



ABSTRACTS MÄRZ 2024

Lever sign test for anterior cruciate ligament injuries: a diagnostic meta-analysis

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Abstract:

Background: Sports-related ACL (anterior cruciate ligament) injuries are frequent. Successful management requires early diagnosis and treatment. One of the clinical tests used to identify ACL damage is the lever sign test. This meta-analysis aimed to assess the lever sign test's diagnostic efficacy for ACL injuries.

Methods: An extensive investigation of the Cochrane Library, Embase, and PubMed databases was conducted until April 2023. Studies assessing the lever sign test's diagnostic efficacy for ACL injuries were also included. A bivariate random-effects model was employed to acquire the pooled estimates of diagnostic odds ratios, specificity, positive and negative likelihood ratios, sensitivity, and curves of the summary receiver operating characteristic (SROC).

Results: The meta-analysis comprised twelve investigations with a total of 1365 individuals. The lever sign test's combined sensitivity and specificity for the purpose of diagnosing injuries to the ACL were 0.810 (95% confidence interval [CI] 0.686–0.893) and 0.784 (95% CI 0.583–0.904), respectively. The positive and negative likelihood ratios were 3.148 (95% CI 1.784–5.553) and 0.210 (95% CI 0.084–0.528), respectively. The study revealed a diagnostic odds ratio of 17.656, with a 95% CI ranging from 4.800 to 64.951. The SROC curve's area was determined to be 0.912 (95% CI 0.857–0.967).

Conclusion: With high specificity and sensitivity, the lever sign test is a reliable diagnostic modality for ACL injuries. However, the test should be

used in combination with other diagnostic tests to increase the accuracy of the diagnosis. Further investigations are warranted to assess the clinical practicability of the lever sign test in various populations and settings.

How Movement Is Assessed Matters. Changes in Forward Bending During Cognitive Functional Therapy Treatment for People with Chronic Low Back Pain

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Abstract:

Objective: To investigate forward bending range of motion (ROM) and velocity in patients with low back pain who were receiving Cognitive Functional Therapy and determine (1) the amount and timing of change occurring at the trunk and pelvis (global angles), and lumbar spine (intersensory angle), and (2a) differences in changes between participants with and without sensor biofeedback, and (2b) participants with and without baseline movement limitation.

Design: Observational study.

Methods: Two hundred sixty-one participants attended Cognitive Functional Therapy treatment and wore sensors at the T12 and S2 spine levels while performing forward bending. Measures included ROM and velocity from both sensors, and the intersensory angle. Regression models estimated changes over time. Time-group interactions tested participants who were sub grouped by treatment and baseline movement.

Results: During the 90-day evaluation period, most change occurred in the first 21 days. Changes in ROM observed at T12 (3.3, 95% CI: 1.0°, 5.5; $P = .001$) and S2 (3.3, 95% CI: 1.2, 5.4; $P = .002$) were similar. Intersensory angle remained similar (0.2, 95% CI: -2.0°, -1.6°; $P = .81$). Velocity measured at T12 and S2, and the intersensory angle increased 8.5 /s (95% CI: 6.7 /s, 10.3 /s; $P < .0001$), 5.3 /s (95% CI: 4.0 /s, 6.5 /s; $P < .0001$), and 3.4 /s (95% CI: 2.4 /s, 4.5 /s; $P < .0001$), respectively, for 0 to 21 days. There were minimal differences in participants who received biofeedback. Larger increases



occurred in participants with restricted ROM and slower velocity at baseline.

Conclusion: During 0 to 21 days, we observed changes at the trunk and pelvis (especially in people with reduced ROM), and velocity changes across all measures (especially in people with baseline movement limitations). Biofeedback did not augment the changes. When targeting forward bending in people with low back pain, clinicians should monitor changes in velocity and global ROM.

Exercise treatments for lumbar spinal stenosis: A systematic review and intervention component analysis of randomized controlled trials.

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Clinical Rehabilitation August 27, 2023

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Abstract:

Objective: To analyze the components used in exercise interventions for people with symptoms of neurogenic claudication due to lumbar spinal stenosis and identify components associated with successful interventions.

Data sources: Eligible papers published up to April 2023 from MEDLINE, EMBASE, CINAHL, PEDro, CENTRAL, Web of Science, and trial registry websites.

