Abstracts June 2023

Developing a patient decision aid for Achilles tendon rupture management: a mixed-methods study

Jan F. L. Gan, Marnee J. McKay, Caitlin M. P. Jones, Ian A. Harris, Kirsten McCaffery, Rachel Thompson, Tammy C. Hoffmann, Sam Adie, Christopher G. Maher, Joshua R Zadro
British Journal of Sports Medicine June 02, 2023
http://dx.doi.org/10.1136/bmjopen-2023-072553

Abstract:

Objective: To develop and user-test a patient decision aid portraying the benefits and harms of non-surgical management and surgery for Achilles tendon ruptures.
Design: Mixed methods.
Setting: A draft decision aid was developed using guidance from a multidisciplinary steering group and existing patient decision aids. Participants were recruited through social media. **Participants:** People who have previously sustained an Achilles tendon rupture and health professionals who manage these patients. Primary and secondary outcomes Semi-structured interviews and questionnaires were used to gather feedback on the decision aid from health professionals and patients who had previously suffered an Achilles tendon rupture. The feedback was used to redraft the decision aid and assess acceptability. An iterative cycle of interviews, redrafting according to feedback and further interviews was used. Interviews were analyzed using reflexive thematic analysis. Questionnaire data were analyzed descriptively.
Results: We interviewed 18 health professionals (13 physiotherapists, 3 orthopedic surgeons, 1 chiropractor, 1 sports medicine physician) and 15 patients who had suffered an Achilles tendon rupture (median time since rupture was 12 months). Most health professionals and patients rated the aid's acceptability as good-excellent. Interviews showcased agreement among health professionals and patients on most aspects of the decision aid: introduction, treatment options, comparing benefits and harms, questions to ask health professionals and formatting. However, health professionals had differing views on details about Achilles tendon retraction distance, factors that modify the risk of harms, treatment protocols and evidence on benefits and harms.
Conclusion: Our patient decision aid is an acceptable tool to both patients and health professionals, and our study highlights the views of key stakeholders on important information to consider when developing a patient decision aid for Achilles tendon rupture management. A randomized controlled trial evaluating the impact of this tool on the decision-making of people considering Achilles tendon surgery is warranted.

Treatment for Acute Anterior Cruciate Ligament Tear in Young Active Adults

L. Stefan Lohmander, M.D., Ph.D., Frank W. Roemer, M. D, Richard B. Frobel l, P.T, Ph. D, Ewa M. Roos, P.T., Ph.D.
NEJM Evidence June 27, 2023
DOI: 10.1056/EVIDoa2200287

Abstract:

Background: Anterior cruciate ligament (ACL) injury of the knee is common in young active adults and often has severe and sometimes lifelong consequences. The clinical management of this injury remains debated. A prior trial of early versus delayed optional ACL repair showed no differences in outcomes at 2 years.
Methods: We present the 11-year follow-up of a randomized clinical trial involving 121 young active adults (mean age 26yo, 74% male) with an acute sports-related ACL tear. We compared patient-reported and radiographic outcomes between those randomized to receive early ACL reconstruction (ACLR) followed by exercise therapy (N=62) and those treated with early exercise therapy plus optional delayed ACLR (N=59). The primary end point at 11 years was change from baseline in the mean of four subscales of the Knee Injury and Osteoarthritis Outcome Score (KOOS) — pain, symptoms, function in sports and recreation, and knee-related quality of life (KOOS4; range of scores, 0 [worst] to 100 [best]; minimal important change=9).
Results: In all, 88% of the cohort followed up at 11 years (53/62 in the early vs. 54/59 in the optional late ACL repair groups), and 52% of those assigned to optional delayed ACLR underwent ACLR. Mean improvement in KOOS4 from baseline to 11 years was 46 points for those assigned to early ACLR plus exercise therapy and 45 points for those assigned to exercise therapy plus optional delayed ACLR (between-group difference, 1.6 points; 95% confidence interval [CI], −8.8 to 5.6; P=0.67 after adjustment for baseline score, full analysis set). About two thirds of the full cohort reported meeting the case definition for a “patient-acceptable symptom state” (KOOS4 patient-acceptable symptom state threshold value=79), whereas 44% had developed radiographic osteoarthritis of their injured knee. Mean summed incident radiographic osteoarthritis feature scores, scores range from 0 to 30 where higher scores indicate more severe joint damage, were 2.4 for the group assigned to early ACLR and 1.0 for the group assigned to exercise therapy plus optional delayed ACLR (mean difference, 1.0; 95% CI, 0.1 to 1.9).
Conclusions: At 11-year follow-up, among young active adults with acute ACL tears assigned to early ACLR plus exercise versus initial exercise therapy with the option of delayed ACLR, there were no differences in patient-reported outcomes. (Funded by the Swedish Research Council; ISRCTN number, ISRCTN84752559.)

