgang, PT, PhD, ATC, FAPTA
President, Orthopaedic Section

UPCOMING APTA MEETINGS

2011

Annual Conference: PT 2011
June 8-11, 2011
National Harbor, MD

National Student Conclave
October 21-23, 2011
Minneapolis, MN

2012

Combined Sections Meeting 2012
February 8-11, 2012
Chicago, IL

Implementation of a Treatment Based Classification System for Neck Pain: A Pilot Study

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ABSTRACT

Background and Purpose: This pilot study assessed a neck classification system implementation for patients with neck pain and dysfunction. **Methods:** Numeric pain rating (NPR) and Neck Disability Index (NDI) values were collected during two phases. During phase one, baseline outcomes were collected while therapists continued current assessment and interventions. During phase two, therapists used a neck classification system and appropriate 'matched' interventions based upon current best evidence. **Findings:** In both phases, clinically and statistically significant improvements in NPR and NDI occurred pre- to post-treatment. There were no differences between phases. **Clinical Relevance:** Patient outcomes improved during both phases. During phase one, therapists used matched, evidence-based interventions one third of the time and had positive outcomes. During phase two, therapists correctly identified classification and used matched interventions two thirds of the time, yet still obtained positive outcomes. This pilot study will lead to future studies to determine if classification systems and matched interventions improve patient outcomes.

Key Words: cervical, neck pain, classification, outcomes

INTRODUCTION

Physical therapists treat numerous patients with neck pain and dysfunction. A variety of interventions and treatment approaches are used, but with varying outcomes. Inconsistent positive outcomes may be caused by evaluation errors as well as incorrect, inappropriate, or non-evidence-based interventions. Therefore, physical therapists have begun to develop other means to enhance outcomes, such as classification systems and clinical prediction rules to specify which patients will benefit from various treatments. Clinical prediction rules indicate patients with unique signs and symptoms who respond favorably to specific interventions.[1-4] A limitation of clinical prediction rules is they do not provide guidance for patients who do not fit those specific signs and symptoms. Classification systems provide guidance for many types of patients.[2,5,6] They not only provide the means to classify patients, but typically identify ideal interventions for each classification based on the best available literature. DeLitto and colleagues[2] reported a classification system for low back pain which used a scoring system based on both subjective and objective characteristics. It identified patients who would respond favorably to physical therapy and those who would not. Further, it attempted to identify specific types of interventions for patients based on their characteristics.

In 2004, Childs et al[5] proposed a neck pain and dysfunction classification system. This system proposed 5 patient classification categories: mobility, centralization, conditioning/increase exercise tolerance, pain control, and reduce headache. Assignment to a classification was dependent upon information the therapist gathered from the patient's history and physical examination. They also identified interventions for each condition. These interventions were treatments shown to be effective for that condition based on existing literature. Fritz and Brennan[6] studied the Childs et al[5] classification system in patients with neck pain and dysfunction. They retrospectively classified patients following the classification system and concluded that the system could be used with their study patient population. Furthermore, they also compared outcomes of patients who received matched or unmatched interventions for the condition. Matched interventions were defined by Fritz and Brennan[6] as those identified to be effective by Childs et al,[5] for that classification. Next, they defined unmatched interventions for those that did not follow the Child's article, and thus current evidence. The outcomes compared were the Neck Disability Index (NDI) and Numeric Pain Rating (NPR) scores. Significantly better outcomes were found when the therapist's intervention(s) matched those identified for the appropriate neck classification versus when the intervention(s) did not match the appropriate neck classification. The classification system and matched interventions used are listed in Table 1.

To date there is no literature reporting the prospective use of Child's classification system and matched interventions.[5] Therefore, the purpose of this pilot study was to compare outcomes of NPR and NDI scores in patients with neck pain and dysfunction, with therapists trained to implement the classification system and matched interventions. The pilot study consisted of two phases. During the first phase, baseline data was obtained while physical therapists continued with their current evaluation and intervention approaches. The second phase involved educating the therapists in the Childs et al[5] neck classification system with matched interventions. A comparison was then made between outcomes of the first and second phases. The overall goal would be to prospectively determine if this classification system with matched interventions could enhance patient outcomes.

METHODS

Approval for the study was obtained from the St. Ambrose University Institutional Review Board and permission obtained from a group of local outpatient physical therapy clinics, Rock Valley Physical Therapy, Moline, IL to participate. Therapists from the clinics were surveyed and found to have no standard approach to patient intervention for cervical pain and dysfunction. Therapists reported their current treatment decisions were based on their entry-level educational and professional experience. Thus, it was determined there was no standard approach for cervical pain and dysfunction. Therapists were recruited to participate in the study from 4 clinics via flyers and information sessions during staff meetings. Data was gathered on therapist

Table 1. Patient Classification and Matched Treatments[5]

Classification	Criterion	Proposed Matched Treatment Components
Mobility	The listed interventions must *both* be received within the first 3 sessions.	Cervical or thoracic mobilization or manipulations. Strengthening exercises for the deep neck flexor muscles.
Centralization	*Either* of the listed interventions must be received.	Mechanical or manual cervical traction (at least 50% of the sessions). Cervical retraction exercises (at least 50%) of the sessions.
Exercise and Conditioning	The listed interventions must *both* be received in at least 50% of the sessions.	Strengthening exercises for the upper-quadrant muscles. Strengthening exercises for the neck or deep neck flexor muscles.
Pain Control	The listed interventions must *both* be received within the first 3 sessions; immobilization with a cervical collar or similar device cannot be used.	Cervical spine mobilization. Cervical ROM exercises.
Headache	The listed interventions must *all* be received.	Cervical spine manipulation or mobilization. Strengthening exercises for the deep neck flexor muscles. Strengthening exercises for the upper-quarter muscles.

background, including demographic data, educational training, and current basis for intervention in patients with neck pain and discomfort. The therapists and office staff were instructed in identification and recruitment of patients for the study. Inclusion criteria were patients presenting with neck pain and dysfunction, including those with symptoms that radiated into their arm, head, or neck. Exclusion criteria included any patient who the therapist considered inappropriate for therapy, demonstrated non-organic complaints or the potential for severe ligamentous instability, had any prior neck surgery, had a fracture present in the neck or upper quadrant, or was referred for two or less therapy sessions (ie, TENS training, education or home exercise program only, etc.). The study consisted of two phases over 8 months.

Phase One

Researchers conducted a training session with all participating therapists simultaneously. They were provided with standardized definitions of patient characteristics and interventions, as well as instructions for standard data collection. All examination procedures and definitions were reviewed and techniques practiced with all participating therapists. The therapists were instructed to assess and treat patients with neck pain and dysfunction as they normally do to establish a baseline of outcomes with their current practice. After obtaining patient consent, the therapists recorded basic patient demographic and intake data, as described below. They categorized patients after the initial examination using a flow sheet. The flow sheet was modeled using the Fritz and Brennon[6] categories, but did not list a classification heading, only a letter A through F (Figure 1). They were told this procedure helped the researchers organize data. Therapists also completed a data form after each visit to track the frequency and duration of visits, as well as intervention(s) provided during that session. Therapists chose from the following Fritz and Brennon[6] categories of interventions: manual therapy, deep neck flexor strengthening (cranio-cervical flexion test), traction (manual or mechanical), retraction exercises, upper quarter exercises, cervical range of motion (ROM), modalities, education, massage/soft tissue, neuro-dynamic mobilization techniques or exercises, or an 'other' category. Specific definitions were provided during the training session for each intervention category. On discharge all relevant intake data was again collected to represent the patient's post-treatment status.

Phase Two

A second training session was held 5 months later to begin phase two. All therapists were provided with the two articles on neck classification.[5,6] The second training session discussed the articles including patient classification and use of the matched interventions. For this phase, therapists again obtained pretreatment information as in phase one, but now classified patients a specific classification category name similar to the prior studies (Figure 2). They were instructed to follow the appropriate evidence-based, matched interventions discussed in the articles. They could add other treatment components as long as they still met the matched interventions requirements as outlined in Table 1, similar to the protocol followed by Fritz and Brennon.[6] Therapists completed a data form after each visit indicating the category of intervention, similar to phase one. The therapists could also indicate if the patient changed classification categories, as described by Childs, et al[5] or Fritz and Brennon.[6] Thus the authors could track changes in the interventions to match the new classification.

Intake Data and Outcomes

The same data was collected on all patients during both phases of the study. Patient information obtained during intake included symptom duration, mode of onset, aggravating and relieving factors, if any prior neck problems, and if headaches or migraines were present. From the physical examination, the therapists determined if there were any signs of nerve root compression or symptoms distal to the elbow. On discharge the therapist noted if headaches were still present and if there were still any signs of nerve root compression. During intake and on discharge, the primary outcomes measured were numeric pain rating (NPR from 0 to 10) and score on the NDI. The NDI is an outcome tool with 10 items related to neck pain and the patient's perceived disability with the scores expressed as a percentage.[7] The NDI is commonly used and has been demonstrated to be a reliable and valid outcome measure for patients with neck pain.[8] The Minimum Clinically Important Difference (MCID) has been

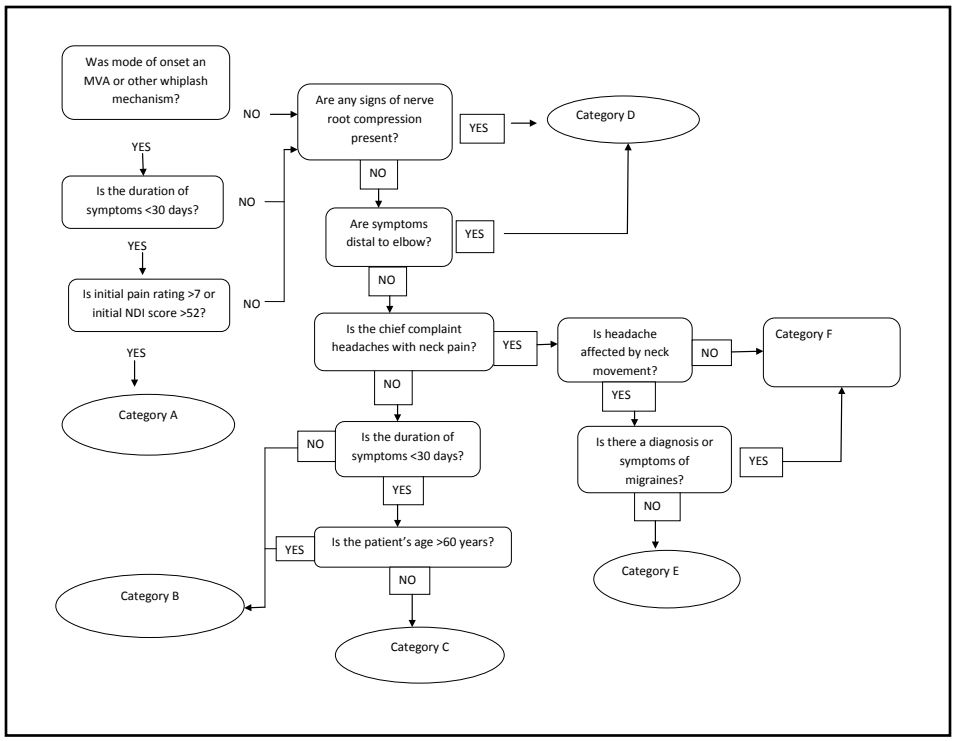

Figure 1. Phase one - flow sheet.

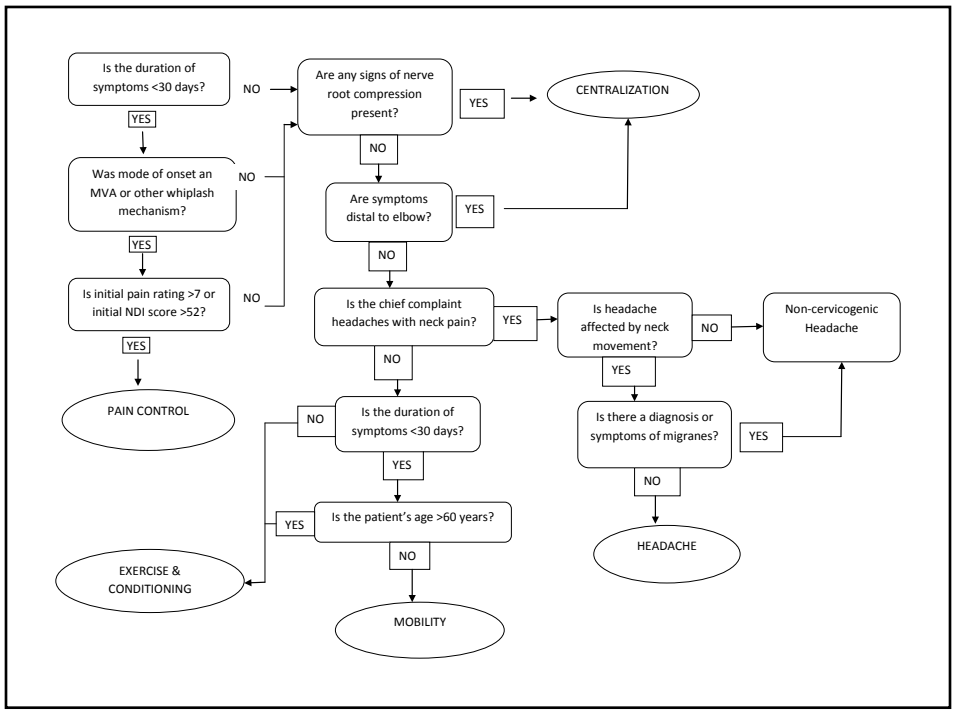

Figure 2. Phase two - flow sheet.

reported to be between 5 and 9.5 points (10-19 % change).[9,10,11]

ANALYSIS

Means and standard deviations were calculated for therapist demographic data, including amount of experience and training in addressing cervical pain and dysfunction. Outcomes of pre- and post-intervention NPR and NDI scores were compared separately for each phase using a paired t-test for both phase one and two to determine if a significant change occurred within the phase due to treatment. The pre- to post change in NDI and NPR were compared between phases one and two using appropriate parametric or nonparametric tests.

RESULTS

Basic demographic information was collected from all therapists involved, including their training and experience with this patient population (Table 2). Originally 17 therapists volunteered to participate, but only 9 actually submitted patient data. Of these therapists, several only submitted one patient for a particular phase and two therapists did not have any patients for phase two for reasons explained later in this paper. The therapists were surveyed prior to the study; all reported being familiar with and used the matched interventions listed by Childs and colleagues.[5]

Phase One Patient Outcome Data

For the final analysis, 33 patients were included in phase one (Table 3) treated by 9 therapists. The mean and standard deviation (SD) for the NDI pre-value was 30.8 $\pm$ 11.5 and post-value was 11.3 $\pm$ 10.2 for an average change of 19.6 $\pm$ 9.7. The difference between pre- and post-values was statistically significant ($t = 11.043$, $df\ 29$; $p < 0.001$). The mean and standard deviation for NPR pre-value was 4.7 $\pm$ 2.3 and post was 1.0 $\pm$ 1.4 for an average change of 3.8 $\pm$ 2.0. The difference between the pre- and post-values was statistically different ($t = 9.974$, $df = 28$; $p < 0.001$).

In this cohort, all of the patients were correctly classified by the therapists using the A-F categories. However, only 11 of the 33 treatments (33%) could be considered the appropriate, matched evidence-based intervention strategy. Therefore, therapists used the appropriate interventions for the patients only one-third of the time. Duration of the patient's complaints was of longer duration; 22 of 33 (66%) reporting symptoms > 30 days. The mean duration was 356.2 $\pm$ 936.0 days. This value was skewed by several patients who listed their durations of symptoms greater than 10 years. The mean number of visits was 7.7 $\pm$ 2.7 occurring over an average time period of 4.0 $\pm$ 1.7 weeks.

