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Author: Dr Sarah Haag

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PERSONAL BIO

Dr. Teddy Willsey is a sports medicine focused physical therapist and private practice owner in Rockville, Maryland. Teddy has an interest in working with high level athletes and return to sport rehab. In addition to practicing PT, Teddy speaks and teaches publicly, writes and blogs regularly, and posts on social media daily. He can be found on Instagram at @strengthcoachtherapy or online at www.teddywillsey.com.

Ben Cormack owns and runs Cor-Kinetic. He is a musculoskeletal therapist with a clinical background in sports therapy, rehabilitation, pain science & exercise stretching back 15 years. He specialises in a movement & exercise based approach with a strong education component and patient centred focus. Ben is a popular international presenter who has delivered conferences presentations and courses all over the world.

Robin Kerr is an Australian trained physiotherapist with 33 years of clinical experience. Her special interests lay in pelvic floor and lumbo-pelvic dysfunction. She is heavily trained in biomechanics and gait lab running analysis, however over the last 20 years has moved towards a focus on motion and the BPS model in the management of persistent pain. You can find more about Robin and her team here www.alchemyinmotion.com.au

Todd Hargrove is a Certified Feldenkrais practitioner, Certified Rolfer, and author. Todd graduated from Hamilton College in 1990 with a B.A. in Economics, and from the University of Washington School of Law in 1995 with a J.D. While working as an attorney, Todd developed chronic neck and back pain, but eliminated it through through self-education, lifestyle change and exercise. Since 2008, he has written a blog at BetterMovement.org, which focuses on applying a modern understanding of pain science and neuroscience to movement-based therapies.
Stephen King is the Director of MAT – Movement Assessment Technologies and creator of The MAT. He has a unique background, being a dual-masters qualified Physiotherapist and Osteopath, while also having undertaken further studies as a Strength and Conditioning Coach and Personal Trainer. Find out more at www.MATassessment.com

Dr Joanne Kemp is a titled APA Sports Physiotherapist of 25+ years’ experience. She is a Research Fellow at the Latrobe Sport and Exercise Medicine Research Centre, Latrobe University, Australia. Joanne has presented extensively on the management of hip pain and hip pathology in Australia and internationally. Her research is focused on hip pain including FAI and early onset hip OA in young and middle aged adults, and its impact on activity, function and quality of life.

Carlo Wood MPT, PhD, APA Sports & MSK Physio, OCS, DNSET is an instructor for Neurodynamic Solutions and owner of a cash only clinic specializing in sports injuries (sportsandorthophysio.net). He is a manuscript reviewer for JOSPT, invited speaker to Orthopaedic conferences worldwide and also part of the US Olympic Committee’s Sports Medicine Volunteer program.

Mariana Wingood is a full time clinician and part-time educator. She is an active member of the Vermont Falls Coalition, Gerontology Society of America, and Academy of Geriatrics. Mariana’s focus is on fall prevention and exercise prescription for older adults. She has presented at a state, national conferences, and international level.
Sandy graduated from Pacific University (Oregon) in 1988 with a Master of Science in Physical Therapy and a Doctor of Physical Therapy degree from Des Moines University in December 2013. She has worked in multiple settings across the US with a neurologic and orthopedic emphasis including a focus in pelvic rehabilitation for pain and dysfunction. Sandy teaches and speaks internationally on the treatment of pelvic pain, and the application of pain science into clinical practice.

Anthony Teoli is a physiotherapist clinician working in private practice in Laval, Quebec. He is also the founder of InfoPhysiotherapy, a website dedicated to facilitating evidence-based practice for physiotherapists. Anthony has conducted two previous studies examining gait and disease progression in individuals with knee osteoarthritis, and is currently collaborating on a study with researchers from McGill University.

Sandy graduated from Pacific University (Oregon) in 1988 with a Master of Science in Physical Therapy and a Doctor of Physical Therapy degree from Des Moines University in December 2013. She has worked in multiple settings across the US with a neurologic and orthopedic emphasis including a focus in pelvic rehabilitation for pain and dysfunction. Sandy teaches and speaks internationally on the treatment of pelvic pain, and the application of pain science into clinical practice.

Sarah Haag is a physiotherapist and co-owner of Entropy Physiotherapy and Wellness in Chicago. At Entropy, Sarah specializes in women’s and men’s health, and on treating the spine and pelvis. She received her Doctorate of Physical Therapy and Masters of Science in Women’s Health from Rosalind Franklin University in 2008. In 2009 she was awarded a Board Certification as a specialist in women’s health (WCS). While not a researcher, she enjoys hanging out with researchers to shorten the gap between research and clinical application.
BACKGROUND & OBJECTIVES:

The purpose of this study was to determine the rate of improvement for mid-portion Achilles tendinopathy (AT) while completing a loading protocol intervention. In this case, improvement was defined as change in pain and function over time. The purpose of the study was to help clinicians answer one of the most common patient questions - “how long will it take to get better?”.

In order to better understand the course of an injury, it is imperative that clinicians begin to appreciate the physiological methods by which improvements are made. A greater understanding of this may also help to guide clinical decision making. The study discusses potential adaptations and the proposed mechanism of the analgesia associated with loading protocols as well.
RESULTS/WHAT THEY FOUND:

The process of pain perception is largely controlled by higher level brain processing, and thus can change quickly. Pain has been shown to decrease significantly following a single bout of isometric loading. Unfortunately, with persistent or chronic pain the analgesic effect of load has been shown to decrease over time. A peak effect is shown at 12 weeks with diminishing returns from the 12-week to 6-month time period.

Both neurological and local tissue-based changes have been thought to contribute to improved function and decreased pain perception. Proposed mechanisms include increased contractility of the fibers as well as hypertrophy of the contractile tissue. None of these changes are observable or measurable in the immediate hours to days following a loading protocol, yet analgesia and improved function are commonplace. It is theorized that immediate adaptations to exercise including analgesia are primarily nervous system-mediated.
LIMITATIONS (THINGS TO KEEP IN MIND):

The study aimed to include a large number of cohorts in order to create a powerful and heterogenous data pool. They included results from both randomized control trials and non-randomized cohort studies, as well as groups that had sham interventions in addition to exercise. It would have been ideal to not include groups that had sham treatments, as this can impact outcomes.

Furthermore, the study takes an extremely generic viewpoint regarding the treatment of AT. There was no discussion of comparing treatment protocols or ideal loading protocols. The objective of the study was to provide averages for healing time and shed light on the longer-term course of treatment. There is little application clinically beyond patient education and clinician knowledge of disease course.

