

IN THIS ISSUE:

Editorial: The Art of Physical Therapy

Letters to the Editor

Clinical Conference 2015

Course Schedule 2015

RESEARCH:

Early changes in somatosensory function in spinal pain

Postoperative pain treatment after total hip arthroplasty

Pre-surgical assessment of temporal summation of pain

Preoperative widespread pain sensitization and chronic pain after hip and knee replacement

Supervised walking in comparison with fitness training for CBP

Pain catastrophizing as a risk factor for chronic pain after total knee arthroplasty

Pain sensitivity and tactile spacial acuity are altered in healthy musicians as in chronic pain patients



3

THE ART OF PHYSICAL THERAPY

After 35 years of clinical practice, an estimated 10,000 patients evaluated and treated, 65 employees hired (and fired), reviews of many clinicians and clinic situations, and consultations with many unique physical therapy offices, I still am surprised by the lack of consistency and efficiency of physical therapy practice as a whole. I feel there are some “bad apples” within our profession who always seem to drag down our reputation through their poor attitudes toward patients, lack of evidence-based care, and just total disregard for anything other than their own personal needs.

Through my professional career I have consistently asked myself what I could do to help our profession get better at “caring” for the needs of our patients. I have tried to be very active in my State and the National Association (APTA and Components) thinking that if people were just more connected to other therapists and standards of these Associations they would naturally improve. But, at present, less than 20% of the physical therapists in the United States are even members of the APTA or their State component. It is hard to achieve a standard of practice when so few are professionally accountable.

I then had a notion that maybe the State Board of Physical Therapy (licensure and regulatory board) of my State might have an effect and was appointed to the State Board in my jurisdiction. I had the opportunity to make and enforce rules and regulations that will bring all of the physical therapist practitioners practice to a standard...or else! I found that I was spending most of my time “slapping” good therapists that made one honest mistake and rarely was able to take a dishonest or incompetent therapist out of our field of practice. I did not enjoy this position at all.

Still being unsatisfied that I was making any difference in our profession, I decided that maybe we were not training up our new therapists to the proper standard of care in the real health care world. I went back to get my PhD in PT and desired to be connected to a faculty to produce great new therapists. I completed my studies (at an age no one should be making this type of lifestyle change) and dragged my wife and kids to central Arkansas

continued on next page

Steven W. Forbush PT, PhD, OCS, CSMT

ISPI INSTRUCTOR



The Art of Physical Therapy

continued from page 1

to take on a teaching position in a well-respected DPT program. I loved (and continue to love) the opportunity to mold and create mindsets and skills in newly graduating therapists, but found resistance in the clinical setting where these students were affiliating and finding new jobs. New graduates were writing to me about their frustrations in the clinic through the resistance to change of their mentors and bosses. What else is left that could be done?

I was in a period of frustration when I ran into an attractive, physically fit, and dynamic blonde lady at a National APTA conference. We ended up sitting at the same table and talking about what we did in the profession. She stated she produced CE for therapists and I stated I liked teaching student therapists and doing continuing education for practicing therapists. Seems this blonde lady was interested in some of my challenging thoughts on treatment of spine, foot, and ankle and invited me to speak with her group on one of my topics. By now you probably realize this “blonde” was Colleen Louw and the CE provider was ISPI. I was introduced to a group of instructors who felt the same way I did about improving our profession...and through education and instruction of everyone they could reach. I was asked to take on a

role in this great group and it has been a great fit for me.

I have been asked to work on creating many new courses for ISPI and teaching some of the existing courses produced by Adriaan and Louie and others. I am fascinated by the detail and evidence that is necessary to produce one of these weekend courses. I love reading the articles on the subjects we need to include and gain understanding of small points which might have always eluded me. I am now so much more involved in pain science and neuroscience education than I ever would have expected. But more importantly, I have learned one vital piece of information from association with these educators and researchers. Physical therapy is much more than science and the evidence...it is ART.

