

ORTHOPAEDIC

PHYSICAL THERAPY PRACTICE

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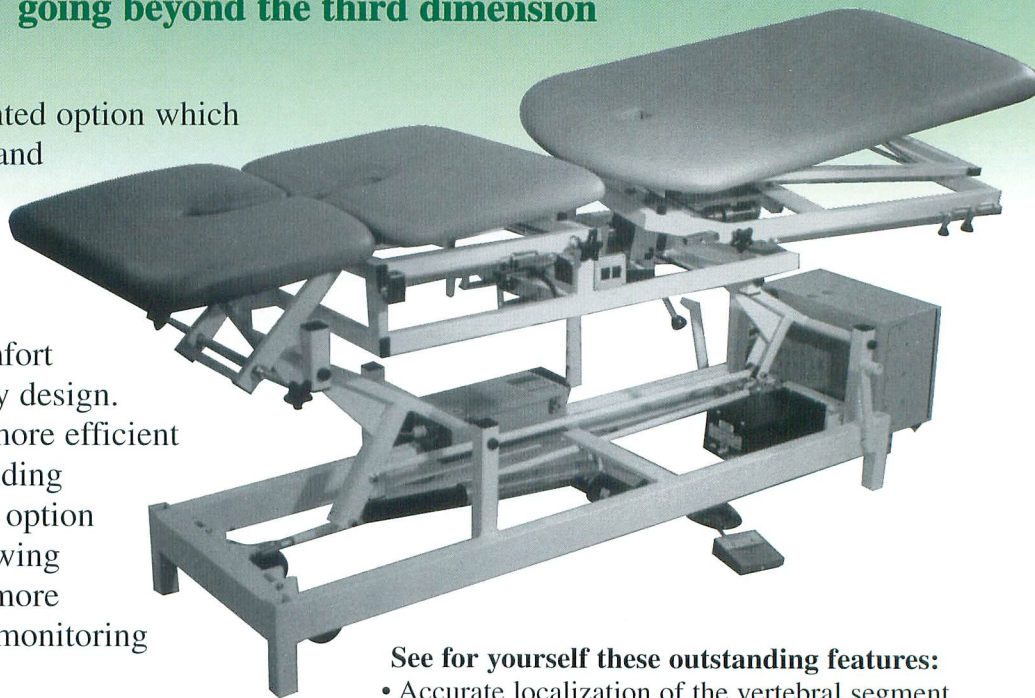


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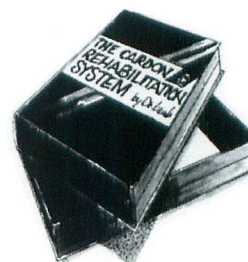
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ORTHOPAEDIC PHYSICAL THERAPY PRACTICE

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MISSION

The mission of the Orthopaedic Section of the American Physical Therapy Association is to be the leading advocate and resource for the practice of Orthopaedic Physical Therapy. The Section will serve its members by fostering quality patient/client care and promoting professional growth through:

- enhancement of clinical practice,
- advancement of education, and
- facilitation of quality research.

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Editor's Message



What Color Are You?

Are you blue, gold, green, or orange?

Recently, the Orthopaedic Section Board of Directors, Committee Chairs, and Special Interest Group Presidents/ Representatives met for the Section's annual fall meeting for the purposes of strategic planning and leadership development. Jody Gandy, PT, PhD, Director of the Department of Education at APTA, facilitated this meeting. On the first evening we were in La Crosse, we all completed the booklet "Color Profile: Understanding How to Communicate and Relate in Your Preferred Style."¹ Jody led us through this process so that we might identify our own temperament tendencies and learning styles, as well as learn about these same tendencies and styles in the others present at the meeting. I believe that most, if not all, of those present found this exercise to be both fun and quite valuable in preparing for the tasks of the weekend.

While learning about one's own personality traits can be eye-opening, this type of process helps to explain why we behave the way we do, and why particular behaviors of others seem to drive us nuts. By knowing our own color, as well as the colors of others, it was easier to understand the dynamics of the group and why we tended to act as we did. Through this process, we learned that the leaders of the Orthopaedic Section are a diverse group, with all 4 colors of the profile well represented. Knowing that, it was much easier to respect differences of opinion as we progressed through the strategic planning process and the Board meeting.

In the strategic planning process, the entire group first looked at the Section's goals and determined what needed to stay and what could change. We narrowed our goals from 8 to 6, and then broke up into 6 groups, each taking one goal. Assignments were made based on position, interest, and color. When it came time to present the work of the small groups, it was relatively easy to see what the dominant color was in any group. I must say, during the presentations, it was obvious that the group in which I worked was missing a color—we had orange, green, and blue covered, but no gold. Some might say this could be a disaster from the start. While the members of my small group all understood exactly what we meant in our objectives and strategies, there were many in the larger group (especially those orange folks) who were a bit frustrated by our work. Let me explain the color thing a little better. The following

descriptions are taken from "Color Profile: Understanding How to Communicate and Relate in Your Preferred Style."¹

We will start with orange. For one whose preferred style is orange, fun is an important factor. The orange person sees work as play, is commonly described as optimistic, energetic, light-hearted, charming, flexible, and a free spirit. In cognitive style, orange equates to the accommodator. An orange person is not afraid to take risks, is decisive, resourceful, impulsive, and a good mediator. This person sees everything as negotiable and knows how to expedite processes. Action is a key word. Orange people need to keep things moving.

For one whose preferred style is blue, people and relationships are what it is all about. The blue person equates to the feeler in cognitive style. Blue people are insightful, nurturing, friendly, good-natured, open, and authentic. Blues are great listeners and advocates of others. They see the good in everything and everybody. A blue person is honest, warm, creative, and looks for meaning in everything. Blue people want everyone to feel good about decisions made. These people are the "touchy feely" folks. Give a blue person a hug and you've helped to make the day.

For one whose preferred style is green, you are the one who asks "Why?" Green people want to understand, control, predict, and explain reality. (Sounds like a good scientist to me!) The green person equates to the converger in cognitive style. These people are analytical, conceptual, and persistent. Greens see the 'big picture' and are good at generating ideas, but prefer someone else manage the details. This person is reserved, prefers to work independently, and wants time to reflect before making decisions. Green people are visionary.

The final color is gold. For those whose preferred style is gold, organization is what it is all about. In terms of cognitive style, these are the assimilators. Gold people are the ones with the big 'to do' list and take great pleasure in crossing off items on the list. Gold people are often described as service oriented, dependable, efficient, and responsible. These people are the 'foundation of society.' They prefer to take care of others, develop long-lasting relationships, and have difficulty saying 'no.' Prepared, punctual, and productive are the 'three Ps' of gold people. Change, clutter, and chaos are the 'three Cs' they hate. If you want to get things accomplished, you need gold people, as they like details and they need closure.

Back to strategic planning. Once we broke up into small groups according to goals, our task was to revise or develop objectives for that goal that were specific, measurable, achievable, realistic, and trackable (S.M.A.R.T). Each of the groups worked diligently to generate these objectives. My group worked on Goal V- Use Technology to Educate and Communicate with Membership. As I said earlier, my group had one green and two orange/blue people. We were great at generating ideas and came up with some great possibilities for the next 3 years—things that were innovative and things that would make people feel good about being a Section member. However, we didn't write our objectives and strategies using the S.M.A.R.T. method. When it came time to discuss objectives and strategies generated by each group, it became evident to the entire group that we didn't have any gold people working on Goal V. Although we thought that everyone would understand what we meant by our general statements, the others wanted details we didn't provide because we thought they were already evident. We needed gold people to generate the lists. While we all laughed about it, this was a clear example of why we need people of all colors/ styles in leadership positions in the Section.

We need gold and blue and green and orange leaders. We need green people to generate ideas and provide strategy. We need gold people for accuracy and thoroughness, procedures, and results. We need orange people for flexibility, creativity, energy, and enthusiasm. And, we need blue people to listen, to build relationships, and to help us feel good about our plans and actions. We need to continue to have a diverse group of leaders for the Orthopaedic Section. There are plenty of open committee positions available in the Section and in the individual SIGS. What color are you?

REFERENCE

1. Bezner JR, Lesch NK. Color profile: Understanding how to communicate and relate in your preferred style. Austin, Tex: Motorola; 2002.



Susan A. Appling, PT, MS,
OCS
Editor, OP

President's Message

During the weekend of October 10, 2003, the Orthopaedic Section Board of Directors, along with Committee Chairs and SIG officers got together in La Crosse, Wisconsin to modify our current strategic plan for 2004-2006. This plan is our guide to what we, the elected officers, appointed members, committee chairs, and special interest groups believe is important for the Orthopaedic Section to accomplish over the next 3 years. This plan is a working document and will be modified as needed. At CSM in Nashville, TN we will be asking for your feedback at the Saturday morning membership meeting. Also, we will publish the strategic plan in *Orthopaedic Practice (OP)* and on our web site. The strategic planning meeting went extremely well, and we believe we have some exciting new goals to lead us forward as well as maintain some of our current goals.

Highlights of the meeting included leadership development led by Jody Gandy, PT, PhD, Director of APTA's Department of Physical Therapy Education. Jody's first evening was devoted to teaching our group how to work together and understand our differences. The program was excellent, and we all came away with a better knowledge of how our individual differences can work together to improve our group, which was extremely helpful when working on our strategic plan. We learned that diversity is an asset not a deficiency.

The main purpose of this meeting was strategic planning for the Section. A whole day was devoted to this. We started by looking at strengths, weaknesses, opportunities, and threats (SWOTs) of the Orthopaedic Section, which those who have done strategic planning are well aware of. Next we looked over our previous strategic plan and determined what to keep, what to change, and what to throw out. Following that we spent considerable time on revising the goals. We were able to reduce the number of our goals from 8 to a more manageable 6. Once everyone agreed on the goals, we split up into 6 groups, one for each goal. These groups then decided on objectives and strategies for their assigned goal.

Some strategies have been 'tried and true' methods that we know work well for us, while some are new and innovative. We also tried to narrow our scope and not be too ambitious, especially at the cost of not being able to accomplish everything.

The draft strategic plan for the next 3 years is on page 29 in this issue of *OP*. 'Highlights' from our new strategic plan include adding 2 motions adopted at last year's CSM Business Meeting to facilitate competence in manual therapy at the entry- and post-professional levels; to become more involved on reimbursement issues in conjunction with the APTA and state chapters, especially, but not limited to, states that have direct access; to promote the growth and utilization of orthopaedic physical therapy practice in emerging health care markets; to promote publication of manuscripts relating to retrieving and interpreting the evidence on orthopaedic physical therapy practice; and finally, there were many new ideas on ways to enhance our web-based communication using new enhancements (music, video, graphics, etc), web cast programming, creating PDFs for advocacy, SIGs, and continuing physical therapy education. I encourage you, our members to become involved. The strength of our Section has always been our stable, loyal membership and I look forward to your input.

On other business, we will have a few new faces on the Board. We welcome Rick Watson who will take over as our new Public Relations Chair at the close of CSM. He will replace Terry Randall. Terry has served two 3-year terms and has done an outstanding job as Chair. Terry's thoughtful comments at meetings will be missed. We also welcome Adam Smith, our new Membership Chair who replaces Michael Wooden. Michael has done a great job of maintaining our membership (and even saw it increase by 2%) despite a most difficult environment. Bob Rowe will be taking over as Practice Chair at the close of CSM. He is replacing Steve McDavitt whose 6-year term has ended. Anyone who has read the copious and well thought out reports that Steve has written for the Practice Committee

realizes the devotion, passion, and energy Steve has put in while Practice Committee Chair and as a member of the Board of Directors for the Section. We wish him well and thank him for all of his effort and time. Susan Appling, our current *OP* Editor will also be completing her second 3-year term and we welcome Chris Hughes as the incoming Editor of *OP*. Susan has done a remarkable job as Editor of *OP*. The superb quality that *OP* has achieved is the result of Susan's diligence and loving care for her work as Editor. Thank you.

Special thanks go out to Jim Dunleavy our APTA Board Liaison for participating in this meeting. Jim goes to so many meetings—I probably should thank his family also. Thank you, the Dunleavy family for allowing Jim to come to our meeting; he has been extremely helpful. I would also like to thank the entire Orthopaedic Section office staff who planned and organized this meeting.



*Sincerely,
Michael T. Cibulka, PT,
MHS, OCS*

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The Pelvic Floor: Functional Anatomy & Applications for Lumbopelvic Stability

Pelvic Floor Pain Step by Step: Evaluation, Education, Exercise • *Kathe Wallace, P.T.*
June 25 - 27, 2004 • Los Angeles, California

Female Pelvic Floor Function, Dysfunction and Treatment - Level I

Kathe Wallace, P.T. and Hollis Herman, M.S., P.T., O.C.S.
March 26 - 28, 2004 • Philadelphia, Pennsylvania
July 30 - August 1, 2004 • Baltimore, Maryland
October 15 - 17, 2004 • Chicago, Illinois
December 2 - 4, 2004 • Las Vegas, Nevada

Female Pelvic Floor Function, Dysfunction and Treatment - Level II

Kathe Wallace, P.T. and Hollis Herman, M.S., P.T., O.C.S.
November 12 - 14, 2004 • Atlanta, Georgia

Pregnancy and Postpartum: Clinical Highlights

Hollis Herman, M.S., P.T., O.C.S.
February 21 - 22, 2004 • Orlando, Florida
June 26 - 27, 2004 • Minneapolis, Minnesota
August 7 - 8, 2004 • San Diego, California

SI Evaluation and Manual Therapy Treatment:

A Rocabado Approach with Pelvic Floor/Transversus Stabilization
Dawn Sandalcidi, P.T., R.C.M.T.

January 17 - 18, 2004 • Atlanta, Georgia
Sept. 11 - 12, 2004 • Newark, New Jersey
Oct. 2 - 3, 2004 • Chicago, Illinois
Nov. 6 - 7, 2004 • Seattle, Washington

Pediatric Incontinence and Pelvic Floor Dysfunction

Dawn Sandalcidi, P.T., R.C.M.T.
May 22 - 23, 2004 • Chicago, Illinois

Rotator Cuff of the Pelvis Chronic Pelvic Pain and Low Back Pain

Janet A. Hulme, M.A., P.T.
April 23 - 25, 2004 • Las Vegas, Nevada
October 8 - 10, 2004 • Orlando, Florida

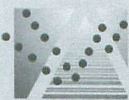
Beyond Kegels I: Bladder Health and the Pelvic Muscle Force Field

Beyond Kegels II: Advanced Techniques and Special Populations

Janet A. Hulme, M.A., P.T.
Feb. 20 - 22, 2004 • San Diego, California
March 12 - 14, 2004 • Atlanta, Georgia
June 4 - 6, 2004 • Minneapolis, Minnesota

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CONTINUING EDUCATION SEMINARS



Stanley V. Paris, PT, PhD, FAPTA
President

S1 - Introduction to Spinal Evaluation & Manipulation

40 Hours, 4.0 CEUs (No Prerequisite) **\$750**

St. Augustine, FL	Paris/Viti	Oct 9 - 13
*Montgomery, AL	Yack	Nov 2 - 6
Pittsburgh, PA	Viti	Nov 7 - 11
Baltimore, MD	Smith	Nov 7 - 11
Orlando, FL	Yack	Dec 3 - 7
Houston, TX	Viti	Dec 10 - 14
2004		
*St. Augustine, FL	Paris/Viti	Jan 11 - 15
Chicago, IL	Yack	Jan 14 - 18
Washington, DC	Smith	Jan 16 - 20
Denver, CO	Yack	Feb 19 - 23
New York City, NY	Yack	Mar 4 - 8
Charlotte, NC	Viti	Mar 11 - 14
Lexington, KY	Lonneman	Apr 21 - 25
Sioux Falls, SD	Yack	Apr 22 - 26
Atlanta, GA	Smith	May 1 - 5
Las Vegas, NV	Yack	May 5 - 9
Amarillo, TX	Viti	May 12 - 16
Springfield, MO	Smith	May 12 - 16
St. Augustine, FL	Paris/Viti	May 19 - 23

E1 - Extremity Evaluation and Manipulation

36 Hours, 3.6 CEUs (No Prerequisite) **\$645**

Omaha, NE	Turner	Oct 16 - 19
Springfield, MO	Busby	Oct 16 - 19
St. Augustine, FL	Paia	Nov 6 - 9
Dallas, TX	Turner	Nov 13 - 16
2004		
Las Vegas, NV	Turner	Jan 15 - 18
St. Augustine, FL	Paia	Feb 19 - 22
Toledo, OH	Turner	Feb 26 - 29
Boston, MA	Busby	Mar 4 - 7
Baltimore, MD	Busby	Apr 22 - 25
Coral Springs, FL	Turner	Apr 22 - 25
Chicago, IL	Busby	May 6 - 9
LaJolla, CA	Turner	May 20 - 23
Atlanta, GA	Busby	Jun 3 - 6
St. Augustine, FL	Paia	Jun 10 - 13

E2 - Extremity Integration

24 Hours, 2.4 CEUs (Prerequisite E1) **\$495**

Denver, CO	Varela	Oct 17 - 19
Las Vegas, NV	Varela	Nov 7 - 9
St. Augustine, FL	Paia	Dec 5 - 7
2004		
Knoxville, TN	Varela	Jan 16 - 18
Washington, DC	Varela	Feb 27 - 29
St. Augustine, FL	Paia	Mar 12 - 14
Omaha, NE	Varela	Mar 26 - 28
Las Vegas, NV	Varela	May 14 - 16

Pelvic Floor Dissection

19 Hours, 1.9 CEUs (No Prerequisite) **\$495**

St. Augustine, FL	Gorniak	Oct 17 - 19
2004		
St. Augustine, FL	Gorniak	Oct 22 - 24

Motor Control & Motor Learning

23 Hours, 2.3 CEUs (No Prerequisite) **\$450**

2004		
Knoxville, TN	Lowe	Mar 26 - 28

S2 - Advanced Evaluation & Manipulation of Pelvis, Lumbar & Thoracic Spine

27 Hours, 2.7 CEUs (Prerequisite S1) **\$495**

Las Vegas, NV	Yack	Oct 3 - 5
New Orleans, LA	Yack	Oct 24 - 26
*Orlando, FL	Yack	Nov 16 - 18
2004		
Atlanta, GA	Yack	Jan 30 - Feb 1
Pittsburgh, PA	Inwin	Feb 20 - 22
St. Augustine, FL	Inwin	Mar 26 - 28
Milwaukee, WI	Yack	Apr 9 - 11
Boston, MA	Yack	May 14 - 16
St. Augustine, FL	Inwin	Jun 25 - 27

MF1 - Myofascial Manipulation

24 Hours, 2.4 CEUs (No Prerequisite) **\$495**

Denver, CO	Cantu	Oct 10 - 12
Las Vegas, NV	Cantu	Nov 7 - 9
Fl. Lauderdale, FL	Grodin	Dec 12 - 14
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The Lumbar Spine Index and Relationships to Patient Function

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Although an estimated 60% to 80% of people experience low back pain (LBP) at some time in their life¹ the pathoanatomical cause for LBP is identifiable in few cases.² In the absence of ability to identify a source for LBP, attempts have been made to develop examination systems that would guide management of the condition. However, little research has been conducted to determine the reliability and validity of LBP classification systems.

Riddle³ reviewed several classification systems judged to be most commonly used by physical therapists treating low back pain. The Bernard and Kirkaldy-Willis, DeLitto, McKenzie, and Quebec Task Force systems were examined. The Bernard and Kirkaldy-Willis and McKenzie systems are pathology-based while the DeLitto and Quebec Task Force systems are clinical guideline indices. Riddle's analysis concluded that none of the reviewed classification systems was more reliable than others and further research should address the development of new classification systems to guide treatment.

*The Guide to Physical Therapist Practice*⁴ (*Guide*) was designed to assist physical therapists in clinical decision making by outlining examination and treatment procedures commonly employed in physical therapy practice. The *Guide* describes examination procedures for people with impairments, functional limitations, and disabilities, but is not intended as a prescription for examination and treatment. The *Guide* includes sections on lumbar examination; some aspects of the exam may have relevance in regards to patient function.

Despite the paucity of evidence in regards to the efficacy of particular classification systems, there is some consensus

among physical therapists on 2 fronts: (1) examination, evaluation, diagnosis, and prognosis are part of the process that helps determine the most appropriate interventions,¹ and (2) the determination of the appropriateness of management strategies relies on the physical therapist's ability to cluster relevant signs and symptoms in the formulation of a diagnosis.⁵

Clinicians and researchers continue to debate the efficacy of particular classification systems. The debate often centers on the pathoanatomical cause for low back pain, rather than which systems best foster improvement in patient function. The classification systems found to meet the criteria of being designed to direct treatment and which are thoroughly described in continuing education courses include the Muscle Balance System developed by Sahrman,⁵ the McKenzie System,⁶ and the Paris System.⁷ In light of the fact that none of these particular systems is more reliable and valid than the others, a system which incorporates several different schools of thought and considers the chronicity of patient symptoms may have relevance to the patient's perceived level of function.

Although low back pain is an ailment that affects many individuals and is likely to be the single most common ailment seen by physical therapists, there remain numerous theories regarding classification and treatment. It is important for physical therapists to classify low back pain to better formulate a treatment program to ensure a more functional outcome for the patient.⁸ Patient self-assessments and physical assessments performed by physical therapists provide two means of obtaining information regarding a patient's level of function.

Four classification schemes used by physical therapists include the Quebec Task Force Classification, McKenzie, joint dysfunction, and muscle imbalance. The appropriateness of these classification systems may be determined through the use of patient questionnaires that assess the patient's perceived level of function. The Oswestry Low Back Pain Disability Index is an example of a patient questionnaire.

The Oswestry Low Back Disability Index is one of the most widely used functional assessment scales and has become

standard for creating new low back pain assessment scales.⁹ The Oswestry is a self-administered questionnaire that looks at difficulties in activities of daily living experienced by people with low back pain.¹⁰

CLASSIFICATION SCHEMES

The Quebec Task Force Classification is a tool used to classify activity-related spinal disorders into 11 categories. The categories are then divided into subcategories according to duration of symptoms and working status at the time of evaluation.¹¹ The goal of the Quebec Task Force (QTF) was to create a diagnostic tool that could be used clinically to help establish a prognosis and aid in clinical decision making. The QTF classification scheme emphasizes history, physical examination findings, radiological tests, and response to treatment, but not responses to movement, as advocated by approaches such as McKenzie.

McKenzie⁶ also developed a classification system to describe the signs and symptoms that result from sustained and repeated movements. McKenzie described 3 syndromes involving low back pain. The 3 syndromes include postural syndrome, derangement syndrome, and dysfunction. Derangements and dysfunction both describe pathology, whereas the postural syndrome does not. Treatment strategies for derangements and dysfunctions include postural correction, self-treatment exercises, and if necessary, manual techniques provided by the physical therapist. The postural syndrome is treated through postural correction only.

Kilby, Stigant, and Roberts¹² assessed the reliability of back pain assessment using the McKenzie algorithm. The authors found the algorithm reliable in examination of pain behavior and pain response with repeated movement, but unreliable in the detection of end range pain and lateral shift.

Many physical therapists, particularly those who practice manual physical therapy, maintain that joint assessment is an integral component of the examination process. Joint assessment enables the PT to determine whether the problem involves joint laxity, a tear of a tissue, or whether connective tissue shortening has occurred.

Gonnella, Paris, and Kutner¹³ examined the reliability of passive intervertebral motion, both within testers, and between testers. The results of this study showed that intratester reliability was good, but that intertester reliability was poor.

The reliability of measuring passive intervertebral motion of the lumbar spine was also evaluated by Insaco and colleagues.¹⁴ These authors also concluded that intratester reliability of passive intervertebral motion testing was greater than intertester reliability. Although Paris⁷ described a rating score for assessment of intervertebral motion, little evidence supports the reliability and validity of these techniques between examiners.

VanDillen et al⁵ determined the interrater reliability of measurements obtained by examiners administering tests proposed to be important for classifying low back pain according to muscle balance. Kappa for the 28 test items related to symptom elicitation was equal to, or exceeded, 0.75. For 72% of the 25 items related to alignment and movement, Kappa value was equal to, or exceeded, 0.40. Van Dillen and colleagues⁵ concluded that there was good reliability in muscle balance evaluation items related to symptoms elicitation, and fair reliability and good agreeability in items related to alignment and movement.