Phase Two Patient Outcome Data

For the final analysis 14 patients were included in phase two (Table 4) treated by 8 of the therapists as one therapist had no patients in phase two. The mean (SD) NDI pre-value was 40.5 $\pm$ 20.0 and post-value

Table 2. Demographic Data of Participating Therapists

- 9 therapists at 4 locations
- 5 male / 4 female
- 3 MPT / 6 DPT trained
- Mean Age (years) 30.4 ± 6.5
- Average years experience: 4.6 ± 4.8 (range 1 -16)
- Average years treating patients with neck pain: 4.4 ± 4.9 (range 1 – 16)
- Two Orthopaedic Clinical Specialists; 4 with other credentials including Certified Strength and Conditioning Specialist, Athletic Trainer Certified, etc.
- All reported reading journals 'occasionally'
- 5 report occasionally searching Internet / 5 rarely search for evidence related to care

Table 3. Phase One Data

Outcome	Pre- Mean (SD)	Pre-range	Post- Mean (SD)	Post - range	Pre – Post change – Mean (SD)	p value (95% CI)
NDI	30.8 ±11.5	2 – 58	11.3 ±10.2	0 – 44	19.6 ± 9.7	0.001 (15.9 – 23.2)
NPR	4.7 ± 2.3	0 – 8	1.0 ± 1.4	0 - 5	3.8 ± 2.0	< 0.001 (3.0 – 4.5)

Initial missing data points: NDI = 1; NPR = 0
Post missing data points: NDI = 2; NPR = 4
SD = standard deviation

Table 4. Phase Two Data

	Pre-mean (SD)	Range	Post-Mean	Range	Pre-Post Change Mean (SD)	p value (95% CI)
NDI	40.5 ± 20.0	4-76	21.2 ± 21.1	0-66	19.2 ± 18.2	0.002 (8.3 – 30.2)
NPR	5.6 ± 2.6	2-10	1.6 ± 2.4	0-8	4.0 ± 2.4	< 0.001 (2.6 – 5.4)

Initial missing data points: 0
Post missing data points: NDI = 1; NPR = 0
SD = Standard deviation

Table 5. Phase One and Two Comparisons

Outcome	Phase One	Phase Two	Difference	p value
NDI Change	19.6 +9.7	19.2 + 18.2	-0.47	0.958
NPR Change	3.8 + 2.0	4.0 + 2.4	-0.200	0.805
Visits (#)	7.7 + 2.7	11.7 + 7.1		0.046
Weeks duration	4.0 + 1.7	5.2 + 3.1		0.172

was 21.2 ± 21.1 for an average change of 19.2 ± 18.2. The difference between pre- and post-values was statistically significant (t = 3.816, 12 df, p = 0.002). The mean NPR pre-value was 5.6 ± 2.6 and post-value was 1.6 ± 2.4 for an average change of 4.0 ± 2.4. The difference between pre- and post-values was statistically significant (T = 6.273, 13 df, p< 0.001).

In this cohort, two patients were miscategorized. The appropriate matched interventions were used for 10 of the 14 patients (71%). The appropriate intervention was carried out for the patient just over two-thirds of the time. The duration of patient's complaints was also longer with 9 of 14 patients (64%) reporting symptoms > 30 days. The mean duration for phase two, however, was 18.5 ± 3.5 days. The average number of visits for this phase was 11.7 ± 7.1 occurring over an average period of 5.2 ± 3.1 weeks.

Phase One and Two Pre- and Post-Differences

Changes in NDI and NPR were compared for phases one and two. These values are listed in Table 5. The t-test for NDI change failed the equal variance test and a Mann-Whitney Rank Sum Test was performed. The NDI change for phase one was 19.6 ± 9.7 and for phase two was 19.2 ± 18.2. The difference was not statistically different between groups (T = 283.5, n = 13, 30, p = 0.958). The NPR change for phase one was 3.8 ± 2.0 and for phase two was 4.0 ± 2.4. The difference was 0.200, which was not statistically significant (t = -0.249, 41 df, p = 0.805). It should be noted that the pretreatment NPR value and NDI scores were higher in phase two, but the difference versus phase one did not reach a significant level (NDI p = 0.093 and NPR p = 0.325). There was a difference in the mean number of visits and weeks of duration of treatment between phases, both being fewer during phase one. For number of visits this was statistically significant (Mann-Whitney U statistic = 140.50, T = 412.5, P = 0.046), but was not for weeks duration of treatment (Mann-Whitney U statistic = 167.50, T = 385.5, p = 0.172).

DISCUSSION

The purpose of this pilot study was to determine if a previously published neck pain classification system and matched interventions improved patient outcomes. The NPR and NDI data was collected before and after therapists were trained in the Childs et al neck classification and matched interventions.[5] In both phases there was a significant reduction in NPR and NDI scores pre- to post-treatment, demonstrating effective therapy treatments. However, there was not a significant difference in outcomes between the phases. The results indicate that intervention produced significant changes in outcomes for patients with neck pain and dysfunction, regardless of training in the classification system and use of matched interventions. In both phases, the outcome changes were clinically meaningful as well as statistically significant indicating that, regardless of the approach, patients improved. A rationale for classification systems use is to support consistency in patient care intervention and standardize outcomes. In this pilot study there was only a trend toward better outcomes in phase two with use of the classification system and matching evidence-based interventions.

There are several possible reasons why no significant difference occurred between phases. The most overriding explanation is the lack of power due to the small number of patients. However, there are several

other factors that may have contributed to the lack of significant difference between phases. First, the classification system training may not have been adequate during phase two. Several therapists did not appropriately classify some patients and matched interventions were followed just over two-thirds of the time. Only one training session occurred and, although the researchers felt the therapists demonstrated comprehension, there was no objective determination that the therapists understood the classification system. Second, the therapists may have had rationale to not follow the matched interventions. The therapists may have based intervention on their experience and patient preferences. There was no means in place on the data forms to indicate a rationale for any deviations in care and no therapists contacted the investigators to ask about deviating care. Third, it is possible that the classification system does not produce significantly better outcomes than other treatments. During phase one, therapists used the matched intervention only one-third of the time, yet still had significant changes in outcomes. A fourth reason no statistically significant difference was seen between phases may have been due to the differing baseline patient characteristics. Patients in phase one had longer duration of the symptoms and phase two patients had higher pretreatment scores in NDI and NPR. Perhaps with higher baseline pain and disability in phase two, it took longer to see the trend toward greater change. A more even distribution of patients may have helped balance the duration and amount of change possible with these patients.

As noted, one major limitation of this study was the low number of patients. During phase one, the clinics implemented a new electronic computer documentation system that required more of the therapist's time each day. Consequently, the burden of extra paperwork and tracking for this study may have caused therapists to not to participate in the research. Several of the therapists who withdrew typically see the majority of patients at the respective clinics. Multiple requests were made to direct appropriate patients toward participating therapists' schedules, but still the number recruited into the study remained low. Another reason for the low numbers of participating therapists may be due to initially collecting too much patient data. Several therapists commented that they had time restrictions during patient intake and were unable to collect all the desired data (ie, cervical and shoulder ROM and Upper Limb Tension Tests.) During phase two, only NDI and NPR data was requested for all patients after collecting baseline demographic data.

An interesting finding was the variation in appropriate classification and subsequent matched interventions between phases. During phase one, approximately one-third of the time therapists used the matched intervention for their patient care, even though the therapists and clinics reported they promote and regularly use best evidence for patient care. During phase two, just over two-thirds of the time the therapists used the matched intervention. Once trained, several therapists still did not categorize patients correctly. Further, they did not follow the appropriate matched intervention for this incorrect category. The increase in using matched interventions during phase two indicates that the therapists were able to be trained, supporting the Fritz & Brennan conclusion that this classification system could be implemented in clinical practice.[6] However, since they only increased use of matched intervention from one-third of the time in phase one to two-thirds of the time during phase two, this means that only a small number of patients received a treatment different than what they would have prior to the training. Thus the change in treatments between phases may not have been enough to produce a clinically meaningful difference.

The authors feel this work supports further study of the use of the classification systems for patients with neck pain and dysfunction as well as the use of matched, evidence-based interventions. This pilot study provides a basis for future study to address limitations in study design and a low sample size. For example, specific issues needed to be addressed may include regular therapist contact to ensure higher patient numbers. Collection of less data or streamlining the data collection process may enhance therapist compliance. Improved therapist training may enhance knowledge and understanding of the classification system. A practice classification activity may have enhanced the therapist's knowledge and use of the system, thus further improving outcomes.

CONCLUSIONS

The purpose of the study was to investigate the implementation of a neck classification system and matched interventions. Therapists were trained in the use of this system, however, therapist compliance was lacking. The therapists did demonstrate clinically and statistically significant improvements in NPR and NDI, regardless of whether they followed a classification system and matched interventions or not. There was a small trend for better patient outcomes when the classification system was used. Further research is warranted to reach definitive conclusions.

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APTA ORTHOPAEDIC SECTION RECEIVES FOUNDATION SERVICE AWARD

The Foundation for Physical Therapy is proud to announce that the APTA Orthopaedic Section will be the recipient of the 2011 Premier Partner in Research Award. The award will be presented to the Orthopaedic Section at the Foundation's "National Treasures Gala" on June 9, 2011, during APTA's Annual Conference at the Gaylord National Hotel in National Harbor, Maryland.

Orthopaedic Section, APTA, Inc.

CSM Board of Directors Meeting Minutes
February 10 and 12, 2011

=DRAFT MINUTES=

James Irrgang, President, called a regular meeting of the Board of Directors of the Orthopaedic Section, APTA, Inc. to order at 6:00 PM CST on Thursday, February 10, 2011.

Present:
James Irrgang, President
Tom McPoil, Vice President
Steve Clark, Treasurer
Bill O'Grady, Director
Kornelia Kulig, Director
Joe Donnelly, Practice Chair
Lori Michener, Research Chair
Beth Jones, Education Chair
James Spencer, Membership Chair
Chris Hughes, OPTP and ISC Editor
Michael Miller, OSC Chair
Eric Robertson, Public Relations/Marketing Chair
Margot Miller, OHSIG President
Clarke Brown, FASIG President
Leigh Roberts, PASIG President
John Garzione, PMSIG President
Amy Hesbach, ARSIG President
Joe Godges, ICF Coordinator
Tess Vaughn, Education Vice Chair

Absent:
Jason Tonley, Residency and Fellowship Education Coordinator
Jennifer Gamboa, Nominating Committee Chair

Guests:
Brian Swanson, APTA Student Assembly Liaison
Felicity Clancy, APTA Vice President of Communications

Gerard Brennan, Incoming Vice President
Aimee Klein, APTA Board Liaison
Tara Fredrickson, Executive Associate
Terri DeFlorian, Executive Director

The meeting agenda was approved with modifications.

Felicity Clancy, APTA Vice President of Communications, presented on the use of social media.

James Irrgang, President, reported on subspecialization for SIGs and residencies. In general there was interest on part of the SIGs and fellowship programs to pursue some form of subspecialization.

=MOTION 1= James Irrgang, President, moved that the Orthopaedic Section Board of Directors approve the creation of a Task Force consisting of representatives from each SIG, residencies, fellowships, the Orthopaedic Specialty Council, and the ABPTS to explore the need for and potential models for subspecialization recognition. ADOPTED (unanimous)

Fiscal Implication: None

James Irrgang, President, recognized Tom McPoil for completion of his two 3-year terms as Vice President on the Board of Directors.

Tom McPoil, Vice President, reported on the informational meeting to discuss the transition of the Imaging EIG to an Imaging SIG. About 25 physical therapists attended.

=MOTION 2= Tom McPoil, Vice President/EIG Liaison, moved that the Orthopaedic Section Board of Directors approve the attached petition to form an Imaging SIG and appoint interim officers for 2011 along with $2,500 to cover start up expenses.

Fiscal Implication: $2,500 budget exception for 2011

James Spencer, Membership Chair, reported that the APTA Student Assembly has expressed an interest to become more actively involved in the Orthopaedic Section. There have only been 2 physical therapists who have taken advantage of the New Graduate Return to School Program in the past couple of years. For doing this they received a 50% reduction in their annual Section dues.

=MOTION 3= James Spencer, Membership Committee Chair, moved that the Orthopaedic Section Board of Directors approve the creation of an annual student member position on the Membership Committee and provide funding for registration to attend CSM for this individual. It is expected that this student will attend, and encourage other students to attend the Welcome Breakfast, Membership Reception, and Membership Meeting. ADOPTED (unanimous)

Fiscal Implication: Annual CSM student weekly registration fee

Chris Hughes, OPTP Editor, reported that OPTP will continue to publish one issue per year that focuses on a University. The Section's APTA Student Assembly Liaison, Brian Swanson, will promote this idea among students.

Chris Hughes, ISC Editor, reported on the feedback received from the Occupational Health, Pain, and Animal Rehabilitation SIGs on co-sponsoring an ISC. One of the 3 ISCs offered each year beginning in 2013 will be co-sponsored by a SIG. Chris will investigate this further with them and submit his recommendation for 2013 ISCs for the March BoD conference call.

=MOTION 4= Tom McPoil, Vice President, moved that the Orthopaedic Section Board of Directors direct the Section Executive Director to have all ISC monograph copyediting performed in-house unless staff time constraints require the use of an outside contractor. ADOPTED (unanimous)

Fiscal Implication: None

Eric Robertson, Public Relations/Marketing Chair, reported that he is posting something new about every 3 weeks on the Section's Fan Page, which has received approximately 1,000 hits. He would like to incorporate more content from the Special Interest Groups as well as have the Section leadership add personality to the page by participating in posting. In addition to the Public Relations/Marketing Chair, the current administrators to the page are James Spencer, Membership Chair. The Board agreed that Terri DeFlorian, Executive Director and Tara Fredrickson, Executive Associate should be added as administrators.

Michael Miller, Orthopaedic Specialty Council Chair, reported there were 165 applicants for SACE for the 2011-2013 cycle. Thirty-one new items were added to the item bank bringing the current total number of items in the bank to 647. Of this number, 167 items have not yet been used on the examination. Because of the number of individuals taking the examination, there are two parallel forms of the orthopaedic specialty examination each year. This requires twice the number of items to be in the bank. The Council continues to work on changing the requirements to sit for the exam. Recommendations from the Section to the ABPTS for vacancies on the Orthopaedic Specialty Council and ABPTS were discussed. The Section will continue to submit recommendations and monitor the selection process. The Orthopaedic Specialty Council will be undertaking a study to revalidate the Description of Specialty Practice for Orthopaedic Physical Therapy. Michael Miller's position on the Council will conclude January 1, 2012. Past Council members cannot be reappointed.

Tom McPoil, Awards Committee Chair, reported that the committee assisted in developing a nomination packet for Dr. Bob Rowe for the APTA Lucy Blair Service Award at the request of the Board of Directors. There were no nominations for the Paris Distinguished Service award, 8 nominations were received for the James A. Gould Excellence in Teaching Award, and at least one nomination for the Bowling-Erhard, PT Student, and PTA Student awards. Following are the 2011 award recipients –

- PTA Student Award – Natalie "Chris" Garland, Somerset Community College, Somerset, KY
- PT Student Award – Stephanie Lynch, Virginia Commonwealth University, Richmond, VA
- James A. Gould Excellence in Orthopaedic Physical Therapy Teaching Award – Eric J. Hegedas, DPT, OCS, MHSc, High Point University in North Carolina
- Richard W. Bowling and Richard E. Erhard Orthopaedic Clinical Practice Award – Catherine E. Patla, PT, DHSc, MMSc, OCS, MTC, AAOMPT

Joe Godges, ICF Coordinator, reported that 6 guidelines have been published since 2008. The goal is to create 15 guidelines by 2015. Currently in progress are the Low Back Pain and the Hip Labral and Non-Arthritic Hip Disorders clinical practice guidelines. Future clinical practice guidelines include:

- Patellofemoral Pain
- Knee Osteoarthritis
- Shoulder Adhesive Capsulitis
- Shoulder Instability
- Shoulder Rotator Cuff Syndrome
- Elbow Epicondylitis
- Carpal Tunnel Syndrome
- Lateral Ankle Sprain

The first guidelines are getting close to needing to be revised. Discussion on how to handle this will begin soon.