Effect of Radiofrequency Denervation on Pain Intensity Among Patients with Chronic Low Back Pain the Mint Randomized Clinical Trials

Johan N. S. Juch, MD; Esther T. Maas, PhD; Raymond W. J. G. Ostelo, PT, PhD; J. George Groeneweg, PT, PhD; Jan-Willem Kallewaard, MD; Bart W. Koes, PhD; Arianne P. Verhagen, PT, PhD; Johanna M. van Dongen, PhD.
Frank J. P. M. Huygen, MD, PhD; Maurits W. van Tulder, PhD
Johan N. S. Juch, MD; Esther T. Maas, PhD; Raymond W. J. G. Ostelo, PT, PhD, et.al.
Jama June 21.2023
doi:10.1001/jama.2017.7918

Abstract:

Importance: Radiofrequency denervation is a commonly used treatment for chronic low back pain, but high-quality evidence for its effectiveness is lacking.
Objective: To evaluate the effectiveness of radiofrequency denervation added to a standardized exercise program for patients with chronic low back pain.
Design, Setting, and Participants: Three pragmatic multicenter, nonblinded randomized clinical trials on the effectiveness of minimal interventional treatments for participants with chronic low back pain (Mint study) were conducted in 16 multidisciplinary pain clinics in the Netherlands. Eligible participants were included between January 1, 2013, and October 24, 2014, and had chronic low back pain, a positive diagnostic block at the facet joints (facet joint trial, 251 participants), sacroiliac joints (sacroiliac joint trial, 228 participants), or a combination of facet joints, sacroiliac joints, or intervertebral disks (combination trial, 202 participants) and were unresponsive to conservative care.
Interventions: All participants received a 3-month standardized exercise program and psychological support if needed. Participants in the intervention group received radiofrequency denervation as well. This is usually a 1-time procedure, but the maximum number of treatments in the trial was 3.
Main Outcomes and Measures: The primary outcome was pain intensity (numeric rating scale, 0-10; whereby 0 indicated no pain and 10 indicated worst pain imaginable) measured 3 months after the intervention. The prespecified minimal clinically important difference was defined as 2 points or more. Final follow-up was at 12 months, ending October 2015.
Results: Among 681 participants who were randomized (mean age, 52.2 years; 421 women [61.8%], mean baseline pain intensity, 7.1), 599 (88%) completed the 3-month follow-up, and 521 (77%) completed the 12-month follow-up. The mean difference in pain intensity between the radiofrequency denervation and control groups at 3 months was −0.18 (95% CI, −0.76 to 0.40) in the facet joint trial; −0.71 (95% CI, −1.35 to −0.06) in the sacroiliac joint trial; and −0.99 (95% CI, −1.73 to −0.25) in the combination trial.
Conclusions and Relevance: In 3 randomized clinical trials of participants with chronic low back pain originating in the facet joints, sacroiliac joints, or a combination of facet joints, sacroiliac joints, or intervertebral disks, radiofrequency denervation combined with a standardized exercise program resulted in either no improvement or no clinically important improvement in chronic low back pain compared with a standardized exercise program alone. The findings do not support the use of radiofrequency denervation to treat chronic low back pain from these sources.