PROCEDURES

Data was obtained at an outpatient orthopaedic physical therapy clinic in western New York state. The evaluations were performed on patients who were being seen for low back pain and were conducted by a licensed physical therapist (PT) who had prior experience with the lumbar examination. The study sample was comprised of 36 people presenting with a primary diagnosis of low back pain who were referred for physical therapy.

Following the completion of the Oswestry, the PT began the evaluation using the lumbar examination (Appendix A). The lumbar examination consisted of 7 items, many of which are typically used in a low back evaluation. These items included a structural exam, active range of motion testing, passive range of motion testing, repeated movement testing, a neurological exam, palpation, and a muscle balance exam. Unlike an algorithm, which involves a problem solving process, all components of the examination were performed at the first and third physical therapy visit. Discharge examinations were not performed using the algorithm due to the possibility that

patients may not attend the final PT session, thereby eliminating that data from consideration. A conversion score was found for each component of the exam, and that score was then weighted according to whether the patient was acute, subacute, or chronic. Acute was defined as pain in the lumbar spine with a duration of 7 days or less. Subacute was defined as pain in the lumbar spine with a duration of 7 days to 7 weeks. Chronic was defined as pain in the lumbar spine with a duration of over 7 weeks.¹⁵

The PT Evaluation Form was used to record the objective measures and includes the conversion scores. The structural exam consisted of an assessment of posture with particular focus on sitting posture, standing posture, presence or absence of lordosis, and presence or absence of a lateral shift. Sitting and standing posture were rated as being good, fair, or poor. The patient's lordosis was classified as either reduced, accentuated, or normal. The patient also was examined to determine if a lateral shift was present. The total postural conversion score was tallied by combining the scores of each component of the structural exam.

The active range of motion exam consisted of 4 different movements. The patient was asked to flex, extend, and sideglide to the left and to the right. The normal range for flexion was 60°, and the normal range of motion for extension was 30°. Sidegliding was assessed visually and was not measured goniometrically. Flexion and extension were measured with a single inclinometer technique.¹⁷ For flexion and extension, each patient was given a conversion score based upon the amount of motion present. For sidegliding, each patient was given a conversion score based upon the amount of limitation present that was assessed visually by the PT. The individual conversion scores for each motion were summed to produce the total active range of motion conversion score.

The repeated movement examination involved testing of repeated flexion and extension, and sidegliding in standing, flexion in lying, and extension from the prone position (McKenzie). A baseline assessment of the location and intensity of symptoms was determined prior to each set of repeated movements. Based upon the patient's response to each movement, a conversion score was noted. The individual conversion scores for each movement were added to produce the total repeated movements conversion score.

The test used for passive range of motion was single segmental mobility testing; each specific joint was classified as normal, hypermobile, or hypomobile. The motions examined were flexion, extension, lateral flexion, and rotation. The movements were tested according to Maitland.¹⁸ The totals for each joint were then added together to comprise the total conversion score for the passive range of motion exam.

The neurological component included a testing of the Babinski reflex, dermatomes, myotomes, and deep tendon reflexes. The dermatomes exam assessed the amount of sensory deficit present in L1, L2, L3, L4, L5, and S1 nerve root levels. Dermatomes were tested by lightly brushing the patient's skin over the relevant dermatome with a disposable paperclip. The patient was instructed to state where and to what extent they felt the contact. The dermatomes were graded based on whether or not they were equal bilaterally.

The myotome exam assessed the strength in L1, L2, L3, L4, L5, and S1 myotomal levels with a break test. Strength was graded as good, fair, or poor.

The deep tendon reflexes examined during the evaluation included the patellar and the Achilles tendon reflexes. The grades for the deep tendon reflexes were normal, hyper-reflexive, hypo-reflexive, or absent.

The slump test and straight leg raise test were performed as part of the neurological exam. A positive finding included peripheralization of symptoms.

The slump test involved having the patient flex the lumbar spine, flex the neck, extend the leg, and dorsiflex the foot. Dural involvement was present in the slump test if neck extension relieved the pain or tightness described by the patient.

For the straight leg raise test, the patient was positioned in supine with his hips and knees extended. The PT then elevated the lower extremity until either pain or tightness was noted by the patient. The leg was then lowered until the pain or tightness was resolved, then the PT dorsiflexed the patient's ankle and the patient flexed his neck. Dural involvement was present if leg or low back pain was present with dorsiflexion and neck flexion. A conversion score was found for each component of the neurological exam. The total neurological conversion score was calculated by adding the conversion scores of each neurological component.

The palpation portion of the exam consisted of an assessment of myofascial

integrity, and was graded based upon the amount of difficulty encountered with skin rolling, skin puckering, tone, and ligamentous tenderness. Skin puckering was performed by gently approximating the skin using the space between the thumb and index finger on both hands simultaneously. A normal finding was a dimpling of the skin, while an abnormal finding was a failure of the skin to dimple. In order to assess tone, the PT observed and palpated the lumbar region bilaterally to see if either side had more or less tone than the other side. Ligamentous tenderness was tested by the patient describing if pain was present while the interspinous spaces were palpated. Scoring was based on elicitation of tenderness. The skin rolling, skin puckering, tone, and ligamentous tenderness conversion scores were added to find the total palpation conversion score.

Finally, the muscle balance screen examined the strength of the upper and lower abdominals, the flexibility of the hamstrings, erector spinae strength, and the flexibility of the hip flexors, which for the purposes of this study, included rectus femoris, iliopsoas, and iliotibial band. The upper abdominals were rated as 50%, 60%, 80%, or 100%. Abdominal grading was performed according to Kendall.¹⁸

The lower abdominals were tested by positioning the patient in supine according to Kendall.¹⁸ Lower abdominal strength was measured by degrees of hip flexion with the knees extended, while maintaining a posterior pelvic tilt.

Erector spinae muscle strength was measured by the number of repetitions of back extensions the patient could perform from prone. The patient was positioned in prone with a pillow under the abdomen, with the hands above the head with the fingers interlaced. The patient was then instructed to lift the head and chest from the table as many times as possible. The patient's scores were based upon the number of repetitions achieved. The number of repetitions of back extensions performed measured erector spinae strength.

Hamstring flexibility was tested using the 90-90 Straight Leg Raise Test. A positive finding for hamstring tightness was if the knee remained flexed greater than 20°.¹⁹

Hip flexor flexibility was examined using the Two Joint Hip Flexor Test.¹⁸ For hip flexor flexibility, each position was graded by measuring the distance between the tibial condyle and the table for each limb. If the distance was greater than 10 centimeters, a score of 1 point

was given for each muscle. For less than 10 centimeters, a score of 0 was given.

Conversion scores were documented for upper abdominal strength, lower abdominal strength, erector spinae strength, hamstring flexibility, and hip flexor flexibility. Conversion scores of each component were totaled to find a total muscle balance conversion score.

The Oswestry was completed and the lumbar algorithm was performed on the initial visit, and then again after the third visit. The Oswestry was graded as a percentage score from 0-100, with a higher number indicating greater disability. The data were recorded in a confidential manner so patients could not be identified.

The data obtained from each subject were retrieved through a retrospective chart review performed by graduate student researchers. The examiner was blinded to the Oswestry scores and the LSI scores throughout the investigation. Similar to the Oswestry, the lumbar algorithm totaled 100%. Using the total conversion scores of each section, the amount of disability was calculated by the graduate student researchers. A Pearson Product Moment correlation was used to calculate the reliability and validity of the algorithm. Validity was determined by comparing the scores on the

algorithm to the patient's score on the Oswestry, which has been shown to be a reliable and valid indicator of back disability.¹⁰

The conversion score was then weighted according to whether the patient was in the acute, subacute, or chronic stages of healing to arrive at a disability score. The structural exam and active range of motion were weighted 5% regardless of the patient's stage of healing. Repeated movements were weighted 60% for patients in the acute stage, 30% for those in the subacute stage, and 5% for those in the chronic stage. Passive range of motion (passive intervertebral motion) was weighted 5% for patients in the acute and chronic stages and 30% for patients in the subacute stage. The neurological examination was weighted 15% for acute, subacute, and chronic patients. Palpation was weighted 5% for patients in the acute, subacute, and chronic stages. The muscle balance exam was weighted 5% for patients in the acute stage, 10% for subacute, and 60% for chronic patients. The disability scores for each section were totaled to arrive at a Lumbar Spine Index score.

Table 1 depicts the patient demographics, QTF scores, and specific patient diagnoses. The majority of the patients

Table 1. Patient Demographics, QTF Scores, Specific Diagnosis (N=36)

Subject	Gender	QTF Score	PT Diagnosis
1	1	3	Derangement 5
2	1	2	Derangement 3
3	2	3	Derangement 2
4	1	3	Derangement 5
5	1	3	Derangement 8
6	2	2	Derangement 5
7	1	2	Derangement 3
8	1	2	Low back pain
9	2	3	Derangement 5
10	1	2	Derangement 5
11	2	1	Derangement 3
12	1	3	Derangement 3
13	1	3	Derangement 6
14	1	3	Derangement 1
15	2	3	Ant. Rot SIJ
16	1	3	Derangement 5
17	1	3	Derangement 3
18	2	3	Derangement 5
19	1	2	Derangement 6
20	2	1	Derangement 1
21	1	2	Derangement 5
22	1	2	Derangement 3
23	2	2	Derangement 4
24	2	2	Derangement 3
25	1	3	Derangement 3
26	2	2	Derangement 5
27	2	2	Derangement 5
28	2	3	Derangement 4
29	1	2	Derangement 6
30	2	2	Derangement 5
31	2	2	Derangement 4
32	2	2	Derangement 3
33	1	2	Derangement 3
34	2	2	Derangement 3
35	1	2	Derangement 5
36	2	2	Derangement 3

Note : Gender abbreviations 1=female; 2=male
QTF abbreviations: 1=Acute; 2=Subacute; 3=Chronic

were diagnosed as experiencing lumbar derangement, and all but one patient fell into the subacute (n=22) or chronic (n=14) classifications. Table 2 depicts changes in the scores. Table 3 shows the correlations between the Oswestry and LSI. The subacute patients showed a .497 correlation (at $p < .05$) with the Oswestry at first visit and .593 correlation (at $p < .05$) with the Oswestry at the third visit. Table 4 shows the correlations of the individual LSI components which showed a significant relationship to the Oswestry. Active range of motion showed a high correlation in the acute and chronic patients while palpation showed a significant correlation in the subacute. Table 5 shows those components which did not exhibit a significant relationship with the Oswestry. Active range of motion approached significance, as did repeated movements in the subacute group. The AROM component also approached significance in the chronic group.

DISCUSSION

For many patients with low back pain (LBP), nonsurgical management includes physical rehabilitation directed at reducing the impairments identified during the examination.²⁰

Interventions that are directed toward reduction of impairment may not address limitations in patient function. With an identifiable source of low back pain being difficult to determine,² an examination process and resulting interventions may be better directed toward restoration of function. This study was designed to determine if a relationship existed between the lumbar examination and the Oswestry, which is a tool designed to assess the patient's perceived level of function. Many classification schemes are used to direct treatment and several components of these schemes were used as the evaluative tool in the present investigation. Components of the examination included postural assessment, repeated movements, passive intervertebral motion testing, neurological testing, palpation, and muscle balance. The weighting of exam components according to the patient's stage of healing is based on the premise that more chronic conditions are more likely to produce restrictive barriers that limit motion. According to Greenman,²⁰ the restrictive barrier can be with the following tissues: skin, fascia, muscle, ligament, joint capsule, and surfaces. Because any of the above may be a source of limited motion, the active range of motion component was weighted 5%. Repeated movements are foundational to

Table 2. Changes in Oswestry and Lumbar Spine Index Scores (N=36)

Subject	Oswestry 2-1	LSI 2-1
1	6.0	-1.0
2	-1.8	-6.0
3	-4.0	-9.0
4	0.0	-3.0
5	-26.2	-11.0
6	0.0	-1.0
7	-2.2	-10.5
8	4.0	-6.0
9	-12.0	-16.0
10	-22.6	-4.0
11	2.9	-10.5
12	2.2	-1.0
13	-6.0	0.0
14	0.0	-12.0
15	6.0	0.0
16	-18.0	-5.0
17	4.0	-4.0
18	2.2	-1.0
19	-11.1	-2.5
20	-18.0	-13.5
21	-9.0	-13.5
22	-15.6	-18.5
23	-24.2	-9.0
24	-8.0	-8.0
25	-8.0	-13.0
26	-6.0	-5.0
27	0.0	-7.0
28	-14.0	-16.0
29	11.0	2.0
30	-2.0	6.5
31	-6.0	-2.0
32	9.0	-8.0
33	-8.0	-6.5
34	2.0	-7.0
35	-22.0	-4.5
36	-14.0	-2.0

Note : Negative values imply that patient condition improved. Therefore the patient demonstrated an improved perceived level of function.

Table 3. Correlational Coefficients for Oswestry Low Back Disability Index and Lumbar Spine Index (N = 36)

Items Correlated	Pearson product-moment Correlation coefficient	Significance Level
	r	p
All Patients (n=36)		
Oswestry 1 versus LSI 1	-0.23	0.892
Oswestry 2 versus LSI 2	0.213	0.212
Difference of Oswestry versus LSI	0.394	0.017
Subacute Patients Only (n=20)		
Oswestry 1 versus LSI 1	0.497*	0.026
Oswestry 2 versus LSI 2	0.593*	0.006
Difference of Oswestry versus LSI	0.251	0.287
Chronic Patients Only (n=14)		
Oswestry 1 versus LSI 1	-0.411	0.145
Oswestry 2 versus LSI 2	-0.043	0.883
Oswestry 2 versus LSI 2	-0.603	0.022

Note: * Fair to good relationship at $p < .05$.

Table 4. Correlational Coefficients of Individual Lumbar Spine Index Components that Show a Significant Relationship to the Oswestry

Component	Correlation Coefficient	Significance Level
All Patients Included (n=36)		
AROM 1	0.371	0.026
Neuro 1	0.327	0.052
Palpation 1	0.327	0.050
AROM 2	0.405	0.014
Neuro 2	0.383	0.021
Palpation 2	0.408	0.014
Subacute Patients Only (n=20)		
Palpation 1	0.549	0.012
Palpation 2	0.606	0.005
Chronic Patients Only (n=14)		
AROM 1	0.433	0.024

Note: The 1 or 2 indicates the Oswestry 1 and LSI 1 or Oswestry 2 and LSI 2. There were no correlations found for the components of the examination in chronic patients.

Table 5. Correlational Coefficients of Individual Lumbar Spine Index Components that did not Show a Significant Relationship at ($p > .05$) to the Oswestry.

Component	Correlation Coefficient	Significance Level
All Patients Included (n=36)		
Structural 1	-0.171	0.318
Repeated 1	0.093	0.598
PROM 1	0.012	0.944
Muscle Imbalance 1	-0.191	0.263
Structural 1	0.032	0.851
Repeated 2	0.158	0.358
PROM 2	0.166	0.333
Muscle Imbalance 2	-0.064	0.710
Subacute Patients Only (n=20)		
Structural 1	0.062	0.797
AROM 1	0.351	0.129
Repeated 1	0.035	0.883
PROM 1	0.011	0.964
Neuro 1	0.326	0.161
Muscle Imbalance 1	0.229	0.331
Structural 2	0.127	0.592
AROM 2	0.436	0.055
Repeated 2	0.412	0.071
PROM 2	0.176	0.458
Neuro 2	0.379	0.100
Muscle Imbalance 2	0.315	0.176
Chronic Patients Only (n=14)		
Structural 1	-0.305	0.289
Repeated 1	0.024	0.934
PROM 1	-0.152	0.605
Neuro 1	0.417	0.138
Palpation 1	0.055	0.851
Muscle Imbalance	-0.500	0.069
Structural 2	0.046	0.877
AROM 2	0.518	0.058
Repeated 2	0.198	0.498
PROM 2	0.042	0.888
Neuro 2	0.449	0.108
Palpation 2	0.060	0.839
Muscle Imbalance 2	-0.239	0.411

the McKenzie approach.⁶ Research pertaining to McKenzie^{5,6,12} has shown some clinical applicability in patients who are acute and subacute. Because of this, the repeated movement component was weighted 60% in acute patients and 30% in subacute patients, but only 5% in chronic patients. Patients in the subacute stage of healing may be treated through manual therapy interventions.^{17,21} Hartman²¹ described secondary dysfunctions as an adaptation to some intrinsic fault in structure and that an adaptation can go on to become a compensation. These considerations warranted a weighting of 30% for the passive range of motion (passive intervertebral motion component) for people in the subacute stage, with equal weighting (5%) for those in the acute or chronic stages. Muscle balance approaches may have particular clinical utility in patients who are in the chronic stage of healing and who have undergone soft tissue changes involving muscle lengthening and shortening. Research supporting the Sahrman approach for muscle imbalances⁵ has been performed on patients with chronic musculoskeletal pain.

The fact that no one component of the exam was found to correlate well with the Oswestry is consistent with find-

ings of Riddle.³ This finding supports clustering of signs and symptoms⁵ and nonreliance on one particular school of thought. An examination may be more valid if it involves a compilation of tests and measures rather than the result of one particular method of testing. The results are also consistent with language explained in the *Guide to Physical Therapist Practice*⁴ regarding delimitation of tests, interventions, and preferred practice patterns. The *Guide* admittedly does not allow for critical evaluation of tests and interventions. The present investigation attempted to analyze how well these tests correlate with a functional tool.

The goal of establishing an objective tool for measuring function should involve a combination of physical assessment and functional assessment. Certain examination approaches may be more valid with consideration of whether the patient is in the acute, subacute, or chronic stage of healing.^{5,7} The establishment of the chronicity of the patient's condition also should be a factor in patient classification and subsequent intervention. The present study was unique in that certain sections of the examination were weighted according to whether the patient was acute (McKenzie), subacute (McKenzie and Paris), or chronic (Sahrman).

CONCLUSIONS

There exists a growing requirement in health care to address patients' functional limitations. Physical therapists are required to use valid and reliable measures to measure these limitations. Although many components of a physical therapy low back examination are impairment driven, this study showed that a lumbar examination which incorporates several schools of thought, and which takes into account the chronicity of the patient's complaints, shows moderate to good correlations with the Oswestry. Future research should involve a larger sample size and a wider distribution of patient types in order to make the results more generalizable. An additional suggestion would be to readminister both tools at discharge.

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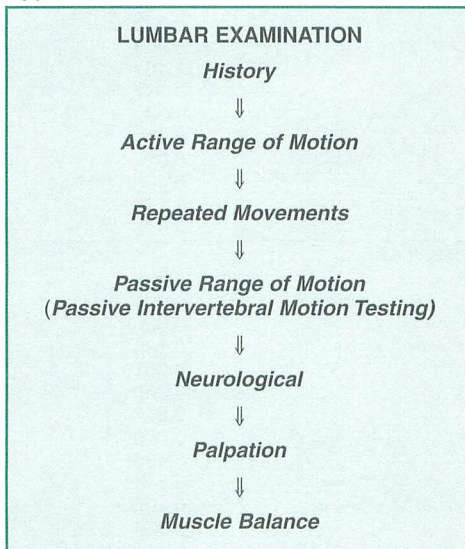
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Appendix A.



Formation of Worldwide Knee Arthroplasty Group

Are you interested in joining a recently formed Internet based Knee Arthroplasty Special Interest Group? The aims of the group are to share information and to encourage networking around the world regarding research, pre- and postoperative rehabilitation programs and outcomes of Knee Arthroplasties. Group homepage: http://groups.yahoo.com/group/knee_arthroplasty or marjonm@ozemail.com.au. There is no cost associated with the membership of the KA group or the registration on the Yahoo site.

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Practice Guideline

Tracy D. Harper, PT, ATC

INTRODUCTION

The following represents a practice guideline for the physical therapy management of adolescent females suffering anterior knee pain. The intent is to guide outpatient physical therapists' clinical decision making processes when encountering patients who are experiencing this syndrome. Following this guideline should promote a trend toward evidence-based practice as well as enhanced treatment outcomes. Other possible benefits include the achievement of efficient care in terms of cost and duration of treatment, and also the standardization of the level of care based on current published best evidence. It should be considered a reasonable starting point for decision making, but should be refined as further high quality studies are published.

The term *anterior knee pain* has been used nearly synonymously with *patellofemoral pain syndrome* in the recent literature,^{1,3} and thus these guidelines for the treatment of anterior knee pain are based on such literature. This practice guideline is intended for the management of all anterior and retropatellar knee pain in the absence of pathologies such as meniscal lesions, osteoarthritis, and spinal referred pain. Although these guidelines have been developed as specific to the adolescent female, most of the evidence explored does not exclusively address physical therapy management of this population. Rather, this population has been included within both the treatment and control populations for most trials retrieved.

DESCRIPTION OF GUIDELINE

These guidelines include key points which have been developed to assist in clinical decision making. The format uses the elements of patient care as outlined in the second edition of the *Guide to Physical Therapist Practice: Examination, Evaluation, Diagnosis, Prognosis (including plan of care), Intervention, and Outcomes*.⁴ To augment the presentation of decision making elements, appropriate tables are included.

Examination

The proposed examination elements are those recommended by expert opinion as referenced in the current literature

regarding the treatment of patellofemoral pain.^{5,6} Proposed interventions and the rationale for each are discussed within the section of the guideline titled *Interventions*. Note that the patient examination also should include all applicable procedures which are standard within orthopaedic practice, including a thorough history-taking as well as systems screening if appropriate. The physical exam should attempt to rule out referred pain from the L-3 or L-4 nerve roots, as well as meniscal and ligamentous pathology.

Elements of the objective examination specific to anterior knee pain include an observation/assessment of:

- Static alignment/posture
 - Q-Angle
 - Patellar alignment
 - Vastus medialis atrophy
 - Knee hyperextension
 - Lower extremity rotation
 - Rearfoot/forefoot anomalies (varus/valgus)
- Dynamic/functional activity
 - Single leg stance
 - Gait (walking and running if applicable)
 - Squat +/- lunge
 - Step-ups/step-downs
- Muscle strength (through manual muscle testing and/or dynamometry)
 - Quadriceps femoris
 - Gluteus maximus and medius
 - Deep hip external rotators
- Muscle length
 - Hamstrings
 - Rectus femoris
 - Gastrocnemius
 - Iliotibial band
- Soft tissue mobility
 - Lateral patellar retinaculum
- Patellar mobility and crepitus
- Biomechanics/structure during gait
 - Subtalar pronation
 - Lower extremity internal rotation
- Patellar tracking

As suggested by Fredericson and Powers,⁵ patients can be classified by suspected causative mechanisms after the evaluation in order that intervention may be focused appropriately. Please see the Table 1, amalgam of intervention strategies suggested by experts in the field of patellofemoral pain,^{5,6} as well as those interventions found to be effective according to quality systematic reviews.^{1,2} As previously noted, specific interven-

tions will be addressed further in the section titled *Intervention*.

Evaluation, Diagnosis, Prognosis (including Plan of Care)

Although current literature regarding anterior knee pain does not provide recommendations regarding the optimal number of physical therapy visits expected for this diagnosis, the *Guide to Physical Therapist Practice*⁴ contends that for a condition of localized inflammation, the expected range for number of visits for an episode of care may be 6 to 24 visits. Localized inflammation most closely matches the syndrome in question, with chondromalacia patellae (a form of anterior knee pain) being listed under possible diagnoses within this condition category. Although no available outcome studies have defined the optimal frequency of visits, at least one higher quality randomized controlled trial claimed efficaciousness for the alleviation of patellofemoral pain using a program of 1 time per week for 6 weeks.³ This frequency and duration is therefore suggested when the patient demonstrates independence and compliance with the home exercise program, and is felt to be making expected progression toward goals. Through re-evaluation, the physical therapist should alter this plan appropriately based on their experience with this patient population as well as expected patient progression.