=MOTION 5= James Irrgang, President, moved that the Orthopaedic Section Board of Directors approve appointing Joe Godges, ICF Coordinator, to a second 3-year term beginning March 1, 2011. ADOPTED (unanimous)

Fiscal Implication: None

Jason Tonley, Residency and Fellowship Education Coordinator, was not able to be present. Discussion on the electronic testing database for residencies was postponed to the March Board of Directors conference call. Jason will be invited to attend to lead the discussion.

=MOTION 6= Kornelia Kulig, Director, moved that the Orthopaedic Section Board of Directors approve appointing Jason Tonley, Residency and Fellowship Education Coordinator, to a second 3-year term beginning March 1, 2011. ADOPTED (unanimous)

Fiscal Implication: None

Margot Miller, OHSIG President, reported that the petition for specialization in Occupational Health Physical Therapy is in the hands of ABPTS and the Occupational Health Physical Therapy: Advanced Work Rehabilitation guideline is in the process of review and approval. The SIG continues to have involvement with OIDAP (Occupational Informational Development Advisory Panel).

Clarke Brown, FASIG President, reported that there were no new activities for the SIG over the last year.

John Garzione, PMSIG President, reported the SIG held two conference calls to discuss starting the process for a pain management subspecialty. The plan is to have 3 or 4 ISC courses, conforming to the International Association for the Study of Pain (IASP) standards, with a final examination. Elections were held for President and Vice President. Marie Hoeger Bement was re-elected Vice President for a second term and John Garzione was re-elected President. Since the terms for President and Vice President run concurrently, a recommendation will be brought forth to the Board of Directors on their March conference call to stagger these terms by 1 year.

Leigh Roberts, PASIG President, reported their Membership Profile Updates are ongoing. The advanced search function allows members to connect their patients to therapists out-of-town who treat performing artists. The resource page has been posted to the PASIG Web site and made LIVE. It contains articles from *OPTP* and citation blasts on performing arts categories (dance, figure skating, gymnastics, musicians, etc.). The newly elected officers for the PASIG are Julie O'Connell, President (2011-2014) and Amanda Blackmon, Nominating Committee (2011-2014).

Amie Hesbach, ARSIG President, reported that the SIG has established working committees to investigate the following:

- Animal rehabilitation resources for ACCEs and CIs
- Professional liability/malpractice insurance options
- Third party payment for services provided by physical therapists in animal rehabilitation
- Continuing education options (ISC vs. newsletter vs. APTA Learning Center)

The SIG is updating their State Liaison Network and will be coordinating efforts with the American Association of Rehabilitation Veterinarians (AARV) as well as APTA state chapter legislative committees. They are in the process of writing their practice analysis. The SIG has been collaborating with the California APTA Chapter, SIG members, and the APTA State Government Affairs office regarding California AB 1980. They were also contacted by the coordinator of the National Animal Rehabilitation and Conditioning Association (NARCA). This organization's goals are to promote legislative changes for practitioners (massage therapists, chiropractors, hydrotherapists, etc.) to legally practice on animals. It was recognized that this might be contrary to the SIG's goals and those of APTA State Government Affairs. This group was told to cease and desist any suggestion that the APTA or ARSIG is in agreement with the goals of NARCA. The President and Vice President terms for the ARSIG are concurrent so a recommendation will be brought to the Board of Directors to stagger the terms for these offices.

=MOTION 7= Tom McPoil, Vice President, moves that the Orthopaedic Section Board of Directors approve the proposed change to the SIG EIG Rules of Order and Policies. ADOPTED (unanimous)

Fiscal Implication: None

Beth Jones, Education Chair, reported the CSM preconference courses were a success and the in-house registration process at the Section office went very well. The growth of attendance at CSM was discussed among the members of the BoD. James Irrgang, President, will discuss the challenges imposed by the continued growth of CSM at the Section President's meeting this week.

=MOTION 8= Beth Jones, Education Chair, moved that the Orthopaedic Section Board of Directors approve offering a regional education course based on the proposal presented by Tess Vaughn, Education Vice Chair. ADOPTED (unanimous)

Fiscal Implication: Projected profit of $5,387

Negotiations with individual sites will be handled by the Section office in consultation with the Treasurer. Guidelines will be set by the Board of Directors and include the percent profit and number of courses per year. The Board agreed to conduct a pilot course in Atlanta in 2011.

Lori Michener, Research Chair, gave an update on the Clinical Research Network. The plan is for the Section to sponsor a multicenter clinical study that will engage Section members to participate in the study. The Clinical Research Network Task Force recommends a 3-year grant, totaling $300,000 ($100,000 per year for 3 years). The Board agreed that this should be looked at as a partnership having contracts that outline the specifics of the project. Lori was charged with taking this back to the Task Force to determine how the project should be structured and bring a written proposal back to the Board for a vote. Once this is decided, the cost for implementation can be determined.

=MOTION 9= Lori Michener, Research Chair, moved that the Orthopaedic Section Board of Directors approve the following 2 New Investigator grants –

- Validity of Clinical Assessments of Resting Scapular Alignment and Scapulohumeral Movement Patterns - Principle Investigator: Dave Ebaugh, PT, PhD. Funding amount = $14,416.
- Defining Muscular Weakness and Gait Alterations in Chronic Patellofemoral Instability – Principle Investigator: Brian Noehren, PT, PhD. Funding amount = $15,000.

ADOPTED (unanimous)

Fiscal Implication: $29,416 of the $45,000 budgeted at $15,000 each for the New Investigator grants

=MOTION 10= Lori Michener, Research Chair, moved that the Orthopaedic Section Board of Directors approve the following Unrestricted grant –

- The Effect of Joint Mobilization on Diffuse Noxious Inhibitory Control Mechanisms in Individuals with Osteoarthritis of the Knee – Principle Investigator: Carol A. Courtney, PT, PhD Funding amount = $24,323

ADOPTED (unanimous)

Fiscal Implication: $24,323 of the $25,000 budgeted

Lori will bring forth a recommendation for the Board of Directors to discuss at a future meeting on how to use the remaining $15,000 still available from the grant budget.

Joe Donnelly, Practice Chair, reported on the highlights of the Manipulation Task Force Meeting –

- The Section will consider co-sponsoring the Private Practice Section motion regarding a change to House policy on autonomous practice.
- Arizona may be bringing forth a motion giving free access to all Section Web sites for all students. The Orthopaedic Section is not in favor of this.
- The Orthopaedic Section will spearhead a motion on developing a scope of practice in dry needling. This is an emerging area of practice.
- AAOMPT is considering holding another Capitol Hill Day in 2012.

=MOTION 11= James Irrgang, President, moved that the Orthopaedic Section Board of Directors approve offering two CSM preconference courses on spinal manipulation each year, the title and speakers to be selected by the Board beginning at CSM 2012. ADOPTED (unanimous)

Fiscal Implication: None

James Irrgang, President, gave an update on the CSM Section's President Meeting –

- Decision making responsibilities of the Sections and APTA related to CSM was discussed.
- Over the last 18 months the CSM contract was reviewed. Multiple topics were discussed including the point system for distribution of payments to Sections and inclusion of AV expenses as a general meeting expense. No agreement was reached regarding any changes in the contract. As such, the current contract remains in effect for the next 3 years through 2013.
- Given all the issues with the growth of CSM and future locations (Chicago), James proposed a Task Force be appointed to look at this. The Task Force should include Sections, APTA, and a neutral party as mediator. Section Presidents are in favor

(continued on page 115)

Orthopaedic Section, APTA, Inc.

CSM 2011 Annual Membership Meeting Minutes
New Orleans, Louisianna
February 11, 2011

=FINAL=

I. CALL TO ORDER AND WELCOME

A. James Irrgang, PT, PhD, ATC, FAPTA, President, called the meeting to order at 6:30 PM.

B. Past Orthopaedic Section President's, newly certified orthopaedic specialists and all certified orthopaedic specialists, the Section Board of Directors, Committee Chairs, and Section office staff were introduced.

C. A moment of silence was held for physical therapists that have passed away in the last year.

D. The agenda was approved as printed.

E. The Annual Membership Meeting minutes from CSM in San Diego, California on February 19, 2010, were approved as printed.

D. Orthopaedic Section Election Results were presented by Nominating Committee Chair, Jennifer Gamboa, DPT, OCS, MTC
For the fall 2011 election there were 993 ballots cast. The number of valid ballots was 990 and the number of invalid ballots was 3. The following positions were elected: Vice President, Gerard Brennan, PT, PhD and Nominating Committee Member, Bill Egan, PT, DPT, OCS, FAAOMPT.

There was a call for nominations from the floor for the 2012 election for the positions of Treasurer, Director, and Nominating Committee Member. The following individuals were nominated for Director – Joe Donnelly and Emilio "Louie" Puentedura. No nominations were brought forth for the positions of Treasurer or Nominating Committee Member.

The deadline for accepting nominations for the Fall 2012 election is September 1, 2011.

E. APTA Nominating Committee Chair, Jim Hughes, reported that the positions up for the 2012 APTA election are President, Vice President, 3 Directors, and 2 Nominating Committee Members. Section members were asked to get involved by submitting their name for one of these positions.

II. INVITED GUESTS

A. *JOSPT* President, David Greathouse, PT, PhD, ECS, FAPTA, reported there were 76 manuscripts and 20 images published in *JOSPT* in 2010. The impact factor is at 2.482. Currently *JOSPT* is ranked number 2 among rehabilitation publications, number 10 in orthopaedic publications, and 9th in sports publications. A mobile Web site has recently been activated at m.jospt.org. Guy Simoneau, *JOSPT* Editor-in-Chief, has extended his contract through 2013.

B. Susan Appling, PT, PhD, OCS, PT-PAC Trustee
- 2009 – 2010 Election Cycle Review
  - ✓ $1.9 million was raised
  - ✓ $1.26 million was raised in contributions to congressional candidates and Political Action Committees
  - ✓ 88% of PT-PAC supported candidates won
- 2010 PT-PAC Totals
  - ✓ There were 7,766 contributors
  - ✓ The average contribution was $121.76
  - ✓ There was a 10% participation rate made up of 1.9% PTs, 5.5% PTAs, and 2.6% students
- CSM 2010 Section Competition
  Of the 9 Sections that participated in the 2010 Section PT-PAC competition, the Orthopaedic Section tied for 3rd place along with the Research Section each having 24.3% of their members contributing.

C. Gerard Brennan, Foundation for Physical Therapy Board of Trustees, announced that the Orthopaedic Section was the recipient of the 2011 Premier Partner in Research Award. The award will be presented at the APTA Annual Conference held in National Harbor, Maryland June 9. James Irrgang, President, announced that all past presidents of the Section would be personally invited to attend the event to receive the award.

III. FINANCE REPORT

The year-end 2009 audit of the Orthopaedic Section's finances showed total assets of $3,482,916 which is a 12% gain over 2008. 2009 audited income was $1,586,289 and audited expenses were $1,405,574 resulting in a profit of $180,715. The unaudited income and expense figures for 2010 are indicating a profit of $261,064. The total amount in the Section reserve fund (checking, savings, LPL investment fund) as of December 31, 2010 was $1,490,358. The Section's encum-

bered fund; including SIG funds and the restricted capital expenses was $120,721. These encumbered funds are a part of the total reserve fund amount. The 2011 operating budget is balanced with income and expenses both at $1,492,502. Operating expenses were 91% of the reserve fund at 2010 year-end. The Section's policy requires 40-50% of total operating expenses in the reserve fund. As of December 31, 2010 the total amount in the Practice, Research, and Education Endowment Fund was $1,158,485. This is a total increase of 18% from the fund's inception in 2007. This includes a deposit of $50,000 in January 2010 and a transfer of $145,000 in January 2011. Income of $338,961 was received from the sale of adjoining frontage land and there was an 8% gain on the LPL reserve 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

A. 2010-2014 Strategic Plan – James Irrgang, President

- The Section is partnering with the APTA on the development of a National Orthopaedic Physical Therapy Outcomes Database. A pilot program to collect and analyze outcomes data based on the Neck Pain Clinical Practice Guidelines will be released to the membership through Osteo-BLAST later this year. The pilot program will consist of the following –
  - ✓ Development of paper-based data collection form
  - ✓ Call for volunteers to pilot test form – training will be provided via a webinar
  - ✓ Collect data for minimum of 10 patients over 6 month period
  - ✓ Submit data to Orthopaedic Section office for data entry and analysis
  - ✓ Provide feedback on performance to those that submit data
  - ✓ Survey individuals regarding burden of data collection and usefulness of information
  - ✓ Use results to plan computerized data collection & analysis system
- Lori Michener, Research Chair, reported that a Clinical Research Network is in the process of being developed. The network will engage Section members to participate in a multi-center clinical research study.

B. ICF-based Clinical Practice Guidelines for Common Musculoskeletal Conditions – Joe Godges, Coordinator

- Workgroups include cervicothoracic spine; shoulder; elbow, wrist, and hand; lumbrosacral spine; hip; knee; foot and ankle
- Published Clinical Practice Guidelines include: Heel Pain – Plantar Fasciitis (2008); Neck Pain (2008); Hip Pain and Mobility Deficits/Hip Osteoarthritis (2009); Knee Stability and Movement Coordination Impairments/Knee Ligament Sprain (April 2010); Knee Pain and Mobility Impairments/Meniscal and Articular Cartilage Lesions (June 2010); Achilles Pain, Stiffness and Muscle Power Deficits/Achilles Tendinitis (September 2010)
- Clinical Guidelines in progress: Low Back Pain and Hip Labral/Non-arthritic Hip Disorders
- Future Clinical Guidelines: Patellofemoral Pain, Knee Osteoarthritis, Shoulder Adhesive Capsulitis, Shoulder Instability, Shoulder Rotator Cuff Syndrome, Elbow Epicondylitis, Carpal Tunnel Syndrome, and Lateral Ankle Sprain
- Open access to published Clinical Practice Guidelines can be found at www.jospt.org
- Section members were invited to visit www.orthopt.org to give feedback on the clinical practice guidelines
- Joe Godges was appointed by the Board of Directors to a second 3-year term as the ICF Coordinator

C. Residency and Fellowship Education (RFE) Committee – James Irrgang, President

The Residency Curriculum consisting of 5 ISCs is completed. This program was developed to provide the didactic component to residency and fellowship programs not affiliated with an academic institution.

Jason Tonley was appointed by the Board of Directors to a second 3-year term as the RFE Coordinator.

D. EIG Petition to become an Imaging SIG – Tom McPoil, Vice President/Board Liaison to EIGs

Tom McPoil presented the history of the Imaging EIG and the reasons they petitioned to become a SIG. An open forum was held during CSM to discuss interest in transitioning to a SIG. The Board of Directors moved to approve the petition for an Imaging SIG at their Board of Directors Meeting during CSM. The next step will be to appoint an interim President and Vice President/Education Chair along with funding for 2011 so a slate of candidates can be generated for the 2012 election ballot.