The obviously good therapists I meet at all of these regional courses have several traits that make them special. They have a desire to learn more. They are unconventional in their practices. They are willing to use evidence to direct their interactions with their clients. And most importantly, they really care about the patient/client and will do most anything to get them to improve. In fact, the best therapists I meet don't even have the best manual skills of the group. However, they interact and communicate well with their patients. They alleviate fear of the unknown and direct the patient

or client to a wellness state of mind. They connect with the mind and body of these people and don't treat them as a means of payment. They are truly ARTISTS. We teach them skills and evidence behind interventions, but their application is through the total mind and body interaction.

So, what have I learned after all of these years? I have learned that therapists need to be trained well; they need to be well read on evidence of practice; they need to challenge the status quo of practice; we need to be a caring profession; and we need to challenge those around us that are not being good professionals in our field to be better. I have learned that I will never, by myself, accomplish my goals of making our profession better, but all of us together can get close to making us a dynamic part of the health care team. I have learned that my colleagues at International Spine and Pain Institute care about our profession the same as I do and are willing to take the time and energy to instill the science and evidence of physical therapy to all of the persons willing to learn...but are also eager to teach the art of physical therapy: the interaction with our patients, the caring for their mind and body, and the instilling of caring for themselves. Thanks for going on this journey with me and with ISPI .

Let's be great artists together.



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REPLY TO THE EDITOR: FEBRUARY 2015 NEWSLETTER

In the February 2015 newsletter I posed a question that has bothered me professionally for a while: Where do we draw the line? The premise of the editorial was that even though most therapies work, especially in line with neuroscience, we have to ask if some treatments may in fact do the opposite, by making people worse. By perpetuating “bad beliefs” we may actually enhance a person’s pain experience, not help. Well, it seems I “struck a nerve” as I received various replies. We thought we’d print two of them:

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I will attempt to answer Adriaan’s question: Where do we draw the line? Is it ethically immoral to use treatment approaches that not only are not helping but also fuel faulty beliefs? My answer is not yet. Let me explain. The field of medicine is constantly finding new and better diagnostic and treatment approaches. When radiographs were first invented, wealthy people had radiographs taken of themselves for kicks. We later learned that radiation can be harmful and stopped taking x-rays for thrills, but we still radiate people increasing their risk of cancer. All medications have side effects but we still take them because the costs do not outweigh the benefits.

While we may lack the evidence that craniosacral therapy or optimal posture reduces pain we also do not have evidence that these practices do harm. I would argue that if applied to help give a person a sense of control (I can feel better if I don’t slouch) or some relief (relaxing while undergoing craniosacral therapy) and we appropriately dose these treatments such that the patient does not become reliant on these strategies the benefit outweighs the costs. If we simultaneously reframe the patient’s beliefs about pain

and thus prevent the patient from becoming overly dependent on these approaches I believe we do no harm. Evidence based medicine is based on research, experience and patient values. When the research demonstrates that an intervention causes harm then the therapist must weigh these findings with the patient’s values and the therapist’s experience.

Finally, we cannot forget the placebo effect. When a patient’s values, culture or upbringing has a strong bias toward a treatment approach such as massage or acupuncture then why not use it to help calm a flare-up so it is easier to get the patient moving without fear. Then once the patient is able to think clearly then the therapist can reframe the patient’s beliefs. So once again, are these interventions harmful? – Not yet, not until we prove these interventions cause harm or over use them.

- Ellen Braatz, WI

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I read your newsletter yesterday and wanted to respond to your article. I am 'right there with you', so to speak, feeling that the more I learn the more I realize just how much I don't yet understand. I may know a great deal about anatomy and physiology but I know that pain is subjective and cannot be measured with a ruler. I feel that physical therapists as a whole do a great job of caring for individuals, connecting with patient in a way that gives them encouragement and hope that things can improve. Chronic pain is tough and consistently being a patient's cheer leader can be very draining. When a patient attends therapy for their initial evaluation, I try very hard to 'read' the individual in terms of their beliefs concerning their pain and what physical therapy has to offer. Although my

physical therapy powers may be great, I cannot offer them healing but rather guidance. I stay a long way away from phases such as "This will fix you" or "I'll make it better" but rather focus on many of the concepts you and others have taught me over the years, namely that appropriate and progressive movement not only encourages physical healing but challenges our CNS to tolerate more activity.