The goals of treatment and expected outcomes for this defined pathology and population includes the following:

- Absence of swelling
- Restored active and passive range of motion of the involved knee
- Normal quadriceps facilitation/timing
- Normal muscle length and soft tissue mobility
- Optimal patellar alignment/tracking
- Improved eccentric control of lower extremity internal rotation and subtalar pronation during stance and gait
- Patient independence with home exercise program
- Patient independence with self patellofemoral taping if applicable
- Return to pain free activities such as prolonged sitting, running, jumping, stair climbing, kneeling, squatting, ambulation on inclines/declines
- Return to normal activities of daily living, recreation, and work if applicable

Table 1. Mechanisms, Exam Findings, and Interventions

Suspected mechanism	Examination findings	Intervention strategies
Abnormal patellofemoral joint mechanics	Bony/structural abnormalities Decreased muscle length Tightness of lateral structures Decreased patellar mobility Quadriceps muscle weakness	Deep tissue massage/soft tissue mobilization Stretching: lateral retinaculum, ITB, hamstrings, quads, gastrocnemius, anterior hip Patellofemoral mobilization General quadriceps muscle strengthening using appropriate open and closed chain exercises McConnell taping Bracing (Protonics)
Altered lower extremity alignment and/or motion	Subtalar joint pronation Hip internal rotation Gait deviations	Orthotic shoe inserts PREs: Gluteus medius/maximus and deep external hip rotators Address quadriceps avoidance pattern Biofeedback
Overuse	Lack of findings upon physical exam	Address training error Rest Anti-inflammatory modalities

Intervention

Possible interventions supported by current best evidence include exercise, soft tissue mobilization, biofeedback-assisted exercise, McConnell taping, foot orthotics, and one type of resistance knee brace. Other relevant interventions common to orthopaedic practice include relative rest, anti-inflammatory modalities, and addressing training errors. Each is addressed in terms of current recommendations and corresponding rationale. A summary table follows the descriptions below.

Exercise

Recommendation: Focus on general quadriceps strengthening, stretching of shortened muscles (hamstrings, rectus femoris, gastrocnemius, iliotibial band), and strengthening of hip musculature (gluteus maximus/medius, deep external hip rotators). Quadriceps strengthening should include open and closed chain exercises, with consideration of normal and pathological patellofemoral biomechanics. That is, avoiding open chain terminal knee extension and also knee flexion angles greater than 90° for closed chain exercise.

Rationale: Studies of sufficient methodological quality support quadriceps strengthening, although no one form of strengthening has been found to be more effective than another.^{1,2} Studies which examine the effect of quadriceps strengthening do so because of the proposed influence on patellofemoral joint mechanics or *tracking*. Experts recommend strengthening the quadriceps muscle group in a comprehensive manner, using both open and closed chain exercises with consideration of patellofemoral joint mechanics. That is, avoiding terminal extension in the open chain, and avoiding large flexion angles within the closed chain.^{5,6} There is controversy over

whether there is value in trying to selectively strengthen the vastus medialis obliquus over the vastus lateralis since studies have not yet proven that isolated recruitment is even possible (nor realistic) with exercise.⁵ Experts suggest, and at least one higher quality study promoted strengthening of the deep external rotators of the hip as well as both the gluteus maximus and gluteus medius.^{5,6} These groups are thought to control excessive lower extremity internal rotation and therefore influence improved patellofemoral tracking. Exercises to promote optimal patellofemoral mechanics also include stretching exercises for those muscle groups thought to influence aberrations in patellar tracking and/or increase patellofemoral compression forces. Stretching of the lateral patellar retinaculum has been suggested as well. These elements have not been studied singularly, but rather as components of a treatment program as would be typical to address in the clinic.³ Treatment recommendations are made based on study findings which include these elements as well as expert opinion regarding the influence of these tight tissues upon patellofemoral mechanics.^{5,6}

Biofeedback

Recommendation: May be best used to facilitate contraction of the quadriceps muscle group when the patient demonstrates quadriceps inhibition during exercise and/or functional activity. Biofeedback in the form of surface EMG may be used to specifically recruit the vastus medialis obliquus (VMO), especially when there is obvious atrophy and/or inhibition.

Rationale: In the literature, surface electromyography (EMG) has been used to assist the patient in both selectively contracting the vastus medialis as well as in contracting the quadriceps in a nonse-

lective manner to remedy the quadriceps avoidance pattern. This pattern of compensatory gait is described by Berchuck and colleagues.⁷ As mentioned previously, selectively activating the VMO has been thought to improve patellar tracking based on the muscle fiber orientation. This remains controversial as previously stated. There is at least one quality study showing success with a physical therapy program in which biofeedback was used; however, the individual program components were not examined.³

McConnell taping

Recommendation: Use patellofemoral taping (McConnell taping) when there is obvious patellar tracking faults and/or faulty orientation, and when doing so achieves at least a 50% reduction in pain with exercise and/or functional activities. Taping also could be helpful in providing a low-load, prolonged stretch to a tight lateral retinaculum if found to be restricting optimal patellar tracking. In order to become proficient at this intervention, the clinician should seek appropriate education and training from an experienced clinician or at a continuing education seminar/lab.

Rationale: Taping the patella in various manners to affect the orientation of the patella relative to the femur has gained widespread clinical appeal as of late despite disagreement over the proposed mechanisms.^{5,8} Studies comparing the efficacy of patellofemoral taping as an adjunct to exercise as opposed to exercise alone have revealed mixed results, although there are at least 2 higher quality studies that reported successful outcomes when taping was used with a specific exercise protocol.^{1,3} Because taping has been shown to reduce pain by at least 50% during exercises, it may be a reasonable addition to the exercise program. If not already trained in the appro-

appropriate examination and application methods, the clinician would be wise to spend the time and funds to do so in order that the specific techniques may be performed effectively. Note however that studies examining the reliability of the assessment techniques have demonstrated poor reliability.⁸

Foot orthotics

Recommendation: Use either custom molded or off-the-shelf foot orthotics when hyperpronation is demonstrated in stance and with gait, especially if the appropriate correction results in at least a 5° improvement in the Q-angle (between relaxed stance and standing in subtalar neutral).

Rationale: Foot orthotics, according to relevant systematic reviews, have shown promise with regard to restoring function and reducing symptoms in the adolescent female suffering patellofemoral pain.^{1,2,9} In the presence of excessive subtalar pronation, an appropriately fitted orthotic may reduce the resultant degree of tibial rotation and therefore prevent abnormal patellar tracking.⁵ Experts recommend, however, that an orthotic is most appropriate when the lower extremity Q-angle can be altered by at least 5° when the foot is placed in the weight bearing subtalar neutral position versus relaxed stance.⁵ Since an orthotic device may be an uncovered expense to the patient, its appropriateness based on this examination result is an important factor to consider. Patient and therapist preferences and experience are also important considerations when making decisions about the utilization of a foot orthotic.

Knee bracing

Recommendation: The selection of a knee brace or sleeve may be based primarily on clinician experience and patient preference, although the Protonics resistance brace may be a reasonable option, especially if covered by the individual patient's insurance. Even if covered by insurance, bracing may be the best choice only when conservative treatment (exercise, taping, etc.) has failed.

Rationale: According to available systematic reviews, studies of high quality examining the efficacy of bracing in the management of patellofemoral pain are few.^{2,9,10} Some reviewers have even recommended against their use due to poor results in at least one study.⁹ The Protonics resistance brace (Inverse Technology Corporation, Lincoln, NE) was the only brace to be recommended

by authors of one systematic review¹ based on a study they claimed to be of sufficiently high methodological quality. However, another reviewer¹⁰ concluded that the same study was of insufficient quality to make recommendations. Despite this disagreement among reviewers and in the absence of stronger evidence, the Protonics brace may still be a reasonable treatment choice since study results indicated significantly high effectiveness. As with any durable medical product, however, the patient is sometimes responsible for at least a portion of the product price. It is therefore suggested that the use of an expensive brace may be recommended only when conservative treatment has failed to result in an expected outcome or according to the experience and preferences of the therapist/patient/physician.

Relative rest/anti-inflammatory modalities/addressing training errors

Although not specifically addressed in current available studies regarding anterior knee pain, these interventions are well accepted in orthopaedic practice for managing any overuse type inflammatory condition. Note that typical errors committed by the athletic population may include but are not limited to: excessive hill running, inadequate rest between training sessions, and rapid increases in training intensity. These should be addressed with both the parent and coach if appropriate.

OUTCOMES

Expected outcomes for this population and pathology are introduced in the section titled *Evaluation, Diagnosis, and Prognosis*. Outcomes may be measured through physical therapy re-evaluation of impairments, objective functional testing, and through patient questionnaires which attempt to quantify symptoms (usually pain) and perceived functional status. The visual analog scale (VAS), as a quantifier of pain, is used in many trials and is therefore a recommended clinical outcome measure. Although there are many available measures of patient perceived functional status, the Knee Outcome Survey Activities of Daily Living is recommended due to a high quality study which demonstrated this to be a reliable, valid, and responsive instrument.¹¹ It may be used to address functional limitations for a variety of knee disorders including anterior knee pain.

Critique

The merits of this guideline are that it is based on the current best evidence

and therefore includes appropriate recommendations for the evidence-based practitioner. It also makes known areas in which evidence may be lacking. Where there has been an absence of sufficient quality studies to support or refute an intervention, the agreement or controversy among experts has been addressed. Note that experts are defined as those who have published most of the higher quality physical therapy literature regarding the topic of patellofemoral knee pain. This guideline also provides the physical therapy practitioner with sufficient information to assist with decision making yet encourages examining their own outcomes in order to possibly add to the available evidence.

This guideline could be improved if it was based on many studies of higher quality rather than relatively few. The relevant systematic reviews all concluded that more quality studies are needed to address the treatment of patellofemoral pain, and that authors had difficulty accepting or refuting many of the studies' conclusions based on methodological errors. These guidelines are therefore heavily based on expert opinion and well accepted patellofemoral joint pathomechanics. Finally, another weakness is that recommendations are based on studies which did not focus upon the adolescent female—with the exception of one promoting the use of foot orthotics.¹²

Application to Practice

These guidelines should be used to assist in making decisions regarding the selection of appropriate exercises as well as in deciding to employ other treatment options such as taping and bracing. The strongest forms of evidence more consistently promote quadriceps strengthening exercises as addressed previously. Since evidence to support the use of durable medical goods is sparse, it is reasonable to suggest that they be used when more conservative care is not completely successful or perhaps when the clinician/patient/physician have experienced past success with their usage. Clinicians should always focus upon the relevant findings resulting from the patient evaluation in an attempt to individualize the intervention, and should alter their treatment plans (as needed) based on re-evaluations. Atypical or undesirable responses to suggested interventions should always result in treatment plan modification, including the potential use of those interventions in which the clinician has had previous success. As strong evidence favoring one mode of treatment is currently sparse, clinicians should document

Table 2. Summary of Interventions

	Exercise	Tape	Brace/sleeve	Biofeedback	Foot orthotics
Evidence?	Yes, but not in support of specific components.	Still controversial, but found to be clinically effective by consensus.	Insufficient quality of evidence, although the Protonics resistance brace has been recommended in one SR.	Still controversy over whether its use in selective VMO activation is warranted.	Yes, for adolescent females exhibiting subtalar pronation.
Description	<u>PREs</u> : Quadriceps; hip external rotators, gluteus medius/maximus; <u>Stretching</u> : hamstrings, anterior hip, gastrocnemius, rectus femoris, ITB	Refers to "McConnell" taping, to normalize and/or enhance patellar alignment and tracking.	Protonics brace provides submaximal resistance to knee extension.	Usually used to assist patient in selectively activating the VMO during appropriate exercises.	Custom or off-the-shelf shoe inserts to reduce excessive subtalar joint pronation and therefore excessive LE rotation.
Proposed mechanism	Enhance normal patellar tracking and function.	Unclear; proposed to unload painful structures, distribute forces more evenly, stretch tight tissues, optimize patellar tracking.	Increases strength and endurance of lower extremity musculature which enhances patellar tracking during ADLs	VMO isolation is thought to enhance optimal patellar tracking. (often used with taping)	Reducing excessive pronation and therefore tibial external rotation reduces excessive lateral patellar motion relative to the femur.
Cost consideration	Per visit, depending on time spent with patient. Typical procedural codes include: therapeutic exercise or activity, manual techniques and/or neuromuscular retraining	Usually used in the clinic during exercises, with patient purchasing for home use. Current cost to the practitioner is ~ \$25.	Without insurance coverage, the device costs \$495 if purchased directly through the manufacturer.	Clinic maintains ownership of the device (costs of devices vary)	Variable (approximately \$25 – \$200) depending if selected device is off-the-shelf or custom-molded.

outcomes consistently in order to perhaps add to the evidence in some manner.

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Neural Mobilization: An Appraisal of the Evidence Regarding Validity and Efficacy

David M. Kietrys, PT, MS, OCS

It is not uncommon for health care practitioners to use popular interventions that have not been adequately studied for efficacy. Furthermore, many popular interventions are based on theory that has not been adequately validated. Neural mobilization is one such intervention. Continuing education and written material on the subject is easy to find. Based on my clinical experience, most physical therapists that practice in outpatient settings have some familiarity with the theory and technique. Many physical therapists integrate this form of intervention into their plans of care for patients who are deemed to have problems with neural tension or neural mobility. It is common for therapists to anecdotally report successful outcomes with this approach.

VALIDITY OF NEURAL MOBILIZATION THEORY

Controversial points of view regarding mobilization of the nervous system have been appearing in the literature. Di Fabio¹ noted, in an editorial, that the clinical tests used to assess neural mobility are not specific to the peripheral nerves, ie, other tissues also are affected, and therefore may not be valid tools to identify adverse neural tension (limited mobility) of the nervous system. This perspective also is offered by some of the originators of the approach, Butler and Gifford.² Di Fabio¹ notes that there is no evidence of satisfactory sensitivity and specificity of the clinical tests used to identify adverse neural tension. Thus, the validity of some of the theoretical constructs of the approach must be questioned. However, some of the theoretical constructs of neural mobility have been validated. Butler³ cites many references in his text that support some of the theoretical constructs of neural mobility, particularly with regard to the physiologic response of nerves to stretch. There is also an adequate body of evidence to support the concept that nerves do normally move in relation to their surrounding connective tissues.^{4,5} Byl and colleagues⁶ demonstrated an increase in strain (ie, lengthening) of the median and ulnar nerves when the limbs were placed in Butler's nerve tension test positions.

Matheson⁷ stresses that although some therapists may overzealously diagnose adverse neural tension based on the results of neural mobility tests, the clustering of signs and symptoms and the process of evaluating the examination information may indeed incriminate the nervous system as the source of impairment. Butler and Coppieters⁸ agree that interpretations of neural tension tests should consider other findings of the examination. Although further study of the validity of isolated neural tension tests is needed, Butler and Coppieters⁸ also note that a typical concurrent validity study would be difficult to design because there is no accepted criterion standard. This fact also would make validity studies of clusters of signs and symptoms difficult to perform. In summary, much needs to be learned about the validity of this therapeutic approach. Although it has been suggested that it is not scientifically sound to practice techniques that are not supported by valid theory,⁹ it is a reality of clinical practice to do just that. Despite the questions regarding the validity of many neural mobility concepts, "the train has left the station," ie, these techniques are rapidly being integrated into contemporary physical therapy practice.

EFFICACY OF NEURAL MOBILIZATION

For better or worse, many physical therapists are less concerned about validation of theory than they are with the evidence for efficacy of interventions. "I don't care why it works, as long as it does" is not an uncommon sentiment. Unfortunately, practitioners may practice the technique based on testimonials from other practitioners rather than a careful review of the literature. The purpose of this section is to briefly review the literature regarding the efficacy of the intervention commonly known as neural mobilization.

Neural mobilization techniques can be applied to peripheral nerves in the upper or lower extremities.³ There have been very few published studies of the efficacy of the intervention.

Scrimshaw and Maher¹⁰ performed a randomized controlled trial of neural mobilization after spinal surgery (lumbar

discectomy and/or fusion). The control group received standard postoperative care consisting of isometric and dynamic exercises. The experimental group received neural mobilization activities in addition to the standard postoperative exercises. Both groups continued their protocols for 6 weeks. Outcome measures included global perceived effect, visual analogue pain scales, the McGill Pain Questionnaire pain rating index, the Quebec Disability Scale, straight leg raise range of motion, and work/activity status. The number of subjects (n=81) was adequate to determine clinically worthwhile effects with 80% power. The authors found there was no benefit to the addition of neural mobilization activities to the standard care in any of the outcome variables analyzed. Although not statistically significant, the data actually suggests a possible harmful effect of neural mobilization on pain, disability, and straight leg raise. The study methods did not allow for random allocation or complete double blinding, and the results did not reject the null hypothesis. These methodological issues would be expected to cause a larger treatment effect. The results of this study cannot be generalized to alternative dosages, alternative methods of neural mobilization, or other patient populations. There was some likelihood that the standard protocol also produced some mobilization of the nervous system, via active movement. However, the specific neural mobilization activities used by the experimental group clearly did not result in a therapeutic benefit in this sample of patients who were status-post back surgery.

Ekstrom and Holden¹¹ published a case study of a patient with lateral elbow pain of 4 months duration. Neural tension testing was 'positive' for limited neural mobility of the deep radial nerve. The authors contend that the results of the neural tension test, combined with tenderness over the radial tunnel and weakness in muscles innervated by the posterior interosseous nerve, suggested a diagnosis of deep radial nerve adverse tension. A comprehensive intervention program over a 10-week period included neural mobilization techniques, as well as ultrasound and exercises. At the conclu-

sion of treatment, the patient was pain free. She had resumed all activities at 4-month follow up. The favorable outcome experienced by this patient suggests that neural mobilization techniques may be effective for lateral elbow pain. A larger randomized controlled trial is needed to confirm the apparent benefit of this intervention for this population. There are also several limitations in this case study report. The neural tension test used by the authors has not been shown to be sensitive and/or specific for deep radial nerve entrapment. The test also stretches the common extensor tendon, and it is possible that stretch of that tendon was the source of increased pain during the test. The patient also received a number of interventions, so it is difficult to determine if the neural mobilization techniques were a factor in the improvement. The neural mobilization techniques also may have had effects on tissues other than the deep radial nerve. For example, the common extensor tendon was stretched with the technique. If adaptive shortening of this tendon was a contributing factor in the patient's pain, then perhaps stretching it over time contributed to the improvement. Despite the limitations of this case study report, further investigation of the use of neural mobilization as an intervention for patients with radial tunnel syndrome is warranted.

Neural mobilization techniques also are used for patients with carpal tunnel syndrome (CTS). Three studies provide conflicting evidence on the efficacy of this intervention technique in this population.

Rozmaryn et al¹² published a large retrospective study (n=197 subjects, 240 hands) of patients with CTS and found that patients who received nerve and tendon gliding exercises in addition to standard care (splinting, anti-inflammatory medication, and steroid injections) were less likely to have surgery than those who received standard care alone. The groups were well-matched demographically, although the proportion of clerical and white-collar workers was greater in the experimental group. There was no significant difference in clinical signs between the groups. Decisions to operate were based on the patient's perception about the success of conservative treatment and the absence of improvement in clinical signs. Forty-three percent of patients in the experimental group underwent surgical release compared to 71% of patients in the control group. At an average follow-up time of 23 months, 62% of the patients in the

experimental group, who did not have surgery, reported a good or excellent result. The authors were unable to make predictive statements about which patients would eventually require surgery in either group. The results of this retrospective study indicate that patients are less likely to require surgery at 23-month follow-up if they receive nerve and tendon gliding exercises as part of their conservative treatment program. This finding suggests the need for a prospective double blind study, which uses validated and reliable outcome tools. Also, data collection at longer follow-up periods is suggested.

Tal-Akabi and Rushton¹³ investigated the effects of carpal bone mobilization and neurodynamic mobilization in patients with CTS. They used a random allocation experimental design with a control group and 2 different treatments groups, with 7 subjects in each group. Outcome measures included a symptom diary (visual analogue pain scale), the Functional Box Scale, the Pain Relief Scale, wrist range of motion, and upper limb neural tension testing. Data was collected before and after one treatment session. Subjects in the experimental groups received either the neural mobilization treatment or carpal bone mobilization and flexor retinaculum stretching. The authors do not describe the dosage of either intervention. Both experimental groups showed significant improvements in pain ratings and extension range of motion compared to the control group. This was a short-term (pre- and post-one intervention session) study. The results cannot be generalized to long-term effects of the interventions, or to the effect of a longer series of treatment sessions. The small number of subjects places the data at risk for a Type-2 error. Also, there is some likelihood that the post-treatment relief in the 2 experimental groups is due to a placebo effect, as the control group had no sham treatment. Overall, this was a poorly constructed study and adds little to the body of literature on this topic.

A more recent paper used a similar nerve and tendon gliding protocol as Rozmaryn et al.¹² In this prospective, randomized trial, Akalin and colleagues⁴ found that the addition of nerve and tendon gliding exercises to splint treatment did not result in a significant difference compared to splinting alone, except for pinch strength, which was better in the experimental group. Both groups had statistically significant improvement at 8 weeks. Outcome measures included the Symptom Severity Scale, the Functional

Status Scale, Phalen's test, Tinel's sign, 2-point discrimination, grip strength, pinch strength, and a satisfaction questionnaire. A strength of this study is the inclusion of measurement of symptomatic relief and functional status. The results of this study suggest that conservative treatment can result in favorable outcomes for patients with CTS. However, the use of nerve and tendon gliding exercises was not found to provide significant benefit when compared to splinting alone. The subjects in this study did not have thenar atrophy, stenosing flexor tenosynovitis, or a positive Phalen's test in less than 30 seconds. Patients meeting those criteria are less likely to have a positive response to conservative intervention.¹⁵

Sweeney and Harms¹⁶ reported a difference in upper limb neural tension test results (median nerve), between the involved and uninvolved sides, in 76% of 29 subjects with mechanical allodynia following hand injury. The subjects performed a 2-week program of neural mobilization (stretching) exercises. Favorable outcomes (in terms of symptom response during the neural tension test) were found in 66% of the subjects. The authors also reported a significant favorable result for the area of symptom response and improved range of motion (during upper limb neural tension testing) in the experimental group. The results of this study suggest that neural mobilization (stretching) is a useful intervention for subjects with mechanical allodynia of the hand. Although a larger study with long-term outcomes for this population is needed, neural mobilization, as an intervention for patients with mechanical allodynia, is supported by the results of this study.

CONCLUSIONS

Clearly, more research is needed to determine the efficacy of neural mobilization techniques for various nerve entrapment syndromes. Currently, there is an inadequate body of literature available to either support or refute the use of this intervention approach. The technique for neural mobilization may involve stretching exercises or gliding exercises or both. Physical therapists should carefully monitor the effects of this intervention in individual patients, and use it on a case-by-case basis if it appears to be contributing to satisfactory outcomes. As more published studies become available for review, therapists will be better able to determine the efficacy of neural mobilization. Until then, therapists will practice based on the literature currently available, expert opinion, and personal experience.

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CASE REPORT

Effects of Thermal Biofeedback in the Treatment of Sympathetically Maintained Complex Regional Pain Syndrome

Roger J. Allen, PT, PhD, Corie M. Cortez, SPT, John W. Friends, SPT, Kim E. Miyake, DPT

Complex regional pain syndrome (CRPS), previously referred to as reflex sympathetic dystrophy (RSD), is a chronic pain condition typically affecting one or more extremities, where pain which is out of proportion in intensity and duration to the level of initial tissue damage persists.¹ Tactile allodynia, or pain secondary to normally nonpainful stimuli, is a hallmark of CRPS.¹ Complex regional pain syndrome related pain may be mediated in part by activity of the sympathetic nervous system, or independent of sympathetic modulation. These conditions are termed sympathetically maintained pain (SMP) and sympathetically independent pain (SIP).² Cases involving SMP typically manifest abnormal vasomotor activity that can lead to thermal as well as tactile allodynia.³ Thermal allodynia can be relentless, causing affected patients to curtail their use of the involved limb for any activity requiring exposure to even slight variations in temperature.