E. Advocacy Grants – James Irrgang, President

The Section awarded 2 Advocacy Grants in 2010, one to the Washington Chapter for advocacy efforts related to their Legislative Impact Day and proposed legislation to remove the prohibition on spinal manipulation; and the second to the South Carolina Chapter for advocacy efforts related to referral for profit.

V. PROPOSED BYLAW AMENDMENTS

The following proposed bylaw amendments to the Section bylaws will be presented to the membership for approval in 2011:

- **ARTICLE VI. MEMBERSHIP MEETINGS**
  Section 3: Notice of Meeting Requirements

  Notice of time and place of Annual and any Special Membership business meetings shall be sent to all Section members at least thirty (30) days prior to the meeting.

- **ARTICLE VII. BOARD OF DIRECTORS & OFFICERS**
  Section 1 G: Meetings and Conduct of Business

  1. Regular Meetings
  The Board of Directors shall have three regular, a minimum of two (2) face-to-face, meetings each year: a winter meeting, a summer meeting, and a fall meeting. If the Association has a Combined Sections Meeting, the Board's winter meeting shall be held in conjunction with it. The time and place of each regular meeting shall be determined by the Board.

- **ARTICLE X. DELEGATE TO THE ASSOCIATION'S HOUSE OF DELEGATES**
  Section 1: Qualifications

  A. Only Physical Therapist and Physical Therapist Assistant members who have been members of the ~~Association~~ Section in any category of membership in good standing for two (2) years immediately preceding may serve as a Section Delegate.

- **EDITORIAL CHANGES**
  1. Regional and Special Interest Groups – Changed to Special and Educational Interest Groups
  2. Executive Director, NOT the Vice President, shall keep the minutes of meetings
  3. Principle Officers – changed to Board of Directors
  4. All references to Business Meetings - changed to Membership Meetings

- **EDITORIAL CHANGES** under ARTICLE XI. ELECTIONS
  1. The slate of candidates shall be published on the Orthopaedic Section Web Site and *NOT in OPTP*.
  2. The Nominating Committee will present its selections in an October *(NOT September)* mailing to all voting members and post on the Section Web Site.

VI. RECOGNITION

The following outgoing officer and committee chair were recognized for their service to the Section as their terms end at the close of the 2011 CSM Membership Meeting –

- Thomas G. McPoil, Jr, PT, PhD, FAPTA – Vice President/Awards Committee Chair
- Jennifer M. Gamboa, DPT, OCS, MTC – Nominating Committee Chair

VII. NEW BUSINESS MOTIONS

No new business was brought forth from the floor.

VIII. OPEN FORUM

No other discussion was brought forth from the floor.

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

ADJOURNMENT 7:35 PM

2011 CSM Award Winners

The Orthopaedic Section awards ceremony was held on February 11, 2011 in New Orleans, LA.
Congratulations to all of this year's award winners.

Outstanding Physical Therapist Assistant 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.

Natalie "Chris" Garland is a second-year student in the Physical Therapist Assistant Program at Somerset Community College in Somerset, Kentucky. Ms. Garland is not only an outstanding student at the top of her class but is highly involved in several service activities outside of the classroom. A model student, she was the recipient of the prestigious Edgar Gadberry Scholarship and selected for membership in the Phi Theta Kappa Honor Society. She was appointed by the president of the college to the PTA Program's Advisory Board in addition to serving as one of the College's Student Ambassadors for the 2010-2011 academic year. She was elected by her classmates to serve as president of her class and was co-chair of the program's fundraising efforts in the 2010 Georgia State - Marquette Challenge for the Foundation of Physical Therapy. As a result of her and her classmate's efforts, the program was honored by the Foundation as the "Most Successful Physical Therapist Assistant Program" in the 2010 Challenge. In addition, she served as the student co-coordinator for the SCC 2010 Physical Therapy Open House, which is a large recruiting event that educates the public about the physical therapy profession. In recognition of her numerous professional activities, she was named the recipient of the James A. Anderson Award, which is the highest honor presented in the program. One of her student colleagues notes that Chris does whatever she can to help her fellow students. One of her clinical instructors writes, "she serves as an excellent role model to students balancing academics and community service." It is obvious that Natalie "Chris" Garland is truly an outstanding individual and a most worthy recipient of the Outstanding Physical Therapist Assistant Student Award who has the potential to contribute to the Orthopaedic Section of the APTA.

Outstanding Physical Therapy 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 recipient of the Outstanding Physical Therapy Student Award is **Stephanie Lynch**. Ms. Lynch received her Bachelor of Science in Education from the University of Virginia in Charlottesville. She will graduate in May 2011 from the Doctor of Physical Therapy (DPT) program at the Virginia Commonwealth University in Richmond. Stephanie has distinguished herself as a leader among her peers, as well as with her involvement in numerous community service activities. During the first two years of her academic career, Stephanie has been involved in a community health fair for underserved members of the Richmond community and with the Crossover Ministry Free Clinic for the underserved in Richmond. During her winter and summer breaks, she has also volunteered at various physical therapy clinics serving those in need of health care in both South and Central America. As a result of her extensive volunteer activity, her classmates selected her to receive the Cindy Gouldin Memorial Scholarship for Service. Even in light of all her volunteer activity, Stephanie has been able to successfully balance the academic demands of her professional studies. She is ranked academically in the top 5% of her class and was selected as the recipient of the Jules Rothstein Memorial Scholarship Award for academic excellence. One of her professor's notes that Ms. Lynch is one of the most mature students we've had at VCU in some time; her enthusiasm has been embraced by her classmates and by the faculty. One of her student colleagues comments, "When I consider all of the many wonderful students and professors I have been fortunate to know at VCU, I count Stephanie among the ones who has inspired me the most and had the greatest impact on my development as a physical therapist." Another one of her professors wrote, "Stephanie is in constant search of opportunities to both serve and learn – she will no doubt develop into a leader in the physical therapy profession." It is obvious that Stephanie Lynch is truly an outstanding student and a most worthy recipient of the Outstanding Physical Therapy Student Award with tremendous potential to contribute to the Orthopaedic Section of the APTA.

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.

Eric J. Hegedus, DPT, OCS, MHSc, is the 2011 recipient of the James A. Gould Excellence in Teaching Orthopaedic Physical Therapy Award. Dr. Hegedus was recently appointed a Professor of Physical Therapy at High Point University in North Carolina. For the previous 8 years, Dr. Hegedus was a member of the faculty in the Division of Physical Therapy, Department of Community and Family Medicine at Duke University. As noted by his faculty colleagues, Dr. Hegedus epitomizes the role of teacher, practitioner, and clinical researcher. Dr. Hegedus joined Duke University in 2003 and until recently has served as one of the directors and primary instructor for the entry-level DPT orthopaedics/manual therapy courses in the curriculum. Dr. Hegedus was instrumental in refining the musculoskeletal curriculum and was a driving force as the faculty moved toward a team-based learning model for the curriculum. In addition to his excellence in the classroom, Dr. Hegedus has been an extremely productive clinical researcher with over 25 peer-reviewed manuscripts as well as publishing in two books, serving as editor for one. One of his colleagues writes, "he is the best clinician I have ever worked with; he maximizes patient output, addresses evidence-based practice, and shares his clinical passion with students on a daily basis." Another colleague comments, "his teaching style and personality have brought to life the profession of physical therapy for our students." Dr. Hegedus is a teacher in the truest sense. One thing that contributes to his remarkable success in teaching orthopaedics is that he is equally skilled in teaching the cognitive and psychomotor aspects of the course. Dr. Hegedus always creates an environment where students grasp and retain vital information. He effectively incorporates emerging research and evidence-based concepts into the classroom and laboratory using a variety of instructional methodologies. As noted by another of his colleagues, "His student evaluations always reflect his incredible expertise, passion, professionalism, superb clinical skills, and genuine love for orthopaedic practice." Both current and former students speak highly of Dr. Hegedus' dedication, teaching skills, and knowledge in the area of musculoskeletal physical therapy. One of his former students states, "I felt Dr. Hegedus gave me many behaviors to emulate as I matriculated through a very demanding physical therapy curriculum so that I could achieve academic success, pursue professional activities, and enjoy time with family and friends – even after graduation, he still serves as a regular mentor to me." It is obvious that Dr. Eric Hegedus is a most worthy recipient of the James A. Gould Excellence in Teaching Orthopaedic Physical Therapy Award. With this award, Dr. Eric J. Hegedus joins a distinguished group of faculty and clinical mentors in orthopaedic physical therapy.

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 2011 Rose Excellence in Research Award is **Dr. Joseph Zeni, Jr, PT, PhD**, for the manuscript, Early postoperative measures predict 1- and 2-year outcomes after unilateral total knee arthroplasty: importance of contralateral limb strength. *Phys Ther*. 2010;90:43-54. Dr. Joseph Zeni is currently an Assistant

Professor at the University of Delaware's Department of Physical Therapy. In addition to teaching Clinical Gross Anatomy to the incoming PT graduate students, he is an active researcher investigating the biomechanical factors associated with the progression of knee osteoarthritis. Joseph is currently working on innovative and engaging physical therapy interventions to reduce movement asymmetry, maximize long-term functional outcomes, and reduce disability after total joint replacement. Joseph received his masters degree in physical therapy from Quinnipiac University in 2003. Following this he worked as a physical therapist at the Rubin Institute for Advanced Orthopaedics in Baltimore, MD before returning to the University of Delaware in 2005 to pursue his PhD in Biomechanics and Movement Science. Joseph completed his PhD under the mentorship of Dr. Jill Higginson in the Department of Mechanical Engineering before beginning a postdoctoral fellowship in the Department of Physical Therapy under the guidance of Dr. Lynn Snyder-Mackler. Joseph is an active member of the APTA and will continue to pursue his clinical research agenda to develop evidence-based treatment guidelines for patients after total joint replacement.

Richard W. Bowling – Richard E. Erhard Orthopaedic Clinical Practice Award

This award is given to acknowledge an individual who has made an outstanding and lasting contribution to the clinical practice of orthopaedic physical therapy as exemplified by the professional careers of Richard W. Bowling and Richard E. Erhard. Individuals selected for this award must have been engaged in extensive orthopaedic physical therapy clinical practice for at least 15 years and have positively and substantially affected the shape, scope, and quality of orthopaedic physical therapy practice.

The recipient of the 2011 Richard W. Bowling – Richard E. Erhard Orthopaedic Clinical Practice Award is **Catherine E. Patla, PT, DHSc, MMSc, OCS, MTC, FAAOMPT**. Dr. Patla has positively and substantially affected the shape, scope, and quality of orthopaedic physical therapy through her clinical practice, education, and clinical research activities. Having started her physical therapy career over 30 years ago, Dr. Patla has been a strong advocate for the development of orthopaedic manual therapy fellowships and residencies. In addition during this same period of time, she has provided countless numbers of orthopaedic and manual therapy continuing education courses to help practicing physical therapists improve their clinical expertise and knowledge. Dr. Patla is currently an Associate Professor of Physical Therapy and Director of the Manual Therapy Fellowship Program at the University of St. Augustine. Although in an academic setting for more than 20 years, Dr. Patla has continued to maintain a consistently active clinical practice throughout her career. In addition, she has contributed numerous manuscripts, monographs, and book chapters in the area of orthopaedics and manual therapy. Dr. Patla has also made significant contributions to the education of doctor of physical therapy students by serving as a strong advocate for the teaching of spinal and extremity manual therapy at the entry level. Just as impressive is the list of the orthopaedic/manual therapy fellows that she has trained, who have gone on to have productive clinical careers and have substantially impacted the practice of orthopaedic physical therapy. Dr. Patla has influenced countless numbers of physical therapists through her activities associated with the physical therapy profession. She has held a number of committee positions within the Orthopaedic Section, the American Academy of Orthopaedic Manual Physical Therapists, and the Florida Physical Therapy Association, and served as a member and Chair of the Orthopaedic Section's Nominating Committee as well as the President of the Florida Physical Therapy Association. She has served as an examiner for the University of St. Augustine Manual Therapy Certification since 1980 and has also served on the Examination Committee of the American Academy of Orthopaedic Manual Therapy since 1997. In recognition of her consistent and sustained contributions to orthopaedic physical therapy clinical practice over the past 30 years, the Orthopaedic Section recognizes **Catherine E. Patla, PT, DHSc, MMSc, OCS, MTC, FAAOMPT**, as the recipient of the 2011 Richard W. Bowling – Richard E. Erhard Orthopaedic Clinical Practice Award.

Journal of Orthopaedic & Sports Physical Therapy Awards

The following annual awards, presented for 7 years by the Journal of Orthopaedic & Sports Physical Therapy, recognize the most outstanding research manuscript and clinical practice paper published in the JOSPT within the last calendar year. The JOSPT Excellence in Research Award is given to the best article published within the category of research reports. The George J. Davies – James A. Gould Excellence in Clinical Inquiry Award is presented to the best article among the categories of case reports, resident's case problems, clinical commentaries, and literature reviews. An award committee consisting of the JOSPT editor-in-chief, two JOSPT associate editors, and the research chairs of the Orthopaedic and Sports Physical Therapy Sections selected the following recipients.

The *Journal of Orthopaedic & Sports Physical Therapy*'s 2010 JOSPT Excellence in Research Award

AWARDED TO: Thiago Yukio Fukuda, PT, MSc, Flavio Marcondes Rossetto, PT, Eduardo Magalhães, PT, Flavio Fernandes Bryk, PT, Paulo Roberto Garcia Lucareli, PT, PhD, Nilza Aparecida de Almeida Carvalho, PT, MSc

FOR: Fukuda TY, Rossetto FM, Magalhães E, Bryk FF, Lucareli PRG, de Almeida Carvalho NA. Short-term effects of hip abductors and lateral rotators strengthening in females with patellofemoral pain syndrome: a randomized controlled clinical trial. *J Orthop Sports Phys Ther*. 2010;40(11):736-742.

Criteria for *JOSPT* Excellence in Research Award:

1. The importance of the contribution of the manuscript to the clinical or basic science related to orthopaedic or sports physical therapy.
2. The relevance of the manuscript to clinical practice.
3. The quality of the research question, methodology, and interpretation/synthesis of the findings with the existing literature.
4. The quality of the writing.

The *Journal of Orthopaedic & Sports Physical Therapy*'s 2010 George J. Davies – James A. Gould Excellence in Clinical Inquiry Award

AWARDED TO: Angela R. Tate, PT, PhD, Philip W. McClure, PT, PhD, FAPTA, Ian A. Young, PT, DSc, OCS, SCS, Renata Salvatori, Lori A. Michener, PT, ATC, PhD, SCS

FOR: Tate AR, McClure PW, Young IA, Salvatori R, Michener LA. Comprehensive impairment-based exercise and manual therapy intervention for patients with subacromial impingement syndrome: a case series. *J Orthop Sports Phys Ther*. 2010;40(8):474-493.

(continued on page 106)

Richard W. Bowling & Richard E. Erhard Orthopaedic Clinical Practice Award Acceptance Speech

Catherine Patla, PT, DHSc, OCS, MTC, FAAOMPT

This acceptance speech was given at the Combined Sections Meeting, February 11, 2011 in New Orleans.

Thank you Erin Conrad for those most gracious words and remembrances.

My appreciation extends to the Orthopaedic Section Awards Committee for deeming me worthy of this award.

When Jay Irrgang called me on the phone in December to inform me of this award, I was first in disbelief. Then I quickly realized that Jay could not have dialed the wrong number. Then my elation started.

Wow - to be acknowledged for 35 years of clinical practice amongst my peers is truly an awesome experience. All of us here in this room can look back on our entry-level education and note that we were all trained for clinical practice. Here is our commonality. It is this clinical practice that I have enjoyed and cherished my entire career.