I do feel that a person's beliefs about their injury and their potential for recovery go a long way toward setting the stage for their improvement in physical therapy. I am encouraged when a patient comes to physical therapy ready to learn and be challenged to grow both physically and mentally. I often-times use an analogy of a person getting food poisoning as a way to explain the reaction our brain can have towards protected movements. I often ask patients if they would like me to bring them Chinese food just days after becoming violently ill from eating bad moo goo gai pan? No one has ever said yes to my kind offer! I explain that in order to eat Chinese food ever again they have to progress cautiously with a positive attitude toward change. When they have a slight flare of pain with movement I will tell them they are just 'licking the spoon' from the Chinese soup and that their body just has to get used to this level of movement before taking a 'bigger bite' of activity. Having a patient who is wise towards careful activity progression and strong mentality with a focused-vision towards long-term recovery is crucial to successful progression in physical therapy. Thank you for all you do to educate, encourage, and support physical therapy. Keep fighting the good fight!

- Mitchell Barber, KS

GIFFORD'S LION

As many readers are familiar, Louis Gifford contributed to the ISPI newsletter in the year prior to his passing. Words cannot describe how grateful we are for his contributions and subsequently his must-read series of books: Aches and Pains. At our June conference 2014 we invited Louis' wife Phillipa to join us as a special guest as we honored Louis for his contribution. In so doing, we have developed a great relationship with Phillipa and remain in constant contact. This month, with her permission, we feature yet another "Louis gem" – the lion-in-the-room.

This metaphor is now synonymous with our patient books and classes, stemming from my years with David Butler. The story, however, starts with Louis during the early years as he, along with David, toured throughout Europe. Louis used the lion-in-the-room story as a metaphor for the stress response. Upon returning from a class in The Netherlands, Louis received major shock: A lion in the room! The course participants mailed Louis a stuff lion, symbolic of their experience at the Aches and Pain course. A few weeks ago Phillipa sent us a picture of the lion, as she recently 're-discovered' it. So there you go...Louis' lion!



A Better Pain Scale



- 0: Hi. I am not experiencing any pain at all. I don't know why I'm even here.
- 1: I am completely unsure whether I am experiencing pain or itching or maybe I just have a bad taste in my mouth.
- 2: I probably just need a Band-Aid.
- 3: This is distressing. I don't want this to be happening to me at all.
- 4: My pain is not f#%ing around.
- 5: *Why is this happening to me??*
- 6: Ow. Okay, my pain is *super* legit now.
- 7: I see Jesus coming for me and I'm scared.
- 8: I am experiencing a disturbing amount of pain. I might actually be dying. Please help.
- 9: I am almost definitely dying.
- 10: I am actively being mauled by a bear.
- 11: Blood is going to explode out of my face at any moment.
- Too Serious for Numbers: You probably have Ebola. It appears that you may also be suffering from Stigmata and/or pinkeye.