A recent case study found that this thermal intolerance was unaffected by desensitization treatment which had successfully addressed tactile allodynia.⁴ This patient responded positively to a treatment course of thermal desensitization with normalization of vasomotor responses to cold challenges and increases in functional usage regarding activities related to exposure to cold materials. A published commentary to that study suggested a trial assessing the potential efficacy of thermal biofeedback training to attenuate CRPS related thermal allodynia.⁵ Thermal biofeedback alone has shown success in resolving symptoms in a preadolescent with RSD.⁶ Belleggia and Birbaumer report the efficacious use of thermal biofeedback in conjunction with other treatment modalities for addressing symptoms associated with RSD.⁷ Current literature has yet to establish whether thermal biofeedback training can yield functional improvements as well as temporal symptom reductions in patients with CRPS.

The purpose of this case investigation was to determine if thermal biofeedback training could decrease pain and increase functional activity for a patient

with long standing sympathetically maintained lower extremity CRPS.

CASE DESCRIPTION

Patient History

The patient in question was a 32-year-old female with a 3-year history of CRPS in the distal left lower extremity secondary to a Grade II ankle sprain that she sustained by missing a step while exiting her home. The patient was functionally limited in standing tolerance, ambulation distance, and stair climbing. The severity of her symptoms was so debilitating that she was unable to work at her job as a tugboat dispatcher more than 4 hrs/day. Three weeks of participation in an inpatient chronic pain program and 10 months of intermittent outpatient care resulted in plateaued functional progress, without expectations of further improvement. Her single point cane (SPC) dependence became so severe that it had resulted in irreversible median nerve damage at her contralateral wrist and she was forced to ambulate with an ipsilateral SPC. Initial pharmacological pain management had been successful via the alpha blocker (vasodilator) transdermal clonidine, yet at the time this investigation began she was no longer obtaining any pain relief from the medication secondary to habituation. The patient reported strong pain provocation with cold exposure and pain attenuation when the limb was warm. Notably, she demonstrated a remarkable aptitude for mentally visualizing warm beaches of her native Hawaii, which suggested that she might be responsive to thermal biofeedback training.

Assessment Variables

The following variables were assessed prior to treatment, weekly during treatment, and at 1 and 6 month follow-up appointments: digital surface temperature of the affected limb, subjective report of pain intensity (0-10 scale), uncued weightbearing symmetry, cane usage, maximum ambulation distance and velocity without SPC, gait abnormalities (via Gait Assessment Rating Score [GARS] and Dynamic Gait Index [DGI]), stair climbing ability, and pain-related

work tolerance via hours worked per week.

Intervention

The patient underwent 8 weeks of thermal biofeedback training (BIW) designed to increase arterial perfusion to the affected limb, which included mental imagery instruction related to foot warming. The patient was oriented to the principles of biofeedback and given 1 week of nonthermal practice using sEMG biofeedback to the right biceps brachii. The next 6 sessions involved thermal biofeedback training to her unaffected foot. The last 10 sessions involved thermal biofeedback training to the affected foot. For thermal training, an analog electronic thermal trainer was used with the thermistor probe placed on the plantar surface of the distal phalanx of the first digit. A daily home program included the use of the portable thermal trainer and mental imagery tapes. She was encouraged to engage in daily foot warming practice at home and log her efforts.

RESULTS

As a function of thermal biofeedback training, the patient made notable progress toward voluntarily increasing the surface temperature of her affected foot, progressing from a pretraining baseline mean of 20.7° C to a sustained resting temperature of over 25° C following 8 weeks of training. Indicative of increased distal vascular perfusion, she maintained her increased foot surface temperature upon follow-up assessment (25.4° C measured 6 months after training). Her self-reported pain intensity also diminished from a pretreatment mean of 6.7/10 to 3/10 following training, a level below what she had experienced at any time since the CRPS diagnosis. Decreases in pain intensity were closely correlated to increases in foot temperature across treatment sessions ($r = -0.84$), a finding that clearly established a dominant neurovascular component to the pain experienced by this patient.

The patient also demonstrated improved standing tolerance and weight-bearing symmetry from 37.3% weight-bearing on the affected side at the onset

of treatment to 46.4% at the end of treatment. This allowed her to meet a primary pretreatment goal of increasing the number of hours she could tolerate working at her job. Her number of weekly on the job hours increased by 37% over the course of treatment.

Furthermore, treatment yielded a mild increase in ambulation velocity from 42 to 53 m/min, and a marked increase in ambulation distance from 150 to 300 meters without SPC assistance. The GARS and DGI revealed notable decreases in gait abnormalities during unassisted gait. The patient reported that increased unassisted walking distance and improved gait mechanics contributed meaningfully to improved work tolerance and ease of daily activity performance.

The patient did not show meaningful improvement in stairclimbing ability or cane dependence outside of the clinic. Although the patient remained dependent on a SPC, it is hypothesized that her improved weightbearing symmetry resulted in decreased stress to the ipsilateral wrist. This notion was not tested directly; however, at 6-month follow-up, the patient reported no left hand or wrist symptoms. The patient's ability to increase vascular perfusion of the affected limb, reduce severity of reported pain, regain weightbearing symmetry, increase work hours, and improve ambulation mechanics, velocity, and distance without the assistance of a cane was maintained through 1 and 6-month follow-up assessments.

CONCLUSION

This lower extremity CRPS demonstrated a strong association between

limb pain and skin surface temperature. Following 8 weeks of thermal biofeedback training, she showed notable improvements in limb pain, qualitative and quantitative aspects of gait, weight-bearing symmetry, and work tolerance.

IMPLICATIONS FOR THERAPISTS

The symptomatic presentation of cold intolerance may implicate sympathetically maintained neurovascular insufficiency as a component of a given patient's pain and resulting functional deficits. If sympathetically mediated neurovascular issues are suspected, it is useful to assess the affected limb's surface temperature. Thermal biofeedback appears to have the potential to increase vascular perfusion of limbs with neurovascular insufficiency, attenuate pain, and aid in functional restoration. Patient selection criteria should include asymmetric limb surface temperature, decreased pain intensity with warmth, aptitude to visualize warmth, and the cognitive ability to use thermal biofeedback information effectively.

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Component Award for Outstanding Legislative Affairs Initiative

The Orthopaedic Section was presented the Component Award for Outstanding Legislative Affairs Initiative. Steve McDavitt, Orthopaedic Section Practice Chair, is shown with APTA President Ben Massey at the 2003 Annual Conference in Washington, DC.

Congratulations!



Letter to the Editor

Orthopaedic Physical Therapy Practice should be commended on their animal physical therapy special issue (Vol. 15, No. 2 2003). Animal physical therapy is a much neglected, and needed, area of veterinary medicine. I have treated referral cases in musculoskeletal pain for 12 years and routinely see poorly managed care that contributes greatly to animal suffering and chronic pain.

I was disappointed that nowhere in your special edition was Myofascial Trigger Point (MTrP) Therapy mentioned. MTrP therapy is a therapy for acute and chronic pain described in detail for humans^{2,3} and briefly in the dog.¹ Trigger points can cause not only muscle pain and weakness, but also reduced muscle (and therefore joint) ROM. Treatment of MTrPs, even in very chronic cases, is associated with rapid improvements in animal pain behaviours, muscle ROM and initial strength gains. Coercing a painful animal is difficult if not, in some cases, impossible. Importantly then, decreased pain behaviours with MTrP therapy are associated with increased animal cooperation, confidence in the therapist and ease of treatment. Early rapid improvements increase the speed of rehabilitation.

I have found animals tolerate MTrP therapy very well provided the therapist is skilled in both MTrP therapy and the understanding of animal pain behaviour relevant to the species being treated. Unfortunately, MTrPs are neglected as a common cause of musculoskeletal pain in humans and, in my experience, animals. Few veterinary practitioners are aware of MTrPs or skilled in their diagnosis and treatment.

Regards,



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RESPONSE BY SPECIAL ISSUE GUEST EDITOR

Many issues in animal rehabilitation were not addressed in this issue. Noninclusion in the issue in no way indicated less significance in rehabilitation care for animals. We requested that clinicians submit papers for inclusion in the special issue. Unfortunately, no one submitted a paper in this area for inclusion in the issue.

Cheryl Riegger-Krug, PT, ScD

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Book Reviews



Coordinated by Michael J. Wooden, PT, MS, OCS

Schneider CM, Dennehy CA, Carter SD. *Exercise and Cancer Recovery*. Champaign, Ill: Human Kinetics; 2003, 219 pp., illus.

It is the 21st century and you probably can't find anyone in the Western Hemisphere who hasn't heard about the benefits of exercise. Researchers have reported everything from increased strength, flexibility and endurance, to decreased anxiety and depression as a benefit of exercise. In this book, the authors write about exercise as an 'intervention for cancer rehabilitation.' Interestingly, the authors praise exercise not only as a way to help patients cope with the effects of the disease, but also to minimize the negative effects of cancer treatments.

The authors suggest that this book be used by professionals working in cancer rehabilitation, by students in undergraduate courses for cancer rehabilitation, and by instructors in workshops training cancer exercise specialists. In my opinion, the text is best suited as an introduction to the topic, and should be accompanied by additional training and information. The book is organized into 9 chapters covering basic information about cancer diagnosis and treatment, exercise physiology, exercise as it applies to patients with cancer, and creating a cancer rehabilitation business.

Chapter 1 addresses basic cancer pathology. Information regarding which cancers are most common, how normal cells become cancerous, and the grading and staging of cancer tumors is clearly and simply presented. This information is especially useful for a student or health care provider who does not have a basic knowledge of cancer.

Chapter 2 begins by describing various forms of cancer treatment. The treatments that are discussed are surgery, radiation therapy, chemotherapy, hormonal therapy, immunotherapy, bone marrow transplantation, and experimental therapies such as gene and vaccine therapy. As in Chapter 1, the information in this section is simply and clearly presented and basic. How each type of therapy affects different types of cancer and healthy tissues is explained. This information is particularly important when thinking about what systems and parts of the body will be affected most by a treatment, whether

it is healthy tissue or cancer. In discussing chemotherapy, 4 different types of drugs were described. As more practical information, it would have been helpful if the authors also gave examples of specific drugs and discussed which category each drug fell into. After describing the types of cancer treatment, the authors then explain the side effects related to cancer treatment. Some side effects are discussed in terms of how treatments affect a physiological system, like the cardiovascular system. Others, such as fatigue and depression, are discussed independent of any system. The authors begin in this chapter to describe some of the research that has been done examining patients with cancer and the effects of the disease and the treatments they undergo to beat it.

Chapter 3 describes, in simple terms, the body's response to exercise (exercise physiology) and the application of those ideas to exercise prescription. Interestingly, the authors state that the chapter is intended to provide "basic concepts for those who have no background in exercise physiology," citing oncology nurses, physical therapists, and others. I suppose that this is the authors' perspective because of their education in exercise physiology, but I found it a disappointing statement about physical therapists who are generally well versed in exercise physiology. The text often describes factors that need to be taken into account when prescribing exercise for patients with cancer and things that need to be adjusted, but the text does not clearly state how or what adjustments to make. This book does not appear to give an individual all the training and information needed to be able to start a cancer rehabilitation practice.

Chapter 4 follows as a discussion of research on cancer and exercise and the guidelines for exercise prescription. There does not seem to be a great amount of research about the effects of exercise on patients with cancer. Moreover, the research that is discussed does not often detail what type of cancer patients had and whether they were receiving treatment during exercise. It may be that results found for patients with breast cancer would not apply to patients with leukemia or lung cancer because systems are affected differently by the disease. More importantly, exer-

cise will probably affect a patient going through chemotherapy differently than a patient who finished chemotherapy 3 months previously, or had surgery to remove a tumor a few months ago. In many studies, the outcomes are self-reported or are subjective measurements regarding fatigue or quality of life. While improvements that are subjective can still be meaningful for individual patients, are they meaningful enough to prescribe exercise as a form of treatment for all patients with cancer? Are the results different than if the patients received massage instead of exercise? The answers to questions like these are not discussed. Clearly, exercise has a benefit to the entire body and one would not expect the benefits to be different for people who had cancer, but these are questions that research perhaps ought to address.

Chapters 5 and 6 discuss the health and fitness assessment for patients with cancer, using the assessment to create goals and finally establishing an exercise program to achieve those goals. The health assessment is, not surprisingly, very detailed and comprehensive. This is what probably sets it apart from other assessments given routinely to individuals at health clubs, gyms, or YMCAs. The assessment tools are not different from those used with healthy populations. However, the information-gathering phase and physician form are very different. The assessment procedure is described in great detail. Tests are performed in specific order and data is recorded meticulously. All these things work to ensure accuracy of data collection and accuracy of reassessment data, two things that are extremely important in examining outcomes. The authors readily state that the assessment tools may not be the best for patients with cancer, particularly because 'normal' values are based on healthy individuals. They report that they are using their data to try to establish norms for patients with cancer. This information would be valuable for anyone working with this population in the future. Regarding exercise prescription, the author's discuss modalities to address items such as endurance, strength, flexibility, body composition, and stress. These items would be addressed in an exercise program for any individual. They move on to describe

how the basic exercise parameters of frequency, intensity, mode, and duration can be manipulated to establish exercise doses. One of the most valuable things in this chapter is the sample workout for patients during treatment and following treatment. It is difficult to emphasize enough how ill patients with cancer sometimes are, but these sample workouts show that patients can very often start walking for 10 minutes or less and are not able to use weight machines because the starting weight is much too heavy. The sample programs also highlight the differences between patients exercising during cancer treatment and those who have completed treatment, at least temporarily. This information and expertise is somewhat lacking in the text, and would be very important for someone working with this population.

Chapter 7 addresses how to use the information in the previous chapters in a more practical way, for example in working and communicating with other medical professionals. The authors stress that safety procedures are needed and that exercise progression with this population is often not linear especially when they are undergoing treatment. The chapter outlines a sample exercise program from beginning to end. It describes the assessment, the exercise prescription by month, and the reassessment after 6 months of participation. The authors' recommendations are included here, regarding issues like group vs. individual exercise, and center-based vs. home based programs.

The final 2 chapters diverge somewhat from the earlier ones. Here the authors discuss how to establish and manage a cancer rehabilitation facility. Business aspects are discussed in great detail; even sample mission statements, organizational structures, and job descriptions are provided. Clearly, the authors feel that their facility is valuable enough to encourage the reader to consider establishing one of their own. Because the information is so detailed, it would be helpful for someone thinking about opening any facility. Individuals should use caution, however, that the information although specific, is not enough alone to guarantee success. As with the other aspects of the book, the information may provide a good beginning, but more education and training are needed to serve this special population appropriately.

Exercise and Cancer Recovery addresses an important and interesting topic, the benefit of exercise for patients with a severely debilitating disease like cancer. Most interesting is the idea that

one of the benefits of exercise may be the relief of reduction of treatment side effects. Many patients with cancer suffer serious side effects from treatment and the authors allege that exercise can help to improve the quality of life for a patient with cancer. Hopefully, the research will continue and grow into examining the effects of exercise on other diseases. As a text this offers a great beginning, but I would recommend that someone planning to work with patients with cancer seek more education and experience before doing so.

Allyson Baughman, MPT



Ehrman J, Gordon P, Visich P, Keteyian S. *Clinical Exercise Physiology*. Champaign, Ill: Human Kinetics; 2003, 618 pp., illus.

This text would be a valuable asset to the rehabilitation professional who works with chronically diseased and disabled individuals. *Clinical Exercise Physiology* is a comprehensive text with both scientific and clinical approaches to exercise prescription and testing.

The editors have provided relevant and accurate information for several target groups. First, to the qualified clinician who performs exercise testing and programming for the diseased or disabled population; secondly, to the individual preparing to take the ACSM- RCEP, a certification examination for exercise physiologists given by American College of Sports Medicine; and finally, to all involved in rehabilitation. This text would serve as a model reference for clinicians.

The book is divided into 8 sections, with 31 chapters addressing the practical issues of clinical exercise physiology across a spectrum of chronic diseases and disabilities. The first 7 chapters provide a foundation by reviewing general exercise physiology-related issues. Included are chapters on compliance to exercise, legal issues, pharmacology, medical history, examination and exercise testing, and prescriptions. The remaining 24 chapters deal with specific diseases and disabilities.

While not all-inclusive, the text provides information on a broad array of diseases that the rehabilitation specialist may encounter. These include diabetes, obesity, end-stage renal disease, myocardial infarction, chronic heart failure, hypertension, pulmonary disease, asthma, cystic fibrosis, cancer, immunodeficiency, arthritis, osteopenia, low back pain, and spinal cord injury. Also included are chapters on pediatric, geriatric, and women's health issues. Each chapter follows a structured format that presents pathophysiology, clinical consideration, signs and symptoms, treatment, graded exercise testing, exercise prescription, special considerations, and a case study.

The editors have succeeded in providing a comprehensive text. An enormous amount of material is discussed and clarified. Within each chapter, the pertinent aspects of exercise physiology have been skillfully addressed for the clinician.

Physical therapists may feel inadequate when implementing exercise programs for patients with chronic disease. This text provides the needed direction. The authors are to be congratulated for their important contribution to rehabilitation.

Dan Bankson, MSPT, CFMT, CSCS



Bottomley JM. *Quick Reference Dictionary for Physical Therapy*. 2nd ed. Thorofare, NJ: Slack, Inc. 2003, 592 pp.

In today's ever-changing and demanding health care system, the physical therapist and physical therapy student are required to possess a tremendous volume of knowledge and clinical skills in order to practice effectively and safely. This knowledge is often times difficult to retain comprehensively. The *Quick Reference Dictionary for Physical Therapy*, 2nd ed, has been created to provide the clinician a convenient and efficient way to access relevant clinical information.

The first 5 appendices provide a dictionary, beginning with commonly used words and definitions, followed by a list of frequently used abbreviations, medical roots from which some medical words originated, and commonly used acronyms for evaluative tests, measurements, and physical therapy organizations.

Appendices 6-12 have been reproduced, with permission from the American Physical Therapy Association including, the Code of Ethics, the Guide for Professional Conduct, the Standards of Ethical Conduct for the Physical Therapist Assistant, the Guide for Conduct for the Affiliate Member, and the Standards for Practice and the Guidelines for Physical Therapy Documentation.

In Appendices 13 and 14 a historical prospective is given, with special attention to practitioners who have made a significant impact on the profession of physical therapy. Resources are provided for the reader to gain insight on the growth and progression of the profession.

Anyone who has moved and gone through the process of obtaining licensure in another state has encountered the difficulty of accessing and obtaining information from licensing agencies. Appendix 15 provides a comprehensive list of addresses, contact information for state licensure boards (including Internet addresses), and information on state practice acts.

As with the rest of the professional world, many physical therapists look toward the Internet to access information pertaining to their profession. Appendix 16 contains an expansive list of Internet web sites that will provide the clinician with information needed to answer clinical, educational, research, and legislative questions.

The next 2 appendices deal with the disablement model established by the World Health Organization and frequently seen pathologies and diseases. The dictionary references the *Guide to Physical Therapist Practice* of the American Physical Therapy Association in Appendix 19 and 20, where it describes tests, measures, and treatment interventions commonly used in physical therapy practice today.

In Appendices 21-28, the reader has access to commonly used references for measures encountered in the clinical setting. Normal ranges for joint range of motion; laboratory values; fracture classification schemes; reflexes and reactions to the central nervous system; metabolic values for exercise; cranial nerve tests; a pictorial representation of the bones, muscles, nerves, and blood supply are listed for the reader.

Weights and measures of the metric system, as well as the English to metric conversion table is listed in Appendices 29-31 and a list of commonly used symbols for documentation purposes is provided in Appendix 32.

A valuable area of the dictionary is in Appendices 33 and 34, where prescription drugs are listed by disease. Recommended daily allowances of nutrients and vitamins are provided for specific age groups and gender. This is a very useful guide to the practitioner who is focused on health and wellness.

In the demanding world of insurance requirements, Appendix 35 offers the

clinician guidelines for physical therapy reimbursement, and information on physical therapy claims review.

Finally, alternative therapies and different types of resources and networking organizations are listed in Appendix 36 and 37 respectively. The dictionary closes with a directory to the organization of the American Physical Therapy Association.

The *Quick Reference Dictionary for Physical Therapy*, 2nd ed is a thorough and comprehensive reference material for the busy clinician. The pocket-sized book is relatively user-friendly and would be a valuable asset to any clinician's library. In today's fast-paced clinical environment, the physical therapist has to base many decisions on his/her knowledge and skill base. This dictionary will provide the clinician with a fast and easy way to access a broad amount of clinical and resource information.

Susan Mercik Davis, PT, MS



McKenzie R, May S. *The Lumbar Spine: Mechanical Diagnosis and Therapy, Volumes I and II*. Waikanae, New Zealand: Spinal Publications; 2003.

Robin McKenzie wrote the first edition of *The Lumbar Spine: Mechanical Diagnosis and Therapy* in 1981. This text was based on a conceptual model of mechanical pain and introduced the physical therapy and medical community to a very useful classification system for low back pain. That original edition was 164 pages long and contained 48 references. Twenty-two years later, this new edition contains 732 pages of text and illustrations along with 58 pages of references. The evolution of mechanical diagnosis and treatment of the lumbar spine is exceptionally well reflected in this 2-volume set.

The first volume begins with an updated section on demographic information and risk and prognostic factors related to the development of and recovery from lumbar pain. Chapters 3 through 6 cover material related to pain, connective tissue properties, intervertebral disc pathology, and spinal biomechanics. The following 3 chapters are devoted to diagnosis and classification of back pain, mechanical diagnosis, and the derangement syndrome as defined by McKenzie. The conceptual model that is theorized to explain a derangement syndrome and the mobility of the disc is presented along with the scientific evidence

that was not available when the original edition was published. This first volume also includes a significant review of the literature related to the McKenzie approach to lumbar pain. It includes randomized versus nonrandomized controlled trials and reliability studies related to evaluation and symptomatic responses. The final 2 chapters essentially present a differential diagnosis approach to evaluating back pain. Included is a chapter on serious spinal pathology that would guide a physical therapist to make a medical referral rather than treat a patient. The last chapter is devoted to diagnostic and management considerations that do not fit into McKenzie's classification of mechanical back pain.

Volume 2 is devoted to issues of patient management. Included are chapters detailing the patient history, physical examination, and evaluation of the clinical presentation. An excellent chapter on clinical reasoning follows. It guides the clinician through the decision-making process regarding patient management, including common errors in clinical reasoning. The remaining 9 chapters detail the clinical presentation and management of the derangement (6 chapters), dysfunction (2 chapters), and postural syndromes (1 chapter). The information presented on McKenzie's derangement classification includes the various central versus peripheral pain presentations, and therefore, is more extensive than the chapters on dysfunction and postural syndromes.

This 2-volume set based on McKenzie's approach to mechanical diagnosis and therapy of the lumbar spine is well organized, well written, and provides excellent references. These texts are a welcome update to McKenzie's initial publication. Both the novice and experienced clinician practicing in an orthopaedic arena would benefit from having these books in their library.

Patricia Downey, MS, PT, OCS

ORTHOPAEDIC SECTION, APTA, INC.

FALL BOARD OF DIRECTORS MEETING

La Crosse, WI • October, 2003

MINUTES

Michael Cibulka, President, called a regular meeting of the Board of Directors of the Orthopaedic Section, APTA, Inc. to order at 8:00 AM Central Time on Saturday, October 11, 2003.

Present:

Michael Cibulka, President
Lola Rosenbaum, Vice President
Joe Godges, Treasurer
Jay Irrgang, Director
Gary Smith, Director
Kelley Fitzgerald, Research Chair
Rob Rowe, Practice Vice Chair
Paul Howard, Education Chair

Adam Smith, Membership Chair
Susan Appling, OP Editor
Pam White, Finance Committee Member
Terry Randall, Public Relations Chair
Rick Watson, Incoming Public Relations Chair
Jeff Stenbach, PASIG President
Joe Kleinkort, Pain Management SIG President
Amie Lamoreaux-Hesbach, Animal PT SIG Nominating Committee
Guy Simoneau, JOSPT Editor

Jim Dunleavy, APTA Board Liaison
Tara Fredrickson, Executive Associate
Terri DeFlorian, Executive Director

Absent:

Steve McDavitt, Practice Chair
Robert Johnson, Orthopaedic Specialty Council, Chair
Mary Ann Wilmarth, HSC Editor
Tim Flynn, Nominating Committee Chair
Deborah Lechner, OHSIG President
Steve Reischl, Foot and Ankle SIG President
Deborah Gross-Saunders, Animal PT SIG President

The agenda was approved as written.