“Immediate improvement in pain does not equal resolution.”
CLINICAL IMPLICATIONS (HOW THIS IMPACTS CLINICAL PRACTICE):

Preparing and educating your patients on disease course sets the stage for improved adherence, engaged patient involvement, and thus expedient recovery. Clinicians should use this information to guide their conversations with patients and assist in educating them. This study helps to answer the question almost all patients have - “how long until this gets better?”. Patient education can help significantly improve clinical outcomes when the intervention is largely dependent on compliance to the home exercise program.

The most important takeaway here is that immediate improvement in pain does not equal resolution. In the case of tendinopathy, flare-ups or regressions are normal and to be expected. While patients can expect reasonably fast results with an immediate loading protocol for AT, they will need to continue to push and do their exercises even when they feel frustrated with persistent low-level symptoms. This simple education piece can go a long way towards a long term and permanent resolution.

The study looked at four distinct loading protocols: heavy eccentric calf training, modified heavy eccentric calf training, eccentric overload, and eccentric overload with active rest. All four protocols involve an emphasis on eccentric exercise, as this has been shown to be effective for tendinopathy rehabilitation. The Achilles tendon has significant eccentric demands in normal human movement. Research has shown patients with AT to exhibit decreased Achilles stiffness, and thus decreased eccentric strength. The common thread across all four rehabilitation loading protocols is therefore to improve the deceleration or braking force of the Achilles tendon.

MUSCULOSKELETAL PAIN AND EXERCISE—CHALLENGING EXISTING PARADIGMS AND INTRODUCING NEW

BEN CORMACK

BACKGROUND & OBJECTIVE:

This paper was a narrative review looking at new concepts for understanding the interaction between pain and exercise. Traditional models of pain that focus on a linear transmission of nociception and a simplistic corresponding representation of what is happening within the tissue are inadequate to explain both pain itself and the responses to therapeutic exercise.

Pain can often be seen as something to avoid during exercise as it maybe a sign that the tissue is sustaining more injury. This assumption has been challenged recently by research indicating that exercise that allows some pain has a small statistical benefit in the short term and does not provide worse outcomes in the medium and longer terms.

The aim of the review was to explore mechanisms that might underpin the effect of exercise on pain and how these then fit into the concept of allowing painful exercise. Hopefully this can help optimise the way therapeutic exercise is prescribed.

METHODS (WHAT THEY DID):

Firstly the authors looked at pain mechanisms such as central sensitisation, affective (emotional) aspects of pain, and the role of the immune system, with many of the mechanisms discussed have a large amount of overlap.

Central sensitisation can be split into hyperalgesia, allodynia, temporal summation of pain (TSP) and diffuse noxious inhibitory control (DNIC). The mechanisms that underpin sensitivity levels such as endogenous opioid activation or inhibition have been shown to be affected by exercise leading to both increased and decreased pain. The role of negative emotional states such as kinesiophobia, catastrophising, low self-efficacy, anxiety and depression are being seen as prognostic factors for recovery from many MSK conditions and share the activation of the same modulatory mechanisms. The role of glial cells and toll-like receptors and other immune system responses also can increase or decrease the experience of pain.
RESULTS/WHAT THEY FOUND:

The authors highlight the function of exercise-induced hypoalgesia (EIH) in the role of central pain modulation. Painful exercise often allows greater dosages of exercise so may also increase the amount of EIH. The authors also discuss diffuse noxious inhibitory control (DNIC) and conditioned pain modulation (CPM) as potential pain-reducing mechanisms involved in painful exercise.

Affective responses may be affected by changes in emotional associations with pain or the fear of pain. The inhibition of previously painful conditioned responses via new ‘safety cues’ may lead to the ‘de-threatening’ of movement. The discussion of immune system responses focused on the amygdala and reducing the potential threat of exercise and associated immune system responses.

LIMITATIONS/THINGS TO KEEP IN MIND:

The limitations of this paper are the narrative nature of the discussions and many of the mechanisms highlighted can have an effect on both painful and pain-free exercise, as well as increase or decrease the pain responses associated with exercise.
**CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:**

The clinical implications of this paper are important. Reconceptualising how exercise works for pain allows us to consider varying potential mechanisms for the modulation of pain. These mechanisms may change the focus of exercise prescription for painful MSK issues and move beyond a tissue-focused view of exercise that does not appear to be supported by the available research.

Many people have a negative view of experiencing pain during or post-exercise when rehabilitating, associating it with increasing tissue damage. This pain-contingent approach may reduce the dosage and increase fear of both pain and activity. By discussing both the research behind painful exercise and the potential mechanisms for why painful exercise may be beneficial, it can hopefully be de-threatened for both therapists and patients.

One area that could have been expanded on in this paper is when painful exercise may be contraindicated, as it may not be suitable for all patients especially those that are unable to currently change their perception or estimation of negative effect. Furthermore, some clinical examples may improve the application of this paper to practice, as many therapists may feel they have an inadequate skill set regarding the education and application of painful exercise.

“By discussing ... the potential mechanisms for why painful exercise may be beneficial, it can hopefully be de-threatened for both therapists and patients.”

**+ STUDY REFERENCE**


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ACUTE CHANGES IN FOOT STRIKE PATTERN AND CADENCE AFFECT RUNNING PARAMETERS ASSOCIATED WITH TIBIAL STRESS FRACTURES

ROBIN KERR

BACKGROUND & OBJECTIVE:
This study investigated if the biomechanical parameters suspected to be involved in running-related tibial stress fracture (TSF) could be altered via acute conversion to forefoot strike (FFS) or increased cadence. Runners with a history of TSF have been found in some areas of the biomechanical literature to exhibit:

- Higher peak & average loading rates
- Higher peak tibial acceleration
- Higher peak hip adduction angles
- Higher peak absolute free moments

METHODS (WHAT THEY DID):
Subjects: 17 habitual rear foot striking (RFS) experienced long distance runners (F=11, M=6; av. age 32.1; av. height 168cm; av. mass 64.9kg) who ran a minimum of 10 km/week (33.5 ± 17.5km/week) were recruited.

Pressure sensitive innersoles were fitted into standardized neutral shoes and linked to provide computerized visual feedback as to foot strike pattern during FFS habituating treadmill runs. A full body marker set and an antero-medial tibial accelerometer were attached. A 16.5m force plate embedded track collected ground reaction force data during overground testing runs. Cadence was increased by 10% over steady-state via metronome auditory feedback on treadmill habituating and overground runs.

Kinematic and kinetic variables for each subject over 3 running conditions were calculated:
1. RFS at preferred cadence
2. FFS at free cadence
3. Increased cadence with free foot strike type

Repeated measures ANOVA and paired t-tests with Bonferroni corrections were used to compare differences in parameters over the 3 running conditions.
RESULTS (WHAT THEY FOUND):

Forefoot Strike (FFS) conversion reduced 2 suspected risk factors for TSF – average and peak loading rates:

- Average loading rates – RFS 48.8 BW/s vs FFS 28.8 BW/s
- Peak loading rates – RFS 77.7 BW/s vs FFS 41.6 BW/s

Increased cadence reduced 1 suspected risk factor – peak hip adduction angle. Peak hip adduction angle has previously been found to be 4° higher in TSF patients. In this study increasing cadence by 11.4% (+/- 4.4%) reduced hip adduction angle by 1.9° on average.