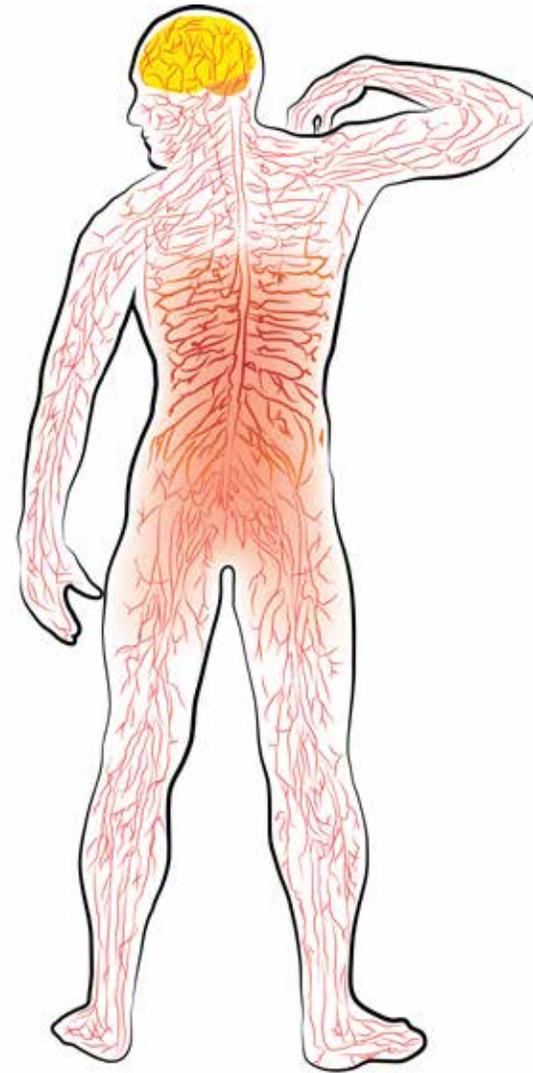
Allie Brosh 2010

Early changes in somatosensory function in spinal pain: a systematic review and meta-analysis

Pain. 2015 Feb;156(2):203-14.

Alterations in sensory processing have been demonstrated in chronic low back and neck pain. However, it has not been yet systematically summarized how early these changes occur in spinal pain. This systematic review examines the available literature measuring somatosensory function in acute (<6 weeks) and sub-acute (6-12 weeks) spinal pain. The protocol for this review has been registered on the International Prospective Register of Systematic Reviews (PROSPERO). An electronic search of 4 databases was conducted to retrieve studies assessing somatosensory function by quantitative sensory testing in adults with spinal pain of up to 12 weeks duration. Two reviewers independently screened the studies and assessed the risk of bias. Studies were grouped according to spinal pain condition (whiplash injury, idiopathic neck pain, and nonspecific low back pain), and, where possible,

meta-analyses were performed for comparable results. Fifteen studies were included. Sources of bias included lack of assessor blinding, unclear sampling methods and lack of control for confounders. We found that: (1) there is consistent evidence for thermal and widespread mechanical pain hypersensitivity in the acute stage of whiplash, (2) there is no evidence for pain hypersensitivity in the acute and sub-acute stage of idiopathic neck pain, although the body of evidence is small, and (3) hyperalgesia and spinal cord hyperexcitability have been detected in early stages of nonspecific low back pain, although evidence about widespread effects are conflicting. Future longitudinal research using multiple sensory modalities and standardized testing may reveal the involvement of somatosensory changes in the development and maintenance of chronic pain.



Postoperative pain treatment after total hip arthroplasty: a systematic review.

Pain. 2015 Jan;156(1):8-30

Treatment of postoperative pain should rely on results from randomized controlled trials and meta-analyses of high scientific quality. The efficacy of a particular intervention may depend on the type of surgical procedure, which supports the reporting of “procedure-specific” interventions. The aim of this systematic review was to document the procedure-specific evidence for analgesic interventions after total hip arthroplasty (THA). This PRISMA-compliant and PROSPERO-registered review includes randomized placebo-controlled trials (RCTs) of medication-based analgesic interventions after THA. Endpoints were postoperative opioid consumption, pain scores (rest

and during mobilization), adverse events, and length of hospital stay. Fifty-eight trials with 19 different interventions were retrieved. High risk of bias, substantial differences in assessment-tools and criteria for pain, irregular reporting of adverse events, considerable differences in supplemental analgesic consumption, and basic analgesic regimens generally characterized trials. Meta-analyses of non-steroidal anti-inflammatory drugs, local infiltration analgesia, intrathecal opioids, and lumbar plexus block provided a 24-hour intravenous morphine-sparing effect of 14.1 (95 % confidence interval: 8.0-20.2) mg, 7.5 (3.7-11.3) mg, 19.8 (14.9-24.7) mg,

and 11.9 (6.4-17.3) mg, respectively. Non-steroidal anti-inflammatory drugs and lumbar plexus block were demonstrated to provide reductions in postoperative pain scores. Intrathecal opioids increased pruritus, and lumbar plexus block reduced nausea and pruritus. The GRADE-rated quality of evidence ranged from low to very low throughout the analyses. This review demonstrated, that some analgesic interventions may have the capacity to reduce mean opioid requirements and/or mean pain intensity compared with controls, but the available randomized placebo-controlled trials does not allow a designation of a “best proven intervention” for THA.