The September 16, 2003 Board of Directors conference call meeting minutes were approved with one change.

The Board of Directors reviewed the To Be Completed Items.

The Board of Directors discussed the status of the \$3,000 earnest money owed the Section from the land sale that fell through and, by consensus, agreed to stay with a 50/50 split. The Board also agreed that if the developer continued to make an issue of this we would pursue the entire \$3,000.

Mr. Rowe reported on the activities of the Education Manipulation Task Force. No action was taken at this time.

The Board of Directors discussed the outline for the proposed 2005 Home Study Course on Orthopaedic Surgical Technology. Jay Irrgang was charged to contact the HSC Editor regarding the Board's suggestions and bring it back to the Board at their next meeting.

The Board of Directors, by consensus, decided the Section could not co-sponsor a reception for Marilyn Moffat at the 2004 APTA Annual Conference at this time due to previous financial obligations.

=MOTION 1= Mr. Smith moved to accept the proposal made by the PASIG to Actors Equity pending APTA approval. ADOPTED (unanimous)

The Board of Directors discussed whether or not there is a need to develop a compendium for teaching first professional level orthopaedic content. Representatives from the Education, Practice, and Research committees were charged to assist in the APTA review process of the Normative Model which is scheduled to begin in November 2003 to see if this would meet the need.

The Board of Directors discussed the possibility of the Animal PT SIG having a strategic planning meeting in 2004 or 2005. Aime Hesbach was charged to bring this idea to the Animal PT SIG Board of Directors to determine their

interest and then report back to the Section Board by CSM.

The Board of Directors discussed the possibility of the Practice Committee having a strategic planning meeting and charged Bob Rowe to take this back to the Practice Committee and report back to the Board by CSM 2004.

The Board of Directors discussed adding a Reimbursement Chair to the Section. Bob Rowe stated that this position could be absorbed within the Practice Committee.

=MOTION 2= Mr. Irrgang moved to approve a Practice Committee representative to attend the APTA Reimbursement Chair Forum November 14-15, 2003 in Baltimore, MD. ADOPTED (unanimous) Fiscal Implication: 2 nights lodging/meals (\$390)

The Board of Directors asked for nominations for APTA offices. Two were brought forth. Mike Cibulka will submit Orthopaedic Section members Steve McDavitt for Director and David Lake for Nominating Committee to APTA by the November 1 deadline.

The Board of Directors asked for nominations for APTA awards. No nominations were brought forth at this time.

The Board of Directors recommended Kelley Fitzgerald for the APTA Advisory Panel on Research. Mike Cibulka will submit the nomination to APTA by the January 1 deadline.

=MOTION 3= Mr. Howard moved to approve the proposed Orthopaedic Section programming for CSM 2004 with time changes. ADOPTED (unanimous)

=MOTION 4= Mr. Howard moved to reimburse the following Section Board of Director members and committee chairs for their presentations at CSM 2004 according to Section guidelines: Mary Ann Wilmarth, Susan Appling, Terry

Randall, Joe Godges, Guy Simoneau, Timothy Flynn. ADOPTED (unanimous)

=MOTION 5= Ms. Rosenbaum moved to change the name of Home Study Course to Continuing Physical Therapy Education (CPTE). ADOPTED (unanimous)

=MOTION 6= Mr. Smith moved to charge Lola Rosenbaum to discuss with the HSC Advisory Panel a possible name change for Home Study Course to be added at the end of CPTE. ADOPTED (unanimous)

=MOTION 7= Ms. Rosenbaum moved to appoint Mary Ann Wilmarth to a second three-year term as HSC Editor beginning June 1, 2004. ADOPTED (unanimous)

=MOTION 8= Ms. Rosenbaum moved to appoint Bob Rowe, Practice Vice-chair, as the Section's liaison to the APTA's Federal and State Government Affairs forums beginning in 2005. ADOPTED (unanimous)

=MOTION 9= Ms. Rosenbaum moved to approve the 2004 JOSPT budget as presented. ADOPTED (unanimous) Fiscal Implication: \$91,464

=MOTION 10= Mr. Godges moved to accept the 2002 Orthopaedic Section audit report by Gillette and Associates. ADOPTED (unanimous)

=MOTION 11= Mr. Godges moved not to implement a dues increase at this time. ADOPTED (unanimous)

=MOTION 12= Mr. Godges moved to withdraw the following Finance Committee recommendation: The Finance Committee discussed the 2003 CSM Board of Directors motion to consider a matching \$10,000 grant to the Arkansas PT Chapter for their present defense of manipulation and due to Arkansas no longer having a need for these funds, the item was discarded. ADOPTED (unanimous)

=MOTION 13= Mr. Godges moved that the 2003 CSM Business Meeting motion to consider making a donation to the PT-PAC in the amount of \$5,000 not be made due to 2004 projected income indicating funds will not be available to make this contribution. ADOPTED (unanimous)

=MOTION 14= Mr. Godges moved that no money from the Education Manipulation Task Force will be allocated

in 2004 since the majority of the expense is projected to occur in 2003. ADOPTED (unanimous)

=MOTION 15= Mr. Godges moved that the Section donate 2 home study courses to the 2004 APTA Diversity 2000 and Beyond fundraiser. ADOPTED (unanimous)

=MOTION 16= Mr. Godges moved to adopt the following policy:

Sale of Home Study Courses to Educational Institutions

A. CD of each HSC will be available for purchase by academic institutions, clinical residency programs, and clinical fellowship programs for \$20 per CD per student for a 6-monograph course and \$15 per CD per student for a 3-monograph course, and \$40 per CD per student for the 11-monograph Current Concepts course. CDs purchased at the 'per student' rate will include a container for each individual CD purchased.

B. PT and PTA programs, clinical residency programs, and clinical fellowship programs may also make bulk purchases of the HSC CDs. The price for these bulk purchases are:

Type of HSC	Price for 50	Price for 100
6-monograph course	\$ 750.00	\$1,000.00
3-monograph course	\$ 400.00	\$ 800.00
11-monograph course	\$1,500.00	\$2,000.00

CDs purchased at the bulk rate will be sent in one container for each lot of 50 or 100 CDs and will be shipped to one location.

C. CDs will be available 1 year after the initial course offering.

D. Rescind the current copyright policy.

E. No CEUs will be given.

ADOPTED (unanimous)

=MOTION 17= Mr. Godges moved to adopt the following policy:

Purchase of Home Study Courses by Individual Physical Therapists:

A. After 3 years a hard copy of the HSCs will be available to individuals at a discount based on membership status. No contact hours can be earned for courses purchased at this discount.

- 6-monograph courses

Orthopaedic Section members	\$60
APTA members	\$125
Non-APTA members	\$175

- 3-monograph course

Orthopaedic Section members	\$30
APTA members	\$75
Non-APTA members	\$100

B. Registrants wanting to earn contact hours must pay full price for the course (hard copy or CD) (ie, Orthopaedic Section members \$150, APTA members \$250, and Non-APTA members \$325 for a 6-monograph course). ADOPTED (unanimous)

=MOTION 18= Mr. Godges moved that unclaimed Flex Plan funds received by the Section at the end of the year will be returned to the concerned employee after the customary taxes are withdrawn. ADOPTED (unanimous)

=MOTION 19= Mr. Godges moved that the 2004 Orthopaedic Section budget be approved. ADOPTED (unanimous) Fiscal Implication: \$1,152,927

=MOTION 20= Mr. Godges moved to accept the Finance Committee policy format for all Orthopaedic Section policies. ADOPTED (unanimous)

The Board of Directors agreed by consensus to schedule the next meeting as a conference call on Thursday, November 13, 2003 at 2:00 PM CST.

The meeting adjourned at 12:15 PM.

Submitted by Terri A. DeFlorian, Executive Director (Adopted by BOD November 13, 2003)



Orthopaedic Section, APTA, Inc.

DRAFT STRATEGIC PLAN • 2004 — 2006



Mission

The mission of the Orthopaedic Section of the American Physical Therapy Association is to be the leading advocate and resource for the practice of Orthopaedic Physical Therapy. The Section will serve its members by fostering quality patient/client care and promoting professional growth through:

- enhancement of clinical practice,
- advancement of education, and
- facilitation of quality research.

Vision

The Orthopaedic Section is the leader in advancing orthopaedic physical therapy practice through the professional development and increased involvement of its members. The Section leads through dynamic and innovative education, practice, and research initiatives while maintaining fiscal accountability and professionalism.

GOAL I: FACILITATE CONTINUED PROFESSIONAL DEVELOPMENT/PROFESSIONALISM IN ORTHOPAEDIC PHYSICAL THERAPY CLINICAL PRACTICE.

OBJECTIVE A: Provide accessible and cost-effective professional development opportunities for members through various methods.

OBJECTIVE B: Encourage development of orthopaedic physical therapy clinical residencies and fellowship programs.

OBJECTIVE C: Facilitate competence in manual therapy (thrust and nonthrust) in physical therapy clinical practice.

GOAL II: ADVANCE, PROMOTE, AND PROTECT THE PRACTICE OF ORTHOPAEDIC PHYSICAL THERAPY.

OBJECTIVE A: Promote knowledge of and provide support for physical therapists as an entry point in the diagnosis and intervention of neuromusculoskeletal dysfunction.

OBJECTIVE B: Promote the growth and utilization of orthopaedic physical therapy practice to serve emerging health care markets (eg, wellness, complementary and alternative medicine, chronic care).

OBJECTIVE C: Promote and protect orthopaedic physical therapy practice in issues related to legislation and regulation.

OBJECTIVE D: Develop a mechanism to ensure (facilitate) reasonable reimbursement for physical therapists as primary provider of diagnosis and intervention for neuromusculoskeletal dysfunction.

GOAL III: PROVIDE LEADERSHIP AND SUPPORT FOR ACQUIRING AND DISSEMINATING THE EVIDENCE THAT VALIDATES THE OUTCOMES AND COST-EFFECTIVENESS OF ORTHOPAEDIC PHYSICAL THERAPY PRACTICE.

OBJECTIVE A: Foster research related to orthopaedic physical therapy practice (clinical, basic science, service delivery, and education).

OBJECTIVE B: Foster the dissemination of evidence related to orthopaedic physical therapy practice.

OBJECTIVE C: Enhance members' ability to retrieve and interpret evidence related to physical therapy practice.

GOAL IV: DEVELOP A PROCESS TO ENSURE CONSISTENT GROWTH IN MEMBERSHIP THROUGH PROACTIVE RECRUITMENT OF NONMEMBERS, RETENTION OF CURRENT MEMBERS, AND DEVELOPMENT OF LEADERS THROUGHOUT THE ORTHOPAEDIC SECTION.

OBJECTIVE A: Increase membership by 2% per year.

OBJECTIVE B: Develop area on the web site that promotes development of individual leadership. Include list of articles and books, chat room with Section leaders, etc.

OBJECTIVE C: Develop a list of mentors for individuals who have identified an interest in Section leadership.

GOAL V: USE TECHNOLOGY TO EDUCATE AND COMMUNICATE WITH MEMBERSHIP.

OBJECTIVE A: Improve member access to Section resources.

OBJECTIVE B: Improve communication between members and the Section (staff, Board, committees, and SIGs).

OBJECTIVE C: Enhance education of members (eg, web, CD, e-mail, etc).

GOAL VI: GENERATE SOURCES OF REVENUE AND IMPROVE THE SECTION'S OPERATIONAL EFFICIENCY TO PROVIDE FINANCIAL RESOURCES THAT SUPPORT THE SECTION'S STRATEGIC PLAN.

OBJECTIVE A: Create innovative mechanisms to generate revenue.

OBJECTIVE B: Improve the Section's operational efficiency.

Orthopaedic Section, APTA, Inc.

Tentative CSM Programming

February 3-8, 2004 • Nashville, Tennessee


TUESDAY 8:00 AM – 5:00 PM	February 3, 2004 Preconference Course Primary Care Education Group (Day 1 of 2) Medical Screening for Physical Therapists Robert DuVall, PT, MMSc, DHSc, OCS, FAAOMPT, MTC, PCC, CSCS Joe Godges, PT, DPT, MA, OCS Edsen Donato, PT, DPTSc, OCS, CHT	1:30 PM - 3:00 PM 2:30PM-3:30 PM	Potential Authors Forum Susan A. Appling, PT, MS, OCS Mary Ann Wilmarth, PT, DPT, MS, OCS Guy Simoneau, PT, PhD, ATC Orthopaedic Certified Specialist (OCS) Exam and Description of Specialty Practice (DSP) – What's the Deal? Richard Ritter, PT, MA Joe Godges, PT, DPT, MA, OCS
WEDNESDAY 8:00 AM- 5:00 PM	February 4, 2004 Preconference Courses Primary Care Education Group (Day 2 of 2) Medical Screening for Physical Therapists Robert DuVall, PT, MMSc, DHSc, OCS, FAAOMPT, MTC, PCC, CSCS Joe Godges, PT, DPT, MA, OCS Edsen Donato, PT, DPTSc, OCS, CHT Mary Bailey, PT, MS, OCS, CHT Performing Arts Special Interest Group An Introduction to Dance Medicine Shaw Bronner, PT, MHS, EdM, OCS Brent Anderson, PT, OCS Jennifer Gamboa, MPT, OCS Marshall Hagins, PT, PhD Occupational Health Special Interest Group Effective Management of Occupational Back Injuries from Initial Assessment to Return to Work Christina Boyle, PT	2:30 PM – 4:30 PM 3:30PM-4:30PM 6:30 PM – 7:30 PM 7:30 PM – 8:30 PM	Manipulation in First Professional Programs: An Academic and Clinical Instructors Workshop Timothy W. Flynn, PT, PhD, OCS, FAAOMPT Robert S. Wainner, PT, PhD, ECS, OCS, FAAOMPT ABPTS OCS Update Rob Landel, PT, DPT, OCS Nancy Henderson, PT, PhD, OCS Robert Johnson, PT, MS, OCS Performing Arts Special Interest Group Business Meeting Performing Arts Special Interest Group - Reception
THURSDAY 10:30 AM-12:30 PM 12:00 PM-4:30 PM 1:00 PM - 4:00 PM 12:30 PM – 4:30PM	February 5, 2004 Marketing Strategies for Physical Therapists Alexis B. Waters Rick Watson, PT Robert DuVall, PT, MMSc, DHSc, OCS, FAAOMPT, MTC, PCC, CSCS Terry Randall, DPT, OCS, ATC Research Platforms Session A Research Platforms Session B The Case for Unloading Sara M. Meeks, PT, MS, GCS Performing Arts Special Interest Group Programming Lori Stotko, OTR, CHT Lynn Medhoff, MPT, MA Nicholas Quarrier, PT, MHS, OCS Shaw Bronner, PT, MHS, EdM, OCS Marshall Hagins, PT, PhD Jennifer Gamboa, MPT, OCS Tara Jo Manal, MPT, OCS	FRIDAY 8:00AM-11:00AM 8:30 AM-10:30 AM 8:30 AM-10:30 AM 9:00 AM -11:00 AM 11:00 AM –1:00 PM 1:00 PM -5:00 PM	February 6, 2004 Manual Physical Therapy – Evidence and Evolution in the Management of Cervical Spine Disorders Timothy W. Flynn, PT, PhD, OCS, FAAOMPT Robert S. Wainner, PT, PhD, ECS, OCS, FAAOMPT John D. Childs, PT, PhD, OCS, FAAOMPT J. Timothy Noteboom, PT, PhD, SCS, ATC Research Platforms Session Case Study Presentations Deactivation of Pain and Dosing Therapeutic Exercise for Patients with Chronic Pain Roger Allen, PT, PhD Unopposed Exhibit Hall Occupational Health SIG Programming Moderator: Dee Daley Ergonomics: Real World Opportunities. Upper Extremity Functional Capacity Evaluations: Unique Characteristics Drew Bossen, PT, MBA Mark Bartkowski, MSPT Clara Clearly, MPT, CHT

1:00 PM - 5:00 PM	Pain Management SIG Programming Laser... A 20-year Clinical Perspective. Functional Manual Therapy... An Overview Joe Kleinkort, PT, MA, PhD, CIE Donald Chu, PT, PhD, ATC Alan Weismantel, PT, OMT, FAAOMPT	2:00 PM-5:00 PM	Primary Care Education Group Programming Professional Advocacy: Applying Evidence to Direct Access Legislative Initiates Robert Duvall, PT, DHSc, MMSc, OCS, MTC, PSS, CSCS Julie Whitman, PT, DSc, OCS, FAAOMPT John D. Childs, PT, PhD, MBA, OCS, FAAOMPT William G. Boissonnault, PT, DHSc, FAAOMPT Richard C. Ritter, PT, MA, OCS Kenneth Mailly, PT
1:00 PM - 5:00 PM	Foot and Ankle SIG Programming The Pediatric Foot. The Adolescent Foot and Ankle: Developmental and Biomechanical Implications on Pathology and Treatment. The Olde Foot. The Diabetic Foot and Age Related Changes Lisa Silverstein, PT, PhD, NCS RobRoy Martin, PT, PhD, CSCS Byron Russell, PT, PhD Jim Birke, PT, PhD, CPed	3:00 PM - 3:30 PM	Rose Research Platform
2:00 PM - 5:00 PM	PTA Education Group Programming Adult and Geriatric Shoulder Scott Bowerman, MD	5:00 PM - 6:00 PM	Primary Care Education Group Business Meeting
5:00 PM - 6:00 PM	Business Meetings Foot and Ankle SIG Business Meeting Pain Management SIG Business Meeting PTA Education Group Business Meeting Manual Therapy Education Group Business Meeting	5:00 PM - 6:00 PM	Animal Physical Therapists SIG Business Meeting
5:00 PM-6:30 PM	Occupational Health SIG Business Meeting	6:30 PM - 8:00 PM	Awards Ceremony
		8:00 PM -11:00 PM	30th Anniversary Celebration
		SUNDAY 8:00 - 12:00	February 8, 2004 Occupational Health SIG Board Meeting

SATURDAY

February 7, 2004

8:30 AM - 11:00 AM	Orthopaedic Section Business Meeting
[11:00AM-1:00PM]	Unopposed Exhibit Hall Time
1:00 PM - 2:30 PM	Research Platforms Session A Research Platforms Session B
1:00 PM - 4:00 PM	Manual Therapy Education Group Programming Current Concepts in Manual Therapy: Science Supporting the Art of Hands-on Treatment in the Upper Quarter John Tomberlin, PT, OCS, CSCS, FAAOMPT
1:00 PM - 5:00 PM	Animal Physical Therapist SIG Programming Equine Physical Therapy and Rehabilitation – An Overview. Spinal Conditions in Dogs – Evaluation and Treatment. Integration of the Human-Animal Bond to Improve Patient Outcomes. Steve Adair, MS, DVM Deborah Gross Saunders, MSPT, OCS Brad Jackson, PT
1:30 PM-4:30 PM	Knee/Patellofemoral Education Group Influence of Hip Mechanics on Overuse Injuries of the Knee. Influence of Foot Biomechanics on Overuse Injuries at the Knee. Mechanisms of Traumatic Knee Injuries. Christopher Powers, PT, PhD Irene McClay-Davis, PT, PhD Jeff Houck, PT, PhD Michael Gross, PT, PhD David Tiberio, PT, PhD Tyler Cuddeford, PT, PhD



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Section News

Education / Programming Committee

For all of you who haven't heard yet, there is now a great way to earn CEUs through the Orthopaedic Section Study Group Program. Go to the Section's website and discover how you can obtain CEUs for your orthopaedic study group meetings.

CSM 2004 will be here before you know it and what a program we have planned for you! CSM will be held in Nashville from February 3-8. The meeting will start with several preconference courses, including: Medical Screening for Physical Therapists, An Introduction to Dance Medicine, and Effective Management of Occupational Back Injuries from Initial Assessment to Return to Work. These programs are being spon-

sored by two of the Orthopaedic Section's SIGs and one of our Education Groups. All 5 of the Section's SIGs and 4 Education Groups also will have outstanding programs prepared on a wide variety of topics throughout the conference.

In addition to the above programming there are 6 short programs being presented that you will not want to miss. For complete programming details check *OP* pages 30-31, check the next issue of *PT Magazine*, or go to the APTA website and look under CSM 2004.

Handouts for CSM will once again be available before and after CSM at the Section's website (www.orthopt.org). APTA members will be able to download and print the handouts of presentations

they plan on attending before they leave for CSM. Plan ahead by visiting the Section website and obtaining handouts that you are interested in. *Handouts will not be available on site at CSM.*

Finally I would like to thank Ellen Hamilton, the SIG and Education Group Program Chairs, our planned speakers, and Jessica Hemenway for all their hard work in putting together CSM. It is only through the hard work of many individuals that this outstanding meeting takes place.

See you in Nashville!

*Paul D. Howard, PT, PhD, OCS, Cert MDT
Education/Programming Committee
Chair*

Section Members in the News

Aimee B. Klein, PT, DPT, MS, OCS was recently awarded the **Mary McDonald Distinguished Service Award** by the Massachusetts Chapter of APTA. This is the highest award that the Massachusetts Chapter bestows recognizing individuals who have provided outstanding service to both the physical therapy profession and the APTA.

Jane Snyder, PT, MA recently received the prestigious **R. Charles Harker, Seq. Policy-Maker Award** from the Section on Health Policy & Administration. This award was created in 1997 by the Section on Health Policy, Legislation & Regulation in memory of Charlie Harker. The award named for him is given annually to an individual whose actions have significantly impacted health policy, who have demonstrated leadership in health policy-making at the state or national levels, and initiated a policy shift of broad magnitude for the profession.

Congratulations Aimee & Jane!

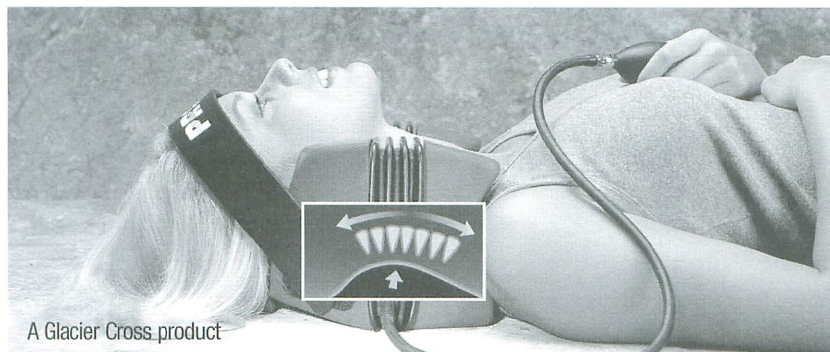
Study Groups

Do you participate in a study group at work or in your local area? Would you like to earn Continuing Education Units (CEUs) for attending the study group meeting? If so, call the Orthopaedic Section or visit the website (www.orthopt.org) for further information.

The Warner Robins, Georgia Study Group (pictured at right) recently held a meeting with 2 area orthopedic surgeons to discuss rehabilitation after total joint arthroplasty. A lively, interactive discussion took place between the surgeons, therapists, and assistants. All participants received CEUs for attending.



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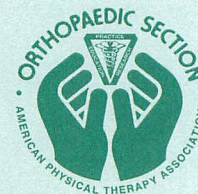
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OCCUPATIONAL HEALTH PHYSICAL THERAPISTS SPECIAL INTEREST GROUP



ORTHOPAEDIC SECTION, APTA, INC.

Winter 2003

Volume 15, Number 4

WHY BOTHER WITH A BACK CLASSIFICATION SYSTEM?

Despite its prevalence and increasing socioeconomic impact, low back pain remains enigmatic. Current classifications of patients with low back pain are based primarily on medical diagnosis. Despite the sophistication and increasing use of current imaging techniques, the origin of back pain is often conjectural. So called positive findings on MRI and CT imaging often confuse the picture rather than add clarity, by encouraging therapists and physicians to treat the 'imaging report' rather than the symptom response presented by the patient. It is tempting to assume the spondylitic spondylolysis, degenerating or bulging disc, or osteoarthritic intervertebral joint must be the source of pain when it is so clearly visible to the radiologist. In truth, how do we really know if these findings are relevant to the clinical presentation? According to Murtagh,¹ preoccupation with organic causation of symptoms may lead to serious errors in the evaluation and care of patients with back pain.

