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I S S U E  1 2

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+ CONTENTS

05 AUTHORS
Tom Goom, Assoc Prof Steve Kamper, Dr Joanne Kemp, Adam Johnson, Dr Jarod Hall, Dr Seth O’Neill, Robin Kerr, Todd Hargrove, Shruti Nambiar, Dr Teddy Willsey, Mariana Wingood & Dr Sandy Hilton

08 Exercise for posterior tibial tendon dysfunction: a systematic review of randomised clinical trials and clinical guidelines [video]
Author: Tom Goom

11 The interplay of exercise, placebo and nocebo effects on experimental pain
Author: Assoc Prof Steve Kamper

14 Return to Sport and Performance after Hip Arthroscopy for Femoroacetabular Impingement in 18- to 30-Year-Old Athletes. A cross-sectional cohort study of 189 athletes [quiz]
Author: Dr Joanne Kemp

18 Kinematic and electromyographic analysis of the Askling L-Protocol for hamstring training [video]
Author: Adam Johnson
## CONTENTS

**21** Are Invasive Procedures Effective for Chronic Pain? A Systematic Review  
**Author:** Dr Jarod Hall

**23** Immediate and short-term effects of short and long duration isometric contractions for patellar tendinopathy [video]  
**Author:** Dr Seth O’Neill

**26** How to empower patients? A systematic review and meta-analysis  
**Author:** Robin Kerr

**29** The impact of therapeutic alliance in physical therapy for chronic musculoskeletal pain: A systematic review of the literature [quiz]  
**Author:** Todd Hargrove

*Click for audio reviews!*
+ CONTENTS

CLICK TO JUMP STRAIGHT THERE

33 Treatment after traumatic shoulder dislocation: a systematic review with a network meta-analysis

Author: Shruti Nambiar

36 Strength training as superior, dose-dependent and safe prevention of acute and overuse sports injuries: a systematic review, qualitative analysis and meta-analysis [quiz]

Author: Dr Teddy Willsey

40 Minimal Detectable Change in Dual-Task Cost for Older Adults With and Without Cognitive Impairment

Author: Mariana Wingood

44 Drivers of international variation in prevalence of disabling low back pain: Findings from the Cultural and Psychosocial Influences on Disability study

Author: Dr Sandy Hilton

47 Quiz Answers

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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.

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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 Rolfper, 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.
+ AUTHORS
PERSONAL BIO

Shruti Nambiar has completed her Masters in Clinical Sports Physiotherapy from Curtin University, Australia. She currently works at a private practice in Mumbai, India. She has previously worked with the Women’s Football team (Perth Glory) and as a Head Physiotherapist for Ultimate Table Tennis League, India. She has recently published an article with other researchers from Curtin University on Characterization of pain among people with Hereditary neuropathy with liability to pressure palsies. Her areas of interest are tendinopathies, management of chronic back pain, shoulder pathologies, and promoting evidence based practice.

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.

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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.
EXERCISE FOR POSTERIOR TIBIAL TENDON DYSFUNCTION: A SYSTEMATIC REVIEW OF RANDOMISED CLINICAL TRIALS AND CLINICAL GUIDELINES

TOM GOOM

BACKGROUND/OBJECTIVES
Posterior Tibial Tendon Dysfunction (PTTD) can be a progressive and disabling condition and is relatively prevalent, especially in women over the age of 40. Despite this, there is a lack of evidence to guide conservative management and exercise prescription for this pathology. This study aimed to determine the treatment effects of local strengthening exercises compared to other conservative interventions for PTTD by performing a systematic review.

METHODS/WHAT THEY DID
Four key electronic databases were searched for full-text papers published in peer reviewed journals up to June 2018. Trials were included if they met the following criteria:

- They investigated individuals with PTTD
- They were randomised
- Local strengthening was compared to other forms of management with respect to pain and/or function
- A diagnosis of PTTD was made based on a minimal list of diagnostic criteria and all stages of PTTD were included.

Studies and their data were analysed including study design, sample size and participant characteristics as well as methods, results and risk of bias.

RESULTS/WHAT THEY FOUND
242 titles and abstracts were screened. Of these 16 full text trials were assessed for eligibility and 3 randomised controlled trials were included within the review. These 3 trials included a total of 93 individuals with PTTD. The mean age ranged from 52.9 to 57.5 years and most of the participants were women.

Exercise protocols varied in each of the included trials and a range of outcome measures were used. A meta-analysis of the results was not feasible. Exercise prescription parameters (such as load, reps, sets, time under tension etc) were poorly described making replication of the methods difficult.

The study concluded - “Based on the limited available literature, it appears that local strengthening exercises provide some benefit in PTTD, and eccentric exercises may be superior for improving pain, disability and self-reported overall foot function than concentric exercises and foot orthoses alone. No recommendations can currently be made regarding optimal exercise prescription based on published clinical trials”.

PHYSIONETWORK
TRANSLATING RESEARCH INTO PRACTICE
LIMITATIONS/THINGS TO KEEP IN MIND

The main limitation isn’t the study itself but the lack of evidence it had to draw upon to reach its conclusions. Only 3 studies were found that met the inclusion criteria and the risk of bias was identified in these studies. With varied interventions and outcome measures and inconsistent descriptions of exercise parameters it’s very difficult to reach clinically meaningful conclusions. This reflects the ‘dearth of evidence’ in the area of PTTD which the authors rightly point out in their discussion.
Individualised treatment that addresses key impairments and incorporates load management, education and progressive rehab is thought to be key.

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

When research finds limited evidence it can be challenging to know how to apply it in practice. We asked the lead author, Megan Ross (Physiotherapist and PhD Candidate at The University of Queensland, Australia) about this and she kindly shared her thoughts:

“Treatment for tibialis posterior tendinopathy has only been studied in a few small clinical trials with poor description of treatments, which provide little direction to clinicians. Current best practice relies on treatment of impairments such as poor heel raise endurance and plantarflexion inversion strength through advice and load management approaches (e.g. exercises for the tibialis posterior muscle beginning with resistance bands and progressive load).”

We’re very grateful to Megan for discussing her work with us and look forward to hearing more from her as her studies of PTTD continue.

As in other areas of tendinopathy, individualised treatment that addresses key impairments and incorporates load management, education and progressive rehab is thought to be key. This review also makes three important points that are very relevant in practice:

1. Treatment of PTTD may depend on the stage of the condition, with stage I and II presentations thought to respond more favourably to conservative management.