Pre-surgical assessment of temporal summation of pain predicts the development of chronic postoperative pain 12 months after total knee replacement. *Pain.* 2015 Jan;156(1):55-61

Patients with knee osteoarthritis demonstrate decreased pressure pain thresholds (PPTs), facilitated temporal summation (TS) of pain, and decreased conditioned pain modulation (CPM) compared with healthy controls. This study aimed to correlate preoperative PPTs, TS, and CPM with the development of chronic postoperative pain after total knee replacement (TKR) surgery. Knee pain intensity (visual analog scale [VAS]: 0-10), PPTs, TS, and CPM were collected before, 2 months, and 12 months after TKR. Patients were divided into a low-pain (VAS < 3) and a high-pain (VAS ≥ 3) group based on their VAS 12 months after TKR. The high-pain group (N = 17) had higher pain intensities compared with the low-pain group (N = 61) before surgery (P = 0.009) and 12 months after surgery

(P < 0.001). The PPTs of the low-pain groups were normalized for all measurement sites comparing pre-surgery with 12 months post-surgery (P < 0.05, contralateral arm: P = 0.059), which was not the case for the high-pain group. The low-pain group showed a functional inhibitory CPM preoperatively and 12 months postoperatively (P < 0.05), which was not found in the high-pain group. The high-pain group had higher facilitated TS preoperatively and 12 months postoperatively compared with the low-pain group (P < 0.05). Preoperative TS level correlated to 12-month postoperative VAS (R = 0.240, P = 0.037). Patients who developed moderate-to-severe pain had pro-nociceptive changes compared with patients who developed mild pain post-surgery. Pre-

operative TS level correlated with the postoperative pain intensity and may be a preoperative mechanistic predictor for the development of chronic postoperative pain in patients with osteoarthritis after TKR.



Preoperative widespread pain sensitization and chronic pain after hip and knee replacement: a cohort analysis. *Pain.* 2015 Jan;156(1):47-54

Chronic pain after joint replacement is common, affecting approximately 10% of patients after total hip replacement (THR) and 20% of patients after total knee replacement (TKR). Heightened generalized sensitivity to

nociceptive input could be a risk factor for the development of this pain. The primary aim of this study was to investigate whether preoperative widespread pain sensitivity was associated with chronic pain after joint replacement. Data were analyzed from 254 patients receiving THR and 239 patients receiving TKR. Pain was assessed preoperatively and at 12 months after surgery using the Western Ontario and McMaster Universities Osteoarthritis Pain Scale. Preoperative widespread pain sensitivity was assessed through measurement of pressure pain thresholds (PPTs) at the forearm using an algometer. Statistical analysis was conducted using linear regression and linear mixed models, and adjustments were made for confounding variables. In both the

THR and TKR cohort, lower PPTs (heightened widespread pain sensitivity) were significantly associated with higher preoperative pain severity. Lower PPTs were also significantly associated with higher pain severity at 12 months after surgery in the THR cohort. However, PPTs were not associated with the change in pain severity from preoperative to 12 months postoperative in either the TKR or THR cohort. These findings suggest that although preoperative widespread pressure pain sensitivity is associated with pain severity before and after joint replacement, it is not a predictor of the amount of pain relief that patients gain from joint replacement surgery, independent of preoperative pain severity.