Accepting this award and planning to speak amongst all of you lends to a wonderful time of reflection; on both this award and self-reflection of one's career.

In the Orthopaedic Section's Web-based material called "OsteoBLAST," the headlines for December 2010 were the announcements of the award recipients for this year. On this same page was the announcement that just a week before we had lost Richard Bowling on 9 December and remembering also that one year and 3 months previous we lost Richard Erhard - for whom both of which this award is named.

This award honors two of our very special colleagues: "Rick and Dick" as they were known.

I was fortunate to have met both of these individuals in my professional life. Rick only in introductions; Dick at many conferences and social gatherings over the years. I unfortunately did not have the opportunity to observe nor work clinically with either of these great clinicians. Many in this room I know have been exposed to their work in the clinic; I envy that of your experiences.

I have read and heard words to describe these individuals. Both were clinical and academic colleagues at the University of Pittsburgh. Both have been acknowledged for their experience in 4 areas: as clinicians, academicians, mentors, and clinical investigators.

Tony Delitto spoke of the "rippling effect" for the work that Rick and Dick did to develop a treatment-based classification system for the evaluation and treatment of low back pain, which has served as the basis to enhance evidence-based physical therapy for the management of low back pain. And we have yet another acronym in our lives: TBC.

As I reflected on these professional practices of Rick and Dick, I admit that I could not be here enjoying my 35 years in this wonderful profession without also reflecting on my experiences in these areas: patient care, mentoring, collegial support, and students.

A quote from Carl Buechner most poignantly brings these 4 areas together for me:

"They may forget what you said, but they will never forget how you made them feel."

Our PATIENTS open our eyes to their reality. They make us humble by both our capabilities and our limitations to help them. They foster our professional growth through needed self inquiry and self development. By and large, our patients feel good from our interventions and they give back to us.

Our MENTORS and our MENTORING - will never forget how you made them feel. Through our self development, many of us have sought mentors to guide and assist our growth. I have been so fortunate to have studied in the clinic with such persons as: Freddy Kaltenborn, Olaf Evjenth, Stanley Paris, and many, many others. Our mentors have made us humble and guided our inquiries beyond even their experiences. They made us feel good about our growth and future.

Mentoring as a vision is embedded in residency and fellowship training. These programs have shown a tremendous growth within the ABPTRFE credentialing process. We may not remember what was said pre-1978 about postprofessional development, but we know it is here to stay as witnessed at the Recognition Ceremony last night. We all feel good about this achievement.

Our COLLEGIAL RELATIONSHIPS "will never forget how you made them feel."

Our colleagues have guided us and developed our practices. We have covered for each other in the clinic during absences. We have dialogued on patient decision making. I have worked with many of you in this room at various levels of my professional development. I am so proud to be able to reflect on these experiences. I thank all of you.

Our STUDENTS will never forget how we made them feel, and may not remember what we said. Our students challenge us to "get down" to their levels. They foster our needs for higher standards of clinical application and academic premises, enhance our reasoning skills, and challenge our metacognition abilities for honesty and integrity to professional endeavors.

By accepting this award, I also accept the responsibilities bestowed by Rick and Dick to enhance our profession with clinical excellence through inquiry directed at improving clinical performance and excellence.

In closing: You may not remember what I said here tonight, BUT trust me that you have all made me feel great.

2011 CSM AWARD WINNERS

(continued from page 105)

Criteria for selection of the George J. Davies – James A. Gould Excellence in Clinical Inquiry Award:

1. The importance of the contribution of the manuscript to the clinical practice of orthopaedic or sports physical therapy.
2. The importance of the clinical topic addressed in the manuscript.
3. The clinical practice implications derived or suggested from the manuscript.
4. The quality of the writing.
5. The clarity of the clinical information/ data presented.

Book Review

Michael J. Wooden, PT, MS, OCS
Book Review Editor

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

Pharmacology for Physical Therapists, Elsevier Inc., 2006, $59.95
ISBN: 9780721609294, 503 pages, Soft Cover

Editor: Gladson, Barbara, PhD, PT, OTR

Description: The authors present a primer on pharmacology as it relates to the practice of physical therapy. Information is presented using a systems approach and emphasis is placed on medication and its effect and contraindications with exercise. Unique aspects of the book include reader access to a companion website for additional resources and a free six-month subscription to a popular Internet drug reference (***Mosby's Drug Consult***). **Purpose:** Basic principles of pharmacology are introduced to educate the physical therapist on how medications can affect patient response to exercise. The authors attempt to present a blend of basic science and clinical relevance to the engage the primary target audience of physical therapy practitioners and students in training. This goal is a valid one and the authors are successful. **Audience:** As the title clearly states, the book was written for physical therapists. All of the discussion questions at the end of each chapter and the writing throughout refer to patient scenarios that physical therapists may encounter. The authors are all physical therapists with doctoral degrees who have appointments in physical therapy programs. Features: The first of the book's 10 sections presents principles of pharmacology, encompassing the development and regulation of drugs, mechanisms of action, and how drugs affect the body. There is also a separate chapter on adverse drug reactions. Sections two through nine are organized into systems (ie, cardiovascular, gastrointestinal, neurologic systems, etc). In addition, some sections uniquely include discussions on pain management, drug treatments for anxiety and depression, infectious disease, and chemotherapy and immune system response. Section 10 covers the interactions that can occur between drug therapy and exercise. Appendix A provides the reader with instruction on how to use the PDR while Appendix B highlights credible online resources for drug information. Appendix C provides a listing of generic and trade names for commonly used drugs. Clear and crisp illustrations are used throughout, many of which relate to the actions of drugs on target tissues. The reader with only a rudimentary knowledge of chemistry may find some figures hard to follow. Each of the chapters is concisely written and is relatively short in length. Case activities at the end of many chapters do a nice job integrating clinical relevance and will aid readers in applying specific aspects of the basic science information. **Assessment:** This book is well written, clearly organized, and rivals some of the other books written for this audience. What the book may lack in detail is made up for by its organized presentation and the inclusion of clinical scenarios. In this regard, even more clinical emphasis would further strengthen the book as a valuable resource. I recommend the book for physical therapists who need a resource that is not so steeped in the basic science underlying medical drug prescriptions, but attempts to show the impact of drug therapy as it directly relates to the care they will provide.

Christopher James Hughes, PT, PhD, OCS, CSCS
(Slippery Rock University)

Cram's Introduction to Surface Electromyography, 2nd Edition, Jones & Bartlett Learning, 2011, $96.95
ISBN: 9780763732745, 412 pages, Soft Cover

Editor: Criswell, Eleanor, EdD

Description: The cornerstone to this introduction to surface electromyography (SEMG) is the electrode atlas in part II, which will assist clinicians with where to place electrodes and what to expect to see at a given movement for a wide variety of muscle actions. **Purpose:** The purpose is to introduce the principles and practices of SEMG to clinicians wishing to use SEMG for patient or client care. **Audience:** This book is intended for beginners who would like to learn and use SEMG as well as advanced professionals who want to deepen their knowledge of SEMG. The audience includes physical therapists, occupational therapists, biofeedback trainers, behavioral medicine practitioners, psychologist, dentists, chiropractors, biomedical engineers, exercise physiologists, and complementary and alternative medicine practitioners. Although the book is most suitable for beginners, it is written well for all clinicians, and advanced SEMG clinicians may find the electrode atlas a very valuable resource. The two authors are distinguished in the field of SEMG, and John Basmjian, DC, MD, FRCP, FRCPS, considered the father of SEMG, contributed the foreword. **Features:** The 17 chapters in the second edition include 13 of the original chapters, the atlas, and the appendixes. Chapter 14, on the "Past, Present, and Future," has been rewritten to reflect progress in the field and new chapters by Jeffrey Cram, Maya Durie, Eleanor Criswell, and Marek Jantos have been added. This edition has an emphasis on somatics. Part I covers the basics of SEMG, including its history, advantages and disadvantages, anatomy and physiology, instrumentation, electrodes and site selection strategies, general assessment considerations, static assessment and clinical protocol, emotional assessment and clinical protocol, dynamic assessment, treatment considerations and protocols, and documentation. Each chapter ends with questions, the answers to which can be found in the back of the book. The book describes SEMG instrumentation very well, explaining the source of SEMG, impedance, differential amplification and common mode rejection, and filtering and quantification of the SEMG signal, and includes excellent figures of SEMG for each topic. The addition of a checklist for SEMG instruments is helpful for clinicians evaluating various SEMG models. The authors point out the importance of the reliability and validity of the data, noting "Inaccurate data are always worse than worthless, because the practitioner and the patient may draw conclusions from the data that are not warranted." The chapter on static/postural assessment using SEMG is excellent, with the authors suggesting different ways to treat muscles depending on the SEMG findings. However, the treatment interventions have no references and would have been strengthened by better research vs. clinical opinion. The electrode atlas, used to describe placement of electrodes in many muscle groups for SEMG, would be more helpful for clinicians if the validity and reliability data was included with each test. **Assessment:** This is an extremely useful introduction to SEMG for clinicians. Advanced SEMG clinicians

may find the instrumentation checklist and electrode atlas attractive. It is clearly written for all readers, despite the sophisticated subject matter. The electrode atlas, equipment checklist, SEMG examples, and references for more in-depth reading are invaluable. The second edition also offers expert opinion from these distinguished authors. I would highly recommend this book for all clinicians wanting a clear, concise book on SEMG.

Daryl Lawson, PT, DSc (Elon University)

Primary Care for the Physical Therapist: Examination and Triage,
Elsevier Inc., 2005, $74.95
ISBN: 9780721696591, 381 pages, Hard Cover

Editor: Boissonnault, William G., PT, DHSc, FAAOMPT

Description: This book introduces the physical therapist clinician to the concepts underlying the practice of primary care in physical therapy. **Purpose:** According to the author, the book is intended to serve as a supplemental resource to other books and research publications related to the preparation of therapists assuming their role in the primary care model of health. In today's health care environment this book is needed and the author's objectives are met. Audience: It is written for physical therapy students and experienced clinicians alike. The author is a scholar and physical therapist and is well qualified to write the book as are the coauthors of each chapter. **Features:** The book's 18 chapters are divided into five major sections. The four chapters in section 1 provide a very good overview of primary care medicine and topics related to effective practice. These include evidence-based exam skills, the patient interview, and cultural competence. The next two sections (chapters 5-11) deal specifically with systems review and examination techniques with a patient case presented at the end of the section to reinforce the material. The coverage of concepts in this section is concise and well organized. Section four discusses care for special populations, including adolescents, obstetric patients, the work injured population, and geriatric patients. Even though each of these populations deserves a complete book of its own, the authors of these chapters were able to highlight the unique treatment considerations of each population and the content fit the theme of the book. Section 5 deals with clinical medicine and covers pharmacology, diagnostic imaging, and laboratory tests and values. This information is included to assist the therapist in understanding the role of each of these components in the diagnostic process. This in turn can enhance a physical therapist's communication with other healthcare professionals in a multidisciplinary healthcare system. Overall, each section contains effective figures, diagrams, and schematics and makes good use of tables to keep information easy to understand. The only shortcoming of the book is its brevity, but the author's intent was to provide a supplemental text that would complement other sources. In addition, there is a companion website for students and instructors which includes an image collection, PowerPoint slideshows, patient cases, web links, and examinations. **Assessment:** This book fills a real need in the educational training of physical therapists. The content is suitable for students learning physical therapy as well as seasoned clinicians who would like to enhance their treatment skills for practice in today's changing healthcare system. I strongly recommend the book because it provides a nice overview of the model of primary care delivery and how the physical therapist can be an integral part.

Christopher James Hughes, PT, PhD, OCS, CSCS
(Slippery Rock University)

Orthopaedic Physical Therapy Practice
Instructions for Authors

Christopher J. Hughes, PT, PhD, OCS, Editor
Sharon L. Klinski, Managing Editor

1. *Orthopaedic Physical Therapy Practice (OPTP)* serves as a publication option for articles pertaining to clinical practice as well as governance of the Orthopaedic Section and corresponding Special Interest Groups (SIG). Articles describing treatment techniques as well as case studies, small sample studies and reviews of literature are acceptable. Papers on new and innovative technologies will also be considered for publication. Language and format of articles should be consistent with the *Guide to Physical Therapist Practice*.

2. Manuscripts should be reports of personal experiences and written as such. Though suggested reading lists are welcomed, references should otherwise be kept to a minimum with the exception of reviews of literature. All authors are required to sign a consent form indicating verification of original work and this form must accompany your work at the time of submission. This form can be found on the Orthopaedic Section Web site (www.orthopt.org) under the *Orthopaedic Physical Therapy Practice* link. Authors are solely responsible for proper citation of work and avoiding any issues with copyright infringement related to writing or use of images or figures. For more information on plagiarism authors may find the following resources helpful:

   http://www.plagiarism.org/
   http://www.turnitin.com/research_site/e_home.html

3. Presenting research: OPTP welcomes traditional experimental research studies as well as case reports. Studies involving human subjects must have successfully met the requirements and been approved through an institutional review board. Case reports involving 3 or less subjects must follow HIPAA guidelines in protecting the privacy of subjects. For more information access the following: http://www.hhs.gov/ocr/hipaa/

4. **Article Review Process**
   Authors will be immediately notified of receipt of document by the Managing Editor. All initial reviews are done by the Editor, Managing Editor, and also possibly a member of the advisory council of OP. Articles are reviewed in the order in which they are received. You will receive a confirmation of your submission and will be updated on the status of your work as we complete the review process.

5. Manuscripts are only accepted electronically. **Save your monograph in Microsoft Word or plain text format. If figures cannot be sent electronically then prepare the content of any original photographs and artwork for shipment.** Include a cover letter indicating author and title of the paper the photographs or artwork are to be used for. Send to:
   Orthopaedic Physical Therapy Practice
   ATTN: Managing Editor
   2920 East Avenue South, Suite 200
   La Crosse, WI 54601-7202
   Tel: 800.444.3982 ext 202
   FAX: 608.788.3965
   Email: Sharon Klinski, Managing Editor at sklinski@orthopt.org and
   Christopher Hughes, Editor at chrisjhughes@consolidated.net

More detailed instructions can be found on the Orthopaedic Section Web site at www.orthopt.org

OCCUPATIONAL HEALTH

SPECIAL INTEREST GROUP

GREETINGS OHSIG MEMBERS!

The Combined Sections Meeting February 8-12 in New Orleans offered networking and educational opportunities. It was a great conference with over 9,000 in attendance! OHSIG activities included educational programming, an OHSIG Board Meeting, and the OHSIG general Business Meeting. If you were unable to attend, here are a few updates for you.

Introducing New Officers
Lorena Pettet, VP/Ed Chair
Jill Galper, Nominating Committee Member
Kevin Svoboda, Membership Committee Chair

Current OHSIG Officers
Margot Miller – President
Lorena Pettet – Vice President/Education Chair
Rick Wickstrom – Practice and Payor Relations Chair
Sandy Goldstein – Communications Chair
Kevin Svoboda - Membership Chair
John Lowe – Nominating Committee Chair
Perry Brubaker – Nominating Committee Member
Jill Galper – Nominating Committee Member
Gwen Simons – Advisor
Bill O'Grady – Ortho BOD Liaison

CSM Programming: Every Day Excellence in Workers Compensation: Preventing Needless Disability, Peer Review Gems, Guidelines and Practical Considerations

This 3-hour program was designed to increase physical therapists and physical therapist assistants' effectiveness in the area of worker rehabilitation. The program covered the latest work rehabilitation guidelines, practice strategies for preventing needless disability, and documentation to quickly and easily demonstrate appropriate care. Various stages of the work comp cycle were discussed, in addition to return to work planning and payment/policy methodologies.