2. Loading in maximal ankle dorsiflexion is thought to increase both tensile and compressive load on the tendon and may increase symptoms. It may be more effective to exercise out of dorsiflexed positions initially with calf strengthening and inversion exercises before progressing into range as tolerated.

3. Consider the needs of the entire kinetic chain in exercise prescription, for example hip abduction strength deficits have been reported in PTTD.

Hopefully future research on PTTD will guide our management of this challenging condition.

**STUDY REFERENCE**


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**Click to return to Contents Page**
THE INTERPLAY OF EXERCISE, PLACEBO AND NOCEBO EFFECTS ON EXPERIMENTAL PAIN

ASSOC PROF STEVE KAMPER

BACKGROUND & OBJECTIVE:
Placebo effects are a topic of great interest in the healthcare world generally, and with respect to pain specifically. In the context of physiotherapy practice, part of the interest is probably driven by the numerous studies indicating that various common interventions don’t appear to work via their long-held theoretical mechanisms. There is also appeal in the idea that placebos offer something for nothing, a sort of ‘free-kick’ added to the effect size of any treatment, regardless of whether that treatment is otherwise useful or not. This study looked at whether providing visual stimuli (lights) that were paired with painful stimuli (hot element on the skin) influenced people’s report of pain in response to the hot element. At the same time the researchers looked at whether performing resisted elbow flexion also influenced pain reporting.

METHODS:
46 healthy volunteers were recruited via advertising at a university campus. The experiment involved being strapped into a chair and receiving painful heat stimulation on the inside of the forearm. Participants underwent a training phase, where they were shown 3 different coloured lights immediately followed by receiving 3 different intensities of heat: low heat (paired with a green light), medium heat (yellow light) and high heat (red light). The idea was that they would learn to associate a certain stimulus intensity with a certain colour. They then went through a series of trials where they got the different coloured lights, but always the same medium heat stimulus. Throughout the trials they received the heat while they flexed their arm against a robotic arm with a set resistance, and also when at rest.

Immediately before each heat stimulus (but after they had seen the coloured light) participants were asked to rate their expected pain level, and then asked to rate their actual pain score after receiving the heat stimulus. The researchers compared pain scores when the lights and heat were matching, and when they were not matching; and with the resisted elbow flexion task, and without.
RESULTS:

When continually receiving the medium heat stimulus, participants rated their pain as higher when they were given the red light, and lower when given the green light. This was interpreted as measuring placebo effects (green) – approximately 12 points on a 100-point pain scale; and nocebo effects (red) – approximately 16 points on the 100-point pain scale.

They also found a small reduction in pain scores when performing elbow flexion compared to at rest – approximately 9/100 points difference.

"When continually receiving the medium heat stimulus, participants rated their pain as higher when they were given the red light, and lower when given the green light."
LIMITATIONS:

Study participants were all healthy and pain-free and agreed to be part of an experiment in which they knew they would be deceived and experience pain. It is worth considering how well these individuals represent the broader population. The study involved a very large number of analyses, and although the authors adjusted for multiple comparisons, details of the analysis are not very clear, interpretation was based on statistical significance, no threshold for meaningfulness of differences was set, and it is unclear whether all the methods and analyses were established a-priori.

CLINICAL IMPLICATIONS:

I would suggest that the findings of this study should not significantly influence clinical practice at this point in time, for a couple of reasons. Firstly, if we in any way buy into the biopsychosocial model of pain, then clinicians should be extremely cautious in considering the implications of this type of study for patients. Patently, the psychological and sociocultural influences on pain reporting during an experiment like this are very different to those of the pain experience of a patient seeking care for their painful condition. There is a real question as to the applicability of this type of paradigm to clinical care.

There is also the question of how a physiotherapist might apply these findings to the clinic. Should physiotherapists change all the light globes in the clinic to green? This speaks to what it actually is that the authors were attempting to manipulate in this experiment; the study does not involve delivery of a placebo intervention in a recognisable form. Based on the methods and discussion, the focus was on expectations, and less explicitly, conditioned responses. There is a body of clinical research that investigates the relationship between expectations and pain in patients with painful conditions. It is messy, difficult to navigate and inconclusive, but better suited to drawing clinical implications.
BACKGROUND & OBJECTIVE:

Hip arthroscopy surgery is an increasingly common treatment for young people with hip pain. Patients expect to return to sport after hip arthroscopy, and this is a common reason for seeking treatment. However, recent studies have shown that pain, function and quality of life remain poor compared to healthy controls at one-, two- and three-years post arthroscopy.

While previous studies have examined return to sport rates after hip arthroscopy, these studies did not specifically evaluate whether patients returned to their pre-injury level of sport, pre-injury level of participation in sport, or to their optimal level of performance in their chosen sport. The aim of this study was to use the Danish National Hip Arthroscopy Registry to determine:

1. the rate of return to pre-injury level of sport;
2. the level of sports participation and performance; and
3. any differences in function between those who had returned to their pre-injury sport and those who had not.

METHODS (WHAT THEY DID):

The authors identified people from the Danish Hip Arthroscopy Registry who were aged 18-30 years at the time of surgery, had femoroacetabular impingement syndrome (FAIS) at the time of surgery, had surgery sometime between 6 months and 6 years earlier, and were playing sport prior to surgery. 355 people were eligible, and these people were invited to do an online questionnaire.

189 people completed the questionnaire. They were asked to complete the HAGOS (Hip and Groin Outcome Score) questionnaire. They were also asked whether they had returned to their pre-injury sport, and if so, whether sport after surgery was:

a. at an optimal level of performance with full sports participation; or
b. at an impaired level of performance with full sports participation; or
c. at an impaired level of performance with reduced sports participation.
RESULTS (WHAT THEY FOUND):
The authors found that after hip arthroscopy only 57% of people returned to the same type of sport and the same level of sport as they were doing prior to their hip injury. Even more surprising was that only one-third of these people (17% of the total group) were able to fully participate in their sport with optimal performance. The authors also found that athletes who had returned to their pre-injury level of sport had significantly better scores on all aspects of the HAGOS questionnaire compared to those who had not.

LIMITATIONS (THINGS TO KEEP IN MIND):
There are some things to keep in mind with this study. Only 65% of people who were invited to take part were included in the study. This could mean that those who did not take part were either much better, or much worse, than those who did, potentially biasing the results. Also, people were asked to recall their level of sport and performance prior to injury and surgery, which was up to six years ago, and compare this to today. This relies on accurate memory of the participants and may be subject to bias.
Patients should be given very clear advice regarding the likelihood of returning to sport, and at what level of performance, prior to deciding whether to have hip arthroscopy surgery.