There were no differences between patterns in peak tibial acceleration or peak absolute free moments.

Kinematic differences at initial ground contact amongst the 3 patterns were noted:

- Significant differences (p<0.001) in foot orientation between RFS (dorsiflexed) v FFS (plantarflexed)
- FFS had greater knee flexion than RFS (p<0.001)
- Increased cadence was associated with more plantarflexed ankle (FFS pattern) (p<0.001)
- FFS was associated with 4% (+/- 3.3%) increase in cadence (p<0.001) versus no increase in cadence with RFS

“Ensuring the runner has the capacity to footstrike in any pattern is the job of the therapist in my opinion.”
LIMITATIONS (THINGS TO KEEP IN MIND):

The study controlled reasonably well for the many confounders plaguing running biomechanical research. However, the small subject number limits the power of the study. Furthermore, this ‘acute’ intervention can give no insight into ongoing adaptation or effects.

VIDEO:
CLINICAL IMPLICATIONS (HOW THIS IMPACTS CLINICAL PRACTICE):

The alteration of foot strike patterns in runners is a very controversial topic. There is no greater conflicting research base than the foot strike literature. For every study in favour of FFS for running injury management, there is one against. Research to date has been fraught with methodological issues such as small sample sizes and a dearth of controlled prospective studies.

Although this study showed a shift from RFS to FFS resulted in lower contact forces, and also that increased cadence reduced hip adduction angle, the leap cannot be made to say these factors may reduce TSF, however tempting. This is an n=1 scenario. We should not be indiscriminately encouraging our patients to convert to FFS to avoid tibial stress fractures without a thorough biomechanical running analysis and application of clinical reasoning. Factors such as co-existing biomechanical issues, training programming error, bone density, poor recovery strategies etc must also be taken into consideration when it comes to TSF.

Having said that, we are physiotherapists who may be involved in preventing or managing tibial stress fractures, so what do we take from this study? VARIABILITY! Runners can be notoriously repetitive in their training/running, unaware of their eroding movement repertoire. Good runners can vary their foot strike pattern and cadence depending on the terrain, intensity and speed required. Ensuring the runner has the capacity to foot-strike in any pattern is the job of the therapist in my opinion. This involves ensuring 3D motion is available throughout the body, especially from the thoracic spine down in runners. Then, progressive conditioning with different foot strike patterns is needed.

Using phone app metronomes is an easy way to introduce variations in cadence during a run. A steady-state running cadence needs to be identified from which to increase. This study found even good runners struggle to increase cadence > 10% for more than several minutes.
+ **VIEWPOINT:** THE ROLE AND VALUE OF SYMPTOM-MODIFICATION APPROACHES IN MUSCULOSKELETAL PRACTICE

**T O D D H A R G R O V E**

**SUMMARY OF VIEWPOINT**

There is a wide variety of methods for the treatment of musculoskeletal pain, including Cognitive Functional Therapy (CFT), the McKenzie Method of Mechanical Diagnosis and Therapy (MDT), the McGill Method, Mulligan’s Mobilization with Movement, and many others. These methods employ different assessments, diagnoses, treatments, and explanations for their efficacy, some of which are directly contradictory. But research shows these different methods provide similar benefits. This raises somewhat of a paradox: if patients receive completely different treatments, why do they get such similar results?

This Viewpoint by Gregory Lehman sought to answer that question by identifying a common element to each therapy that he believes may be largely responsible for the beneficial results. Lehman argues (1) that every popular therapeutic method uses symptom modification as a key part of the process, and (2) that symptom modification is a plausible contributor to good therapeutic outcomes. Lehman makes the following arguments in favor of his position.

First, it is often impossible practically to identify an anatomical cause for pain. It is also very hard to find reliable evidence linking pain to certain movement patterns or postures. This suggests that successful therapy does not depend on a specific diagnosis of anatomical or movement-based faults.

Second, research shows that the efficacy of motor control therapies does not depend on actually changing motor control. For example, studies have shown improvements in shoulder pain after therapy to improve shoulder movement patterns, even though there was little or no change in the movement patterns. This suggests that successful therapy does not depend on changing movement in any specific way.

Third, similar results are often obtained using therapeutic methods with completely different, even opposite, approaches to improving biomechanics. For example, in CFT, patients with low back pain are often advised to relax the core musculature. In the McGill Method, which gets similar results, patients are usually advised to activate or brace the core. This again suggests that the efficacy of either method is not related to changes in biomechanics, but to some other common factor.
“Symptom modification ... may be the unifying theory for why different therapies work.”

Symptom modification is a good candidate for the common factor linking the different methods. Symptom modification basically means finding a movement or exercise that immediately changes the patient’s symptoms for the better. Every popular method includes some form of symptom modification, and uses it as a basis for deciding which kinds of exercise or therapies the patient should repeat on their own. It can even be found in highly disparate treatments whose stated intention is effecting change in specific anatomical structures, such as McKenzie, neurodynamic techniques, and isometric loading for tendinopathies.

There are several plausible reasons why symptom modifications may account for the beneficial results of a therapy. Most importantly, it can be used as a method to change beliefs that may be contributing to the pain or preventing healing. For example, the patient may believe that the pain cannot be changed, or that the pain is beyond their control, or that exercise will not help, or that they need surgery or drugs to control the pain. Symptom modification might be used to change any of these ideas. It could increase self-efficacy and locus of control, reduce catastrophizing and kinesiophobia, play a key role in a program of pain education, increase compliance with an exercise program, and encourage return to meaningful functional activities. It is exactly these factors that research shows are most predictive of recovery from chronic pain. Thus, clinicians should turn their attention away from making specific biomechanical changes, and towards these factors as the true targets for therapy. Symptom modification is a logical pathway to hit these targets, and may be the unifying theory for why different therapies work.