Physiotherapists' perceptions on using a multidimensional clinical reasoning form during psychologically informed training for low back pain.

Ian Cowell, Alison McGregor, Peter O'Sullivan, Kieran O'Sullivan, Ross Poyton, Ged Murtagh
Musculoskeletal Science and Practice June 08, 2023
https://doi.org/10.1016/j.msksp.2023.102797

Abstract:

Purpose: Building clinical reasoning skills is important to effectively implement psychologically informed practice. We developed a multidimensional clinical reasoning form (CRF) to be used by physiotherapists in a psychologically informed practice training program for low back pain. In this paper we describe the development of the CRF, how the CRF was used in the training, and present an evaluation of physiotherapists' perceptions of the CRF.
Methods: Qualitative semi-structured interviews were conducted with ten physiotherapists purposively sampled in primary care. Data were gathered through pre, and post training focus group interviews and a secondary analysis of individual physiotherapist interviews conducted after the training. Thematic analysis was used to analyze the data and capture the emergent themes.
Results: Two main themes emerged **before** the training: (1) the CRF 'needs formal training' and (2) 'lacked instruction'. Three main themes emerged **after** the training (1) it provided 'a helpful framework for multidimensional clinical reasoning' (2) the CRF, and accompanying operational definitions, helped physiotherapists 'elicit information, with 'question prompts' helpful in facilitating patient disclosure (3) 'Utility' - although the CRF was not formally used by the physiotherapists it provided a conceptual reasoning framework to work from with more challenging patients.
Conclusion: The CRF was not designed to be used in isolation by clinicians without training. However, when used as a training adjunct it appears to be valued by physiotherapists to help develop their critical thinking and better characterize patients' presentations in order to personalize care from a bio-psychosocial perspective.

Epidemiology of MRI-detected muscle injury in athletes participating in the Tokyo 2020 Olympic Games

Hiroki Katagiri, Bruce B Forster, Lars Engebretsen, Jae-Sung An, Takuya Adachi, Yukihisa Saida, Kentaro Onishi, Hideyuki Koga
British Journal of Sports Medicine December 05, 2022
doi:10.1136/bjsports-2022-105827

Abstract:

Objective: Muscle injury is one of the most common injuries occurring at the Olympic Games often with devastating consequences. Epidemiological injury surveillance is recognized by the IOC as essential for injury prevention and management. We aimed to describe the incidence, anatomical location and classification of MRI-detected muscle injuries in athletes who participated in the Tokyo 2020 Olympic Games.

Methods: Two board-certified orthopedic surgeons, highly experienced in reviewing MRIs, independently and retrospectively reviewed all MRIs collected at the Tokyo 2020 Olympic Games from clinical reports generated by board-certified musculoskeletal radiologists at the IOC Polyclinic. The presence and anatomical site of muscle injuries were classified as: type a: myofascial/peripheral; type b: muscle belly or musculotendinous junction; and type c: injury which extends into the tendon, with reference to the British Athletics Muscle Injury Classification.
Results: Fifty-nine MRI-detected muscle injuries were seen in 40 male and 19 female athletes. 24 athletes (41%) were unable to fully compete in their event. Fifty-two injuries (88%) involved lower extremity muscles with hamstring muscle injuries most common (32 of 59, 54%). Half of all muscle injuries occurred in athletes participating in athletics (30 of 59, 51%). 21 athletes (35%) sustained type an injury, 14 athletes (24%) type b injuries and 24 athletes (41%) type c injuries. Of athletes with type c injuries, 18 (75%) did not complete their competition, a rate significantly higher than types a and b (OR 14.50, 95% CI 4.0 to 51.9, $p<0.001$).
Conclusion: For athletes sustaining muscle injuries during the Olympic Games, our study demonstrates the prognostic relevance of muscle injury anatomical site and severity for predicting completion or non-completion of an Olympic athlete's competition.