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

This study has some important findings for surgeons treating patients with hip arthroscopy surgery, and for physiotherapists looking after patients following hip arthroscopy. Patients are often told that hip arthroscopy will enable them to return to sport in the same capacity as they were playing pre-injury. Patients may even choose to have hip arthroscopy in order to return to optimal sporting performance. This study shows that this is not the case for the majority of people aged 18-30 years who undergo hip arthroscopy. Patients should be given very clear advice regarding the likelihood of returning to sport, and at what level of performance, prior to deciding whether to have hip arthroscopy surgery.

Previous studies have shown that patients who have hip arthroscopy surgery have weaker hip muscles, poor dynamic balance and poor functional task performance 12 months after surgery. These deficits in physical function may be related to the sub-optimal sports participation and performance seen in the current study.

Therefore, physiotherapists who are treating patients after hip arthroscopy should ensure that rehabilitation is comprehensive and targeted to the individual patient’s impairments. Rehabilitation programs should include exercise targeted towards strength of the hip, trunk and lower limb, as well as improved dynamic balance and functional performance. Physiotherapists should also devise a tailored return to sport plan for patients that follows them until their desired level of sporting function is achieved.
ARTICLE BY DR JOANNE KEMP

QUIZ

Question —
What percentage of people in this study returned to full participation in their sport with optimal performance following hip arthroscopy?

- 57%
- 25%
- 17%

Click here to link to quiz answer
KINEMATIC AND ELECTROMYOGRAPHIC ANALYSIS OF THE ASKLING L-PROTOCOL FOR HAMSTRING TRAINING

ADAM JOHNSON

BACKGROUND AND OBJECTIVE:
Hamstrings strains are regularly acknowledged as the most commonly sustained injury in a range of field sports involving regular high speed running. Due to this fact, the Askling L-Protocol is of particular interest to clinicians as it displayed a reduction in return to sport time and also a reduction in reinjuries compared to a standard hamstring rehabilitation program. This initial study was only a qualitative analysis of the program and there has not been an analysis of the exercises to understand why they may be effective. Therefore, this study aimed to determine the characteristics of muscle activation and synchronize them with measures of joint displacement and velocity to allow greater understanding of the exercises.

METHODS/WHAT THEY DID:
The study recruited eleven physically active participants (five females and six males) who competed at either competitive (five) or recreational (six) level sport. The subjects completed familiarization sessions before then completing ten repetitions of the three Askling L-Protocol exercises (Extender, Diver and Glider). The exercises were performed in a randomized order. Data analysis was then performed in order to determine the kinematic and EMG characteristics of the exercises. Surface EMG recorded activity within the following four muscles - Biceps Femoris, Semitendinosus, Gluteus Maximus and Rectus Femoris. Sterophotogrammetric technology was utilized in order to complete the kinematic analysis of the exercises.

RESULTS/WHAT THEY FOUND:
Extender - the extender exercise is driven by the Rectus Femoris muscle with negligible activity of the Biceps Femoris and Semitendinosus muscles. Participants were only able to complete the exercise to an average of 18 degrees of knee flexion range.

Diver - the Gluteus Maximus muscle reached peak activation of around 84% maximum voluntary contraction (MVC) in this exercise, with peak hamstring activity of 50% MVC achieved at the beginning of the concentric phase.

Glider - this exercise produced the greatest value of hamstring activity at 55-60% MVC for Biceps Femoris and Semitendinosus.
LIMITATIONS/THINGS TO KEEP IN MIND:

It is worth considering that this study did not get the participants to complete the sets and repetitions as prescribed in the original study, with all participants performing just 10 reps of each exercise in this study. It could be argued that this affects the average EMG activity seen, especially in the more challenging Glider exercise.

"The Diver and Glider exercises demonstrate peak hamstring muscle activity in comparable ranges to those seen in the running injury mechanism."

VIDEO:
CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:

There is a substantial level of evidence on the high injury burden of hamstring injuries within professional sport, with some studies suggesting that this burden may even be showing an increasing trend. Therefore, this study forms an important part of trying to understand why the Askling L-Protocol may have been effective in cutting down return to sport time, and perhaps more importantly, reducing the reinjury rate upon return to sport.

What this study demonstrates is that the three exercises do not achieve any greater than 60% MVC within the medial or lateral hamstring muscles. This is an important finding both in the context of hamstring injury rehabilitation and prevention. From a prevention viewpoint, it may be that the protocol is appropriate for use prior to training sessions in a group setting. The submaximal nature of the exercises would suggest that there would not be any significant fatigue-related peak torque angle changes as has been noted when performing the Nordic Hamstring Exercise prior to training.

Another key finding of the study is that the Diver and Glider exercises demonstrate peak hamstring muscle activity in comparable ranges to those seen in the running injury mechanism. This may be useful when prescribing the exercise in a rehabilitation setting, with the muscles being exposed to submaximal activity in transferable ranges of hip and knee flexion, allowing for greater confidence and ability to tolerate the subsequently higher loads when reintroduced to running later in the rehabilitation process.

This study is a positive step forward in trying to understand the benefits of the Askling L-Protocol. However, it must be recognised that despite discussion of the potential for shifting the peak torque angle through the eccentric activity in the protocol, this study did not actually analyse any potential physiological changes. Until this takes place then the protocol can only be seen as a complementary protocol alongside other higher load exercises such as the Nordic Hamstring Exercise which has been shown to be able to induce physiological changes such as increasing fascicle length in Biceps Femoris long head through its supramaximal nature.

Click to return to Contents Page

STUDY REFERENCE

ARE INVASIVE PROCEDURES EFFECTIVE FOR CHRONIC PAIN? A SYSTEMATIC REVIEW

D R J A R O D H A L L

BACKGROUND & OBJECTIVE:
Chronic pain is a major worldwide problem, costing hundreds of billions of dollars per year. Surgery is increasingly being used by sufferers in an attempt to treat chronic pain. The purpose of this study was to evaluate the current evidence for invasive procedures compared with their identical sham procedures in the treatment of chronic pain, and assess the impact on reducing pain, medication use, disability, adverse events, and enhancing health-related quality of life for patients with various chronic pain conditions.