Lehman notes several limitations to keep in mind. Symptom modification should be seen as a means to an end, and not the end in itself. Although symptom modification appears to be helpful, it is unknown whether it is necessary. Finally, symptom modification might not always be possible, and this implies that other methods for success are not available.
NONINVASIVE MEASUREMENT OF SCIATIC NERVE STIFFNESS IN PATIENTS WITH CHRONIC LOW BACK RELATED LEG PAIN USING SHEAR WAVE ELASTOGRAPHY

D R C A R L O W O O D

BACKGROUND & OBJECTIVE:

It has been shown there is increased cross sectional area and altered transverse displacement of the sciatic nerve in chronic low back related leg pain (CLBRLP) sufferers, as well as increased stiffness in other peripheral neuropathies. Little is known about the stiffness of the sciatic nerve in the CLBRLP population. Shear wave elastography is a reliable way of estimating neural stiffness in healthy and clinical populations. This study was designed to determine whether sciatic nerve stiffness is altered in people with CLBRLP. They hypothesized that nerve stiffness would be increased in the affected limb of people with CLBRLP.

METHODS (WHAT THEY DID):

The sciatic nerve shear wave velocity (index of stiffness) was measured in both legs of 16 participants (8 with unilateral low back–related leg pain and 8 healthy controls) between 18-45yo with a BMI <30 and CLBRLP >6 months. Spinal surgery or acute states preventing them from assuming a prone position were used as exclusion criteria. Stiffness was measured 10cm below the gluteal fold during a passive ankle dorsiflexion motion performed at 2º/s in an isokinetic dynamometer. EMG was used to ensure passive motion. The ankle ROM and passive torque, as well as muscle activity, were also measured.
RESULTS/WHAT THEY FOUND:

There were no significant differences found in demographics between the CLBRLP group and healthy controls. The stiffness measurements revealed good intra-rater reliability. During all measurements, the mean EMG values for semitendinosus, medial gastrocnemius, and tibialis anterior muscles were < 2.8% for the CLBRLP group and for the control group. In the group with CLBRLP, the affected limb showed higher sciatic nerve stiffness compared to the unaffected limb (11.3%; P=0.05). However, no differences were observed between the unaffected limb of people with CLBRLP and the healthy controls (P=0.34).

“The affected limb showed higher sciatic nerve stiffness compared to the unaffected limb.”

LIMITATIONS/THINGS TO KEEP IN MIND:

Less sliding occurs in a nerve the farther it is from the site of convergence. The authors measured the posterior thigh which is removed from the ankle. Tension in the nerve does not develop until the last 1/3 of the movement. Only using 80% of their maximal ROM as the authors did, does not capture all of the potential tension development which is important in analyzing stiffness. In addition, the authors potentially let constant pain patients into the study which may signal an inflammatory state. It is known that viscoelastic properties of the nerve are markedly different compared to a chronically scarred nerve.
CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:

The authors were able to demonstrate that we can appropriately identify a mechanically impaired nerve. They credit the results to “persistent endoneural edema as a result of constant mechanical aggressions led to intraneural fibrosis” and “assuming that the affected nerves of the population with CLBRLP may be under long-term stress due to a mechanical etiology, we hypothesize that nerve viscoelastic properties could be compromised, which may result in increased nerve stiffness”.

However, I think the study could be done more cleanly as stated above in the limitations section. They may find more stiffness by measuring the nerve closer to the joint that is being moved. This may show the difference between the controls that they hypothesized.

The clinical implications of this study demonstrate that we are headed in the direction of having improved confidence in realizing a nerve with unilateral presence of pain, numbness, or both, originating in the lumbar spine or buttock region and traveling downward in the posterior area of the lower limb for longer than 6 months can potentially be mechanically impaired due to stiffness. It would be appropriate to consider using a mechanical treatment to address this stiffness. However, we could still benefit from further research on dosage, order of movement, duration, and intensity. In addition, we still need to consider other concomitant contributing factors like sliding, compression, blood flow, inflammation, sensitivity and the brain’s role in the situation that may still affect these mechanical issues.

STUDY REFERENCE

DANISH HIP ARTHROSCOPY REGISTRY: PREDICTORS OF OUTCOMES IN PATIENTS WITH FEMOROACETABULAR IMPINGEMENT

Dr. Joanne Kemp

BACKGROUND & OBJECTIVE:

Hip arthroscopy is commonly performed on people with femoroacetabular impingement (FAI) and the rates of hip arthroscopy surgery for this condition are increasing. The authors of this study aimed to determine whether certain pre-operative factors predicted whether or not someone with FAI would have a poor outcome following hip arthroscopy surgery, by using a large national surgery registry. In particular, they were interested in knowing whether someone’s age, sex or extent of cartilage damage affected their outcomes from the surgery.

METHODS (WHAT THEY DID):

The authors used the Danish hip arthroscopy registry to collect questionnaire information from 1835 patients with FAI over a 3-year period (2012-2015). There were 2054 operations in total as some patients had more than one hip arthroscopy during this time period (11% of the patients had surgery on both hips). The patients and the surgeons used an online data collection system to complete the questionnaires. Patients completed the HAGOS questionnaire before their surgery, and then again 1-year and 2-years after the surgery.
Results/What They Found:

Over the 3-year period of the study, 53% of the patients were female, and the average age of the patients was 38 years. The patients’ ages ranged from 9 - 79 years. Almost half of the patients were aged over 40 years.

Patients aged under 25 years did significantly better on the HAGOS questionnaire and were 74% more likely to have better outcomes than both of the older age groups. The findings of the HAGOS pain, sport and quality of life subscales are summarised in Figure 1, and are compared to previously published HAGOS scores for people aged 18-60 years who do not have hip pain.

Figure 1: Difference in outcomes between people aged <25 years, between 25 and 39 years, and over 40 years for pain, sports function and quality of life.
RESULTS (CONTINUED):

People with severe cartilage damage were worse for symptoms, physical activity and quality of life at 1-year post-surgery, and remained worse for quality of life at 2 years post-surgery.

Interestingly, in contrast to the authors’ hypothesis that women would have poorer outcomes, women and men had the same results for almost all outcomes after surgery, suggesting that sex does not influence outcomes. However, men were 20% more likely to return to a higher level of sport after surgery.

“People who are younger than 25 years, and do not have a lot of cartilage damage, will have the best outcomes following surgery.”

LIMITATIONS/THINGS TO KEEP IN MIND:

Almost half of the patients in this study were aged over 40 years. This is a lot older compared to the athletic groups of young adults who are often thought to be a typical patient having surgery for FAI. Men and women will likely not have different outcomes. However, all patients have more pain and worse function compared to people without hip problems. These things should be kept in mind when advising patients of likely outcomes for hip arthroscopy for FAI.
CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:

This large cohort study of people having hip arthroscopy for FAI shows that people who are younger than 25 years, and do not have a lot of cartilage damage, will have the best outcomes following surgery. Here are some of the key take-aways:

- People under 25 years with FAI are 75% more likely to do better after hip arthroscopy surgery than people 25 years or older.

- While the outcomes from each group improve post-operatively compared to pre-operatively, they do not get better after 1 year. In addition, they do not get close to the score of a person without hip pain, suggesting that while hip arthroscopy may provide some improvement for patients with FAI, they will continue to have ongoing issues after surgery.