The McKenzie Method Is an Effective Rehabilitation Paradigm for Treating Adults with Moderate-to-Severe Neck Pain: A Systematic Review with Meta-Analysis

Anthony N Baumann, Kevin Orellana, Leah Landis, Marc Crawford, Caleb J. Oleson, Hudson Rogers, Deven P Curtis, Keith D Baldwin
Cureus May 19,2023
DOI: 10.7759/cureus.39218

Abstract:

Neck pain is a common musculoskeletal condition frequently managed with numerous conservative interventions. The McKenzie method of mechanical diagnosis and therapy (MMDT) is a form of physical therapy evaluation and treatment that aims to improve pain and disability in patients with musculoskeletal pain, including neck pain. To date, no systematic review with meta-analysis has examined the use of the McKenzie MMDT for neck pain. This study aimed to examine the effectiveness of the McKenzie MMDT in adult patients with neck pain. A systematic review and meta-analysis were performed using PubMed, ScienceDirect, MEDLINE, CINAHL, Web of Science, and Google Scholar. Full search terms were "McKenzie method" OR "McKenzie approach" OR "McKenzie treatment" AND "neck pain." Inclusion criteria were the use of the McKenzie MMDT, level I randomized control trials (RCTs), adults, and outcomes of pain (0-10 scale) and disability (neck disability index). A total of 11 RCTs met the final selection criteria from 1,955 articles on initial search with 289 patients receiving the McKenzie MMDT out of 677 total patients. For meta-analysis, there was a clinically insignificant but statistically significant improvement in pain (1.14/10 points) in patients receiving the McKenzie MMDT versus control interventions ($p=0.19$). For severity of pain, there was a clinically and statistically significant improvement in moderate or severe pain (2.06/10 points; $p<0.01$), but not in mild-to-moderate pain ($p=0.84$) when comparing the McKenzie MMDT to control

interventions. Overall, the McKenzie MMDT provides very small but statistically significant improvements in neck pain of all severity compared to control interventions. However, the McKenzie MMDT does provide clinically and statistically significant pain improvement in moderate-to-severe neck pain. Use of the McKenzie MMDT did not provide any significant improvement in disability compared to control interventions. This study is the first systematic review with meta-analysis on the effectiveness of the McKenzie MMDT for adult patients with neck pain.

Improving the Effectiveness of Exercise Therapy for Adults with Knee Osteoarthritis: A Pragmatic Randomized Controlled Trial (BEEP Trial)

Nadine E. Foster, D. Phil, Elaine Nicholls, PhD, Melanie A. Holden, PhD, Emma L. Healey, PhD, Elaine M. Hay, MD
American Congress of Rehabilitations Medicine June 2023
https://doi.org/10.1016/j.arrct.2023.100266

Abstract:

Objective: To investigate whether knee osteoarthritis (OA) related pain and function can be improved by offering enhanced physical therapist-led exercise interventions.
Design: Three-arm prospectively designed pragmatic randomized controlled trial.
Setting: General practices and National Health Service physical therapy services in England.
Participants: 514 adults (252 men, 262 women) aged ≥45 years with a clinical diagnosis of knee osteoarthritis (N=514). Mean Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores at baseline were 8.4 for pain and 28.1 for function.
Interventions: Participants were individually randomized (1:1:1 allocation) to usual physical therapy care (UC control: up to 4 sessions of advice and exercise over 12 weeks), individually tailored exercise (ITE: individualized, supervised, and progressed lower limb exercises, 6-8 sessions over 12 weeks), or targeted exercise adherence (TEA: transitioning from lower limb exercise to general physical activity, 8-10 contacts over 6 months).
Main Outcome Measures: Primary outcomes were pain and physical function measured by the WOMAC at 6 months. Secondary outcomes were measured at 3, 6, 9, 18, and 36 months.
Results: Participants receiving UC, ITE, and TEA all experienced moderate improvement in pain and function. There were no significant differences between groups at 6 months (adjusted mean differences (95% confidence intervals): pain UC vs ITE, -0.3 (-1.0 to 0.4), UC vs TEA, -0.3 (-1.0 to 0.4); function UC vs ITE, 0.5 (-1.9 to 2.9), UC vs TEA, -0.9 (-3.3 to 1.5)), or any other time-point.
Conclusions: Patients receiving UC experienced moderate improvement in pain and function; however, ITE and TEA did not lead to superior outcomes. Other strategies for patients with knee osteoarthritis to enhance the benefits of exercise-based physical therapy are needed.