METHODS (WHAT THEY DID):
The study design was a systematic review of randomized controlled trials (RCTs). RCTs that compared any invasive procedure, including classical surgery, with a parallel sham procedure for patients with chronic pain conditions were eligible to be included in the review. To be eligible, all procedures needed to be compared with an identical yet sham procedure that used the same invasive approach, instruments, and ritual but eliminated the hypothesized active component of tissue manipulation. For the purposes of this review, chronic pain conditions were defined as conditions in which pain had persisted for more than three months.

Studies were grouped according to chronic pain condition and the procedure reported in the examined study. Because of the variety of conditions and treatments, a meta-analysis was not done for the entire study sample.

RESULTS/WHAT THEY FOUND:
25 studies involving a total of 2000 patients with specific chronic pain conditions met eligibility criteria for the systematic review. The procedures used included arthroscopic surgery or irrigation, heart catheterization with laser treatment or septal repair, endoscopic sphincterectomy, percutaneous or open neurectomy (mechanical or via radiofrequency), laparoscopic surgery or laser treatment, vertebroblasty, intradisc delivery of electrothermal energy, and surgical ligation of internal mammary arteries.

Seven studies with 445 participants were included in the meta-analysis for back pain. The overall pooled standardized mean differences (SMD) for reduction of low back pain was 0.18 which translates to a 4.5 point reduction in pain on the 0-100 point VAS. Three studies involving 496 participants were included for knee pain due to osteoarthritis. The SMD was 0.04 for this condition, equating to a one-point VAS score reduction. The proportion of improvement due to sham treatment in low back pain was 73%. In osteoarthritis, the average improvement in the sham surgery group was greater than after real surgery. On average, when compared with their own identical controls across all studies, pain reduction in the sham surgical groups accounted for 87% of the improvement seen with active surgical treatments.
Pain reduction in the sham surgical groups accounted for 87% of the improvement seen with active surgical treatments.

LIMITATIONS/THINGS TO KEEP IN MIND:

This study has several limitations. First, there are few studies in any one pain condition, resulting in substantial clinical heterogeneity across populations and interventions. A sufficient number of studies with reasonably low heterogeneity were present only for back and knee pain. Second, many types of invasive procedures for pain have not been subjected to sham-controlled studies, so results may not apply to those procedures and conditions. Finally, none of the studies were double-blind, precluding full rigor in the evaluation of these procedures for chronic pain.

CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:

The findings of this study raise several questions for clinicians, researchers, and policy makers. First, can we as a medical community justify widespread use of these procedures without rigorous testing? Without such testing, the true efficacy of invasive procedures for chronic pain will remain unknown and potentially put millions of patients at risk. The risks of surgical and invasive procedures are not minor and appear to be higher with real compared to sham procedures. Risks in both groups include anesthesia, permanent injury to the body, psychological stress, and time, cost, and productivity losses. Without more rigorous examination, large numbers of patients are exposed to risky and possibly unnecessary procedures. Furthermore, new procedures will be invented and applied with the belief that they are specific and necessary without knowing whether this is true.

The medical profession needs more nonpharmacological approaches for chronic pain, so it is unfortunate that the current evidence does not support the efficacy of invasive procedures for this problem. The implications of continuing to use these procedures without knowing whether they provide specific benefit are in urgent need of further research and discussion. In the meantime, it seems prudent that invasive procedures for chronic pain be avoided unless done as part of a clinical research study.
Immediate and Short-term Effects of Short and Long Duration Isometric Contractions for Patellar Tendinopathy

Dr. Seth O'Neill

Background & Objective:
Patellar tendinopathy causes disability for many active young adults involved in jumping sports. Management of these individuals in-season is difficult and challenging. Recently heavy long duration isometric contractions of the quadriceps have shown some promise for pain reduction. This study aimed to examine whether shorter duration contractions may be useful and also examined a potential mechanism of effect – transverse strain.

Methods (What They Did):
The study randomised 16 males to different interventions. The different interventions matched time under tension as this may be important for tendon adaption. Subjects were recruited from volleyball teams, basketball teams and word of mouth. All subjects refrained from their sport for the 4-week intervention period and undertook load-based rehabilitation for their patella tendinopathy for >3 months.

The short duration intervention required 24 sets of 10 sec isometric contractions with 20 seconds rest between each repetition whilst the long duration required 6 reps of 40 seconds isometric contractions with 80 seconds rest between repetitions. Both interventions were completed at 30 degrees of knee flexion and exercises were completed 5x per week over the 4-week intervention period. The rate of perceived exertion was used to correspond to 85% Maximum Voluntary Contraction (MVC) during this period.

Single leg decline squat (SLDS) and hopping were used as functional provocation tests to measure pain which was scored on a Visual Analogue Scale (VAS).

Results/What They Found:

Pain changes
High levels of adherence were found with 96-100% for both interventions. There were significant reductions in pain immediately after either intervention and a mean reduction of 1.66 on VAS. There was no between group difference.

Tendon changes
Over the 3 time points for measurement the antero-posterior (AP) thickness changed by 0.86mm, 1.04mm and 1.29 mm respectively, all exceeding the minimal detectable change of the measurement. These changes relate to a 14%, 17% and 22% change in transverse strain which was not significant (p=0.08) but may be clinically important.
LIMITATIONS/THINGS TO KEEP IN MIND:

The authors chose different duration holds, reps, percentage of MVC and positions from previous studies on patellar tendinopathy, so the minimal reduction in pain may be related to this. However, the original studies may prove to be non-replicable (replication is underway). It is also worth noting higher MVC’s (85%) were used in this study.

VIDEO:
Either short or long duration isometric contractions appear suitable for clinical use dependent on patient tolerance.

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

Total time under tension appears to be important when using isometric contractions for immediate or longer-term pain reduction for patellar tendinopathy. Either short or long duration isometric contractions appear suitable for clinical use dependent on patient tolerance.

Whilst mean reductions in pain on both the SLDS and the hop tests were observed, the level of reduction was likely not meaningful; what constitutes a meaningful improvement is probably context specific and needs further study/consideration. Clinically you can try either the long duration or short duration isometrics for immediate pain reduction and see if pain reduces. If the patient reports that the change is worthwhile then continue, if not just focus on long term improvements. It is unclear whether refraining from sport for the 4 weeks is necessary.

Previous work has identified that the transverse strain changes are linked to fluid dynamics of tendons and that tendinopathic tissue has less change. The fact that over the 4-week intervention period transverse strain increased suggests that the loading intervention may influence fluid dynamics. This may be important for clinical resolution. If the project had a larger sample size the transverse strain measures would likely be statistically significant. It would be interesting to test the relationship between transverse strain and symptoms.