- People with severe cartilage damage have worse outcomes than those with mild cartilage damage, for both femoral and acetabular pathology.

- People with severe acetabular cartilage damage were 21% more likely to have worse outcomes than those with mild cartilage damage.

- Outcomes from hip arthroscopy for FAI do not differ between men and women, suggesting that sex does not influence outcomes. Women start at a worse place, and so potentially have larger gains from surgery. However, men did return to a higher level of sport after surgery.

STUDY REFERENCE

ARTICLE BY DR JOANNE KEMP

QUIZ

Question — Name two factors linked to better outcomes following hip arthroscopy surgery for FAI.

Click here to link to quiz answer
EXPECTANCY REDUCES SYMPTOMS BUT NOT FUNCTIONAL IMPAIRMENT FOLLOWING EXERCISE INDUCED MUSCULOSKELETAL INJURY

STEPHEN KING

BACKGROUND & OBJECTIVE:

The placebo effect is a commonly recognised phenomena seen by health professionals and researchers alike. Higher quality research recognises the huge effect placebo has on outcomes and is accounted for with double-blinded research studies. There is previous research that shows how placebo can improve symptoms, but the authors undertook this study as there is little research measuring the influence of the placebo effect on pain and function after acute musculoskeletal injury. The authors wanted to determine whether providing affirmational instructions about the efficacy of the treatment would affect response to a sham intervention.

METHODS (WHAT THEY DID):

In this study, they recruited 40 (29 female, 11 male) participants. They excluded responders who reported involvement in regular (2-3 times a week) resistance training exercise (e.g. weight lifting), had suffered any injury to the upper extremity (shoulder/arm/wrist/hand) in the past six months or who were taking anti-inflammatory medications or supplements.

The 40 participants were randomly assigned to an expectancy or non-expectancy group before completing the same resistance training program. The training program involved subjects using their dominant arm to perform 3 sets of 20 repetitions of isokinetic biceps curls. Following this protocol, both groups were given the same sham treatment from the same administrator. The sham treatment was laser treatment using a dummy electrode.

The expectancy group was primed with the following statement: “Hello, I have extensive experience with using the therapeutic laser and you can expect the treatment to significantly decrease your pain level and speed your recovery”. The non-expectancy group was told: “You will undergo a therapeutic treatment for your impairment and since this is a scientific study I will not be able to speak with you during the treatment”.

At reassessment on Day 3 and 5, pre-injury measures that included self-reported rating of muscle pain using a VAS, elbow range of motion (ROM), biceps muscle strength, and a self-report questionnaire for symptoms and disability of the upper extremity (QuickDASH) were reassessed.
RESULTS/WHAT THEY FOUND:

There were no significant differences between groups in ROM, strength or self-reported disability on the QuickDASH questionnaire. There was however a significant difference in self-reported pain between the two groups. The expectancy group perceived less pain in their biceps compared to the non-expectancy group at Day 3 follow-up, but not at Day 5 as pain levels in both groups had returned to baseline.

“Substantial effect that the therapeutic alliance between patient-practitioner has on the outcome of therapy.”

LIMITATIONS/THINGS TO KEEP IN MIND:

One limitation of this study was that they did not pre-interview people on their previous therapy experiences or treatment with laser. With a small population such as in this study, it would good to ascertain pre-existing thoughts and beliefs.

This was also a heavily female weighted study. There is a growing body of research over the past ~10 years that indicates substantial sex differences in clinical and experimental pain responses, and some evidence suggests that pain treatment responses may differ for women versus men. A future trial with more even gender bias would be interesting to see.
CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:

This study adds to the growing body of literature of the substantial effect that the therapeutic alliance between patient-practitioner has on the outcome of therapy. Previous studies have shown similar results in many different conditions and with many different treatment modalities, from expectation of surgical intervention (Mahomed et al 2018), massage and acupuncture (Irnich 2001) and exercise (Bishop et al 2011), expectation of the success and benefit of the intervention has been shown to be beneficial for the patient.

This study reminds us of the importance of treating the individual patient and building a therapeutic alliance with them. It important we help frame what we do with patients when they’re in pain in a positive way to give them hope and expectation that their condition will improve. We must also think about the potential negative or nocebo effects our communication and expectation setting can have on patients. Negative or poorly-framed information may be particularly detrimental and lead to undesirable outcomes from therapy.

Ensuring that we appear confident in our management plan, while listening to their previous interactions with therapy and being understanding of their potential expectations to the therapy we provide may be beneficial to clinical practice.

+ STUDY REFERENCE


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CHARACTERISTICS OF OLDER ADULTS WHO ARE UNABLE TO PERFORM A FLOOR TRANSFER: CONSIDERATIONS FOR CLINICAL DECISION-MAKING

MARIANA WINGOOD

BACKGROUND & OBJECTIVE:

Most clinicians know that the risk of falling increases with age, however, a limited number of clinicians address the ability to complete a floor transfer (FT). FT is an important component of functional mobility and the lack of assessment of FT ability is a gap in our practice. Nearly 50% of older adults are unable to get up off the floor and physical therapists should be addressing this mobility limitation. The researchers conducting this study addressed this practice gap by examining the health-related factors among older adults who were independent, assisted, or dependent with the FT. They also established the parallel reliability between self-reported and actual performance of a FT.

METHODS (WHAT THEY DID):

This was a cross-sectional study of cognitively intact and independently ambulating community-dwelling older adults from New York City. The participants were divided into 3 groups based on their self-reported levels of difficulty in the FT – independent, assisted, and dependent. The following data was collected: FT ability questionnaire, comprehensive subject assessment, and the FT Test.

The testing procedure for the FT test were as follows:

Instructions: Participants were asked to transfer themselves from a standing to a supine position on the floor and then back up without any kind of support, unaided, and without time restriction.

Number of Trials: 1

Scoring:

- Success/independent = ability to stand up without stumble, assist, and support during this condition
- Unsuccessful/assisted = inability to complete without assist/support/stumble à re-attempted using a modified condition (use of an armless chair for balance/self-support)
- Dependent = inability to complete FT even with a modified condition
RESULTS/WHAT THEY FOUND:

Out of the 45 participants, 18 individuals (40%) performed the FT independently, 10 (22.2%) required self-assistance, and 17 (37.8%) were dependent.

Performance-Related Factors:

Sociodemographic factors associated with the inability to perform the FT included age and a marital status of being widowed.