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Hilton Minneapolis/Bloomington, MN

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Adriaan Louw PT, PhD, CSMT

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Paul Mintken PT, DPT, OCS, FAAOMPT

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Steve Schmidt PT, M.Phys, OCS, FAAOMPT

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Supervised walking in comparison with fitness training for chronic back pain in physiotherapy: results of the SWIFT single-blinded randomized controlled trial. Pain. 2015 Jan;156(1):131-47



Effectiveness of brief/minimal contact self-activation interventions that encourage participation in physical activity (PA) for chronic low back pain (CLBP >12 weeks) is unproven. The primary objective of this assessor-blinded randomized controlled trial was to investigate the difference between an individualized walking program (WP), group exercise class (EC), and usual physiotherapy (UP, control) in mean change in functional disability at 6 months. A sample of 246 participants with CLBP aged 18 to 65 years (79 men and 167 women; mean age \pm SD: 45.4 \pm 11.4 years) were recruited from 5 outpatient physiotherapy departments in Dublin, Ireland. Consenting participants completed self-report measures of functional disability, pain, quality of life, psychosocial beliefs, and PA were randomly allocated to the WP (n = 82), EC (n = 83), or UP (n = 81) and followed up at 3 (81%; n = 200),

6 (80.1%; n = 197), and 12 months (76.4%; n = 188). Cost diaries were completed at all follow-ups. An intention-to-treat analysis using a mixed between-within repeated-measures analysis of covariance found significant improvements over time on the Oswestry Disability Index (Primary Outcome), the Numerical Rating Scale, Fear Avoidance-PA scale, and the EuroQol EQ-5D-3L Weighted Health Index ($P < 0.05$), but no significant between-group differences and small between-group effect sizes (WP: mean difference at 6 months, 6.89 Oswestry Disability Index points, 95% confidence interval [CI] -3.64 to -10.15; EC: -5.91, CI: -2.68 to -9.15; UP: -5.09, CI: -1.93 to -8.24). The WP had the lowest mean costs and the highest level of adherence. Supervised walking provides an effective alternative to current forms of CLBP management.

Pain catastrophizing as a risk factor for chronic pain after total knee arthroplasty: a systematic review. J Pain Res. 2015 Jan 5;8:21-32.

Total knee arthroplasty (TKA) is a common and costly surgical procedure. Despite high success rates, many TKA patients develop chronic pain in the months and years following surgery, constituting a public health burden. Pain catastrophizing is a construct that reflects anxious preoccupation with pain, inability to inhibit pain-related fears, amplification of the significance of pain vis-à-

vis health implications, and a sense of helplessness regarding pain. Recent research suggests that it may be an important risk factor for untoward TKA outcomes. To clarify this impact, we systematically reviewed the literature to date on pain catastrophizing as a prospective predictor of chronic pain following TKA.



continued on page 9

Pain sensitivity and tactile spatial acuity are altered in healthy musicians as in chronic pain patients.

Front Hum Neurosci. 2015 Jan 6;8:1016.

Extensive training of repetitive and highly skilled movements, as it occurs in professional classical musicians, may lead to changes in tactile sensitivity and corresponding cortical reorganization of somatosensory cortices. It is also known that professional musicians frequently experience musculoskeletal pain and pain-related symptoms during their careers. The present study aimed at understanding the complex interaction between chronic pain and music training with

respect to somatosensory processing.

For this purpose, tactile thresholds (mechanical detection, grating orientation, two-point discrimination) and subjective ratings to thermal and pressure pain stimuli were assessed in 17 professional musicians with chronic pain, 30 pain-free musicians, 20 non-musicians with chronic pain, and 18 pain-free non-musicians. We found that pain-free musicians displayed greater touch sensitivity (i.e., lower mechanical detection thresholds), lower tactile spatial acuity (i.e., higher grating orientation thresholds) and increased pain sensitivity to pressure and heat compared to pain-free non-musicians. Moreover, we also found that musicians and non-musicians with chronic pain presented lower tactile spatial acuity and increased pain sensitivity to pressure and heat compared to pain-free non-musicians.

The significant increment of pain sensitivity together with decreased spatial discrimination in pain-free musicians and the similarity of results found in chronic pain patients, suggests that the extensive training of repetitive and highly skilled movements in classical musicians could be considered as a risk factor for developing chronic pain, probably due to use-dependent plastic changes elicited in somatosensory pathways.