**+ STUDY REFERENCE**

HOW TO EMPOWER PATIENTS? A SYSTEMATIC REVIEW AND META-ANALYSIS.

ROBIN KERR

BACKGROUND & OBJECTIVE:
Patient-centred medical care focusing on patient empowerment is often promoted in chronic disease management. The ability to take responsibility for one’s own health via the acquisition of insight into the rehabilitation process, promotion of the ability to make informed decisions and ultimately achieve positive transformation is the foundation of this approach. This systematic review and meta-analysis explored what factors are involved in patient empowerment. Knowledge was identified as a prominent cornerstone, then the outcomes of behaviour change techniques (BCTs) such as goal setting and action planning were examined.

METHODS:
A systematic review of 32 studies involving 5649 baseline participants was conducted according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. RCT studies that mentioned “patient empowerment” and involved adults with one or more chronic diseases were included. Multiple “empowerment” measuring scales/tools were used in the studies. Following this, 23 studies involving 3544 participants were used in a Cochrane Collaboration Tool based meta-analysis.
RESULTS:

Objective 1: Effect On Patient Empowerment

- Findings were in favour of interventions promoting patient empowerment with effect estimate 0.43 (95% CI [0.23,0.62] p <0.0001).
- Heterogeneity was high I=86% p <0.0001
- Effect estimate was significantly higher in studies involving individual sessions versus group sessions
- Effect estimates of BCTs were higher in studies combining 2 or 3 BCTs

Objective 2: Modalities Of Interventions

- 17 intervention categories were successful vs 16 unsuccessful
- Subgroup analysis showed increased effect estimate for studies without group sessions 0.59 (95% CI [0.23,0.94] p=0.001 I=92% p<0.00001)
- Web based intervention - 50% successful
- Phone call - 75% successful
- Mixed interventions (meeting and phone calls) - 60% successful
- Knowledge was the most frequently used BCT however was not sufficient alone to create an effective intervention that supported patient empowerment.
- Goal setting and action planning were more frequent in successful interventions.

“KNOWLEDGE + GOAL SETTING + ACTION PLANNING = PATIENT EMPOWERMENT”

LIMITATIONS:

The studies included predominantly diabetes plus several other chronic somatic diseases often co-presenting but not directly managed in physiotherapy. Extrapolation was limited as heterogeneity was high. The words “patient empowerment” were used excluding other closely related terms. Significant socio-demographic variables were present throughout the studies, which may be significant in relation to diseases such as diabetes. Despite these limitations the therapeutic validity of empowerment-based interventions can be supported.
CLINICAL IMPLICATIONS (HOW THIS IMPACTS CLINICAL PRACTICE):

A thorough understanding of the concept of patient empowerment is necessary to ensure effective clinical application.

The principles of patient empowerment incorporate:

- The patient’s inherent capacity to be responsible for their own life
- The complex experience of personal transformational change
- Possible facilitation by health care workers
- Education/knowledge provision facilitating patient insight into their rehabilitation process
- Enablement of informed decision making by the patient
- Respect of patient autonomy by caregivers via focus on the patient’s experiences, priorities and fears

Practical application of the findings in this study probably starts with the realization that education alone is not enough. It is interesting to contemplate that many persistent pain programmes may be predominantly lecture-based in regard to pain neuroscience education. If left at that it is possible that patient empowerment may be lacking. The use of individual sessions with the use of 2 to 3 BCTs is proposed as an effective intervention.

Self Determination Theory and practical techniques such as Motivational Interviewing sit well within the patient empowerment scenario. These techniques are not often taught in undergraduate physiotherapy programmes and likely only ever become elective depending on personal preference in continuing professional education. Physiotherapy may possibly need to consider curriculum change towards these techniques with less emphasis placed on the biomechanical subjects such as manual therapy, which have not been sufficiently supported by the research base.

The main clinical takeaway from this study is:

KNOWLEDGE + GOAL SETTING + ACTION PLANNING = PATIENT EMPOWERMENT

+ STUDY REFERENCE

THE IMPACT OF THERAPEUTIC ALLIANCE IN PHYSICAL THERAPY FOR CHRONIC MUSCULOSKELETAL PAIN: A SYSTEMATIC REVIEW OF THE LITERATURE

TODD HARGROVE

BACKGROUND & OBJECTIVE:
Therapeutic alliance (TA) has been the subject of research in the field of psychology for some time. Now that psychosocial issues have been shown to be important in musculoskeletal pain, there is growing interest in the effect of TA in physical therapy.

Other reviews have found that TA positively affects outcomes in physical rehabilitation for a wide variety of diagnoses including brain injury, musculoskeletal conditions, and multiple other pathologies. This systematic review offered a more focused study on TA and pain in the context of physical therapy. It also sought to define TA and identify the factors that contribute to its development.

METHODS (WHAT THEY DID):
The authors identified seven studies that met the inclusion criteria. Three investigated the effect of TA on chronic musculoskeletal pain and four examined the factors that influence the strength of TA.

RESULTS (WHAT THEY FOUND):
The three studies on the relationship between TA and pain found that a stronger TA was associated with better outcomes. One found that a strong TA even in the absence of any intervention could reduce pain.

In the four studies looking for the factors that create a strong TA two were identified in multiple studies: (1) the development of a trusting relationship with positive affect; and (2) an individualized treatment plan created with patient values in mind, including compliance.

Not surprisingly, anger and hostility on the part of the patient were correlated with the weaker TA whereas depression was not. It was also found that the therapists’ assessment of the strength of the TA was only moderately well-correlated with that of the patients.
LIMITATIONS (THINGS TO KEEP IN MIND):

The selected studies were a relatively small sample size and all but one of the studies had a high risk of bias. In addition, the construct of TA is complex, hard to define and may involve other variables that were not measured, including expectation of a good outcome.
Therapists should spend time listening to the client about their fears, goals, motivations, limitations and past history so that the client can be an active participant in forming the treatment plan.

**CLINICAL IMPLICATIONS:**

Psychosocial factors heavily influence chronic pain caused by musculoskeletal conditions. Furthermore, cognitive factors like self-efficacy and optimism are associated with improved outcomes. One systematic review has found that physical therapists get better results when they utilize a biopsychosocial approach to therapy that includes pain education and graded exposure.