Participants who completed the FT independently:

- 100% were independent with iADLs (instrumental activities of daily living) and/or used no assistive device indoors
- 94.4% were independent with ADLs, and/or were non-fallers, and/or used an assistive device outdoors
- 88.9% were classified as recreational ambulators, and/or had no ED visits and/or were hospitalized
- 83.3% required no caregiver support

Participants who were classed as dependent with the FT:

- 100% were dependent with iADLs, and/or had 3 or more co-existing chronic diagnoses, and/or took 4 or more medications
- 88.2% used a 2-handed assistive device for outdoor mobility and/or had surgical procedures
- 82.4% were homebound
- 64.7% required at least daily caregiver support
- 58.8% were classified as a faller
- 52.9% used a 2-handed assistive device during indoor mobility

These findings are summarized in Box 1+2.
RESULTS (CONTINUED):

Box 1: Factors significantly associated with FT performance

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Number of emergency department visits</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Number of hospitalizations</td>
</tr>
<tr>
<td>Ability to perform ADL’s and/or iADL’s</td>
<td>History of falls</td>
</tr>
<tr>
<td>Number of chronic medical diagnosis’</td>
<td>Ambulatory device used indoors and/or outdoors</td>
</tr>
<tr>
<td>History of surgical procedures</td>
<td>Ambulatory status</td>
</tr>
<tr>
<td>Number of medications</td>
<td>Caregiver support</td>
</tr>
</tbody>
</table>

Box 2: Factors not significantly associated with FT performance

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Mass Index</td>
<td>Pain (near significance p = 0.058)</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
</tr>
</tbody>
</table>

Parallel reliability between self-reported FT ability and the FT test was 0.92 (95% CI, 0.88-0.97).
## Limitations/Things to Keep in Mind:

<table>
<thead>
<tr>
<th>Limitation</th>
<th>Why it matters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrospective study with self-reported falls, hospitalizations, emergency department visits, chronic medical conditions, and surgical procedures.</td>
<td>Can lead to difficulty remembering the event/details about the event, which can result in recall bias.</td>
</tr>
<tr>
<td>Convenience sample</td>
<td>Can result in poor representation of the general population, also known as sampling bias.</td>
</tr>
<tr>
<td>Test Procedure:</td>
<td>This can affect the transfer technique and alter the simulation of a real-life situation.</td>
</tr>
<tr>
<td>• Safety Protocol</td>
<td></td>
</tr>
<tr>
<td>• Watching a video about the transfer</td>
<td></td>
</tr>
</tbody>
</table>
**CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:**

Among community-dwelling older adults, self-reported FT ability and actual FT test are reliable and robust assessments of functional mobility. See Figure 1 for its implications.

**Figure 1:** Algorithm of FT screen and its implications

- Perform Floor Transfer Screen
- Independent
- Dependent
  - More likely to have:
    - Multiple comorbidities.
    - Difficulty with iADL’s + ADL’s.
    - Need Caregiver support.
    - Frequent Falls.
    - Use 2-handed assistive device.
    - Limited mobility-> homebound
- Benefit from in-depth evaluation and/or physical therapy
- Continue with usual care/service
“Among community-dwelling older adults, self-reported FT ability and actual FT test are reliable and robust assessments of functional mobility.”

**Clinical Implications (Continued):**

A floor transfer test is an important assessment of functional mobility. If an individual is unable to perform the FT, it may be beneficial to break it down into the following components:

1. Stand in front of a chair with arm rests.
2. While holding the chair step forward with the strongest knee into a half-kneeling position.
3. Lower both knees to the floor, starting with the back knee.
4. Bring one hand at a time to the floor.
5. Lower hips onto the floor to move into side-sitting.
6. Move down into a side-lying position and roll into a supine position.
7. Reverse the order to get back up - supine->side-lying->side-sitting->prone-kneeling->bring hands onto the chair and push the body into half-kneeling->standing

**Study Reference**

A 2-YEAR PROSPECTIVE COHORT STUDY OF OVERUSE RUNNING INJURIES. THE RUNNERS AND INJURY LONGITUDINAL STUDY (TRAILS)

TOM GOOM

BACKGROUND & OBJECTIVES:

Running injuries are very common with around 65% of runners reporting injuries each year. Previous research has conflicting findings and methodological flaws meaning it’s been hard to determine causes of running injury. This prospective study aimed to identify risk factors that could aid in prevention and management of running injury.

METHODS (WHAT THEY DID):

300 runners were recruited who ran a minimum of 5 miles per week and had been injury free for the last 6 months. Data was collected at baseline (including training and injury history, strength, biomechanics, gait analysis and psychosocial variables), and runners were followed up over 2 years with injuries diagnosed by an orthopaedic surgeon.
RESULTS (WHAT THEY FOUND):

Injury rates were similar to previous research - 66% of runners in this study sustained at least 1 injury.

What was related to running injury?
- Female runners were injured more often than males (73% of female runners v 62% of males).
- Maximum knee stiffness was significantly higher in the injured group and was the only significant predictor of injury in multivariable analysis. Knee stiffness is defined as the ratio in change in internal knee extensor moment with change in knee flexion during the first half of the support phase of running. This internal knee extensor moment is largely created by the quadriceps so stiffness will be increased by either an increase in quadriceps contraction or a reduction in knee flexion during the stance phase (or both).
- Some psychosocial measures were predictive of injury status, i.e. “Those with worse mental health-related quality of life and more negative affective states” were more likely to be injured

What wasn’t related to running injury?
- Previous injury was not a significant risk factor or predictive of injury, which is surprising as this differs from most previous research. There was also no difference in weekly mileage or running experience between injured/uninjured runners.
- The data suggests injury incidence was not influenced by shoe type or foot posture. Subtalar joint motion did not predict overuse injuries and there were no statistically significant differences in rear foot motion between the injured and uninjured groups.
- Strength was not predictive of running injury and there no significant differences in knee, ankle and hip strength between injured/uninjured participants. There were no significant differences between groups for height, weight, BMI, or age. Q-angle, arch height and knee and ankle flexibility were also all similar between groups.
- After adjusting for training pace and body weight no ground reaction force variables were significant predictors of injury.
LIMITATIONS (THINGS TO KEEP IN MIND):

This was an ambitious study with a host of measures conducted over a 2 year period which is no mean feat! There will always be challenges with such a study. For example many of the outcomes relied of self-reported questionnaires and findings were based on baseline data. For example, we don’t know if strength changed over that time period. More detailed tracking of training load over time would also have helped determine the relationship between training load error and injury.

I’d also question the reliability of some of the tests. For example is measuring flexibility, Q-angle and arch height using photographs and software reliable and valid? Arch index was assessed through footprint based on a paper from the 80’s. There are more suitable tests such as Foot Posture Index which have been used elsewhere in running research.