We thank the speakers for sharing their expertise including John Lowe, PT; James Hughes, PT; Nicole Matoushek, MPH, PT, CEES, CEAS; and Chris Juneau, PT, DPT, ATC, EMBA. They offered great insights related to providing work rehab services.

Petition for Specialization in Occupational Health PT

The petition has been submitted to ABPTS. We will share updates as we can. Hats off to the OHSIG BOD for this effort!

Guidelines Update

The Work Rehabilitation Guideline was presented in draft form at CSM. We are hopeful this will be available for members soon; watch for updates. Rick Wickstrom is leading the effort on revising the Ergo guideline; the Ergo Taskforce met at CSM.

Occupational Informational Development Advisory Panel (OIDAP)

We continue to provide feedback to OIDAP (Occupational Information Development Advisory Panel). Rick Wickstrom has spearheaded this effort and we thank him for his continued work.

Need Authors

If you are interested in submitting an article for *OPTP*, please let us know. You can talk with any one of the OHSIG BOD members. We thank Nicole Matoushek, MPH, PT, CEES, CEAS, for her contribution to this issue, *Peer Reviews: Empower Yourself, Improve Your Treatment Outcomes & Reimbursement!* Nicole has over 18 years of experience in physical therapy and the workers' compensation industry. She currently is VP at Align Networks. She can be reached at www.AlignNetworks.com.

Member Involvement

Our goal for this year is to increase the opportunity for member involvement in OHSIG committees and activities. We believe we are stronger through member involvement. We look forward to working with more of you this coming year! We'd love to hear from you. Contact any of the Board members with your ideas/input. You can find the officer listing on the Orthopaedic Section Web site, under Special Interest Groups.

Professional Regards,
Margot Miller PT
OHSIG President

PEER REVIEWS: EMPOWER YOURSELF, IMPROVE YOUR TREATMENT OUTCOMES & REIMBURSEMENT!

By Nicole Matoushek, MPH, PT, CEAS, CEES

INTRODUCTION

If you are reading this article, you most likely treat patients in the workers' compensation sector and you likely have been involved directly with a Payor representative or Peer Reviewer. This article will discuss how to improve your clinical outcomes and treatment efficiencies, increase your referral stream, and how to potentially increase your reimbursement under the various managed care programs in this industry. This article also offers perspective to better understand the Payor community's goals; why Peer Review is performed; and how you can improve

the Peer Review experience to benefit you, your patient, and your client (referral source).

As frustrating as it may be to be called away from treating patients to speak on the phone with a workers' compensation Payor representative or Peer Reviewer, or re-do your clinical documentation for them, it is important to understand that you too have something to gain from the experience. If you pay attention to these concepts in this article you will: improve your treatment efficiencies, provide documentation that is useful and objective, provide evidence of the need for continued skilled care, and in some instances improve your reimbursement for services rendered.

THE APTA'S POSITION ON PEER REVIEW

A great starting point when learning about the rules of Peer Review is the American Physical Therapy Association (APTA). The APTA provides Peer Review guidelines for use by the insurance industry. The intent of these Peer Review Guidelines is to facilitate reviews of claims submitted by physical therapists for physical therapy services and to enhance the understanding of reimbursement issues related to physical therapy.[1]

The APTA Guidelines for Review of Physical Therapy Claims has 6 categories.[1] As a treating therapist, you should be familiar with these categories and be prepared to discuss, defend, or provide additional documentation regarding any of these categories. The 6 categories and the concepts covered under each category are:

- General: examination, physical findings, impairments associated with condition, interventions, treatment frequency and duration, progress, goals, and treatment planning
- Referral Process: state laws, direct access, direction of care concepts
- Documentation: objective and useful clinical notes, comply with APTA standards
- Interventions: palliative treatments, active regimens, continuance beyond plateau
- Provider Credentials: provided by licensed PT/PTA, any sanctions
- Billing Statements: bill codes/CPT codes, dates correspond to services rendered

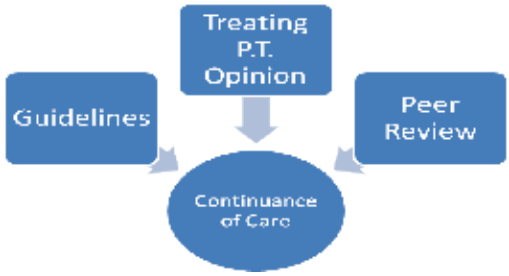
TYPES OF PEER REVIEWS

There are traditionally two types of peer reviews in the workers' compensation industry, a Retrospective Review and a Prospective Review. The Retrospective Review is performed on therapy cases where care has already been provided. This type of review is performed to assess and determine any evidence for ongoing care, determine medical necessity, to identify the appropriateness of care provided, or to identify clinical plateau. This review type can also be used for retro bill review to make reimbursement determinations. The second type of review is the Prospective Review. The Prospective Review is performed on cases where care is ongoing. This review seeks to clarify treatment progress, goals, plan, or rationale for ongoing treatments. It is frequently performed when treatment exceeds published Clinical Guidelines or re-authorization period.

PEER REVIEWS USED TO HELP DETERMINE TREATMENT DIRECTION

Peer Reviews are often used by the Payor or Managed Care Organization to authorize additional treatment or help in clinical decision making processes. In the context of this article, the Payor may be considered the claims adjuster, Case Manager, therapy management network, Peer Reviewer, or other stakeholder. Specifically, the Payor is seeking to clarify clinical status by securing more objective documentation on therapy treatments and patient status. Peer reviewers need to understand physical therapy better than they do, which is where therapists can be an asset. Our assistance can lead to better clinical decision making as well as help peer reviewers determine treatment direction. For example, the Payor may wish to identify or verify clinical plateaus; this should be seen as an opportunity to modify your treatment plan to better fit individual patient needs or the specific goals of the Payor or employer. Next, the Payor may seek clinical rationale for treatment that is in excess of recommended Clinical Guidelines, to verify additional treatment as part of their recertification or reauthorization process, or to identify clinical outliers, which are patients who have a co-morbidity that supports slower than expected progress or longer than expected treatments. Lastly, they may seek to identify opportunities for specialty Return to Work programs such as a Work Hardening, Work Conditioning or Work Transition program, or even a Functional Capacity Evaluation.

Remember, Physical Therapists (PTs) are the experts in identifying eligible candidates for RTW programs; payors rely on us for this expertise! Recall this statement from the APTA regarding the input of the treating therapist regarding clinical decision making: "The public is best served when decision about initiation, continuation, and discontinuation of physical therapy services includes the judgment of the physical therapist who has actually examined, evaluated, and diagnosed the patient."[2]



THE MIND SET OF THE PEER REVIEWER

It will benefit you if you understand how the Peer Reviewer is thinking. Take a moment to think about what they are trying to achieve. The Peer Reviewer has one foot in clinical practice and one foot in managed care and is continuously seeking ways to bridge this gap. I recall being questioned by my PT peers when I left clinical practice and entered the world of Peer Review and managed care. They called me a traitor for going to the dark side. I responded with my very strong belief that I was now able to improve my clinical skills in a different way and also improve the clinical skills of all the therapists I was in

contact with that allowed me to *serve the profession in a much larger way*. These Peer Reviewers are not your enemies; they are just like you, on your side and always seeking to serve the therapy profession in the grandest way they can.

The Peer Reviewer is serving the PT community by educating and enforcing clinical management philosophies of published, evidence-based guidelines. For example, the Peer Review will be looking for opportunities to apply and enforce clinical management philosophies as per the ***APTA Guide for Professional Conduct***, including the following key concepts:

- A physical therapist shall exercise sound professional judgment.
- A physical therapist shall be responsible for the evaluation, diagnosis, intervention, re-examination, and modification of the plan of care; and the maintenance of adequate records, including progress notes.
- A physical therapist shall determine when a patient will no longer benefit from physical therapy services.

Additionally, the Peer Review will be looking for opportunities to apply and enforce clinical management philosophies as per Official Disability Guidelines (ODG), including the following key concepts from the ODG:

- As time progresses, therapist should provide an increase in active regimen of care, decrease in passive treatments.
- Home Exercise Program (HEP) compliance and progression- HEPs should be given day one and updated as patient progresses; this ultimately prepares the patient for the independence from the need for continued therapy.
- Wean visits over time- 3x, 2x, 2x, 1x /week, as opposed to 3x4 weeks for all patients as they improve and don't require frequent hands on interventions.
- Patients should be reassessed at regular intervals (6 visits, 2-4 weeks).
- When treatment duration/visits exceed recommended guidelines, provide objective clinical rationale for continuance of care, note exceptional factor/clinical outlier/co-morbidities.

THE PEER REVIEW PROCESS IS MUTUALLY BENEFICIAL: HERE IS HOW YOU CAN IMPROVE THE PROCESS

The Peer Review process should be a mutually beneficial and positive experience. The following are tips on how you can help make it a mutually beneficial process:

- Provide clear, concise, objective clinical documentation.
- Support your recommendations for ongoing care or RTW program with clinical evidence.
- Be open minded to a collaborative effort-listen to advice.
- Modify treatments or interventions according to shared treatment determinations.
- Understand goals of other stakeholders.
- Bill appropriate CPT codes that reflect care provided.
- Ensure documentation supports billing/CPT codes.
- Become familiar with your state Work Comp laws and regulations.
- Become familiar with your Payor's philosophy in treatment oversight and management.

Peer to peer discussions can be empowering and effective. Below are 10 easy to follow steps that will help you to improve the Peer Review process so that all parties win!

10 Steps to Improve Peer Review Process

1. Have the patient's chart available.
2. Know what your treatment plan and goals are.
3. Have good communication with the treating physician.
4. Create inherent flexibility into your treatment plan: for example, when you receive "Eval and Treat" orders, deviate from the standard "3x4 weeks" treatment plan; instead use "1-3 x 2-4 weeks;" then provide care based on the needs of the individual patient and get the physician sign off.
5. If the patient is not progressing, it's ok! Speak up! Contact adjuster, MD, CM, referral source.
6. Have a thorough understanding of the patient's work duties and physical limitations; request a job description if you are not familiar with the essential job demands.
7. Make sure the services you provide are skilled and the patient is progressing towards therapy and work goals.
8. Do not feel threatened or under scrutiny; do not be defensive; rather think of it as two master minds coming together for a collaborative plan.
9. Ask the peer reviewer for their insight and expertise; the reviewer can help provide information to solidify treatment plan recommendations.
10. Answer all of the questions of the reviewer.

SUMMARY

All stakeholders involved in the workers' compensation claim (adjuster, Case Manager, Peer Reviewer, Payor/Network) have something to gain, including you! Respect the timelines and requests for additional information; this empowers the Payor to make better decisions about continuance of care. Remember, they may not be a therapist and may not understand therapy or your documentation. When you help them, they will help you, and this ultimately helps your patient. Finally, Peer Reviews should have the *goal of a noncontentious clinical care dispute resolution–we are all on the same team!*

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Nicole Matoushek has over 18 years of experience in physical therapy and the workers' compensation industry. She currently is VP at Align Networks. She can be reached at www.AlignNetworks.com.

PERFORMING ARTS

SPECIAL INTEREST GROUP

GREETINGS FROM THE PASIG!!

I would like to take the opportunity to introduce myself, Julie O'Connell, as the new President of the PASIG. I will be serving a 3-year term and will strive to provide great leadership to our group. The Performing Arts Special Interest Group (PASIG) held our annual business meeting during CSM this year. The minutes of the meeting are included in this newsletter.

I would like to thank our outgoing board members. **Leigh Roberts** served 3 years as President and provided tireless leadership to our SIG. She will be continuing to participate with us as she contributes to her work on the PASIG Resource Center. **Jason Grandeo** will be leaving us as the Nominating Committee Chair. Thank you for your time and contributions to the PASIG.

Congratulations to our newest Board members: Kendra Hollman-Gage as the incoming Nominating Committee chair and Amanda Blackmon as a Nominating Committee member.

Lisa Donegan-Shoaf will continue to serve as our Vice President/Education Chair, **Amy Humphrey** as our Scholarship Committee Chair, and **Shaw Bronner** as our Research Committee Chair. We look forward to a strong year with this excellent leadership.

We are excited about our PASIG Resource Center that is located on the Orthopaedic Section Web site at http://www.orthopt.org/sig_pa.php. We are looking for contributors to our Research Committee citation blasts so please reach out to Shaw Bronner at sbronner@liu.edu by April 1, 2011. Please check out our Independent Study Courses including 20.3 Physical Therapy for the Performing Artist that was released in September 2010 and 18.3 Dance Medicine: Strategies for the Prevention and Care of Injuries to Dancers.

Sincerely,
Julie O'Connell

Leigh Roberts presenting the PASIG Student Research Award to Kari Oki, University of Southern California. The title of her poster presentation at CSM 2011 is "Achilles and patellar tendon morphology in young dancers with and without tenalgia."

PASIG BUSINESS MEETING MINUTES

February 12, 2011
Combined Sections Meeting, New Orleans
Meeting began at 7:05 a.m.
Meeting adjourned at 7:30 a.m.

I. Approval of Minutes from last meeting
- a. Motion by Shaw Bronner and second by Amanda Blackmon.
- b. Minutes were approved

II. Budget for 2011-
- a. $2500 total
  - i. $1250 for support to officers/committee chairs to attend CSM
  - ii. $260 Web site updates/database
  - iii. $400 for Student scholarship
  - iv. $450 Conference calls
  - v. $40 Outgoing officer plaques
  - vi. $100 for President/VP retreat
- b. Motion to approve budget

III. Committee Chairpersons Appointed
- a. Scholarship Committee – Amy Humphrey, PT, DPT, OCS
- b. Nominating Committee – Kendra Hollman- Gage, PT, DPT
- c. Research Committee – Shaw Bronner, PT, PhD, OCS
- d. Public Relations – Open
- e. Practice - Open

IV. Committee Reports
- a. Scholarship Committee-Leigh Roberts (as Amy Humphrey was not in attendance)
  - i. 2011 award to Kari Oki from the University of Southern California. The title of her poster presentation is, "Achilles and patellar tendon morphology in young dancers with and without tenalgia."
- b. Research Committee- Shaw Bronner
  - i. Citation Blasts
    1. 57 Citation Blasts have been E-mailed to date since 2005.
    2. Contributors in 2010: Matt Gannott, Jeff Stenback, Brooke R. Winder, Amanda Ting, Danielle Krynicki, Justin Zelenka, Michelle Ziegler, and Shaw Bronner.
    3. Topics in 2010: Gymnastics, Accessory Bones of the Foot, Osteochondroma of the Proximal Fibula, Bone Health in Gymnasts, Cuboid Subluxation, Extensor Hallucis Longus Laceration, Peroneal and Tibial Nerve Entrapments, Pilates Training, Stage Fright/Performance Anxiety, Effects of Static Stretching and Warm-up Protocols on Performance, and Psoas Major Function.
    4. Sign-up to provide a citation blast by April 1, 2011 to Shaw Bronner at sbronner@liu.edu.
  - ii. Glossaries
    1. At CSM 2010, over 10 subjects were identified for glossaries. To date, 3 have been submitted and posted on the PASIG Web page: ice skating, artistic gymnastics, and hip hop dance.
    2. Glossaries Needed in 2011 - PLEASE SIGN UP FOR TOPIC.
- c. Education Committee-Lisa Shoaf
  - i. Independent Study Course entitled "Physical Therapy for the Performing Artist" was released in September 2010. Topics include Figure Skating, Artistic Gymnastics, and Instrumental Musicians.

d. Nominating Committee-Leigh (as Jason Grandeo was not in attendance)
   i. Outgoing Officers
      1. Leigh A. Roberts, PT, DPT, OCS –President
      2. Jason Grandeo, PT, DPT, OCS – Nominating Committee Chair
   ii. Election results

CSM BOARD OF DIRECTORS MEETING MINUTES

(continued from page 99)

of an in depth review process of CSM. The process for the review will be discussed and presented to the Section Presidents for approval.