A TA is thought to favorably affect these psychosocial factors by helping to reduce fear and anxiety, build optimism and self-efficacy, and improve compliance with the treatment plan. TA is built by establishing rapport and building a sense of trust and ownership over the treatment plan. It has also been described as involving positive feelings between client and practitioner and agreement on the goals of the interventions.

Therefore, therapists should develop their communication skills so they can build a good working relationship with the client. They should also spend time listening to the client about their fears, goals, motivations, limitations and past history so that the client can be an active participant in forming the treatment plan. This will improve the quality of the treatment plan as well as patient compliance with the plan.

**STUDY REFERENCE**

Question —

Which of the following was identified as a factor that created a strong therapeutic alliance in several of the studies included in this systematic review?

A – following a biopsychosocial approach to treatment
B – anger and hostility from the patient
C – an individualized treatment plan created with patient values in mind

Click here for quiz answer
BACKGROUND & OBJECTIVES:
Traumatic shoulder dislocation commonly occurs from a high-energy trauma in games or training, or from a fall on an outstretched arm. Athletes involved in contact/overhead sports and males are at higher risk of sustaining these injuries. The risk of recurrence is highest during the first two years following the first episode of traumatic shoulder dislocation. This systematic review aimed to determine which treatment method helps to reduce the incidence of chronic shoulder instability following a first-time traumatic shoulder dislocation and to guide clinicians on how to best treat patients with chronic post-traumatic shoulder instability.

METHODS (WHAT THEY DID):
Thirteen electronic databases and reference lists of included studies were searched for data without any limitations on language or publication date. Included studies were randomized control trials (RCTs) that compared treatments after first-episode of traumatic shoulder dislocation or chronic post-traumatic shoulder instability, and that included outcomes related to shoulder instability, function and quality of life (QOL). Data extraction was conducted for outcome measures through all follow-up phases. Risk of bias was assessed according to Cochrane Back review group guidelines. Grading of Recommendations Assessment, Development and Evaluation (GRADE) was used to ascertain the quality of evidence. A meta-analysis and network meta-analysis were conducted.

“Shared decision-making between the clinician and patient should be considered in the context of the patient’s functional requirements and level of sports participation.”
RESULTS (WHAT THEY FOUND):

25 studies were included in this systematic review. 12 studies were related to first-time traumatic shoulder dislocation and 13 studies were on chronic post-traumatic shoulder instability. Mean participant age ranged between 20.3 to 36 years and the mean follow-up duration ranged from 1 year to 11.9 years.

For first-time traumatic shoulder dislocation:

- **Early surgery:**
  Bankart repair caused fewer re-dislocations compared to arthroscopic lavage and non-surgical treatment at 1 year and 2 years follow-up.

- **Factors that showed no effect on rate of recurrent instability and re-dislocation:**
  - Position of arm immobilization in external rotation (ER) or internal rotation (IR)
  - Restricted band usage

For chronic post-traumatic shoulder instability:

- **Open v/s arthroscopic surgery:**
  Open labrum repair helped to prevent recurrent dislocations and instability compared to arthroscopic surgery.

- **Factors that showed no effect on rate of recurrent instability and re-dislocation:**
  - Type of suture anchors or tacks (absorbable vs non-absorbable)
  - Accelerated versus traditional post-surgical rehabilitation
  - Type of surgical method

LIMITATIONS (THINGS TO KEEP IN MIND):

- Patient population was predominantly young men, athletes and patients who suffered a traumatic shoulder dislocation without a glenoid fracture. Therefore, the relevance of these findings to women, non-athletes, older population and patients with concomitant glenoid fracture is debatable.

- Re-dislocation rate was the most commonly reported primary outcome measure. Effect of interventions on QOL was lacking in the majority of the studies. This is important because patients often complain of weakness, apprehension and shoulder pain after primary traumatic shoulder dislocation without having any episodes of re-dislocation.
Several factors predispose patients to recurrent instability and re-dislocation such as age, gender, participation in contact or overhead sports (e.g. rugby, football, judo, swimming etc.) and type of lesion. Bankart lesions with or without bony involvement are common among patients with traumatic shoulder dislocation. Surgeons prefer treating traumatic dislocations with a repair due to the high risk of recurrence causing further damage to the soft tissues and potentially, the development of osteoarthritis.

Labral repair was the most effective intervention for preventing re-dislocations following a primary traumatic shoulder dislocation. Patients were more comfortable being immobilized in an arm sling versus ER brace, though neither had any effect on the rate of re-dislocation or instability. Almost half of the patients treated conservatively reported no episodes of re-dislocation or instability for 2 years since the initial injury. These patients also did not show a poorer prognosis of instability, QOL or osteoarthritis. Patients should be educated about the available treatment options with knowledge of the associated risk of recurrence following a conservative versus surgical approach. This shared decision-making between the clinician and patient should be considered in the context of the patient’s functional requirements and level of sports participation. A conservative approach, if appropriate, can help avoid unnecessary surgeries and also provide patients with a more economic treatment option.

Open labral repair can be used for patients with chronic post-traumatic shoulder instability though it is supported by low-quality evidence. However, the effect of conservative treatment versus surgical treatment on chronic instability patients has not been thoroughly investigated.
STRENGTH TRAINING AS SUPERIOR, DOSE-DEPENDENT AND SAFE PREVENTION OF ACUTE AND OVERUSE SPORTS INJURIES: A SYSTEMATIC REVIEW, QUALITATIVE ANALYSIS AND META-ANALYSIS

BACKGROUND & OBJECTIVE:
Although it is well known in the sports world that exercise and training for sport is extremely important, the degree to which various components of a training program contribute to injury prevention is not as well understood. Several studies have implicated strength training and multicomponent interventions as more effective for preventing injury than proprioception and stretching as standalone interventions. This review aimed to take a closer look at sports injury prevention via strength training.

METHODS (WHAT THEY DID):
Six studies were used in this meta-analysis: all with the common thread of being randomized controlled trials (RCTs) of strength training-based injury prevention programs. Exclusion criteria included studies with multivariable interventions (more than just strength training), inadequate design of control arms, studies with previous injury groups or specific injury focuses, and the use of any devices: tape, orthoses, braces, etc. Inclusion criteria included RCTs, injury free groups, strength training intervention, and adequate follow up periods.