Knee arthroplasty

continued from page 8

METHODS: We searched MEDLINE, EMBASE, and PsycINFO databases to identify articles related to pain catastrophizing, TKA, risk models, and chronic pain. We reviewed titles and abstracts to identify original research articles that met our specified inclusion criteria. Included articles were then rated for methodological quality, including methodological quality. Due to heterogeneity in follow-up, analyses, and outcomes reported across studies, a quantitative meta-analysis could not be performed.

RESULTS: We identified six prospective longitudinal studies with small-to-mid-sized samples that met the inclusion criteria. Despite considerable variability in reported pain outcomes, pain catastrophizing was identified as a significant predictor of chronic pain persisting ≥ 3 months following TKA in five of the studies assessed. Limitations of studies included lack of large-scale data, absence of standardized pain measurements, inadequate multivariate adjustment, such as failure to control for analgesic use and other relevant covariates, and failure to report non-significant parameter estimates.

CONCLUSION: This study provides moderate-level evidence for pain catastrophizing as an independent predictor of chronic pain post-TKA. Directions for future research include larger, well-controlled studies with standard pain outcomes, identification of clinically-relevant catastrophizing cut-offs that predict pain outcomes, investigation of other psychosocial risk factors, and assessment of interventions aimed to reduce pain catastrophizing on chronic pain outcomes following TKA surgery.



Top Left: Colleen Louw with first time attendee Lisa Grabbe **Top Right:** Adriaan Louw, Louis Puentadura, Colleen, Bill O'Grady **Bottom:** Adriaan speaking at the Medbridge booth



ISPI staff and faculty braved the conditions, along with 10,000 physical therapists to attend the annual Combined Sections Meeting in Indianapolis. CSM is a monster in its own right – so many people, vendors, classes and fun. CSM gives us an opportunity to mingle with other presenters, scientists, vendors, our loyal followers and showcase us to new people. Thanks to those who stopped by to say 'Hi'. Thanks to the ISPI staff and faculty attending and hanging out – Colleen, Adriaan, Louie, Steve, Terry, Kory and Brian. We look forward to Anaheim 2016 where it's VERY unlikely to have...snow!

Once upon a time...

...there were two people who worked for two different companies aimed at 'helping' people in pain.

On a beautiful sunny day in paradise, a magical phone call appeared from nowhere with a magic offer - spread YOUR message to everyone in the US! Better yet, who will be spreading your message? The voice of Darth Vader himself....James Earl Jones.

First, the fairy godmother (producer) called the physical therapist. The therapist had all that was needed – experience, representing a workforce of 200 000 professionals, hands-on care, and time with patients, non-pharmacological treatments, no addictive drugs, treatments supported by evidence in high-quality randomized controlled trials and systematic reviews. The message would go out millions of Americans: Pain is a normal human experience and need not lead to suffering or a search for expensive tests and treatments...There was only one catch though: The fairy godmother said – we need \$30 000 from you to help get your message out. The PT was sad, since it was

way beyond his means and seemed unfair... he can REALLY help people, without trying to sell anyone anything!

Next, the fairy godmother called the pharmaceutical representative. He too was “helping” people in pain. The same offer was made. This time however, the response was different: Only \$30 000 to spread my message to millions? Absolutely; sign me up! Our message? Drugs are good; needed by people in pain and can help manage people’s pain, as long as they steadily increase the dose over time. Side effects? Read it in the small print in an obscure magazine (Family Circle, page 37).

Everyone in the US with pain lived happily ever after...everyone had drugs; some lost their will to fight and some did not care anymore...