“Challenges the widespread assumption that ‘over-pronation’ is a key cause of running injury.”
CLINICAL IMPLICATIONS (HOW THIS IMPACTS CLINICAL PRACTICE):

This study is revealing from what it found wasn’t connected to injury - strength, flexibility, arch height and shoe type to name a few. Previous research has found that many aspects of lower limb alignment such as leg length difference, Q-angle and foot posture aren’t associated with injury. Mixed results have been reported for strength and flexibility.

From a clinical stand point such results would question the importance of detailed lower limb alignment assessment for runners. Alongside other recent research it also challenges the widespread assumption that ‘over-pronation’ is a key cause of running injury. The finding that psychosocial factors were predictive of running injury adds to growing research in this area and highlights that assessment of mood and mental wellbeing is important in athletes.

 Increased knee stiffness being related to injury raises the question as to whether interventions to decrease knee stiffness may be effective. Further research is required in this area but, in theory, increasing step rate (cadence) can reduce knee stiffness and has been found to reduce load at the hip and knee. While knee stiffness was the lone predictor of injury in multivariable analysis the group mean difference was just 2% and explained only 12.3% of the variance. This suggests there are other factors not identified in this study that are likely to be significant in the development of running injury.
ARTICLE BY TOM GOOM

QUIZ

Question — What was the only significant predictor of injury in multivariate analysis in this study?

Click here for quiz answer
PREVALENCE OF KNEE OSTEOARTHRITIS FEATURES ON MAGNETIC RESONANCE IMAGING IN ASYMPTOMATIC UNINJURED ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

ANTHONY TEO LI

BACKGROUND & OBJECTIVE:

Features detected on MRI that are commonly present in knee osteoarthritis (OA) such as meniscal tears, cartilage defects, and bone marrow lesions (BMLs), are often interpreted as the cause of the patient’s pain and symptoms. These findings tend to guide and inform medical and surgical clinical decision making. However, the relationship between MRI features of OA and the patient’s symptoms is unclear. Therefore, the aim of this systematic review and meta-analysis was to determine the prevalence of, and factors contributing to, MRI features of OA in asymptomatic uninjured knees.

“Imaging must be interpreted in the context of clinical presentations.”

METHODS (WHAT THEY DID):

A search was conducted for studies reporting the prevalence of MRI features of knee OA in:

- Asymptomatic adult knees (i.e. mean age ≥18 years with no knee symptoms during any activity)
- No history of injury or surgery
- In the following databases: EMBASE, Medline, CINAHL, SPORTDiscuss, Web of Science and Scopus

Primary outcomes: individual MRI features that were assessed semi-quantitatively, AND included in the definition of MRI-defined knee OA (e.g. cartilage defects, meniscal tears, osteophytes, etc.).

Secondary outcomes: other MRI features previously associated with knee OA (e.g. effusion-synovitis, subchondral cysts, ligament tears, subchondral sclerosis, etc).
RESULTS/WHAT THEY FOUND:

46 cross-sectional studies and 17 longitudinal studies, with a total of 4751 individuals and 5397 knees, were included in this systematic review. Here is a summary of the results:

<table>
<thead>
<tr>
<th></th>
<th>Overall Pooled Prevalence</th>
<th>Pooled Prevalence (&lt; 40 years)</th>
<th>Pooled Prevalence (≥ 40 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articular Cartilage Defects</td>
<td>24% (95% CI 15% to 34%)</td>
<td>11% (6% to 17%)</td>
<td>43% (29% to 57%)</td>
</tr>
<tr>
<td>Meniscal Tears</td>
<td>10% (95% CI 7% to 13%)</td>
<td>4% (2% to 7%)</td>
<td>19% (13% to 26%)</td>
</tr>
<tr>
<td>Bone Marrow Lesions</td>
<td>18% (95% CI 12% to 24%)</td>
<td>14% (6% to 24%)</td>
<td>21% (14% to 31%)</td>
</tr>
<tr>
<td>Osteophytes</td>
<td>25% (95% CI 14% to 38%)</td>
<td>8% (0% to 25%)</td>
<td>37% (22% to 53%)</td>
</tr>
</tbody>
</table>

Prevalence rates generally increased with age and were influenced by factors such as physical activity levels and type of MRI sequences used.

LIMITATIONS:

This study had several important limitations that may have affected the results and the authors’ interpretation of the results. Firstly, significant between-study heterogeneity (I² values ranging from 60.2% to 98.6%, depending on the outcome measured) was present, and was not explained by the variables measured. Other unexplained potential confounding factors, such as BMI or the subjective interpretation of MRI results, for instance, could contribute to OA feature prevalence detected by MRI. However, the contribution of these confounding factors to OA feature prevalence assessed via MRI remains unclear.
This study provides valuable insight into the high prevalence of OA features on MRI in healthy, asymptomatic, uninjured individuals aged ≥40 years. Does this mean that there is no association between knee imaging findings and pain? Not quite. The truth is, there is substantial variability between studies (i.e. methodology, nature of the study population, results, etc.) addressing this question, making for a difficult comparison. This is well illustrated by a systematic review by Bedson & Croft published in 2008 examining the discordance between clinical and radiographic knee osteoarthritis, which found that between 15-76% of those with knee pain had radiographic osteoarthritis, and between 15-81% of those with radiographic knee osteoarthritis had pain. So why is there no consensus?

First and foremost, knee OA is a complex, multi-factorial disease of the whole person. The pain experienced by an individual with knee OA cannot simply be reduced to the knee OA features found on imaging. Consequently, imaging will likely never be able to fully capture and explain the patient’s pain experience.

Furthermore, the inconsistency between studies regarding imaging procedures and techniques may also affect the prevalence of OA features reported. For instance, the type of MRI sequence used varied between studies, and was shown to be a factor affecting OA feature prevalence rates. Similarly, many studies investigating OA features via radiographs did not provide sufficient x-ray numbers or views to estimate the association between OA features and pain. The latter reflects variation in diagnostic accuracy with the use of different imaging types and techniques.

Therefore, it is recommended that the results of knee imaging should not be used in isolation when assessing patients with knee osteoarthritis. Imaging must be interpreted in the context of clinical presentations and can be considered in conjunction with the clinical evaluation to inform clinical decision making.

**CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:**

ARTICLE BY ANTHONY TEOLI

QUIZ

Question — What percentage of participants in this study aged 40 years or older had articular cartilage defects on MRI?

A) 19%
B) 43%
C) 21%
D) 37%

Click here for quiz answer
IMPARED SLEEP PREDICTS ONSET OF LOW BACK PAIN AND BURNOUT SYMPTOMS: EVIDENCE FROM A THREE-WAVE STUDY

DR SANDY HILTON

BACKGROUND & OBJECTIVE:

Low back pain and burnout contribute to work-related loss through absent or poor performance. Sleep quality and quantity is linked to both pain and burnout through changes in the amygdala’s regulatory ability. The literature describes this change as related to increasing sleep debt. The authors set out to ‘disentangle’ the relationship between burnout and pain to see if there is a way to predict them based on sleep patterns.