The six studies used in the meta-analysis included 7739 participants aged 12-40 with 177 observed injuries. Four studies analyzed acute outcomes, one analyzed an overuse outcome, and one analyzed all injuries. Three of the studies compared pre-season hamstring strengthening programs with the aim of preventing acute hamstring injuries. The fourth study introduced a 14-week program with four daily squat and lunge pattern exercises with the goal of preventing anterior knee pain in military recruits. The fifth study applied a 20 minute, whole season intervention to reduce ACL injuries. Finally, the sixth study looked at the effects of a resistance training intervention and time lost due to injury in 13-14 year old soccer players.
RESULTS/WHAT THEY FOUND:

The strength training programs as a whole reduced the likelihood of injury by 66%, with 95% certainty. The programs had an average of 8 months of intervention with zero adverse events reported. Interestingly, the program with the shortest intervention time achieved the least favorable results: 43% injury reduction.

When studying the multiple variables of strength training (duration, volume, intensity), it was found that a 10% increase in volume (reps completed) resulted in a 4.3% relative risk reduction, assuming intensity (weight lifted) and duration (time length of program) were constant. Strength training appears to have a direct preventative effect for soft tissue injuries of the hamstrings, ACL injuries, and anterior knee pain, while having an indirect effect on reducing time lost to due to injury.

LIMITATIONS:

The meta-analysis was only able to find six studies that met inclusion criteria, two of which were authored by the meta-analysis author. It would be ideal to see a larger number of RCTs on strength training and sports injury prevention included. For example, the Achilles, adductors, low back, and rotator cuff/shoulder are other common areas that can benefit from strength training and would be a helpful addition to a larger and more powerful meta-analysis.

It is also important to note that the information within this review can only be extrapolated to the injuries the authors studied in each particular paper. This meta-analysis, although helpful, could have been saved for another few years to be able to include more studies. The narrow scope of it cannot be applied to ‘sports injuries’ as a whole and as such, it is probably not titled correctly. As always, while this paper helps contribute to our overall body of knowledge, further research is warranted.
This information should help motivate clinicians to advocate early strength training interventions for field and court athletes as well as an increased focus on strength training in the latter stages of recovery with the goal of preventing future injury.

CLINICAL IMPLICATIONS/HOW THIS IMPACTS CLINICAL PRACTICE:

The results of this study undoubtedly point towards the importance of strength training in the prevention of soft tissue injuries and time lost due to injury. The proposed mechanism of injury prevention is gradual tissue conditioning, strengthening failure thresholds, and sufficient technique and physiological preparedness.

This information should help motivate clinicians to advocate early strength training interventions for field and court athletes as well as an increased focus on strength training in the latter stages of recovery with the goal of preventing future injury. While the studies included did not look at other common soft tissue injuries of the upper extremities, back, hip, or foot/ankle, it is certainly plausible that responsible strength training might have a net positive impact on the likelihood of these injuries occurring as well.

The most important takeaway from this study was the significance of strength training for all athletes, regardless of age or sport. Even more significant than volume, intensity, or duration, there was a very clear relationship between actual strength improvement and injury prevention. The number one clinical implication: all athletes should participate in resistance training. The physical demands of competitive sport require high levels of strength and body control. The process of resistance training results in improvement of contractile tissue strength, higher proportions of fat free mass, improved performance, and reduced likelihood of injury.

+ STUDY REFERENCE

ARTICLE BY DR. TEDDY WILLSEY

QUIZ

Question —

In this review, the strength training programs as a whole reduced the risk of injury by:
A – 43%
B – 35%
C – 66%
D – 89%

Click here for quiz answer
MINIMAL DETECTABLE CHANGE IN DUAL-TASK COST FOR OLDER ADULTS WITH AND WITHOUT COGNITIVE IMPAIRMENT

MARIANA WINGOOD

BACKGROUND & OBJECTIVE:
Dual Tasking occurs when an individual performs two concurrent tasks that could be performed independently. Each task has a separate goal and assessment. Typically, it includes one motor task, such as walking, and either a secondary motor task (e.g. carrying an item) or a cognitive task (e.g. thinking about the groceries you need to buy). As we age, our ability to dual task significantly declines.

For older adults, dual tasking requires increased attention to one or both tasks resulting in decreased performance of one or both tasks. This type of decrement is called dual task cost (DTC) and is highly correlated with fall risk. When an individual develops a cognitive impairment (CI) their ability to complete each component of a dual task decreases significantly, affecting DTC exponentially. The effect of aging/cognition on DTC and its strong correlation to falls risk highlights the importance of DTC assessment in all older adults. DTC can be assessed during Self-Selected Walking Speed (SSWS) and Timed Up and Go (TUG) tasks. See Box 1 for the DTC formula and an example.

Box 1: Dual Task Cost

<table>
<thead>
<tr>
<th>Formula:</th>
<th>DTC (%)= (dual task-single task) *100</th>
<th>single task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td>TUG: 12 seconds TUG; with secondary task: 15 seconds</td>
<td>DTC= 15 sec- 12 sec * 100</td>
</tr>
</tbody>
</table>

This article examined test-retest reliability and minimal detectable change (MDC) values for DTC in older adults with and without cognitive impairments, as well as for dual tasks of varying difficulty.
METHODS

Design: test-retest design

Subjects: adults 65 years and older who were able to walk at least 10 meters independently and see enough to complete cognitive testing. They were excluded if they had Parkinson’s disease or if they were receiving physical therapy for balance or gait.

Assessment: 2 testing sessions 7-14 days apart

- Assessing Cognition: Montreal Cognitive Assessment (MOCA). Participants were categorized into high (MOCA score ≥ 26/30) and low (MOCA score < 26/30) cognitive groups.