The Board discussed potential issues with CSM being in Chicago in 2012. The Section will need a strategy to ensure the meeting runs as smoothly as possible. Beth Jones will keep the Board informed as programming and information from APTA becomes available.

The January 24, 2011 Board of Directors Conference Call Meeting minutes were approved as printed.

Following are the dates and times for the Spring Semester Board of Directors Conference Calls the second Monday of every month beginning at 8:00 PM EST-

✓ March 14, 2011
✓ April 11, 2011
✓ May 9, 2011

=MOTION 12= Amie Hesbach, ARSIG President and Carrie Adamson, ARSIG Vice President, moved that the Orthopaedic Section Board of Directors –

1) …change the name of the Animal Rehabilitation Special Interest Group (ARSIG) to the Animal Physical Therapy Special Interest Group (APTSIG).

2) …approve that the ARSIG/APTSIG, OS, and APTA refer to the practice of "animal rehabilitation" by physical therapists and physical therapist assistants to "the field of physical therapy in animal rehabilitation." POSTPONED INDEFINITELY (unanimous)

Fiscal Implication: None

Bill Bossionnault, Foundation for Physical Therapy President and Barbara Malm, Foundation for Physical Therapy Executive Director, gave an update on the Orthopaedic Section Foundation Agreement Concerning Funding of Research Grants and Projects -

- The Section was congratulated on receiving the 2011 Premier Partner in Research Award.
- There has been no action with the corporate donor who expressed interest in contributing to the Section's research fund.
- A referral for profit study was chosen as the top need from Sections from the survey sent out by the Foundation requesting feedback for their research initiative. This will be investigated to determine what kind of funding is needed to accomplish this. The Private Practice Section has agreed to fund the request for proposal. The Orthopaedic Section will be asked to help fund the study at some point. Funding needs for this project may range from $500,000 to $1 million. This is part of what will come out of the FRP development.
- James Irrgang asked if the Foundation would consider partnering with the Section on our clinical research network project. The Section was encouraged to submit a proposal for the Foundation to consider. The next Board meeting of the Foundation where a proposal could be discussed is in June at the APTA Annual Conference.

James Irrgang, President, reported there were no items for the consent calendar.

James Irrgang, President, reported the following motions were adopted unanimously via e-mail - None.

The following items were presented as part of the President's updates -

- Steve Clark, Treasurer, reported the Section's reserve fund is at 84% after moving an additional $145,000 from checking into reserves.
- National Orthopaedic Physical Therapy Outcomes Database Update was presented by James Irrgang. Criteria for collecting data on Neck Pain was discussed. The Board agreed to add a training component for clinicians on filling out the form. The Board was asked to submit comments to James as soon as possible.
- Elected Officer Qualifications Task Force recommendation discussion from the January Board conference call was continued.

=MOTION 14= James Irrgang, President, moved that the Orthopaedic Section Board of Directors approve the attached policy on elected officer qualifications. ADOPTED (unanimous)

Fiscal Implication: None

=MOTION 15= Beth Jones, Education Committee Chair, moved that the Orthopaedic Section Board of Directors approve Kevin Lawrence for another 3-year term as Education Committee Member beginning 2011. ADOPTED (unanimous)

Fiscal Implication: None

=MOTION 16= Beth Jones, Education Committee Chair, moved that the Orthopaedic Section Board of Directors appoint Nancy Bloom as a new member to the Education Committee for a 3-year term beginning 2011. ADOPTED (unanimous)

Fiscal Implication: None

=MOTION 17= Steve Clark, Treasurer, moved that the Orthopaedic Section Board of Directors approve the proposal submitted by Per Mar Security Systems for a Managed Access Control (FOB) System for the Section office building. ADOPTED (unanimous)

Fiscal Implication: $1,500 installation fee plus $15/month service agreement along with applicable taxes.

The meeting adjourned at 10:35 AM CST
Submitted by Terri DeFlorian, Executive Director

PAIN MANAGEMENT

SPECIAL INTEREST GROUP

PRESIDENT'S MESSAGE

President: John E. Garzione, PT, DPT, DAAPM (2011-2014)
Vice President: Marie Hoeger Bement, PT, PhD (2011-2014)
Nominating Committee: Neena Sharma, PT, PhD (2010-2013)
Bernadette Jaros, PT (2010-2012)
Research Chair: Joel Bialosky, PT, PhD (2011-2014)

WOW, if you have read any other information about this year's CSM in New Orleans, you have heard that it was the biggest meeting ever. The down side was that we froze our nay nays (no, that's not a new anatomical term) off walking between the Hilton and the Conference Center due to the unseasonable cold. The programming was excellent, as usual, and I want to personally thank the Education Committee for their fine work. The Ortho Section staff of Terri DeFlorian and Tara Fredrickson, as well as the Orthopedic Section BOD, went above and beyond to continue to make this meeting a huge success.

The SIG business meeting minutes are enclosed in this newsletter.

Our program titled, "Enhancing Clinical Practice through Psychosocial Perspectives in the Management of Low Back Pain" presented by Julie Fritz, PT, PhD; Steven George, PT, PhD; Christopher Main, PhD; and William Shaw, PhD, was well received by the 300+ attendees. This international, multidisciplinary panel consisted of authors who contributed to the PTJ special issue on psychological perspectives that will be published in April 2011. I thank these excellent presenters/researchers for their work and their informative presentation that will add to our practice of pain management.

The ISP Taskforce is busy preparing topics and speakers for the pain management home study courses that we hope will be available for purchase in the near future.

Hope you have a wonderful spring.

John E. Garzione, PT, DPT, DAAPM

PAIN SIG MEETING MINUTES CSM 2011 NEW ORLEANS

Friday, February 11, 2011

The meeting was called to order at 7:00 a.m. by John Garzione, President.

Last years' minutes were published in *OPTP* and approved.

All involved with SIG activities were thanked for their participation over the past year. Joel Bialosky was especially thanked for his contributions to the quarterly E-mail blasts. We still need more articles for the *OP* newsletter; submissions can be emailed to johngarzione@frontiernet.net.

Marie Hoeger Bement was re-elected Vice President and John Garzione was re-elected President of the SIG with both terms expiring in 2014. Thanks go to the Nominating Committee of Neena Sharma and Bernadette Jaros. Short discussion was held about the expiring terms for President and Vice Presidents at the same time. Since the group is still small, it was decided to leave the term limits as they stand for now unless that poses a problem in 3 years.

Two conference calls were held last year to discuss ISC course titles. The members felt that doing the ISC courses should be pursued, but a pain management subspecialty examination should be tabled at this time. Neena Sharma requested to be included in the conference call list.

ISC course topics were discussed and the course committee members will be asked by E-mail for course topic suggestions for submission to ISC Editor, Chris Hughes. Some suggestions were: Basic Neurosciences, Pain Mechanisms, Interventions, Pain Assessment, Neuropathic Pain, Central Pain, with more topics to follow. The E-mail will also include an attachment of the "instructions to authors." (John G. will do this.)

Facebook Posts: John Ware volunteered to submit monthly posts from the PMSIG to the Ortho Section's Facebook page.

The consensus of the meeting attendees was that since pain encompasses all areas of physical therapy, the SIG is interested in bringing new information of pain education to all Sections.

The meeting was adjourned at 7:45 a.m.

Respectfully submitted by John E. Garzione, President

What and Who is the "Difficult" Patient? The Role of Stress and Central Sensitization in Persistent, Widespread Musculoskeletal Pain

John Ware, PT, MS, FAAOMPT

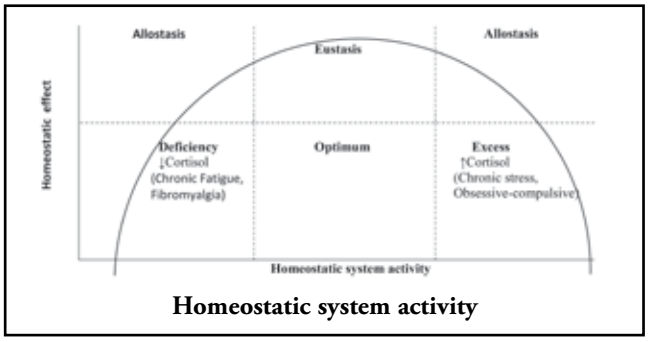
Physical therapists who use manual techniques for patients with musculoskeletal pain problems are particularly aware of the multiple manifestations and complexity of persistent pain. The variability in responses to manual techniques for painful conditions is evident on both a casuistic level as well as in outcomes studies on randomly sampled populations of patients. To wit, despite recent findings validating the beneficial effects of spinal manipulation for patients with acute low back pain,[1] results on nonsurgical treatments for patients with chronic, nonspecific low back pain (CNSLBP) have demonstrated small effect sizes, at best.[2] Recently, Wand and O'Connell[3] have suggested that our approach to the problem of chronic pain from a biomechanical/biomedical perspective resulting in classification schemes that are based in patterns of defects or impair-

ments in biomechanics may be misdirected:

> CNSLBP patients have back pain yet no conservative or surgical pain relieving measures directed at the back appear effective. They display a number of biomechanical abnormalities, however, treatment directed at normalising lumbar biomechanics has little effect and there is no relationship between changes in outcome and changes in spinal mechanics. Finally, these patients demonstrate some psychological problems but psychologically based treatments offer only partial solution to the problem. A possible explanation for these findings is that they are epiphenomena, features that are incidental to a problem of neurological reorganisation and degeneration.

These authors make a plausible and well-referenced argument that a persistent, nonpathological pain state such as CNSLBP is a manifestation of aberrant cortical processing in the brain as opposed to a collection of peripheral impairments in strength, flexibility, posture, or body mechanics. Evidence showing that the best predictors of chronic musculoskeletal pain and disability are psychosocial in nature[4] supports the idea that biomechanical manifestations of persistent pain may actually exist as defensive, albeit maladaptive, strategies of a homeostatic system struggling to cope with a multitude of intrinsic and extrinsic stressors.

A recent review by Chrousos[5] details the dominant physiological processes in play when the human organism is under stress. He describes the neurophysiological pathways exerted by neuroimmune processes in the brain's hypothalamic-pituitary-adrenal (HPA) and the locus ceruleus-norepinephrine (LC-NE) axes, which are responsible for producing an appropriate response to internal and external stressors. A modified version of a figure from the Chrousos paper[5] is provided below to illustrate how suboptimal effects can lead to either deficient or excessive adaptation, along with examples of each condition's common clinical diagnoses:



Homeostatic system activity

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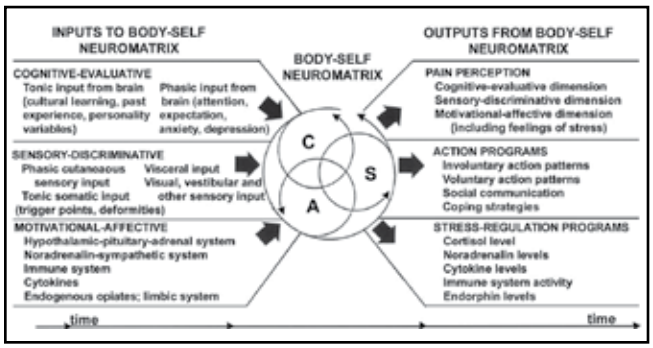
The inverted U-shape curve depicts how homeostatic system activity exerts influence on complex homeostatic effects, and graphically shows the dose-dependent relationship of activity to these effects. The consequences of maladaptive responses to stress are maladaptive disorders and diseases that physical therapists often encounter due to their involvement in the treatment of patients with persistent musculoskeletal pain complaints.

One of the complex effects exerted by the stress system is the release of inflammatory mediators, including a variety of cytokines, neuropeptides, prostaglandins, and leukotrienes.[6] This results in the production of what has been termed an "inflammatory soup"[7] at the site of injury, or actually within tissues where injury--or a danger threat--is perceived. Therefore, from the biomedical/biomolecular perspective, it could be argued that all pain is ultimately "inflammatory" in nature, although different pain syndromes will display a distinctive "inflammatory" biochemical profile.[6]

In addition to these cellular and humoral processes, however, many behavioral responses, including fear and/or anger, are also triggered through the HPA/LC-NE axes. One of these is a motor response. According to Melzack's neuromatrix theory,[8] part of the behavioral response to a painful stimulus includes an "Action Program" as depicted here in the "Neuromatrix Diagram:"



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An appropriate motor response is part and parcel of the adaptive return to eustasis, as described by Chrousos.[5] An aberrant motor output then is another consequence of the persistent pain state, which is of particular interest to the physical therapist (PT) since it is the neuromusculoskeletal system that produces movement and that PTs are uniquely trained to treat. The "Sensory-Discriminative" class of input midway down on the left side of the neuromatrix diagram is ostensibly what physical therapists are trying to affect with manual and movement therapies. If the therapist can introduce some novel input that the brain does not perceive as nociceptive, then it may sense no further survival threat to the organism it's charged with protecting. Furthermore, it will try to interact with itself and the new input at nonconscious levels (the brain as "self-referential hub"), which may help it resolve the maladaptive response it has marshaled against the perceived noxious threat. The "Cognitive-Evaluative" class of input at the top on the left hand side of the diagram is affected and potentially modified by education about pain and better information on how the patient might understand and cope with it. Simply understanding pain on a detached, factual level has been shown to be helpful for certain chronic pain conditions.[9] (*See footnote below for additional attribution.)

**Much of the information described here regarding the different dimensions of the pain neuromatrix was paraphrased from personal communication with Diane Jacobs, PT, Saskatoon, SA Canada.*

Thus, stress leads to normal physiological responses that in some patients can lead to aberrant reactions causing the stress system to go awry. What are the features of these patients and how can the clinicians who treat them identify them better, and perhaps gear treatments more suited to their needs? Nijs et al[10] have recently published a review that examines the process and characteristics of central sensitization (CS), which in certain patients can be considered the ultimate manifestation of the stress response run amok. However, according to Latremoliere and Woolf,[11] the initial process of CS that is predominant after trauma or surgery is distinctly different from that seen in patients with chronic/persistent pain. They describe a biochemically distinct process that is phosphorphylation-dependent in the former versus transcription-dependent in the latter, which includes the production of new proteins in the synaptic cell membrane. This explains how temporally sustained CS results in very biochemically complex structural or "plastic" changes in the nervous system. If sustained for too long (ie, beyond the time required for tissues to heal adequately), the result is the transcription-dependent form of CS, which according to these authors is mediated by sustained peripheral inflammation and nerve injury.[11(p 904)]

Nijs et al[10] continue on to describe clinically useful methods of identifying this maladaptive response to stress typical of the transcription-dependent, neuroplastic form of CS. Physical therapists are aware of several medical diagnoses that are typically associated with CS such as fibromyalgia, certain types of whiplash associated disorders, and chronic nonspecific low back pain, to name a few. However, these authors caution that the medical diagnosis alone may not be sufficient to determine the presence of CS, and current research is yet unclear on the relationship between many medical diagnoses and CS. However, certain symptoms and signs in combination with the medical diagnosis can be helpful in identifying the presence of CS. They break the symptoms down into two classes--those that are characteristic of CS and those that might be characteristic of CS:

Characteristics of Central Sensitization:

- Hypersensitivity to bright light
- Hypersensitivity to touch
- Hypersensitivity to noise
- Hypersensitivity to mechanical pressure
- Hypersensitivity to medication
- Hypersensitivity to temperature

Might be Related to Central Sensitization:

- Fatigue
- Sleep disturbances
- Unrefreshing sleep
- Concentration difficulties
- Swollen feeling, eg, in limbs
- Tingling/Numbness

Adapted from Nijs et al 2010, p 3

Clinical signs of CS can be relatively simple to identify. One of the easiest ways to identify the presence of CS is by performing pressure pain threshold testing in an area distant from the patient's primary complaint. A pressure algometer is used to identify the presence of pain below the normal threshold of 4kg/cm^2. These authors also suggest the use of a hot or cold stimulus remote from the primary site of nociception to determine hypersensitivity and potential CS. A well-researched phenomenon is the increase in pressure pain threshold associated with exercise in normal individuals. However, no change or a decrease in pressure pain threshold following exercise (through algometry) suggests CS. Finally, in this same paper Nijs et al refer to the research by separate groups studying the role of neural tension testing in various patient populations. Sterling and Kenardy[12] have found an association between the likely presence or absence of CS and measurably significant differences in hypersensivity during neural tension testing in the upper extremity. Furthermore, Coppieters et al[13] found that neurodynamic testing remained stable and reliable over a 48-hour period. Therefore, neurodynamic testing as described by Butler[14] and more recently by Shacklock,[15] may provide a valid conceptual paradigm for physical therapists to use that can meaningfully differentiate patients with or without CS based on their level of onset and submaximal pain provocation during neurodynamic testing.