In the primary care of back pain, the medical model fits poorly. It can be usefully replaced by a rapid symptom-directed approach. This approach uses a carefully structured history and a confirmatory physical examination to identify the clinically relevant pattern of pain. Medicine has always used syndromes, a collection of signs and symptoms, to describe conditions for which there is no accepted cause. Approaching back pain as a series of syndromes forms a natural basis for immediate treatment. If the patient's treatment is successful, this confirms the strength of the original hypothesis. It is not necessary to know the precise physical source of the symptoms to recognize a particular pain pattern or choose the initial treatment. In fact separating these syndromes from their presumed pathology increases their effectiveness.²

Effective conservative management depends on a classification that is clinically relevant and sufficiently detailed to provide a logical basis for treatment. The implementation of the classification system developed by the Canadian Back Institute (CBI) followed a decade of development. In 1992 it became the primary tool for determining diagnosis and initial treatment direction at all the Canadian Back Institute Clinics. To ensure content and construct validity, the system was revised biannually for 4 years using clinician feedback with more than 100,000 patients before reliability testing was initiated.³

The Patterns of Pain classification system developed by CBI consists of 5 major patterns of pain. The first 4 patterns are primarily physical, and the fifth is a pattern of abnormal, pain-focused behavior. The components included in the pain patterns are chosen to provide the framework for formulation of an active management strategy. The essential elements of this system are determined by the location of the dominant symptoms and by the particular movements or postures that exacerbate or alleviate the pain. A clinical picture sufficient to initiate therapy is constructed from the information provided by the patient history and physical examination. The history includes a limited number of pertinent questions designed specifically to help identify the precise pattern of pain.² A carefully structured physical examination, with an emphasis on repetitive test movements and a focused neurological examination, screens for serious disease while it supports or refutes the presumptive pain pattern diagnosis.

The use of a classification system is just the first step in providing an effective management program for the treatment of nonspecific back injuries. Initial directional preference is established by the recognition of the pattern, and steps taken to focus the patient on the postures and activities that will relieve pain symptoms. The use of the 'patterns of pain' assists communication between therapists and other members of an interdisciplinary team, and helps in planning progressions in a functional recovery program. The strength of any classification system can only be proven over time by its usefulness and therapeutic application. After working with this classification system for over 10 years, I have found it to be an invaluable tool in the overall management of nonspecific back injuries.

Christina Boyle is the National Director Clinical Services for CBI Health in Toronto, Canada. She will be speaking at CSM on this very topic. To hear more, please join us in Nashville!

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INJURY PREVENTION—ALL SYSTEMS GO

Margot Miller, PT

Injury prevention is a growing market area for physical therapists. Several factors support industry's focus on injury prevention: injury costs, injury types, aging population, CEO and corporate commitment to safety and health. Therapist expertise evaluating worker and work in combination with a ready market makes injury prevention service provision a growth market opportunity for therapists.

INJURY COSTS

The cost of work injury is recognized as the largest driving force supporting prevention services. Businesses spend \$170 billion a year on costs associated with occupational injuries and illnesses, expenses that directly affect a company's profit margin. Workplaces that establish safety and health programs can reduce injury and illness costs by 20% to 40%, the difference between operating in the black and running in the red.

Consider the Following Facts:

- According to the National Safety Council, workplace injuries in the United States cost employers \$131 billion during 2000. Workplace injuries occurred at a rate of one injury every 1.5 seconds, or 2400 per hour.
- OSHA estimates that the cost of a lost-time injury is \$27,700. The most frequent injuries are musculoskeletal disorders (MSDs).
- Injuries with lost days are the most costly. In 2001, over 1.5 million cases involved days away from work. Of these, nearly 670,000 involved sprains/strains, which translates to more than 4 out of 10 injuries/illnesses.
- Over the last 10 years, the rate of a lost time injury has decreased by an average of 2.8% per year; yet the overall cost of injury and illness rose 6.4% per year.

(Sources: www.osha.gov; www.bls.gov)

To compound the problem for industry, injuries and illnesses increase workers' compensation and retraining costs, increase absenteeism, and increase faulty product. Injuries/illnesses also contribute to decreased productivity, decreased morale, and decreased profits. OSHA notes a Fortune Five company increased productivity 13% and a small, 50-person plant decreased faulty product, saving more than \$265,000 with implementation of strong safety and health programs.

INJURY TYPES

Let's take a further look at the top injuries. The top 10 industry/occupations that account for nearly one-third of lost work days due to injury include the following: truck drivers, nursing aides/orderlies, laborers/nonconstruction, construction laborers, janitors/cleaners, carpenters, assemblers, cooks, stock handlers/baggers, registered nurses. Sprains and strains continue to be the leading cases in every major industry division. Although MSD cases have actually declined since 2000, they continue to account for over one-third of all lost day cases, higher in service industries, manu-

facturing, truck drivers, and stock handlers/baggers. Carpal tunnel syndrome had the highest median days away from work. Among the most frequent events or exposures, repetitive motion, such as grasping tools, scanning groceries, and keying activities resulted in the longest absences from work.

AGING POPULATION

Due to 'Baby Boomers,' the size of the aging population will impact the workforce well into the 21st century. In 1980, only 30% of the working population was 45 and older. In 2010, this is expected to rise to 40%. In general, injury frequency decreases with age, while injury severity increases with age. Reduced injury frequency with age is usually attributed to job experience. Greater injury severity among older workers is attributed to diminishing resilience as the neurologic and musculoskeletal system age. Since older workers have had increased exposure, cumulative trauma disorders and repetitive strain injuries appear more prevalent among older workers.

The result? Companies will need to invest more in matching worker and work. Successful companies, recognizing skilled labor as a critical asset, will monitor job placement and match worker abilities and work tasks throughout the work cycle.

CEO AND CORPORATE COMMITMENT TO SAFETY AND HEALTH

The CEO and corporate commitment to safety have dramatically increased in the last 10 years. The costs attributed to occupational injuries/illnesses, as well as importance of competitive advantage in the market place, are driving forces behind commitment to health and safety. Delphi, Goodyear, and Motorola represent companies where commitment to worker safety and health are part of the corporate culture.

The world leader in mobile electronics and transportation components and systems technology, Delphi's Health and Safety Policy states: "We are committed to protecting the health and safety of each employee as our overriding priority. We believe that all occupational injuries and illnesses are preventable. The implementation of actions to help our employees realize a healthy, injury-free environment is a leadership responsibility." (www.delphi.com)

Goodyear, the world's largest tire company, reports: "Goodyear believes ergonomics should be incorporated into equipment, jobs, and workplace design. Through hazard recognition, evaluation, and risk control, each Goodyear facility is implementing an ergonomic process to reduce the risk of injuries and illnesses. Such a program supports Goodyear's competitive advantage, maximizes productivity, and enhances the quality of associates' work life." (www.goodyear.com)

The safety policy of Motorola, global leader in wireless, automotive, and broadband communications, states: "We believe everyone has the right to work in a safe and healthy environment. Motorola's key beliefs are 'constant respect for people' and 'uncompromising integrity.' We provide a safe and healthful workplace for each and every Motorola

employee. As people are our most important asset, we endeavor not only to protect the health of our people, but also promote their well-being." (www.motorola.com)

Physical Therapists and Injury Prevention Services

The evidence supports a growing commitment by business and industry to worker health and safety, which is good news for industrial physical therapists. We can play a vital role in injury prevention service provision. Our background and expertise in body function and movement in conjunction with our ability to evaluate both worker and workplace are key factors in injury prevention. Injury prevention services include: identification/reduction of physical stressors contributing to cumulative trauma, identification of ergonomic tools/modifications to decrease physical forces involved in performing job requirements, job description development, design of ADA compliant prework screens for hire and job transfer, education for workers specific to the work, stretch breaks, and job rotation.

The market is ready. How about you? If not, there are excellent resources available to you, starting with the Occupational Health Special Interest Group of the Orthopaedic Section of APTA (www.orthopt.org). In addition, many companies offer comprehensive training in job analysis and prework screening. And lastly, become familiar with OSHA's website (www.osha.gov) and the Bureau of Labor Statistics website (www.bls.gov). Physical therapists can play a more active role in the injury prevention market.

Margot Miller is the General Manager of Isernbaden Work Systems. She can be reached at mmiller@workwell.com, 218-728-6455. She is Treasurer of the OHSIG.

PLAN NOW FOR OCCUPATIONAL HEALTH PT PROGRAMMING AT CSM!

****Preconference Workshop Wednesday Feb 4, 2004****
"Effective Management of Occupational Back Injuries from Initial Assessment to Return to Work"

Total Time of Program- Full Day
Speaker -Christina L. Boyle, PT
Title: National Director Clinical Services and Accreditation, CBI Health, Canada

This course will provide participants with a thorough understanding of the effective management of individuals who have sustained work-related nonspecific low back pain. The course will elaborate on the system of back care developed by the Canadian Back Institute, and provide participants with the practical tools and useful strategies that have proven successful in the treatment of occupational back injuries for this national network of clinics. CBI uses an evidence-based approach to back care, with assessment and treatment strategies that have evolved through research. Some of CBI Health's research and a number of their published studies will be made available to participants and referenced to support the presentations.

Also look for these great OHSIG programs during CSM- Thursday and Friday Feb 5 & 6, 2004

Ergonomics: Real World Opportunities

Cosponsored with PPS • Total Time 2 1/2 Hours

This program will discuss important considerations in growing an ergonomics business. Practitioners who have made the transition from the clinic to the role of consultant will discuss a variety of these service options.

Upper Extremity Functional Capacity Evaluations: Unique Characteristics and Standards

Cosponsored with Hand Section • Total Time 1 1/2 Hours

This course will address appropriate testing procedures, interpretation of data, and key elements of the written report in a comprehensive upper extremity FCE. Current APTA standards and evidence-based practice in the area of FCEs will also be discussed.

Incorporating Occupational Health/Ergonomics Content into the Entry Level Physical Therapy Curriculum

Cosponsored with Education Section • Total Time 3 Hours

This presentation will review the present state of occupational health/ergonomics in entry-level physical therapy curriculum, as well as how to integrate occupational health/ergonomics to facilitate optimal learning and competence in work assessment skills in the entry-level physical therapist.

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FOOT & ANKLE

SPECIAL INTEREST GROUP ORTHOPAEDIC SECTION, APTA, INC.

PRESIDENTS REPORT

You all will be getting notices about CSM and it is time to make your arrangements. Nashville will be a busy place and the FASIG will have the usual 4 hours of programming. Steve Paulseth, Vice President, is in charge of programming for this meeting, and he has an interesting schedule of programming.

The topics will look across the life span from pediatric to adolescent to geriatrics. In addition, a special topic on diabetic foot problems will be given. The list of speakers and topics are:

The Pediatric Foot

Lisa Selby-Silverstein, PT, PhD, NCS

The Foot from Adolescence to Adulthood

Rob Martin, PT

The Aging Foot

Byron Russell, PT, PhD

Diabetic Foot Problems and Aging

Jim Birke, PT, PhD, CPed

Special thanks to Steve Paulseth for his organization of these speakers and topics.

RESEARCH RETREAT

The second foot and ankle research retreat will be April 30th and May 1st at the Department of Biokinesiology and Physical Therapy, University of Southern California. In the editorial page of the August 2003 *Journal of Orthopaedic and Sports Physical Therapy*, Irene McClay-Davis discusses the need and benefit of focused research interests. Irene McClay-Davis and Debbie Nawoczenski are the course directors and in charge of abstracts and generating the course content. At this time the two key note speakers will be Neil Sharkey and Arne Lundberg. The Orthopaedic Section will be assisting in registration and organization as well as the Department of Biokinesiology and Physical Therapy, University of Southern California.

NOMINATIONS

The nominating committee led by Tom McPoil has come up with the following candidates for the open positions. They are:

President	Steve Paulseth
Vice President	Cheryl Maurer
Treasurer	Mark Cornwall
Nominating Committee	Steve Reischl

FOOT AND ANKLE RESEARCH RETREAT II

Measuring Foot Motion: Forward and Inverse Dynamics

Sponsored by:

The Foot and Ankle Special Interest Group of the Orthopedic Section of the American Physical Therapy Section
and the
Department of Biokinesiology and Physical Therapy,
University of Southern California.

Location:

Department of Biokinesiology and Physical Therapy
University of Southern California
Los Angeles, CA

April 30-May 1, 2004

Conference Organizers:

Irene McClay Davis, PT, PhD
Deborah Nawoczenski, PT, PhD
Blaise Williams, PT, PhD

Keynote Speakers:

Arne Lundberg, MD, PhD
Karolinska Institute, Stockholm, Sweden

Neil Sharkey, PhD

Pennsylvania State University, State College, PA

Mission

Until recently, the majority of studies involving foot mechanics have represented the foot as a single rigid body. Given that the foot has over 30 bones and 30+ articulations, this is an extremely oversimplified approach. The mission of this research retreat is to explore new ways of measuring foot motion. Abstracts on both inverse and forward models are invited for submission. In addition, submission of papers that investigate new ways of segmenting the foot or use new technology for measuring foot motion are encouraged. It is hoped that this retreat will provide a forum for rich academic discussion of approaches to the problem of measuring the inherent complexities of the foot.

Retreat Format

This 1.5 day retreat will incorporate 1 hr presentations by the keynote speakers who have been invited for their body of knowledge in the area of foot measurement. In addition, 15-minute podium presentations will be given by the participants with accepted abstracts. There will be ample time allotted for discussions.

** Abstracts were due October 15, 2003 **

AN INEXPENSIVE WOBBLE BOARD

Paul M. Gablinger, MD, PhD, MPH

ANKLE SPRAINS AND WOBBLE BOARDS

Ankle sprains are among the most common orthopaedic injuries. While most of these are mild and heal without complications, up to 42% of patients develop subsequent functional instability.¹ Ankle instability and the risk of recurrent sprains are worsened by decreased range of motion² and decreased strength of the ankle evertors.³ Early mobilization has been found to help prevent these,⁴ with optimal results from the use of wobble boards.⁵ Rehabilitation with wobble boards has been shown not only to hasten healing but also may prevent further ankle injuries by improving balance control,⁶ ankle movement discrimination, and more accurate foot placement.⁷

Despite the demonstrated advantages of wobble board practice, a notable barrier is their cost: wobble boards retail for \$60-\$100. This is often beyond the means of students, and equivalent to a day's take-home wage for many workers. A typical recommendation for ankle rehabilitation is a course of physical therapy, with wobble board sessions 3 days per week for 10 minute sessions. However, many students and workers find it impractical to make so many trips to the clinic, and out-of-pocket costs or insurance coverage pose other limitations on the number of sessions. In the author's clinical experience, optimal healing occurs with even more frequent wobble board practice, with up to 2 sessions of 10 to 15 minutes per day during the acute phase.

Wobble board practice is valuable not only to hasten healing of ankle sprains, but also to prevent them. Regular practice on the wobble board is recommended as a prophylactic measure for participants in vigorous sports such as football, or occupations with a high propensity for ankle sprains, such as telephone line repair.

In my experience, ideal management of ankle sprains combines a course of physical therapy (as short as a single session) with access to a personal wobble board. In order to make this economically feasible, I designed a homemade version which may be constructed for about \$10 or less.

CONSTRUCTION METHOD

The optimal dimensions of a wobble board are a diameter of 350 mm with a ball height of 50 mm.⁸ These dimensions are precisely the size of a standard toilet seat lid (although toilet lids are slightly oval in shape rather than round) and a bisected toilet tank float. An inexpensive wobble board can therefore be constructed as follows:

Materials:

1. Standard toilet seat lid (not padded)
2. 1 or 2 plastic toilet tank floats
3. A 65 mm (2.5 inch) wood screw
4. Strong, all-purpose glue

Other than the glue, the total cost of new materials is about \$10 at hardware stores, and they may be obtained free at salvage or a plumber's refuse. Required tools include a screwdriver and a small saw, such as found on a Swiss army

knife or multi-tool. Total construction time is about 10 to 20 minutes.

Construction:

1. Remove any hinges or attachments from the toilet seat lid.
2. Using the saw, cut the screw extension off the plastic tank float to create a smooth oblong sphere.
3. Cut this sphere in half to create two half shells. The cut should be made slightly to one side of the exact middle, so that one half shell is about a half inch (1 cm) longer than the other.
4. Dab a few spots of glue inside the longer half shell. Fit the shorter half shell inside the longer one and press firmly. Combining the half shells will provide enough stability to hold up to about 170 pounds. If the user is heavier, a second float may be bisected, and the process repeated, such that there are 4 half-shells glued together to form a single very sturdy half-shell able to support several hundred pounds.
5. Poke a hole through the center of the combined half shells, using the auger from a multi-tool or the screw.
6. Place the toilet lid upside down on a firm surface. Measure the lid and mark the middle.
7. Apply glue along the rim of the half shell. Center the half shell over the lid middle mark, with the shell rim on the lid. You will need to guess at this point, but precision is not necessary.
8. Drive the screw through the hole in the half shell until it meets the seat, and then continue to screw it firmly about 1 cm into the seat, taking care not to penetrate beyond the other surface of the seat. A 65 mm screw will penetrate just far enough to hold fast while sinking the screw head into the plastic. Apply glue once more along the edge of the half shell rim where it meets the lid, for further adhesion.
9. A small adhesive furniture foot pad may be added to cover the screw head, if there is concern that it might scratch a hardwood floor.

RESULTS

Many patients enjoy this project and consider it rather humorous because of the materials employed. Patients are pleased that they have created something and are motivated to use it.

Health care modalities that are available in the home encourage compliance. Patients can engage in other activities while doing their wobble board exercises, such as listening to music, watching television, or looking after children. Being able to carry out these exercises at their convenience is a great benefit in encouraging optimal use.

SUMMARY

Ankle sprain rehabilitation and prevention is improved with practice on a wobble board, but these are prohibitively expensive for many patients. Wobble boards for home use may be constructed with a minimum of time and cost, and may encourage their use.

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Dede Lewis, PT

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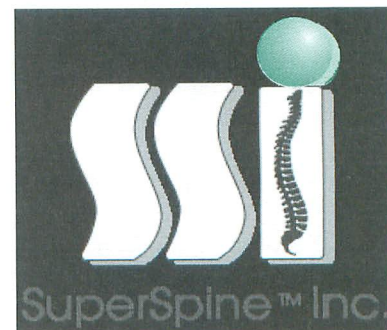
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PASIG



Performing Arts Special Interest Group • Orthopaedic Section, APTA

MESSAGE FROM THE PRESIDENT

Hello! Hopefully this newsletter finds all of you in good health and enjoying the fall activities in your area. CSM is rapidly approaching in EARLY February of 2004 in Nashville, Tennessee, so begin planning now. You can obtain those necessary CEUs at our preconference course, *Introduction to Dance Medicine*, taught by several well-known physical therapists. Visit our website at www.orthopt.org for further information and a brief outline of topics to be covered. All preconference courses will be held the Wednesday preceding opening ceremonies for CSM. Our *beginner to intermediate level* course is a great way to begin and/or progress your involvement with dancers, grow your practice, and network with others with like interests. Registration has begun, so don't get left out!

We are still finalizing work with relation to our Practice Analysis. The survey has been completed, tallied, and submitted to the Orthopaedic Section for approval. It will need to complete this approval process before we can say that it is completely finished. Please join me in expressing our profound thanks to the National Advisory Board, and most specifically, Jennifer Gamboa, Marshall Hagins, and Tara Jo Manal for their tireless efforts in getting this important document completed. As part of our general programming this year, we are including a discussion about how the Practice Analysis was begun, the process itself, and ideas for how this document can be used in the future. Our general programming is exciting this year, and I encourage you to make time to join us. This year, we have also asked the Education Committee of the Orthopaedic Section to try grouping together performing arts-related platform presentations, which will hopefully encourage everyone to come out and support your fellow PASIG members as they present their hard work. We will attempt to list performing arts-related platform presentations on our web site prior to CSM this year so that you will have a heads-up on presentations that you don't want to miss!

An update on Actor's Equity....the Orthopaedic Section has agreed to back our recommendations to Actor's Equity and we are currently submitting these recommendations for the Section's approval. The Orthopaedic Section BOD is to be commended for helping us gain credence with a nationally-based organization. Our Task Force (created in Tampa, Florida at CSM 2003) has provided their input and has allowed us to make our recommendations consensus-based, since there is a lack of literature on which to otherwise base

our recommendations. I will continue to send each task force member an update on this subject and am asking for their continued support as we try to delineate tasks that can best be accomplished by this group.

Susan Clinton, our Secretary, has been working on a revised membership directory. This should be available as of CSM 2004. Hopefully, all of you have completed your updated contact information forms that were sent out through the Orthopaedic Section. If you did not fill in one of these forms, please contact Tara Fredrickson at the Orthopaedic Section office (1-800-444-3982 x203). Obviously, the directory is only as useful as it is accurate. For those of you who have not already done so, you may visit our website at www.orthopt.org and see our newer, more professional look. Finding a performing arts PT, a fellow PASIG member, and upcoming courses or even job listings is becoming possible on the website. Please give Adrienne McAuley, our Treasurer, feedback on what you would like to see on our site. For those wishing to post their course offering on the web site, this is now possible for a small fee (paid to the Orthopaedic Section).

On another note, the Orthopaedic Section has asked that we consider offering a home study course on *Performing Arts and PT*. While we still need to determine how and when this will occur, we will still be soliciting manuscript ideas—approximately 4 to 6 monographs are required to put a home study course together. This would be an honor and we are grateful to the Orthopaedic Section for the invitation to participate. Once overhead has been covered, the Orthopaedic Section would split profits with us on a 50/50 basis. The PASIG stands to benefit both in terms of education and in terms of our bottom line. I welcome your ideas and comments related to this issue.

As you can see, there is much happening in our special interest area. We want you to get involved with YOUR special interest group and there are many ways in which you can do so. Plan on attending this next CSM, meet up with a few of your fellow performing arts colleagues, and attend our preconference course, general programming, or our PASIG reception. There is fun to be had by all and I look forward to seeing many of you again. I hope that each of you is having a productive year and are able to enjoy the arts in your region. Until next time....

Jeffrey T. Stenback, PT, OCS
President, Performing Arts Special Interest Group

ANNOUNCEMENTS

Combined Sections Meeting in Nashville, TN
PASIG Preconference Course

PERFORMING ARTS SPECIAL INTEREST GROUP INTRODUCTION to DANCE MEDICINE

INSTRUCTORS: Brent Anderson PT, OCS
Shaw Bronner PT, MHS, EdM, OCS
Jennifer Gamboa MPT, OCS
Marshall Hagins PT, PhD

- I. Introduction to Dance:
Lecture/Interactive Demonstration
- II. Preseason Screening for Dancers:
Lecture/Demonstration
- III. Dance-specific Functional Examination and
Evaluation:
Lecture/Demonstration
- IV. Treatment Essentials for Dancers:
Lecture/Lab
- V. Getting Started in Dance Medicine:
Panel Presentation/Discussion

Look for a more detailed course outline on our web site at
www.orthopt.org

Nominating Committee

We have a strong slate of candidates running for PASIG office. They include for Vice President: Tara Jo Manal, and for Secretary: Karen Hamill and Julie O'Connell. We thank each of them for accepting the nomination.

The Candidate Biographies and Statements are printed below. The Orthopaedic Section will be mailing ballots to PASIG members. New officers will be announced at the CSM PASIG Business Meeting on February 5th. Please be sure to attend! We thank each of you for your time and hope you will begin considering now nominations for President, Treasurer, and one Nominating Committee member for next year. Please don't hesitate to contact me with suggestions, including self-nominations.

*Shaw Bronner
Nominating Committee Chair*

VICE PRESIDENT

Tara Jo Manal PT, OCS, SCS

Tara is a board certified Specialist in Orthopaedic and Sports Physical Therapy and teaches at the University of Delaware. Tara is a content expert member of the Performing Arts Physical Therapy Special Interest Group and a member of the Specialization Academy of Content Experts of the American Board of Physical Therapy Specialties. Tara has consulted with and rehabilitated skaters of all skill levels from recreational to Olympic medalists and lectured on skating injuries, prevention, and rehabilitation. Tara is currently completing her PhD in Biomechanics and Movement Sciences, has authored articles and book chapters on injury and rehabilitation, and presents her work at local and national conferences.