- Assessment:
  - Single motor task: 6-meter SSWS (3-meter acceleration and deceleration) and TUG
  - Single cognitive task: counting forward by ones starting at a random number between 10 and 20 and counting backward by threes starting at a random number between 70 and 90.
  - Dual Task - combined cognitive and motor tasks:
    - SSWS1: SSWS while counting forward by ones
    - SSWS3: SSWS while counting backward by threes
    - TUG1: while counting forward by ones
    - TUG3: TUG while counting backward by threes

RESULTS:

Difference between High and Low Cognitive Groups:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>High Cognitive Group</th>
<th>Low Cognitive Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOCA, mean (SD)</td>
<td>27.5 (1.4)*</td>
<td>19.7 (5.6)*</td>
</tr>
<tr>
<td>SSWS, mean (SD), m/s</td>
<td>1.1 (0.3)</td>
<td>1.0 (0.3)</td>
</tr>
<tr>
<td>TUG, mean (SD), sec</td>
<td>11.8 (4.7)*</td>
<td>15.7(6.8)*</td>
</tr>
</tbody>
</table>

* indicates significant difference between two groups
MDC’s of DTC: (as a percentage)

<table>
<thead>
<tr>
<th>Assessment</th>
<th>High Cognitive Group</th>
<th>Low Cognitive Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUG1</td>
<td>11.2</td>
<td>29.1</td>
</tr>
<tr>
<td>TUG3</td>
<td>41.4</td>
<td>129.1</td>
</tr>
<tr>
<td>SSWS1</td>
<td>10.2</td>
<td>20.2</td>
</tr>
<tr>
<td>SSWS3</td>
<td>22.0</td>
<td>26.5</td>
</tr>
</tbody>
</table>

General DTC Results

- Greater DTC among individuals with low cognition demonstrated.
- SSWS3 and TUG3 resulted in greater DTC than SSWS1 and TUG1.

General MDC Results:

- MDC was smaller for less challenging tasks for both individuals with and without CI.
- MDC was larger for individuals with low cognition and dual tasks involving counting backward by threes.
- Older Adults with CI need to improve DTC at a greater extent than those without a CI before the improvement is not due to error/chance.

LIMITATIONS

The primary limitation of this study is the use of percent for DTC. By using percent change the likelihood of having outliers or skewed results increases. This explains the larger MDC’s and lower levels of reliability identified. By repeating the study with a larger number of subjects the data variability in the reliability results and the MDC’s could improve. If the results of the larger study were homogenous with these results we could confirm the accuracy of the results, further strengthening the findings.
When these tools are used in the clinic it is important to use appropriate MDC’s to ensure that the change in the score is not due to chance or error.

**Clinical Implications (How this impacts clinical practice):**

SSWS and TUG are valid, reliable, and feasible outcome measures used to determine level of mobility, frailty, risk of falls, and effectiveness of an intervention. By adding a secondary task, clinicians receive additional information about the patient’s cognition, falls risk, and ability to manage household and community mobility requirements.

When these tools are used in the clinic it is important to use appropriate MDC’s to ensure that the change in the score is not due to chance or error. The authors confirmed this by identifying a significant difference between MDC’s found in older adults with and without CI. They also confirmed the previously identified difference between DTC among older adults with CI versus without. This means that when a patient has a diagnosis that could affect the results of the outcome measure, it is important to use normative values, cut-off scores, and psychometric properties, including MDC’s, that are specific for that diagnosis.

Overall, this is a great initial study that highlights the importance of dual task cost and provides clinicians with a foundation of MDC’s to use in the clinic.
DRIVERS OF INTERNATIONAL VARIATION IN PREVALENCE OF DISABLING LOW BACK PAIN: FINDINGS FROM THE CULTURAL AND PSYCHOSOCIAL INFLUENCES ON DISABILITY STUDY

DR SANDY HILTON

BACKGROUND & OBJECTIVE:

The literature supports risk factors for low back pain (LBP) of heavy lifting, somatization, low mood/stressors in the workplace, and negative beliefs about recovery. Despite the emphasis on ergonomics in the workplace, this has not reduced the amount of LBP.

The authors in this study set out to determine the reason for the wide variation in LBP internationally. The authors proposed that beliefs and expectations around LBP contribute to the continued trends in disability and that this may vary across different cultural and social backgrounds.

METHODS (WHAT THEY DID):

Baseline information about musculoskeletal pain and risk factors was collected from 11,710 participants aged 20-59 years. Participants were from 18 different countries and 45 different occupations that fell into three categories: nurses, office workers, and those with manual tasks. Mental health, somatizing (faintness/dizziness, chest pain, nausea, shortness of breath, and temperature dysregulation), and questions of belief were assessed via a questionnaire. Negative beliefs of the ability to heal or return to work were tracked as well. Musculoskeletal (MSK) pain sites were illustrated with a body diagram and participants were asked if they had pain in any body regions in the last year that lasted longer than a day (pain propensity).

After a mean time period of 14 months, 9055 subjects were successfully followed-up. The authors used a longitudinal study to avoid risk of bias of simultaneous reporting of risk factors, and compared the amount of sites of MSK pain per person to a baseline measure. The study used multiple random intercept Poisson regression to compare the association of disabling LBP to risk factors at baseline. They also looked at group-level risk factors with a regression model.
RESULTS/WHAT THEY FOUND:

The authors took their data and calculated population attributable fractions (PAF) for each of the factors. These were taken to represent the “potential importance” as a driver of LBP.

Pain propensity was found to be the strongest risk factor for LBP. Multiple regression models were run on the data looking at risk, and found only 1 predictor – lack of support for long-term unemployment. The prevalence of disabling LBP was lowest in Japanese workers (6%) and largest in Nicaraguan nurses (46%). The table of prevalence of disabling LBP by country in Figure 1 of the paper shows no clear pattern of risk and large differences in prevalence between countries.

LIMITATIONS:

The statistical analysis and interpretation of the results allows for a large amount of error if the models are not precise or if they do not capture a meaningful correlation between risk factors. If the estimates of prevalence are off, the data is not reliable. Finally, there was missing data in the study which was reported but nonetheless would have affected the calculations.
The results of this study suggest that a person’s overall risk of MSK problems closely correlates with their risk of LBP.

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

Key take home message: The results of this study suggest that a person’s overall risk of MSK problems closely correlates with their risk of LBP. There is no specific risk based on country or occupation. This study also reports that there is little support to the push for ergonomic education or adaptations to mitigate the risk of LBP in workers.

The analysis is in line with previous studies that show a wide variance in LBP across the world, and that there is not one cause of this pain. The authors propose that it is the individuals’ previous pain experiences and their beliefs about pain that increase the risk of LBP.

Clinically, this study provides some reason to put effort into education on the ability of MSK conditions to resolve, and that movement and continued activity is helpful rather than harmful for MSK conditions. If people have less concern about their recovery and continue to be active, it is possible that the overall risk of disabling LBP can be mitigated. If we can decrease the propensity to MSK pain to the low levels seen in Pakistan, Japan, and Sri Lanka then the financial global burden of LBP would likely be significantly reduced.

QUIZ
ANSWERS

Article by Dr Joanne Kemp
*Answer*—17%

Article by Todd Hargrove
*Answer*: C

Article by Dr Teddy Willsey
*Answer*: C—66%

Click author names above to link to the original articles