In addition to metrics that directly relate to and assess the "difficult" patient's biophysical state, it has already been mentioned that psychosocial variables are known to play a significant role in the prediction of pain chronicity. What are the best ways to identify *who*, in addition to *what*, these patients are?

Several clinical assessment tools for identifying and grading pain behavior have become available to PTs over the years. One of the more widespread clinical testing schemes used is based on Waddell's classic study of non-organic physical signs in low back pain.[16] However, this particular biopsychosocial framework has been criticized for its inability to appreciate the ultimate subjectivity of the pain experience. An objective determination of psychological distress is made entirely by the clinician's discretion, which is fraught with potential contaminating variables and circular reasoning errors. In fact, Quinter et al[17] effectively critiques the entire biopsychosocial model as an explanatory theory of pain for the very reason that the ultimate "aporia" of pain makes it objectively unknowable. As Quintner et al put it:

> Our examination of the conceptual proposals generated within the biopsychosocial framework reveals that there has been no resolution of how the different domains of analysis relate to each other, let alone explain the phenomenon of pain. The exercise reflects our desire for sense-making rather than in fact making sense.[p6]

Thus, clinicians and researchers struggle in their theorizing about pain as they reason around in circles trying to make sense of the non-sense-able.

With these profound limitations in mind, ethical clinicians remain obligated to help their patients with persistent pain find relief. Several other recent patient questionnaires have been developed in an effort to understand what it is patients are trying to tell us from their aporia of pain. On one end of the conceptual continuum, they have been asked about the abstract notion of fear-avoidance beliefs,[18] and on the other more explicit end they have been asked to describe their pain with a variety of descriptive adjectives.[19]

Arguably, however, these methods fail to extract sufficient meaning or provide dialectic synthesis because they do not

adequately address the multidimensionality of the pain neuromatrix. There is a recently developed clinical tool that has undergone preliminary validation studies that shows promise for describing the patient with persistent pain from a more comprehensive, albeit evolving, perspective. The instrument is called the Pain Beliefs Screening Instrument (PBSI), and was developed by Sandborgh et al[20] in 2007. These authors suggest that, in addition to pain intensity physical therapy should be most concerned with psychological factors that are known to produce altered motor outputs, such as fear of movement/injury, self-efficacy, and catastrophizing. Such an instrument as the PBSI, which addresses these key factors related to chronic disability due to pain, is more likely to not only provide a risk profile for patients at high or low risk of disability, but also produce a detailed patient classification capable of guiding specific treatment interventions.

Manual and movement therapies for the "difficult" patients who are suffering with persistent pain have become culturally accepted practices even in advanced, industrialized societies. However, with such affluence, the potential for exploiting the "aporia" by proposing all manner of "snake oil" in order to alleviate pain and suffering can come at major financial and, at times, mortal costs. Popular news stories are frequently reported about the latest parent who refuses traditional treatment for their seriously-ill child in favor of some "miracle" remedy from "natural" substances, or some celebrity goes on television and radio extolling the virtues and life-extending capabilities of some mixture of herbs. We in the profession of physical therapy are not immune from the subtle corrupting potential of the aporia of pain. Physical therapists have embraced many techniques for the treatment of pain that have failed to stand up to scientific rigor, yet their use in clinical practice continues. Physical therapists pay large sums of money for continuing education courses to learn these techniques and gain credentials behind their names, which make claims that no scientific study, not to mention prior scientific plausibility, has been able to support. Only through ongoing rational understanding and vigorous study of the multidimensional pain experience, guided by a compassionate desire to help others, will effective and expedient conservative treatments for patients with difficult pain problems ultimately come about.

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ANIMAL REHABILITATION

SPECIAL INTEREST GROUP

MESSAGE FROM THE PRESIDENT

Is it spring yet? After my first winter in Boston, I'm reminded of the harsh, endless winters growing up in the Midwest. Fun times as a kid with "snow days," sledding, and hot chocolate, but challenging as an adult and especially as a physical therapist. It's not just about shoveling snow with proper body mechanics. How do you rehabilitate a Maltese after a cruciate ligament stabilization surgery when the snowdrifts tower over not just the dog, but also the dog's owner? When any pavement that's exposed is iced over like the TD Garden before a Bruins game? Regardless, I hope that you all had a healthy and safe winter. It was a wonderland here more days than not!

Thanks to all of those who were able to attend our programming at CSM this February in New Orleans. CSM attendance broke the records and Dr. VanDyke's lectures were very well attended. Thanks to Dr. VanDyke not only for her lectures but for being an advocate for physical therapists in animal rehabilitation.

We're looking forward to another productive year ahead. We'll soon be updating our Web page (www.orthopt.org) and more regularly updating our status on the Orthopaedic Section's Facebook page. If you have not already, you soon will receive a blast E-mail inviting you to participate in a survey regarding our legislative statement/position. This is a follow-up to our legislative luncheon from CSM 2010. Our hope is that following review of this survey by our members, we will be able to come to a consensus with regards to our SIG's position on legislation appropriate for physical therapists in animal rehabilitation. We will look forward to review of this consensus statement by the Orthopaedic Section and APTA as well.

As you are well aware, we are ALWAYS looking for volunteers. What skills can you share with other SIG members?

- Are you interested in your state's rules and regulations pertinent to a physical therapist's practice on/for animals? Volunteer to be a state liaison. Contact our practice chair/state liaison coordinator, Charlie Evans at cevans@ivghospitals.com.
- Have you treated an interesting case? Do you have a client handout that you'd like to share? Maybe a favorite exercise? Contact our newsletter chair, Lisa Bedenbaugh at LHinerman2@aol.com.
- Would you like to share what you learned when searching for research on a particular physical therapist's intervention for animals? Reviewed an article or series of articles? Ready to write up a paper for publication or an abstract for CSM posters or platforms? Contact our research chairs, Jennifer Brooks or Kirk Peck at jenequinept@charter.net and kirkpeck@creighton.edu.
- Do you have a physical therapy student in your practice? Are you looking for resources to help you to further educate that student? Contact Tammy Wolfe or Amie Hesbach at milehiwolfe@msn.com and ahesbach@ivghospitals.com.

There's always SOMETHING that can be done! Help us help our SIG!

Happy spring!
Amie

Animal Rehabilitation Special Interest Group (ARSIG) Business Meeting

APTA CSM 2011 New Orleans, Louisiana
February 11, 2011

Call to Order

Welcome

Roll Call & Introduction of 2011 Officers & Committee Chairs
Amie Lamoreaux Hesbach – President
Carrie Adamson Adrian – Vice President
Kirk Peck and Jennifer Brooks – Research Committee Chairperson
Charles Evans – Practice Committee Chairperson/State Liaison Coordinator
Cheryl Riegger-Krugh – Nominating Committee Chairperson
Jennifer Hill – Nominating Committee
Nancy Doyle – Nominating Committee
Lisa Bedenbaugh – Newsletter Chairperson
Jay Irrgang – Orthopaedic Section (OS) Liaison/ARSIG Advisor

Old Business

The CSM 2010 ARSIG Business Meeting Minutes were approved as presented.

President's Report (Amie Hesbach)

Legislative statement: There has been a motion to change the name of our SIG from "Animal Rehabilitation" to "Animal Physical Therapy," to better reflect the nature of what we do. Our SIG will continue to discuss this change with the Orthopaedic Section leadership. It was decided not to pursue a name change through the House of Delegates this year, so that more discussion and planning can take place.

Practice analysis: The data has all been collected and analysis of statistical results continues. The SIG hopes to have the results ready for members by CSM next year.

NARCA: There has been recent formation of a new group, the National Animal Rehabilitation and Conditioning Association, which invited members of the ARSIG to join.

Their mission is to work on resolving legislative issues arising around the practice of animal rehabilitation by nonveterinarians. There was discussion between members of NARCA and the ARSIG, and after consultation with the APTA, the ARSIG's position is not to currently join in, but continue our legislative efforts under the guidance of the APTA.

California: There is currently an issue arising in California that may restrict or prohibit Physical Therapists from being able to practice Animal Rehabilitation. The issue has been taken up by the California Veterinary Medical Association, which has developed a task force to examine the issues. Members representing the ARSIG/APTA will be presenting information to the task force to support the use of physical therapists treating in a collaborative manner with veterinarians. We will keep you apprised of any developments.

Clinical instructor resources: There is interest among SIG members to compile resource materials for those members who act in the capacity of clinical instructors. Tammy Wolfe and Lisa Bedenbaugh volunteered to assist in developing an outline of needed topics and begin compiling information. We welcome any other members who have an interest in assisting, or who have content that may be appropriate to add, to contact Lisa at *LHinerman2@aol.com*.

AARV (Dr. VanDyke): The American Association of Rehabilitation Veterinarians recently issued a revised position statement that included the use of physical therapists as a member of a collaborative, interdisciplinary team to provide rehabilitation to animals. They have also put out a "standards of practice" to the state Veterinary Medical Associations, recommending that in the practice of Animal Rehabilitation that there be a "veterinarian of record, who has medically cleared the animal, and that the evaluation and plan of care be initiated by a PT or vet. The ARSIG and AARV have open dialogue now, to work in a collaborative manner, and plans are in the works to try to match up state liaisons from each group, to assist with exchange of information between the organizations.

ACVSMR (Dr. VanDyke): There is a new college in the veterinary field now, the American College of Veterinary Sports Medicine and Rehabilitation. The fellows of this college would be similar to physiatrists in the human world. There has been interest from the ARSIG to discuss possible collaborative research work between ARSIG practitioners and residents in the veterinary program, in order to further advance the field of animal rehabilitation.

IAVPM: The International Association of Veterinary Pain Management is an interdisciplinary organization designed to promote education and expertise in the pain management of animals. Health care members who are interested in joining can go to www.iavpm.org for more information.

IAVRPT: Preliminary information was received that the 7th Annual Animal Rehabilitation symposium will be held overseas, possibly Austria. To keep informed on any new developments, or to join the organization, go to www.iavrpt.org.

Vice President/Education Committee Report (Carrie Adrian)

CSM 2011 - Dr. Jan Van Dyke lecturing on Veterinary Zoonoses, What You Need to Know Before You Treat That Puppy! and Veterinary Red Flags, Endocrine, Metabolic, and Medical Syndromes That Might Be Lurking in Your Canine Rehab Patient.

Educational Opportunities: CSM preconference course; potential canine rehab ISCs: Discussion of what types of continuing education would be most beneficial to our membership. Ideas of having exercises, documentation forms, and the like added to the ARSIG's Web page were brought up, as well as having an independent study course for topics such as biomechanics, zoonoses/red flags, etc. There was also discussion of having a preconference course prior to CSM for a more "hands-on" topic, such as specific manual therapy interventions. If any members have specific topics they would like to see, please contact Carrie Adrian at *carrie.adamson@vcahospitals.com*.

CSM 2012 programming ideas: Members were asked about topics of interest for next year's CSM programming. Some of the ideas brought forth for discussion included "how I treat," with a panel of several clinicians and their methodologies; "Motor control in the trunk," for both canine and equine, "biomechanical changes in geriatric and sporting dogs," "what are likely contributors to certain presentations" and "different problems/diagnoses prevalent in different breeds."

Equine clipboard - Jen Brooks has volunteered to develop an equine version of the canine clipboard sold by the Orthopaedic Section, with proceeds to benefit the ARSIG.

Practice/State Liaison Committee Report (Charlie Evans)

After the blast E-mail sent to all the addresses that we had at the time, here are the liaisons and the states they represent who have responded positively.

Alaska	Laura Culp Elliott
California	Amy Kramer
	Tanya Dorman
Florida	Stacie Brown
Georgia	Lisa Bedenbaugh
Kansas	Connie Schulte
Maryland	Steve Strunk
Massachusetts	Amie Hesbach
Nebraska	Kirk Peck
Nevada	Robyn Roth
New Hampshire	Charles Evans
	Jennifer Brooks
New Jersey	Lisa Saez
New York	Linda McGonagle
North Carolina	Sarah Bauman
Tennessee	Cassy Englert
Washington	Cindy Benson McGregor
Wisconsin	Courtney Arnoldy

Janet Steiss informed us that she is retiring this year and would not be able to continue as the liaison for Alabama.

Deb Gross Saunders informed us that she was extremely busy and did not feel she could do justice to the Connecticut liaison position so she is stepping down.

The remainder of the presently listed liaisons either have not responded at this time or their E-mail address was no

longer valid and bounced back. If you are interested in serving as a liaison, please contact Charlie Evans at: cevans@ivghospitals.com

Research Committee Report (Kirk Peck and Jennifer Brooks)

Nominating Committee Report (Cheryl Riegger-Krugh)

Newsletter Committee Report (Lisa Bedenbaugh):

ARSIG members are encouraged to submit articles or other information regarding animal rehabilitation to LHinerman2@aol.com for future newsletters. Also, if you have interest in other topics or information to be presented, please E-mail Lisa for consideration.

Other Old Business

Professional Liability Issues (Deanna Rodgers)
Veterinary Insurance Reimbursement Issues (Charlie Evans)
Resources for ACCEs (Cheryl Riegger-Krugh)
Taskforce for the Definition of Standards of Education for Nonphysical Therapists (Cheryl Riegger-Krugh)
Continuing Education/Residency/Fellowship discussion

New Business

Call for Nominations, Committee Chairs, Committee Members
- Clinical education committee
- State liaisons
- ISC committee

Request for Additional Information
- Study groups?
- CAAPT (Certificate of Achievement in Animal Physical Therapy)?
- Legislative position online survey
- CPA Statement
- Other

Open Forum

MVRH Employment Announcement

Adjournment

Educational Programming:

The ARSIG was very excited to have Janet Van Dyke, DVM, present on "Zoonoses and Red Flags" at CSM this year. Dr. Van Dyke spoke about metabolic disorders (Addison's and Cushing's disease); parasitic, bacterial, and fungal infections; and the precautions of working with those animals presenting with those issues. She also spoke about the "red flags" that can present similar to musculoskeletal problems, and when to contact the referring veterinarian to discuss the case further.

A summary of Dr. VanDyke's talk will be available shortly to Section members on the Orthopaedic Section's Web site (www.orthopt.org).

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