Candidate Statement

I would be honored to represent the Performing Arts Special Interest Group PASIG, as Vice-President. I have

experience in management as the Director of the University of Delaware Physical Therapy Clinic and Director of the University of Delaware Orthopedic Residency Training Program. I have been actively involved in the treatment of dancers, gymnasts, actors, and figure skaters over the past 9 years. I have worked with the United States Figure Skating Association as faculty for the US Nationals as well as programs designed to promote promising young skaters. I have worked with the Performing Arts Special Interest group for the past several years collaborating with an amazing group of professionals. The PASIG is a resource for developing clinicians and practicing clinicians in the areas of performing arts and a source of expertise for the performing arts community. Through collaborative efforts with PASIG members, I have participated in the development of a description of advanced clinical practice for physical therapists in the performing arts, publication in *Orthopaedic Physical Therapy Practice*, and programming at Combined Sections Meetings for the past 3 years. I would like to continue the forward momentum of this special interest group in serving its members and leading the growth of physical therapy in the performing arts.

SECRETARY

Karen Hamill PT, EMT

Karen has been in allied medicine for 12 years in Los Angeles. She currently practices physical therapy in an outpatient pilates clinic. Besides her degree in physical therapy, she is a certified pilates instructor, emergency medical technician, strength and conditioning specialist, and massage therapist. She has worked in the administrative capacity of health care and understands the importance of being fiscally responsible. Her strengths are the clinical application of evidence-based treatments with performers. Working backstage at Disney's The Lion King, Aida, and Pilobolus has enabled her to quickly identify and treat the dysfunctions of artists. While working at the Dance Clinic of California State University at Long Beach she has seen a variety of movement patterns and injuries. She understands how to restore movement and prevent additional injury. Continued learning is always a high priority. In addition, Ms. Hamill has worked with athletic trainers, stage and company managers, and administrators. She has maintained ties with professional organizations including the Orthopaedic and Sports Sections of the APTA, IADMS, NDTA, and NSCA.

Candidate Statement

Serving as secretary of PASIG for the Orthopaedic Section of APTA will enable me to assist with making PASIG the premiere resource for the rehabilitation and prevention of injuries for the performing arts community. I am eager to continue establishing a strong foundation in the treatment of artists, and, through the PASIG, we can heighten the visibility of physical therapists that devote their talents to this group of people. Promoting and encouraging active membership will allow us to use the talents of our affiliates. The expert clinical skills that we possess have the potential to produce outstanding research methods that can be used for educating and mentoring others. We must also continue seeking outside sources to foster relationships with other allied health and dance educators. Providing evidence-based techniques and communicating these techniques will

benefit not only therapists but all health care professionals as well as educators in dance, theatre, and music departments. Increasing our visibility with the performers and thus gaining recognition from companies that employ them will enable us to spread the word of our mission and what it is that we excel at. As PASIG's growth continues we must insure that we are viable financially as well as effective in providing sound treatment to this population. I am excited to be able to serve as Secretary of PASIG and thank you for giving me the opportunity.

Julie O'Connell PT, ATC

Julie is a graduate of the University of Wisconsin-Madison and is a dance medicine specialist/manager at AthletiCo Sports Medicine and Physical Therapy in Chicago. She is the lead physical therapist for the Joffrey Ballet of Chicago where she has developed a preventative medicine program and is working on research to demonstrate the effectiveness of such a program. She consults for Hubbard Street Dance Chicago and other various companies that reside in or travel through Chicago. She is a certified practitioner of Pilates for Rehabilitation. She presented a poster with her colleagues at the IADMS Conference in 2002 on developing a screening tool for the adolescent dancer. She has served as a member of the Nominating Committee and a Regional Director of the Central region for the PASIG for the past 2 years.

Candidate Statement

I wish to serve as the Secretary for the PASIG to promote, through communication, the inner working of the organization. As a relatively new member of the PASIG, I am excited about what I have gained from this organization and hope to become more actively involved in promoting it. I would like to reach out to the physical therapy community and describe the exciting work that is being done in this area. I want to foster the relationship of current members and to encourage new members to become involved to strengthen the organization. I look forward to this new opportunity and feel that I would be a good candidate to fulfill the responsibilities of this position.

*Please contact: Shaw Bronner PT, MHS, EdM, OCS
Nominating Committee Chair
Work: 718-246-6577
Fax: 718-246-6585
Email: sbronner@liu.edu.*

EDUCATION COMMITTEE

Programming for CSM 2004

The education committee is proud to present another innovative and informative collection of topics designed to improve the skills of the therapist involved with performing artists.

Preconference Course

The PASIG is offering a 1 day preconference course on dance medicine taught by physical therapists Brent Anderson, Shaw Bronner, Jennifer Gamboa, and Marshall Hagins. It is a comprehensive introductory- to intermediate-level course designed for therapists interested in learning

how to treat dancers as well as those experienced in performing arts medicine who would like to perfect their skills. It includes introduction to movement vocabulary, epidemiology of dance injuries, preseason screening, and labs addressing analysis of movement mechanics and treatment of specific dance injuries.

Conference Programming

Music

This year the PASIG is teaming up with the Hand Section to sponsor Lori Stotko, OTR, CHT, who will present on the use of taping, splinting, and ergonomic modification of instruments in the treatment of overuse injuries in musicians.

Shop Talk

Lynn Medoff, MA, MPT and Nicholas Quarrier, PT, MHS, OCS will present an interactive session with musicians to demonstrate their treatment techniques in improving posture, movement mechanics, and preventing and treating injury.

RESEARCH

Dance

Shaw Bronner, PT, MHS, EdM, OCS, who works with the Alvin Ailey modern dance company, will present her research on the effect of comprehensive management on injury incidence and time loss.

Advanced Clinical Practice

Jennifer Gamboa, MPT, OCS, Marshall Hagins, PT, PhD, and Tara Jo Manal, PT, OCS will present the outcomes of a 2-year project to create a description of advanced clinical practice in the performing arts.

The PASIG is also planning a reception at CSM so all members and other therapists can come and meet the speakers and indulge in some great conversation together in a more relaxed atmosphere. Please watch the web site and the newsletter for more information!

We hope to see you in Nashville!

*Lynn Medoff, MPT, MA
Vice Chair of the Education Committee*

PUBLIC RELATIONS/MEDIA COMMITTEE

The web site is up and running. The PASIG is working closely with the Orthopaedic Section to add more information and keep the postings up to date. Please note that if you want to be listed in 'Find a PT,' you need to email your request directly to tfred@orthopt.org. Simply type PASIG in the subject line and include your contact information in the body of the email. Due to privacy concerns there will not be an automatic registration of all members. Thank you for your cooperation.

Our budget is somewhat tight this year as we will incur costs associated with the elections process for new Board members. We should be in a position to gain additional funds from the CSM preconference course. Please share the information about the course with your colleagues who may not be Orthopaedic Section members and are not receiving the *OPTP* publication.

*Adrienne McAuley, PT, OCS
Treasurer*

MEMBERSHIP COMMITTEE

The membership update is almost complete. Every member should have received an email requesting updates on contact information as well as any affiliations with performing arts academies and student clinical sites. Please be sure that each of you completes the updates and returns this email as soon as possible so we can meet our goal of a new updated Membership Directory in 2004. Be sure to tell us if your information can be included in our new website for membership contact.

If you did not get an email, please contact me as soon as possible so your information can be updated and included in the new directory (Susan's e-mail: sclint@lsuhsc.edu).

*Thank you
Susan C. Clinton, PT, MHS*

GET INVOLVED IN THE PASIG AND THE FUTURE IS YOURS!

Join your fellow PASIG members in becoming an ambassador for the Performing Arts! The PASIG wants to encourage all our members to become actively involved by serving as committee members, regional directors, officers, or by offering your input at business meetings and through communication with other PASIG members. Remember, when you give of your time and energy to the PASIG, it's like giving a gift to yourself! The PASIG is only as strong as its members. If you have an interest in committee involvement, please contact the applicable Committee Chairperson, who are listed in the Directory on the last page of this newsletter.

For a complete listing of our officers please visit our website.

PASIG Resources

Let PASIG help you MARKET your services!



PASIG BROCHURES AND LOGO PINS are available to help you advertise and build your performing arts patient base. You can use the **BROCHURES** to market yourself to the performing arts community, the medical community, and to colleagues in the physical therapy community. You may proudly wear the **PASIG Logo Pin** to increase professional exposure.

The **PASIG MEMBERSHIP DIRECTORY** is an excellent resource for referrals, especially when your patients travel out of state. It includes state-by-state and alphabetical listing of PASIG members, as well as a Student Affiliation Site List. And don't forget, we still have **DANCE/MUSIC GLOSSARIES** available to assist you and your colleagues in communication with your performing artist patients. **ORDER NOW!**

PASIG PINS	\$5.00
PASIG DIRECTORIES	\$3.00
PASIG BROCHURES	\$15.00 (package of 25)
GLOSSARIES	\$2.00

TO ORDER: Call the Orthopaedic Section at 1-800-444-3982 x 203.

All proceeds benefit the PASIG.

Performing Arts Special Interest Group MEMBERSHIP FORM:

To be a PASIG member, you must also be a member of the Orthopaedic Section. You may use this form for **new membership, change of address, or updating your information.**

Name: _____ Prof. degrees/certifications: _____

Company Name: _____ Address _____

City _____ State _____ Zip _____ Phone _____ Email _____

APTA member number: _____ Orthopaedic Section Member: yes no

Years of experience treating performing artists: _____

What percent of your patient population are performing arts patients?

- Dancers Gymnasts Skaters
- Musicians Singers Circus Performers

Please list if you are affiliated with any performing arts schools, companies, or groups below:

Do you accept Student Affiliations?
 Yes No

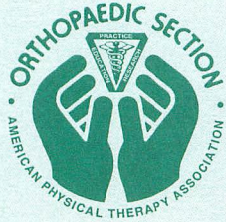
Are you interested in serving as a mentor to other physical therapists or physical therapy students interested in the treatment of performing artists? Yes No

Are you interested in serving on any of the PASIG Committees?

- Practice Public/Media Relations
- Education Website
- Nominations Membership/Regional Director
- Research

Can we list your name and contact information on the PASIG website, www.orhtopt.org for membership contact?
 Yes No

Thank you for taking the time to complete this questionnaire. We look forward to having you as a member. Please return this form to the Orthopaedic Section or email the information to tfred@orthopt.org.



Pain MANAGEMENT

SPECIAL INTEREST GROUP • ORTHOPAEDIC SECTION, APTA, INC.

Letter from the President

Joe Kleinkort, PT, MA, PhD, CIE

By the time you receive this message Christmas will be quickly approaching. Another year passes and CSM is around the corner. The programming this year will as interesting and exciting as last year. I will have the honor to share the podium with Dr Don Chu, a delightful colleague, as we enlighten the audience with the latest on Laser Therapy. This is the last country to be able to use this tremendous modality and if you have never experienced its power you should join us for an informative 2 hours. Following that presentation a long time friend and colleague, Alan Weismantel will present 2 hours on his compilation of techniques in the area of orthopaedic manual therapy. If you enjoyed John Iams presentation last year you will be impressed as well with Alan's refreshing new approaches to answer the Pain Management questions.

I am happy to announce a new area that Sandy Pomeroy has graciously accepted to assist in which is the new web page online for our SIG in the Orthopaedic web site. She will help develop and keep it current. She will be Chair of the newly formed IT Board along with Elaine Pomerantz. Thanks to both of you for a great job and your tireless giving of your time to this work.

There looms on the horizon a very ominous sign of increasing chronicity in this country of all types. As our science progresses at a fast pace our medical care system in this country is grinding closer and closer to gridlock in every sector. How many of you enjoy being paid ON TIME by insurance companies when you file? One million five hundred thousand dollars is spent in this country every hour on health care that equates to \$1.45 trillion a year. Employers now only cover 68% of their employees with health care and that figure is rapidly decreasing. More are out of jobs and have no health care. At the same time we have 18.2 million workers 55 or older, and this figure will increase to 25.8 million by 2008. By 2025 over 20% of the population will be over 65! Just this year more money for the first time was spent on Complimentary Medicine than Allopathic. At this writing there is a bill in the House that would put all nutraceuticals under FDA control and require a prescription for use...even vitamin C and E!!! We must hear these signs of a ground swell of the chronicity that we are about to face in this country. We must be ready for that fast approaching era and be

ready with viable alternatives to address the growing problems health care faces. Step up to the challenge with all the new treatments and modalities that are now available for us to assist in turning back the tide of suffering.

As always we welcome any articles that you have to get the word out to other fellow colleagues interested in Pain Management. I hope that each of you has a very blessed holiday and in some way are able to make it a blessing to others as well.

The Birth of the CTexterciser

In 1987 Caryl A. Washburn (now Thompson) was in private practice as an occupational therapist specializing in hands and upper extremities. She began to see a dramatic increase in the diagnosis of carpal tunnel syndrome. Most patients were postcarpal tunnel syndrome release, but more and more employers, risk managers, and the patients themselves were seeking therapy before surgery. They wanted an alternative to the time loss and pain of surgical recovery.

They were also observing that their coworkers who had the surgery frequently had to change jobs permanently, had to have a 'redo' of the original surgery, and were having the other hand released. Mrs. Washburn was making the same observation in her practice. It was her desire to develop a program to meet the needs of both types of patients, postop and preop. It was already apparent that traditional modalities were not making a significant difference in the resolution of carpal tunnel syndrome. Using elevation, contrast baths, retrograde massage, and wrist and digit exercises she was able to alleviate the edema. The patient then received instructions in a home program which included modification of sleep habits, night time resting splints, instruction in contrast baths, and exercises. The patients had some success with this program, but as soon as they returned to work full-time in the same position, the problem resumed. Some of the patients also had complaints of neck and low back pain, which she treated at the same time using modified myofascial release techniques. It was immediately evident that the patients receiving the proximal therapy had a dramatic decrease in carpal tunnel syndrome symptoms. This led her to develop a protocol for non-surgical intervention for carpal tunnel syndrome. Following success after success with this program it became evident that, if seen early enough, the patients could receive therapy to resolve the symptoms and not miss time from work.

One of the first patients to come in to the clinic preop was a senior flight attendant. She was scheduled for 4 surgeries, carpal tunnel release on each hand, ulnar nerve transposition on the right elbow, and a deQuervain's surgery on the left hand. The carpal tunnel releases were to be done simultaneously followed by the others at a later date. She was quite concerned about this plan and was seeking other options. After a consultation and initial evaluation the patient decided to proceed with the conservative therapy before surgery. After just one therapy session, she was able to continue to fly international flights working the galley on a Boeing 747. This fact is mentioned because of the hand labor intensive requirements of the job. She would then receive therapy 2 to 3 times a week when she was in between flights. This worked very well for her and she was able to work 4 more years to retirement. To date, the patient has not had any of these scheduled surgeries. One day towards the end of her scheduled therapy she commented, "I like the exercises and I do them. If I had a tool I could exercise with it would be so much better." This launched a whole new era for carpal tunnel syndrome intervention.

The first step was to look in catalogs and stores to locate such a tool. Many were tried, including the Dexterciser I and II, the Juxtacisor, Theraband etc. Each one had major flaws toward achieving the goal. The goal was to provide the patient with a light weight hand held tool that s/he could use as part of an exercise routine to help prevent the return of the carpal tunnel syndrome symptoms. This meant finding a tool that would, through its use, promote all movements of the wrist and forearm in a smooth motion, while at the same time carrying the motion in one fluid movement up and through the shoulders into the cervical girdle. None were to be found. With Mr. Washburn's assistance in providing construction labor and leg work, the CTexterciser was formulated, designed, and constructed. The first unit, used by this patient, was so successful more units were constructed. It has undergone radical changes in design and materials used since then. A patented device, the CTexterciser is now 4 loops affording 360° of wrist and forearm circumduction. It is made of a nickel alloy which does not dull, and which allows multiple bending of the wire before it breaks. An unofficial test found that with repetitive opening and closing in a continuous test it took over 1,000 repetitions to break. This equals almost 3 years of opening and closing if done daily. The handle design is a pistol grip to prevent the patient from rolling the handle, promoting more use of the wrist. It is made of a patented nonallergenic moderately hard gel base with a smooth finish to avoid any irritation for those with tactile sensitivity. The slider is nontoxic material and is yellow to allow increased perceptual motor acuity and is especially formulated with drag to slide slowly to lessen gravity assist. The handle is fastened to the wire with an especially engineered nickel cap with an internal fastening system to prevent wobble, and is covered by a nontoxic blue cap. The result is a portable, lightweight (12 oz. avg.), nonallergenic, attractive, hand held exercise tool. When moving the slider through the loops from one side to the other and back it pro-

motes 360° circumduction of the wrist and forearm. When keeping the elbow extended, the movement flows up and through the shoulder to the cervical column. A red marker on one side of the handle provides a start point to prevent losing track of direction mid way through the task. This tool is user friendly. It is collapsible, which makes it portable and easy to store. It fits nicely into a briefcase, suitcase, or a computer case for travelers. It is time efficient, the average time to traverse the loops and return is 30 seconds. Used on a regular basis this tool may decrease proximal tension alleviating distal symptoms of carpal tunnel symptoms by promoting full range of motion. Therapists may modify the angle of the loops and the number of loops extended to employ this tool in treatment of other hand and upper extremity injuries. It has been suggested that for a work place exercise intervention program to be effective it must meet the following criteria: be easy, be fun, be unobtrusive, elicit the participation of coworkers, not involve distant equipment, have minimal set up time, be inexpensive, and not take away from the performance of the job. The CTexterciser design addresses and meets all of these criteria.

In summary the CTexterciser is a patented tool designed by a hand therapist to assist in nonsurgical intervention for carpal tunnel syndrome. It can be used pre- and postsurgery and is particularly important when used in the work place, and at home for prevention. Easy to use, the CTexterciser promotes 360° of wrist and forearm circumduction with follow through to the shoulder and cervical girdle. Made of nontoxic materials, the handle and slider are designed to promote light hand grip and perceptual motor function as well as range of motion. The shaft and securing mechanism are designed to provide stability in the unit. This unit meets the criteria for a successful exercise tool in the work place.

Gabapentin Iontophoresis for Neuropathic Pain

John Garzione, PT, AAPM

Oral Gabapentin (Neurontin) has been used in pain management for neuropathic pain over the past several years.¹ With therapeutic dosages approaching 25 mg/kg of body weight, up to 1800 mg per day, the potential for adverse effects (such as ataxia, depression, and dizziness) are great.² Another concern, with oral dosing, is the patient may develop seizures if they inadvertently forget or abruptly stop taking the medication.

Anti-epileptic medication for pain management is based on electrophysiological studies that demonstrated seizure type activity of the pain perpetuating peripheral nerves. These peripheral seizures were reduced with anticonvulsant medications.³

With the help of compounders at Family Pharmacy of Aiken South Carolina, I started using Gabapentin in Iontophoresis for localized neuropathic pain. Gabapentin is an electrically neutral substance that is compounded to increase the pH to make the drug move electrically under the negative pole. The following case report illustrates the adjunctive use of Gabapentin in iontophoresis for neuropathic pain.

The patient, a 40-year-old female typist who underwent a right carpal tunnel release 22 months ago and a left carpal tunnel release 2 weeks after the right. The right wrist and hand healed and she had normal range of motion and 4/5 strength. She developed pain, swelling, the inability to make a fist, and weakness of her left hand and was referred to physical therapy. She was able to actively flex her fingers to within 4 cm of the distal palmar crease (DPC) and passively her fingers could be flexed to 3 cm of the DPC. She averaged .2 cm swelling in the left wrist as compared to the right and had a sensory loss to touch and sharp sensation of the distal 2-4 fingers. There was redness, allodynia, and 2° F increase in skin temperature of the left palmar area. Grip strength measurement on the right was 15 kg and the left was 5 kg and she rated her pain as a 7/10. She previously had been doing cold packs to the left hand TID for 20 minutes, active and passive finger flexions for 10 reps TID, and 50 attempts at squeezing a rubber ball, prior to her starting therapy. I felt that her pain and dysfunction were neuropathic in origin. Previously this would take at least 12 treatments of nonsteroidal iontophoresis,⁴ high voltage electrical stimulation, coban wraps, and exercise to reduce the pain and swelling enough to allow for active flexion of the fingers to the DPC and 50% of strength gain.

Her first treatment consisted of Gabapentin iontophoresis with the active electrode at the surgical site of the wrist for 40 m amps/min, followed by 15 minutes of high voltage pulsed galvanic stimulation at 28 pps and coban wraps of the fingers. Her home program was not changed. She returned to physical therapy the next day and was able to passively flex her fingers to the DPC with 5/10 pain. At the time of this writing, she has undergone 5 treatments and has progressed to 11 kg grip strength on the left and is now able to actively flex her fingers to the DPC. Her pain level is 4/10.

This report shows promising outcomes with the addition of Gabapentin iontophoresis to the treatment plan of neuropathic pain conditions.

REFERENCES

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American Academy of Pain Management

Tom Watson, PT, MEd

The American Academy of Pain Management (AAPM) held its 14th Annual Clinical Meeting September 4-7 in Denver, Colorado. The theme was "Together We Are Going Places." Of the nearly 900 attendees approximately 10 were

physical therapists. The programs were very dynamic and informative and were geared specifically for multidisciplinary pain practitioners. The topics ranged from basic sciences of pain including anatomy and physiology, diagnosis and treatment of pain, pharmacological interventions, prayer, fibromyalgia, behavioral options for pain, Tai Chi, Yoga, Pilates, and self-regulation of pain. Information on naturopathy and homeopathy was well described. There was an excellent program on the history, theories, and protocols of electrotherapy for use in pain management. Recent research, information, and the clinical trials of the use of Cannabis were presented as a tract. Did you know there are more receptor sites in the brain for cannabis than there are for endorphins? There was an excellent course on pharmacy/prescription drug intervention describing the use of NSAIDs, anticonvulsants (gabapentin, etc), anesthetic agents, centrally acting analgesics, and opioids as they relate to pain management. There were short classes on chiropractic sciences, aromatherapy, the role of humor, kinesiology muscle testing, research and design, and practice risk management. I was a moderator for 'therapeutic yoga as a pain management modality' and 'Pilates.' There is some scientific basis for the use of yoga but no scientifically validated use of Pilates was presented. The instructors for these classes were excellent and very informative. Diagnostic classes using ultrasound, surface EMG, laboratory studies, and radiology were informative and very educational.

The fibromyalgia update classes, which lasted half a day, described new insights into the diagnosis, management, and treatment designs. The speakers discussed the concurrences of chronic fatigue syndrome, fibromyalgia syndrome, and myofascial pain syndrome. Statistically 35% to 70% of chronic fatigue syndrome patients have fibromyalgia syndrome as well. Dr. Neil Nathan emphasized treating the biochemistry first followed by the myofascial components. He further described viral infections as being a component of FMS patients. Many of his referrals are from ENT specialists because of the prevalence of chronic sinusitis. He described HHV6 variant A as associated with multiple sclerosis and HHV6 variant B associated with chronic fatigue syndrome and chronic fibromyalgia syndrome. He further suggested heavy metal poisoning including mercury might contribute to fibromyalgia syndrome. Amalgams may be a source but the electromagnetic fields generated by gold and silver fillings or crowns may influence the brain resulting in dysfunction. Dr. Jacob Tietelbaum discussed the hypothalamus as being a potential source of fibromyalgia. The components of treatment must deal with sleep, hormones, nutrition, and infection. He has a questionnaire that health care professionals can download to help you evaluate FMS at no charge at endfatigue@aol.com. Chronic fatigue syndrome, fibromyalgia syndrome, and myofascial pain syndrome affects approximately 2% to 4% of population. "91% get better when you treat the hypothalamus." A recent study by Tietelbaum is available in the *Journal of Chronic Fatigue Syndrome*. It may also be found at www.vitality101.com. There are 4 treatment keys: nutrition, sleep, hormones, and

infections. He recommends beginning with treatment of nutritional deficits. Most Americans are on to the Standard American Diet, (SAD), and consume 140 lb of sugar annually, 18% of their diet consists of white flour, and this results in poor absorption, nutritional losses, and increased nutritional needs. He recommends omega three fish oil 'Eskimo 3,' CoQ10, decreased sugar intake, increased water and salt intake, and high protein diet. One hundred years ago, according to the *New England Journal of Medicine*, most adults had 9 hours of sleep per night; today we get 6 1/2 hours. We are sleep deprived. Without deep REM sleep, there is decreased growth hormone production. Causes for deprivation of sleep include dysfunction of the hypothalamus, pain, restless legs syndrome, sleep apnea, snoring spouse, and young children. Dr. Tietelbaum recommends valerian root, passionflower, hops, and wild lettuce combination, taking 2 to 4 capsules 1 hour before bedtime. Do not take more than 4 per day. He also recommends 5HT 100-400 milligrams per day but do not combine with Prozac; sleep drugs include Ambien as the best and is nonaddictive. A new sleep medication called Sonata, is short acting lasting only 3 hours. Other medications he suggests include Klonopin-which is addictive, Neurontin, or Deseryl. Hormone therapy, which is beyond the scope of physical therapy, is indicated in most patients. He suggests DHEA if there is a decreased arm and leg hair growth. Finally, infections are quite prevalent and include fungal/yeast infections. He has a yeast questionnaire available at his web site. He suggests avoiding sweets and taking probiotic preparations including acidophilus.