The authors proposed that sleep problems could be an early warning sign for both risk of onset of pain and for burnout. Participants were asymptomatic, without low back pain and not suffering from “emotional exhaustion.” They expected that symptoms of burnout at the first follow-up would be predictive of the participant developing back pain by the second follow-up, and that this would be more pronounced among the older subjects and women.
**METHODS (WHAT THEY DID):**

Participants were drawn from an initial 2013 population-based survey in Switzerland (N=16,634). A random sampling of this data pool was selected (N=2,860) for initial inclusion. The final study sample after exclusions (those with back pain and/or emotional exhaustion at baseline) and non-return of questionnaires was N=406. Women comprised 38.8% and older subjects (45+ years) comprised 46.4%.

Sleep problems were assessed with two questions:
- “In the last four weeks, how well did you sleep?”
- “Did your sleep problems have any effects on your tiredness during the day?”

Low back pain was assessed with these questions:
- “Current back problems:
  * 0 = No
  * 1 = Yes, but not currently undergoing treatment
  * 2 = Yes, currently undergoing treatment”
- “Note for low back/buttocks the average intensity of pain that you experienced in the last 4 weeks”.

Burnout had three questions to clarify the components of burnout:
- *Emotional exhaustion* - “In the last 4 weeks did you feel worn out?”
- *Depersonalization* - “How often do you feel that the things you do in daily life have little meaning?”
- *Reduced performance* - “How often do you feel that you can’t cope with the demands of your work?”

Data analysis was done through a confirmatory factor analysis to find paths between the variables, and the model fit was assessed by Root Mean Square Error of Approximation, Comparative Fit Index, and Standardized Root Mean Square Residual. These models predicted paths from sleep problems to LBP and burnout at the 24 and 36-month follow-ups.
RESULTS (WHAT THEY FOUND):

Sleep problems were found to be predictors of both low back pain and burnout. Low back pain at the first follow-up was positively associated with burnout at the second follow-up, supporting the hypothesis of the study. They also found sleep difficulty to be a stronger risk factor for burnout than for low back pain and strongest in women 45 and older.

“Questions on if a person is having quality sleep ... should be part of our assessments.”

LIMITATIONS (THINGS TO KEEP IN MIND):

The authors state that they don’t know if sleep problems increase in relation to low back pain and/or burnout as the study design did not check for the reserve correlation. Additionally, this study shows trends in the general population in Switzerland and we don’t know if the results are transferable to other countries.

CLINICAL IMPLICATIONS (HOW THIS IMPACTS CLINICAL PRACTICE):

Sleep is critical to good health. Questions on if a person is having quality sleep (7-8 hours and do you wake rested) should be a part of our assessments and should be re-assessed as treatment progresses. Sleep hygiene principles can be implemented such as setting regular sleep/wake times, getting regular exercise, and minimizing caffeine and alcohol.

This is not only important to the health of our patients, it is important to the health of us as clinicians. We need to model the same behaviors for our patients, and also for our own health. If sleep disruption is predictive of low back pain and burn out, we should take care to preserve our sleep in order to promote our best health.

+ STUDY REFERENCE


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THE ROLE OF THE OBTURATOR INTERNUS MUSCLE IN PELVIC FLOOR FUNCTION

DR SARAHA AG

BACKGROUND & OBJECTIVE:

Pelvic floor muscle dysfunction (PFMD) is the broad term used to describe a number of disorders in pelvic health. While the mechanisms of PFMD are complex and variable, one common intervention is pelvic floor muscle training, or ‘Kegel’ exercises. The objective of this study was to investigate the effects of obturator internus strengthening on the muscle strength (peak squeeze pressure) of the pelvic floor and on hip external rotation strength. It was hypothesized that the exercise group would have increased pelvic floor muscle strength compared with the control group after a 12-week hip strengthening intervention.

METHODS (WHAT THEY DID):

This randomized control trial included 40 nulliparous women with no diagnosis of pelvic floor dysfunction. Information gathered at baseline included Pelvic Floor Distress Inventory (PFDI-20), vaginal muscle squeeze and hip external rotation strength. The control group (n=20) was told to continue their normal activities, without the addition of any new exercises for the 12 weeks. The intervention group (n=20) was assigned 3 exercises to perform 3 times per week for 12 weeks. The exercises were clamshells, isometric hip external rotation, and ‘monster walk’. Each exercise was to be performed 3 x 10.

VIDEO:
RESULTS/WHAT THEY FOUND:

All 40 participants completed the study. At the end of 12 weeks, the exercise group displayed an increase in pelvic floor muscle strength based on vaginal peak pressure measures and an increase in hip external rotation strength. It was noted that no subjects reported any onset of pain or pelvic floor dysfunction during the course of the 12-week protocol.

“Using hip strengthening to ‘improve pelvic floor strength’ may overlook, as well as not address, the underlying cause of PFMD.”

LIMITATIONS:

The main limitation of the study was the small, healthy sample of women – it is not known if women with PFMD would respond in the same way. The authors also noted the exercises in the study were not progressed or individualized as they would be following principals of clinical exercise prescription. Finally, the authors note that it is not possible to isolate the obturator internus during hip external rotation activities, so the improvement in pelvic floor strength could not be attributed solely to the obturator internus.
**CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:**

This study concludes that ‘strengthening the deep rotators of the hip surrounding the PFM, such as the obturator internus, improves PFM strength in healthy young women. This could be particularly beneficial in patients who have difficulty performing the traditional Kegel exercises’.

The conclusions of the authors should be applied with caution in the clinic for the following reasons:

1) Previous research has shown that the most effective way to strengthen the pelvic floor muscles is to do pelvic floor muscle exercises. If strengthening is what is needed to address this dysfunction, we owe it to our patients to offer an intervention that has been proven to work.

2) Using hip strengthening to ‘improve pelvic floor strength’ may overlook, as well as not address, the underlying cause of PFMD. PFMD etiology is multivariate, and strengthening is not always necessary or appropriate. Improving muscle coordination and awareness may lead to a perceived improvement in strength and function much more quickly than 12 weeks, and may address some of the other issues that may accompany a diagnosis of PFMD, such as pain, sexual dysfunction or ‘emptying abnormalities’ of the bowel or bladder.

However, this study does support that having a person exercise more than they were previously can lead to gains in strength in muscles other than the ‘target’ muscle of that exercise.

**STUDY REFERENCE**


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QUIZ
ANSWERS

Article by Dr Joanne Kemp
Answer: age (<25 years), less severe cartilage damage

Article by Tom Goom
Answer: maximum knee stiffness

Article by Anthony Teoli
Answer: B) 43%