Review methods: Literature searches were performed by an Information Specialist. We searched for randomized trials evaluating exercise interventions for people with neurogenic claudication symptoms (the primary symptom of lumbar spinal stenosis). Two authors independently performed study selection, data extraction, and quality assessments using the Cochrane Risk of Bias tool Version 2 and the TIDieR checklist for intervention reporting. Details of intervention components were extracted, tabulated, and synthesized using an intervention component analysis approach.

Results: We found thirteen trials reporting 23 exercise interventions delivered to 1440 participants. These featured 60 different components.



Most exercise interventions included supervision and flexion-based exercises. Balance exercises were rarely included. Exercise components featured more frequently in successful interventions included stretches, strength or trunk muscle exercises, fitness exercises, especially cycling, and psychologically informed approaches. Interpretation is limited by low study numbers and heterogeneity. No conclusions could be drawn about exercise supervision or dose.

Discussion: Exercise interventions for people with neurogenic claudication typically feature multiple components. Common features such as supervision, lumbar flexion, and aerobic fitness exercises and also less common features such as stretches, strengthening exercises, and psychologically informed approaches warrant consideration for inclusion when designing and optimizing exercise interventions for people with lumbar spinal stenosis.

Insufficient Evidence for Load as the Primary Cause of Nonspecific (Chronic) Low Back Pain. A Scoping Review

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Abstract:

Objective: To assess the causal role of the relationship between loading and the onset of nonspecific low back pain (NSLBP) and persistence of NSLBP (chronic low back pain [CLBP]).

Design: Scoping review.

Literature Search: We searched the literature from 2010 until May 2021 using a combination of terms related to (spinal) load and the Bradford-Hill (BH) criteria.

Study Selection Criteria: Operational definitions were developed for every criterion of the BH framework for causality. Study selection was based on the causal role of load in the onset of NSLBP and persistence of chronic low back pain.



Data Synthesis: The BH criteria were operationalized, and causation was considered established when evidence supported the BH criteria *strength*, *temporality*, *biological gradient*, *experiment*, and *biological plausibility*.

Results: Twenty-two studies were included. There was no consistent support for an association between load and the incidence of NSLBP, or that more load increased the risk of NSLBP/CLBP. Half of the studies did not support specific load exposures to increase incidence of or increase pain in NSLBP/CLBP. Half of studies did not support load preceding NSLBP. No study supported plausible biological explanations to influence the relationship between load and NSLBP/CLBP, or that similar causes have similar effects on NSLBP. Nine of 10 experimental studies did not support that load results in NSLBP or that relieving load reduces NSLBP/CLBP.

Conclusion: There was insufficient evidence to support a causal relationship between loading and the onset and persistence of NSLBP/CLBP based on the BH criteria. These results question the role of load management as the only/primary strategy to prevent onset and persistence of NSLBP/CLBP.

Paraspinal muscle oxygenation and mechanical efficiency are reduced in individuals with chronic low back pain.

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Abstract:

This study aimed to compare the systemic and local metabolic responses during a 5-min trunk extension exercise in individuals with chronic low back pain (CLBP) and in healthy individuals. Thirteen active participants with CLBP paired with 13 healthy participants performed a standardized 5-min trunk extension exercise on an isokinetic dynamometer set in continuous passive motion mode. During exercise, we used near-infrared spectroscopy to measure tissue oxygenation (TOI) and total hemoglobin-myoglobin (Th.B.). We used a gas exchange analyzer to measure breath-by-breath oxygen consumption (VO₂) and carbon dioxide produced (VCO₂). We also calculated mechanical efficiency. We assessed the intensity of low back pain sensation before and after exercise by using a visual analogue scale. In participants with CLBP, low back pain increased following exercise (+ 1.5



units; $p < 0.001$) and Th.B. decreased during exercise (-4.0 units; $p = 0.043$). Paraspinal muscle oxygenation (65.0 and 71.0%, respectively; $p = 0.009$) and mechanical efficiency (4.7 and 5.3%, respectively; $p = 0.034$) were both lower in participants with CLBP compared with healthy participants. The increase in pain sensation was related to the decrease in tissue oxygenation ($R^2 = -0.420$; $p = 0.036$). Decreases in total hemoglobin-myoglobin and mechanical efficiency could involve fatigability in exercise-soliciting paraspinal muscles and, therefore, exacerbate disabilities in daily life. Given the positive correlation between tissue oxygenation and exercise-induced pain exacerbation, muscle oxygenation may be related to persisting and crippling low back pain.