I would strongly encourage physical therapists interested in any aspect of pain management and treatment to join the American Academy of Pain Management. The AAPM was founded in 1988 and has a code of ethics and patient rights statement. I have been a member since 1989, there is. It is the largest multidisciplinary pain academy in the world with over 6,000 members of which 1%+ are PTs. There is a psychometrically validated board certification examination that is available for all health disciplines. This academy was founded on the premise that pain is best treated by a multidisciplinary approach. At these meetings, all health care professionals involved in pain treatment and management come together as one on equal footing. There is no delineation between massage therapists, physical therapists, neurosurgeons, chiropractors, psychologist, lawyers, or acupuncturists. We all come together for the good of the patient. Remember, "Pain does not have to be a way of life."

Tom Watson, PT, MEd

Fellow American Academy of Pain Management

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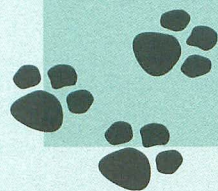
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3. State Liaisons: To date there are 33 states that have Animal SIG Liaisons.
4. The APTA has a web site that lists all of the State Practice Acts: www.apta.org/advocacy/state/state-practice
5. The offices of Vice President and Nominating Committee Member are still awaiting nominations. Please contact Amie Lamoureux-Hesbach using her contact information with any nominations.

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- The home study course **BASIC SCIENCE FOR ANIMAL PHYSICAL THERAPISTS** is still available. Contact 800-444-3982 or 608-788-3982 for more information.

The Animal Physical Therapist Special Interest Group (Animal SIG) Update:

1. Proceedings of the 2nd International Symposium for Rehabilitation and Physical Therapy in Veterinary Medicine – August 2002, Knoxville, TN are available now for \$20. They are a great resource. Contact David Levine at david-levine@utc.edu.
2. Orthopaedic Section Member and nonmember directories are available through the Section Office 800-444-

An Introduction to Canine Sports for the Canine Rehab Practitioner

Katie Bruesewitz, MPT

For the physical therapist, making the transition from practice in humans to a canine practice means learning new anatomy, new behaviors, and new ways of communication. It should also mean learning about new sports. Just as we need to be familiar with the activities and sports of our human clients to set appropriate goals, so should we have an understanding of the sports in which our canine patients participate, so that we can set goals and establish treatment plans

to return them to competition in these endeavors. This article gives an introduction to the basics of some of the more popular dog sports.

Never before have we had so many choices or opportunities to participate in sports with our dogs. There are several sanctioning organizations which sponsor or award titles for various dog sports. They include the United Kennel Club (UKC), the American Kennel Club (AKC), the American Mixed Breed Obedience Registry (AMBOR), the Hunting Retriever Club (HRC), and others. The AKC is the largest sanctioning body for canine sports. In 2000, over 2 million dogs participated in AKC events ranging from dog shows to obedience, earthdog trials, hunt tests and field trials, and lure coursing trials. As the AKC is the most popular registry and offers the broadest spectrum of activities, this article will focus mainly on events sanctioned by the AKC.

CONFORMATION

Conformation, or all-breed shows are what are commonly referred to as 'dog shows.' During the competitions, dogs are judged on the basis of how well they conform to a written standard for that particular breed. Dogs are judged standing or 'stacked,' and gait is judged from the side, front, and rear. Each animal is judged based upon the soundness of its construction, including angulation at the shoulder and hip, and length and proportion of the limbs and body. The judge is also analyzing breed type: the characteristics that make that breed stand apart from the other breeds of dogs. Breed type can include coat color, markings and texture, head and body shape, expression, temperament, and overall appearance. During the show, breeds are judged individually, and points, based on the number of dogs of that breed entered, are awarded to the best male and female nonchampion specimens. When a dog has won 15 points, including wins at 2 shows worth 3 or more points, that dog has earned the title of 'Champion.'

The likelihood of injury to the dogs during competition is low. Competition involves posing the dog in a stacked position to allow the judge to assess the dog's structure, and gaiting the dog in a straight line and in a circular pattern around the ring to allow judgment of gait and moving soundness. Many exhibitors, especially professional handlers with many dogs to exercise, will use treadmill or 'roading' exercise to condition show dogs, so there is potential for overuse injuries. Show dogs may also be candidates for individualized fitness programs for weight loss or improvement of muscle tone.

OBEDIENCE

Canine/human teams can compete in AKC obedience at 3 levels: novice, open, and utility. Each level requires progressively more difficult skills of the team. Novice obedience includes on and off leash heeling, recall exercise, standing for examination, and long sit and down stay exercises. At the open level, retrieving and jumping skills are added to the event, and all heeling is done off leash. The sit and down stay are 3 to 5 minutes in length and the handler is out of the dog's sight during this time. The utility level is the most challenging. Scent discrimination, directed jumping, and obedience to hand signals are included in the competition.

Obedience training at the higher levels can include much repetitive jumping, so there is potential for injury or overuse problems at the carpus, elbow, and shoulder. Many dogs are trained to heel in a 'head-up' position with the dog looking to

her right and up at the handler's face. This position may cause muscle or joint problems at the cervical region or front limb assembly.

AGILITY

Agility is the fastest growing sport in the canine world. In 2000, over 260,000 competed in AKC agility. Many thousands more were entered in trials sanctioned by the North American Dog Agility Council (NADAC) and United States Dog Agility Association (USDAA). This is also the sport with the highest potential for injury...to both canine and human members of the team. Agility involves high-speed navigation by the dog of a series of obstacles, including jumps, weave poles, tunnels, A-frames, teeter-totters, and dog walks. Additional factors that may contribute to risk of injury include:

- **Age of competitors:** Dogs may begin competing in AKC trials when they are 12 months old. At this age, growth plates may not be completely closed, and are subjected to the stress of repetitive jumping in both training and competition. Twelve months is the minimum age at which dogs can *compete*; to be ready for competition at this age would require training and jumping at least several months earlier, increasing the risk of joint and physcale injuries.
- **Availability of training and safe equipment:** The rapid increase in agility's popularity has led to a demand for agility training classes. In some areas, there is a lack of facilities with qualified instructors and/or safe equipment. Dogs beginning in agility must be taught correct jumping technique and safe navigation of the contact obstacles. Failure to have a good foundation in these skills increases the risk of injury.

FIELD EVENTS

The retriever breeds, pointing dogs, beagles, and spaniels are all eligible to participate in AKC field trials and/or hunt tests. These events are designed to test the natural ability and trainability of the dogs in a simulated hunting environment. Field trials are competitive, with judges selecting first through fourth place dogs and several dogs to receive Judges' Award of Merit (JAM). Hunt tests are pass/fail, with dogs being judged against a standard, not the other dogs in the stake. The AKC confers titles at 3 levels of hunt test: junior, senior, and master hunter. There are several smaller organizations that sponsor field events, and many breed clubs also offer working certificate programs to evaluate the natural hunting ability of dogs in the breed.

Areas of concern for field events include injuries related to running on uneven terrain and hidden hazards, such as ditches or holes in the ground, heat-related problems, general over-use injuries such as tendonitis, and injuries related to lack of warm up or conditioning.

This is a basic introduction to some popular dog sports. Other activities include flyball, canine freestyle, frisbee competition, tracking, earthdog trials, coonhound events, and lure coursing. For a more in depth understanding of the demands of each sport, therapists are encouraged to attend dog shows, agility trials, and other events to see them first hand. Contact the AKC (www.AKC.org) or your local kennel club for information about events in your area.

REFERENCES

1. AKC Events Calendar April, 2001

Electrical Stimulation

Deborah Gross Saunders, MSPT, OCS, CCRP™

Wizard of Paws

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The combination of electrical stimulation and animals does not appear to be a healthy pair. However, the combination has proved extremely beneficial in the rehabilitation of both small and large animals. Electrical stimulation in various forms is a very effective form of treatment of many human conditions and has the continued ability to do so in the animal field.

The history of electrical stimulation dates back to 1745 and went through progressions up to the invention of the induction coil by Faraday. The laws of electrophysiology were developed in the mid 1800s. Since that time period, the utilization of electrical stimulation has continued to evolve. This evolution has included the use of electrical stimulation for animals.

The term electrical stimulation encompasses the utilization of neuromuscular electrical stimulation (NMES), transcutaneous electrical nerve stimulation (TENS), direct current (Iontophoresis), and functional electrical stimulation (FES). Electrical stimulation may also be used for wound healing, edema reduction, increasing sensory awareness, tissue repair, and in electromyographic feedback.

NMES is probably the type of electrical stimulation most widely utilized in the animal field to provide muscle strengthening and re-education, improve function, and improve mobility. Optimally, the **waveform** should be either symmetrical or symmetrical biphasic. Symmetrical biphasic has been shown to be the most comfortable for larger muscle groups when the other parameters are held constant. Asymmetrical biphasic generally works well with smaller muscle groups.

Pulse duration is generally set between 100-300 μ sec. A strong, titanic contraction is the goal while setting the **frequency**. A frequency setting between 30 to 50 pps or bursts/second is usually optimal. **Duty cycles** vary according to the goal of treatment. For muscle strengthening, the unit should be set to a 1:3 to a 1:5 ratio¹ (10 seconds on: 30 seconds off, etc). A 1:1 or 1:2 ratio is optimal for an increase in muscle endurance. The **ramp** is set between 2 and 4 seconds for the comfort of the patient.² The longer the ramp, the longer the transition period from an off to an on position. For initial treatments, it is advised to set the ramp time longer, or 4 seconds if available. Electrodes need to be as large as possible to create a comfortable treatment. However, the electrodes should not be so large as to stimulate unwanted muscles. Too small of an electrode may cause a painful and intolerable treatment. Before utilizing NMES on a dog, there are guidelines that should be adhered to. Contraindications and precautions should be respected. The hair should be clipped to a short length; however, NMES may be uncomfortable if the dog is closely shaved on the day of treatment. The area needs to be cleaned with alcohol prior to placing the electrodes on the dog. Introduce the dog to the unit and the electrodes prior to beginning. Some dogs respond well to the NMES while others become agitated or excited. The dog should be muzzled or lightly restrained for the treatment. In addition, the trained clinician should try

the unit out on themselves prior to beginning with the dog. This will allow the clinician to experience the settings and sensation of the individual unit prior to utilizing the unit on the dog. Once the dog is set up, the motor point should be located on the specific muscle by placing a water soluble gel on one of the electrodes. A low current should be utilized to move the pad around to locate the motor point. Once the motor point is located, maintain the electrode at the location. The second electrode is then placed distal to the motor point. The treatment guidelines mentioned above should then be initiated. Cocontractions may also be set up on 2 muscle groups, such as the hamstrings and quadriceps.

Initially, the dog may not be able to tolerate the NMES at the amplitude required to produce a muscle contraction. A few options exist in this case. A lower level may be used for the entire treatment to assist in the acclimation to the unit, and then a higher amplitude may be attempted at the next treatment. In addition, a low amplitude may be used to produce a visible contraction for 10 seconds. A rest or off period should be allowed for 10 to 20 seconds and then another 10-second amplitude may be used at a slightly higher amplitude. The dog may quickly acclimate to the NMES in this fashion. This procedure may also be attempted after a day of sensory stimulation also. The third option is to not perform the NMES. If there is any chance the dog or clinician may become injured during the treatment, alternatives to strengthening would be sought.

So can the NMES turn a dog into the Arnold Schwarzenager of dogs? It is highly unlikely. In healthy individuals, a contraction produced by a NMES unit may be up to 80% to 90% of volitional contraction.² With any rehabilitative program following an injury, surgery or trauma, NMES should be combined with therapeutic exercise. NMES is best utilized in the immediate postoperative period (2 to 4 weeks), atrophy of muscle groups, and selective strengthening of one muscle or a group of muscle. Johnson et al performed a study examining the use of electrical stimulation as a treatment on dogs with surgically treated cranial cruciate stifles.⁷ Dogs treated with NMES 3 weeks after stabilization, for a period of 4 weeks (30 minutes bid, 5 days a week to the quadriceps and hamstrings) were compared to a group of control dogs were cage rested instead of being treated with NMES. The dogs were allowed controlled leash walks at 7 weeks, and then at 11 weeks, were allowed unrestricted activity for 30 minutes daily for the last 6 weeks. Radiographs demonstrated fewer bony changes in the dogs receiving NMES. The NMES had less cartilage damage and less crepitation during range of motion. The thigh circumference was larger in the NMES group at 9 and 13 weeks. In addition, subjective lameness scores were better in the NMES group.

TENS is another type of electrical stimulation that may be used in animals for the relief of pain, muscle spasm, and to decrease sensitivity.^{4,5} Electroanalgesia may be divided into 4 components: subsensory level stimulation, sensory level stimulation, motor level stimulation, and noxious level stimulation. Sensory level stimulation is perceived by the patient as the most comfortable and is therefore the first choice in the treatment of animals for pain. Typically, the duration of analgesia after the recommended 20 to 30 minute sensory level stimulation treatment is not exactly known but there is effectiveness post-treatment.⁶ The subsensory level stimulation may not be effective, and it is unclear as to how

long the duration of analgesia lasts. The motor level stimulation produces a strong visible contraction and a recommended treatment session of 30 to 45 minutes produces analgesia for hours. However, this is often painful or uncomfortable to the animal and may not be tolerable for the recommended length of time. Noxious level stimulation is not an option for animals for obvious reasons.

For sensory level stimulation, electrodes are most commonly placed around the pain location or on the location of pain.^{6,8,9} Some positions work best at different situations and the clinician should experiment with the placement of the electrodes. This level of stimulation is most beneficial for acute pain.

For acute pain, such as in trauma or postoperative pain, a **pulse duration** of 2-50 μ sec is recommended. The **frequency** is recommended between 50 to 100 pps.⁹ The **amplitude** is set to a comfort level. A visible contraction should not be obtained. At this level of electrical stimulation, only the large diameter, superficial cutaneous fibers are activated. If there is a visible contraction, the amplitude is set too high. The time of treatment should be approximately 30 minutes. When placing the electrodes on the dog, the skin needs to be shaven and cleaned with alcohol.

Studies on TENS have been produced in the human population with varying results. Ersak et al demonstrated the TENS is an effective modulator in low back pain.⁴ Nathan et al demonstrated prolonged electrical stimulation was effective in the control of post-herpetic neuralgia.⁸ Hargreaves and Lander demonstrated the effectiveness of electrical stimulation in acute pain compared to a sham electrical stimulation.⁶ In the canine population, Millis et al examined 5 dogs with osteoarthritis secondary to cranial cruciate tears. The dogs were examined on a force plate prior to treatment. The dogs were given continuous interferential current with a frequency of 70 Hz for 25 minutes with varying intensities. Following the treatment, the results were gathered at 30 minute intervals over a 4 hour time frame, after 24 hours, and again after a 4 day rest break after application of the TENS. The greatest results were found immediately post-application. In addition, after a 4-day rest break, each of the dogs exhibited an increase in weight bearing from the baseline of the effective extremity.

The use of TENS in human medicine has been disputed at times, and various studies have led to this. One of the major criticism in the study of electrical stimulation has been the fact that investigators may not be utilizing the 'right' or correct stimulation characteristics. In addition, the placement of the electrodes and the characteristics of the patients' subjective feedback may also be an issue. Many still do believe that TENS is generally assumed to be the most effective treatment for acute and postoperative pain. In addition, many if not all tools utilized to measure the pain of an animal are objective. Therefore, results may be more beneficial to the use of TENS as more studies are performed in the animal population.

Electrical stimulation does have its place in the animal field as it does in the human field. In conjunction with other forms of therapy, both NMES and TENS have been shown effective in increasing muscle strength and increasing function through a reduction of pain, respectively. There continues to be a need for further studies on the various utilizations of electrical stimulation.

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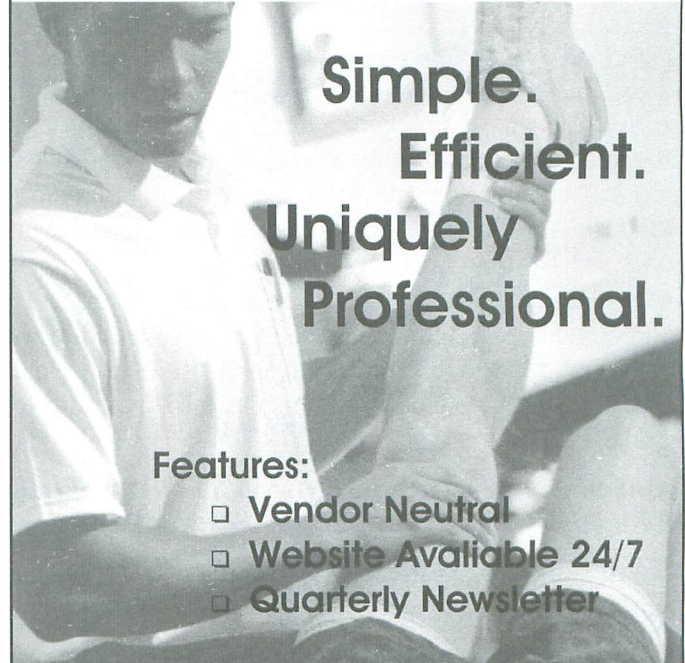
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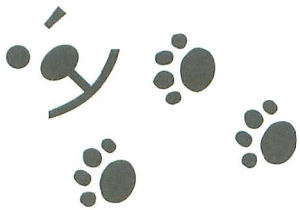
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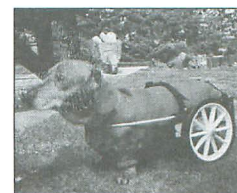


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Autonomous Practice in Physical Therapy: Past, Present, and Future—Robert E. DuVall, PT, DHSc, MMSc, OCS, FAAOMPT, MTC, PCC, CSCS and David Greathouse, PT, PhD

Significance of Subjective Examination in Differential Diagnostics—Robert E. DuVall, PT, DHSc, MMSc, OCS, FAAOMPT, MTC, PCC, CSCS and Joseph J. Godges, PT, DPT, MA, OCS

Physical Examination Procedures to Screen for Serious Disorders of the Low Back and Lower Quarter—Mary Bailey, PT, MS, OCS, CHT

Physical Examination Procedures to Screen for Serious Disorders of the Head, Neck, Chest, and Upper Quarter—Edsen Donato, PT, DPTSc, OCS, CHT

Imaging Principles for Primary Care Physical Therapy—J. B. Barr, PT, DPT, OCS

Autonomic Pharmacology: Implications for the Physical Therapist—Cathy Paterson, PhD; Rebecca Kern, PT, OCS; and Jack Kern, PharmD

2004 Courses

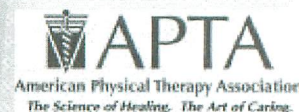
- ◇ Clinical Applications for Orthopaedic Basic Science
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- ◇ Effective Prevention and Management of Work-related Injuries*
- ◇ Orthopaedic Interventions for Selected Disorders
- ◇ Prosthetics and Orthotics
- ◇ Current Concepts of Orthopaedic Physical Therapy*
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Fees*

Orthopaedic Section Member	\$150
APTA Member	\$250
Non-APTA Member	\$325

\$10 shipping and handling for each course ordered.

*Please contact the Section office for fee information.

Additional Information

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AN ORTHOTIC IS...

In plain words an orthotic is a brace to control the foot while standing or walking. But that's a lot to do, so take a minute and we'll try to explain. Think of your body as a house, standing strong and erect. If a foundation is not laid properly or as any foundation settles with time you will start seeing cracks in the floors, walls and ceiling from the stress. So it is with your body that when your foot is out of line it can put the skeletal structures under stress. It has been proven that an unbalanced foot can cause problems as high in the kinetic chain as the cervical vertebrae (the neck). The foot may be the basis for neck pain, back pain, hip and knee pain, not to mention foot pain itself.

The foot has 26 bones connected by ligaments, tendons, and muscles and as time goes on with repetitive stress from walking, standing, and running, the foot can become misaligned and cause problems, such as heel pain, arch pain, metatarsal pain, and bunions. This is where a custom made orthotic can help. An orthotic can support the foot and control the alignment of these 26 bones to a neutral position, while still allowing the foot to function as a mobile adapter.

Orthotics are used by professional athletes, runners, tennis players, dancers, and most importantly, -YOU- the everyday person who needs relief from foot discomfort. Orthotics are used to help control structural misalignments, correct gait abnormalities, relieve pressure, and serve as a shock absorbing cushion (footbed). Your custom made orthotics will help control your foot whether you are walking on level ground, uphill, downhill, or on a rocky road.

Please don't be fooled by imitations sold over the counter without a prescription. Custom orthotics are exactly that: custom made from a cast of **your** feet. They will fit no one else and are made by prescription only. Your health care specialist will make a cast or impression of your non weight bearing feet and send it to an orthotic lab where exact replicas will be made of your feet. These replicas are then corrected to your health care specialist's measurements and diagnosis. The lab will use specialized materials to custom design an orthotic to correct your problem. Ask your health care provider if the lab they are using is accredited by the Prescription Foot Orthotic Laboratories Association (PFOLA).

How long will you have to wear orthotics? That depends on your problem, but think of your orthotics as you would your eyeglasses. They won't cure your problem, but with their use, they will allow you to function with a minimum of discomfort. The break-in period for your orthotics should be 4-6 weeks with reasonable comfort.

Hopefully this has been helpful to you in understanding what a custom orthotic is and what it can do for you. This only briefly explains the complexity of orthotics, but your health care specialist can further review your personal need - so please ask.

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February 4, 2004

Primary Care Educational Group

"Medical Screening for Physical Therapists"

February 3-4, 2004

Performing Arts Special Interest Group

"Introduction to Dance Medicine"

February 4, 2004

Look for more information in
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Contact Jessica Hemenway at the Section
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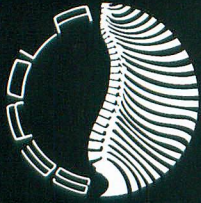


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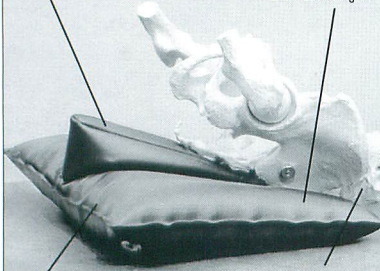


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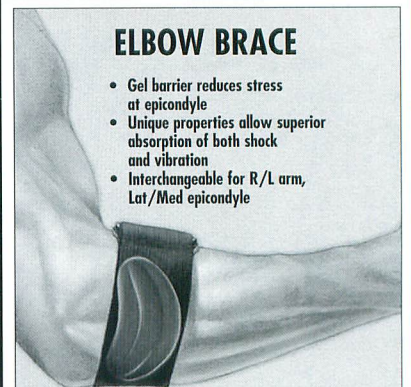


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