The End

2015 COURSE SCHEDULE

Sat/Sun	Mar 14 & 15	A Study of Neurodynamics: The Body's Loving Alarm System	Lincoln, NE
Sat/Sun	Mar 14 & 15	Spinal Manipulation I: A Physical Therapy Approach	Duluth, MN
Sat/Sun	Mar 21 & 22	The Whiplash Patient: An Update on Examination & Treatment	Flower Mound, TX
Sat/Sun	Mar 21 & 22	The Lower Quadrant: A Differential Diagnosis Approach to Manual Therapy	Liberty, MO
Sat/Sun	Mar 28 & 29	The Cervical Spine: A Manual Therapy and Pain Science Approach	Woodbury, MN
Sat/Sun	Mar 28 & 29	Spinal Manipulation I: A Physical Therapy Approach	Carroll, IA
Sat/Sun	Apr 11 & 12	The Thoracic Spine: A Manual Therapy and Pain Science Approach	Cedar Rapids, IA
Sat/Sun	Apr 11 & 12	The Lumbar Spine: A Manual Therapy and Pain Science Approach	Mill Creek, WA
Sat/Sun	Apr 11 & 12	Therapeutic Neuroscience Education: Educating Patients About Pain	Coeur d'Alene, ID
Sat/Sun	Apr 18 & 19	The Upper Quadrant: A Differential Diagnosis Approach to Manual Therapy	Des Moines, IA
Sat/Sun	Apr 18 & 19	Therapeutic Neuroscience Education: Educating Patients About Pain	Minneapolis, MN
Sat/Sun	Apr 18 & 19	Spinal Manipulation I: A Physical Therapy Approach	Las Vegas, NV
Tuesday	April 21	Why Do I Hurt? (2 hours)	Bloomington, MN
Friday	April 24	A Therapeutic Treatment Approach to Cervicogenic Headaches	Ames, IA
Fri/Sat	Apr 24 & 25	Spinal Manipulation I: A Physical Therapy Approach	Saranac Lake, NY
Saturday	April 25	A Therapeutic Treatment Approach to Cervicogenic Headaches	Kansas City, MO
Saturday	April 25	Too Hot to Handle: Desensitizing the Hypersensitive Patient	Ames, IA
Sunday	April 26	Education and Exercise for Fibromyalgia Patients: A Neuroscience Approach	Kansas City, MO
Sat/Sun	May 2 & 3	Therapeutic Neuroscience Education: Educating Patients About Pain	Houghton, MI
Tuesday	May 5	Why Do I Hurt? (2 hours)	Davenport, IA
Saturday	May 9	Too Hot to Handle: Desensitizing the Hypersensitive Patient	Des Moines, IA
Sat/Sun	May 16 & 17	The Cervical Spine: A Manual Therapy & Pain Science Approach	Roseburg, OR
Sat/Sun	May 30 & 31	Therapeutic Neuroscience Education: Educating Patients About Pain	Denver, CO
Sat/Sun	June 6 & 7	Therapeutic Neuroscience Education: Educating Patients About Pain	Chandler, AZ
Friday	June 19	Too Hot to Handle: Desensitizing the Hypersensitive Patient	Bloomington, MN
Fri/Sat/Sun	Jun 19-22	The Clinical Conference: Every Joint Has a Brain	Bloomington, MN
Sat/Sun	Jun 27 & 28	Spinal Manipulation I: A Physical Therapy Approach	Flower Mound, TX
Sat/Sun	Aug 15 & 16	The Thoracic Spine: A Manual Therapy and Pain Science Approach	Tulsa, OK
Fri/Sat/Sun	Aug 21-23	Therapeutic Neuroscience Education: Educating Patients About Pain	Santiago, Chile
Sat/Sun	Sep 26 & 27	The Lumbar Spine: A Manual Therapy and Pain Science Approach	Des Moines, IA
Sat/Sun	Sep 26 & 27	Therapeutic Neuroscience Education I: Educating Patients About Pain	Spartanburg, SC
Saturday	October 3	Too Hot to Handle: Desensitizing a Hypersensitive Patient	Kansas City, MO
Sunday	October 4	Preoperative Therapeutic Neuroscience Education	Kansas City, MO
Sat/Sun	Oct 10 & 11	The Upper Quadrant: A Differential Diagnosis Approach to Manual Therapy	Liberty, MO
Sat/Sun	Oct 17 & 18	A Study of Neurodynamics: The Body's Living Alarm	Chandler, AZ
Sat/Sun	Oct 24 & 25	Elbow, Wrist and Hand, Differential Diagnosis & Management	Flower Mound, TX
Sat/Sun	Dec 12 & 13	The Cervical Spine: A Manual Therapy & Pain Science Approach	Story City, IA