Integrating Person-Centered Concepts and Modern Manual Therapy

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Synopsis: Person-centered care places the whole patient at the center of the assessment and treatment plan. This includes an appreciation of the biological, psychological, and social contributors to the patient's status; use of shared decision-making to arrive at a feasible, person-centered care plan; and planning beyond the clinical encounter. Whereas person-centered care has been trending among musculoskeletal pain care, the application of this concept in a management plan that incorporates manual therapy (MT) has yet to be explored. Traditionally, MT has involved a practitioner leading the treatment session and providing the technique; however, recent advances in the MT literature and training are more reflective of a person-centered care model. The objectives of this clinical commentary are to outline our vision of person-centered MT, including support on why and how it should be applied. We endeavor to answer *What is person-centered MT? Why should person-centered MT be adopted? How should person-centered MT be utilized?* We present literature answering each of these questions and present a clinical framework to link evidence to practice in which we outline person-centered MT-based assessment and intervention.



Specific and shared mechanisms associated with treatment for chronic neck pain: study protocol for the SS-MECH trial

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Abstract:

Background: Treatment mechanisms involve the steps or processes through which an intervention unfolds and produces change in an outcome variable. Treatment mechanisms can be specific to the intervention provided (i.e. pain modulation) or shared with other treatments (i.e. reduced fear of movement). Whether specific and shared treatment mechanisms are different across interventions and whether they lead to the outcomes seen in trials is largely unknown. The management of individuals with chronic neck pain routinely include manual therapy (MT) and resistance exercise (RE), as both approaches are included in clinical practice guidelines, and both yield similar outcomes.

Objectives: Our study plans to answer two research questions: 1) what are the specific mechanisms associated with MT versus interventions (and are these different), and 2) what are the shared mechanisms associated with these interventions, and do specific or shared mechanisms mediate clinical outcomes?

Methods: This study will involve a 2-group parallel (1:1) single-blinded randomized trial to compare the specific and potential shared treatment mechanisms between these two approaches. We will enroll individuals with a history of chronic neck pain and evaluate whether specific or shared mechanisms mediate clinical outcomes.

Results: We hypothesize that MT and RE approaches will both exhibit different specific treatment mechanisms, and that both approaches will exhibit shared treatment mechanisms, which will notably influence outcomes at both discharge and 6-months.

Conclusions: This study is important because it will help identify what specific or shared treatment mechanisms are associated with different interventions and, how different treatment mechanisms influence clinical outcomes.



Orthopedic Manual Physical Therapy: A Modern Definition and Description

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Physical Therapy & Rehabilitation Journal March 08, 2024

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Abstract:

Currently, orthopedic manual physical therapy (OMPT) lacks a description of practice that reflects contemporary thinking and embraces advances across the scientific, clinical, and educational arms of the profession. The absence of a clear definition of OMPT reduces understanding of the approach across health care professions and potentially limits OMPT from inclusion in scientific reviews and clinical practice guidelines. For example, it is often incorrectly classified as passive care or incorrectly contrasted with exercise-therapy approaches. This perspective aims to provide clinicians, researchers, and stakeholders a modern definition of OMPT that improves the understanding of this approach both inside and outside the physical therapist profession. The authors also aim to outline the unique and essential aspects of advanced OMPT training with the corresponding examination and treatment competencies. This definition of practice and illustration of its defining characteristics is necessary to improve the understanding of this approach and to help classify it correctly for study in the scientific literature. This perspective provides a current definition and conceptual model of OMPT, defining the distinguishing characteristics and key elements of this systematic and active patient-centered approach to improve understanding and help classify it correctly for study in the scientific literature.

Running-Related Injuries Among More Than 7000 Runners in 87 Different Countries: The Garmin-RUNSAFE Running Health Study

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Abstract:

Objective: To describe the cumulative injury proportion after 1000 and 2000 km of running among runners from 87 countries worldwide using wearable devices. Secondly, examine if the cumulative injury proportion differed between runners from different countries.