Moderators of the effect of therapeutic exercise for knee and hip osteoarthritis: a systematic review and individual participant data meta-analysis

Prof Melanie A. Holden, PhD, Miriam Hattle, PhD, Jos Runhaar, PhD,
Prof Richard D Riley, PhD, Emma L. Healey, PhD, Jonathan Quicke, PhD, et al.
The Lancet Rheumatology June 12, 2023
https://doi.org/10.1016/S2665-9913(23)00122-4

Summary:

Background: Many international clinical guidelines recommend therapeutic exercise as a core treatment for knee and hip osteoarthritis. We aimed to identify individual patient-level moderators of the effect of therapeutic exercise for reducing pain and improving physical function in people with knee osteoarthritis, hip osteoarthritis, or both.
Methods: We did a systematic review and individual participant data (IPD) meta-analysis of randomized controlled trials comparing therapeutic exercise with non-exercise controls in people with knee osteoarthritis, hip osteoarthritis, or both. We searched ten databases from March 1, 2012, to Feb 25, 2019, for randomized controlled trials comparing the effects of exercise with non-exercise or other exercise controls on pain and physical function outcomes among people with knee osteoarthritis, hip osteoarthritis, or both. IPD were requested from leads of all eligible randomized controlled trials. 12 potential moderators of interest were explored to ascertain whether they were associated with short-term (12 weeks), medium-term (6 months), and long-term (12 months) effects of exercise on self-reported pain and physical function, in comparison with non-exercise controls. Overall intervention effects were also summarized. This study is prospectively registered on PROSPERO (CRD42017054049).
Findings: Of 91 eligible randomized controlled trials that compared exercise with non-exercise controls, IPD from 31 randomized controlled trials (n=4241 participants) were included in the meta-analysis. Randomized controlled trials included participants with knee osteoarthritis (18 [58%] of 31 trials), hip osteoarthritis (six [19%]), or both (seven [23%]) and tested heterogeneous exercise interventions versus heterogeneous non-exercise controls, with variable risk of bias. Summary meta-analysis results showed that, on average, compared with non-exercise controls, therapeutic exercise reduced pain on a standardized 0–100 scale (with 100 corresponding to worst pain), with a difference of –6·36 points (95% CI –8·45 to –4·27, borrowing of strength [BoS] 10·3%, between-study variance [τ^2] 21·6) in the short term, –3·77 points (–5·97 to –1·57, BoS 30·0%, τ^2 14·4) in the medium term, and –3·43 points (–5·18 to –1·69, BoS 31·7%, τ^2 4·5) in the long term. Therapeutic exercise also improved physical function on a standardized 0–100 scale (with 100 corresponding to worst physical function), with a difference of –4·46 points in the short term (95% CI –5·95 to –2·98, BoS 10·5%, τ^2 10·1), –2·71 points in the medium term (–4·63 to –0·78, BoS 33·6%, τ^2 11·9), and –3·39 points in the long term (–4·97 to –1·81, BoS 34·1%, τ^2 6·4). Baseline pain and physical function moderated the effect of exercise on pain and physical function outcomes. Those with higher self-reported pain and physical function scores at baseline (ie, poorer physical function) generally benefited more than those with lower self-reported pain and physical function scores at baseline, with the evidence most certain in the short term (12 weeks).

Interpretation: There was evidence of a small, positive overall effect of therapeutic exercise on pain and physical function compared with non-exercise controls. However, this effect is of questionable clinical importance, particularly in the medium and long term. As individuals with higher pain severity and poorer physical function at baseline benefited more than those with lower pain severity and better physical function at baseline, targeting individuals with higher levels of osteoarthritis-related pain and disability for therapeutic exercise might be of merit.

Pain catastrophizing and kinesiophobia mediate pain and physical function improvements with Pilates exercise in chronic low back pain: a mediation analysis of a randomized controlled trial

Lianne Wood, Geronimo Bejarano, Ben Csiernik, Gisela C. Miyamoto, Gemma Mansel, Jill A. Hayden, Martyn Lewis, Aidan G. Cashin
Journal of Physiotherapy July 03, 2023,
https://doi.org/10.1016/j.jphys.2023.05.008

Abstract:

Question: How much are the reductions in pain intensity and improvements in physical function from Pilates exercise mediated by changes in pain catastrophizing and kinesiophobia?
Design: This was a secondary causal mediation analysis of a four-arm randomized controlled trial testing Pilates exercise dosage (once, twice or thrice per week) against a booklet control.
Participants: Two hundred and fifty-five people with chronic low back pain.
Data analysis: All analyses were conducted in R software (version 4.1.2) following a preregistered analysis plan. A directed acyclic graph was constructed to identify potential pre-treatment mediator-outcome confounders. For each mediator model, we estimated the intervention-mediator effect, the mediator-outcome effect, the total natural indirect effect (TNIE), the pure natural direct effect (PNDE), and the total effect (TE).
Results: Pain catastrophizing mediated the effect of Pilates exercise compared with control on the outcomes pain intensity (TNIE MD –0.21, 95% CI –0.47 to –0.03) and physical function (TNIE MD –0.64, 95% CI –1.20 to –0.18). Kinesiophobia mediated the effect of Pilates exercise compared with control on the outcomes pain intensity (TNIE MD –0.31, 95% CI –0.68 to –0.02) and physical function (TNIE MD –1.06, 95% CI –1.70 to –0.49). The proportion mediated by each mediator was moderate (21 to 55%).
Conclusion: Reductions in pain catastrophizing and kinesiophobia partially mediated the pathway to improved pain intensity and physical function when using Pilates exercise for chronic low back pain. These psychological components may be important treatment targets for clinicians and researchers to consider when prescribing exercise for chronic low back pain.

Treatment based classification systems for patients with non-specific neck pain. A systematic review.

Francois Maissan, Jan Pool, Edwin de Raaij, Harriet Wittink, Raymond Ostelo
Musculoskeletal Science and Practice February 20, 2020
https://doi.org/10.1016/j.msksp.2020.102133

Abstract:

Objective: We aimed to identify published classification systems with a targeted treatment approach (treatment-based classification systems (TBCSs)) for patients with non-specific neck pain and assess their quality and effectiveness.
Design: Systematic review.
Data sources: MEDLINE, CINAHL, EMBASE, PEDro and the grey literature were systematically searched from inception to December 2019.
Study appraisal and synthesis: The main selection criterium was a TBCS for patients with non-specific neck pain with physiotherapeutic interventions. For data extraction of descriptive data and quality assessment we used the framework developed by Buchbinder et al. We considered as score of 3 as low quality, a score between 3 and 5 as moderate quality and a score 5 as good quality. To assess the risk of bias of studies concerning the effectiveness of TBCSs (only randomized clinical trials (RCTs) were included) we used the PEDro scale. We considered a score of six points on this scale as low risk of bias. Results: Out of 7664 initial references we included 13 studies. The overall quality of the TBCSs ranged from low to moderate. We found two RCTs, both with low risk of bias, evaluating the effectiveness of two TBCSs compared to alternative treatments. The results showed that both TBCSs were not superior to alternative treatments.
Conclusion: Existing TBCSs are, at best, of moderate quality. In addition, TBCSs were not shown to be more effective than alternatives. Therefore, using these TBCSs in daily practice is not recommended.

MRI-Detected Muscle Injury in Athletes Participating in the Tokyo 2020 Olympic Games

Katagiri et.al.