Design: Cohort study with an 18-month follow-up.

Methods: Runners aged ≥ 18 years who were familiar with the English language, and who were using a Garmin sports watch that supported tracking of running were eligible for inclusion. The exposure was residential country; self-reported running-related injury was the primary outcome. A generalized linear model was used to estimate the cumulative injury proportion for each country and the cumulative risk difference between the countries (country with the lowest risk used as reference). Data were analyzed at 1000 and 2000 km.

Results : The proportions of injured runners among the 7605 included runners from 87 different countries were 57.6% [95% CI: 56.9%, 59.0%] at 1000 km and 69.8% [95% CI: 68.3%, 71.4%] at 2000 km. Runners from the Czech Republic (40.3% [95% CI: 28.7%, 51.9%]), Austria (41.1% [95% CI: 25.9%, 52.2%]), and Germany (41.9% [95% CI: 36.0%, 47.9%]) had the lowest cumulative injury proportions at 1000 km, whereas Ireland (75.4% [95% CI: 60.4%, 90.4%]), Great Britain and Northern Ireland (73.2% [95% CI: 69.3%, 77.1%]), and Finland (67.5% [95% CI: 47.2%, 87.7%]) had the highest proportions. At 2000 km, Poland (47.7% [95% CI: 36.0%, 59.4%]), Slovenia (52.2% [95% CI: 28.5%, 75.8%]), and Croatia (54.2% [95% CI: 35.6%, 72.7%]) had the lowest proportions of injured runners. The highest cumulative injury proportions were reported in Great Britain and Northern Ireland (83.6% [95% CI: 79.6%, 87.6%]) and the Netherlands (78.3% [95% CI: 70.6%, 85.9%]).

Conclusion: More than half of the population of adult runners from 87 countries using wearable devices sustained a running-related injury during follow-up. There were considerable between-country differences in injury proportions.



A Systematic Review of Clinical Practice Guidelines on the Diagnosis and Management of Various Shoulder Disorders

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Archives of Physical Medicine and Rehabilitation October 11, 2023

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Abstract:

Objective: To perform a systematic review of clinical practice guidelines (CPGs) covering the management of common shoulder disorders.

Data Sources: A systematic search of CPGs on specific shoulder disorders was conducted up to August 2022 in relevant databases. Study Selection: Twenty-six CPGs on rotator cuff (RC) tendinopathy, RC tear, calcific tendinitis, adhesive capsulitis, glenohumeral (GH) instability, GH osteoarthritis, or acromioclavicular disorders published from January 2008 onward were screened and included.

Data Extraction: CPGs methodological quality was assessed with the AGREE II checklist. All recommendations from CPGs were extracted and categorized by shoulder disorder and care components (evaluation, diagnostic imaging, medical, rehabilitation, and surgical treatments). After semantic analysis of the terminology, recommendations for each shoulder disorders were classified by 2 reviewers into “recommended,” “may be recommended,” or “not recommended.” Disagreements were resolved by discussion until reviewers reached consensus.

Data Synthesis: Only 12 CPGs (46%) were of high quality with major limitations related to the applicability and editorial independence of the guidelines. The initial evaluation of shoulder pain should include patient’s history, subjective evaluation focused on red flags, and clinical examination. Magnetic resonance imaging is usually not recommended to manage early shoulder pain, and recommendations for X-rays are conflicting. Acetaminophen, oral non-steroidal anti-inflammatory drugs, and rehabilitation including exercises were recommended or may be recommended to treat all shoulder pain disorders. Guidelines on surgical management recommendations differed; for example, 6 CPGs reported that acromioplasty was recommended or may be recommended in chronic RC tendinopathy, whereas 4 CPGs did not recommend it.



Conclusions: Recommendations vary for diagnostic imaging, conservative vs surgical treatment to manage shoulder pain, although several care components are consensual. The development of evidence-based, rigorous CPGs with a valid methodology and transparent reporting is warranted to improve overall shoulder pain care.

Risk Factors for Running-Related Injury in High School and Collegiate Cross-country Runners: A Systematic Review

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Journal of Orthopedic & Sports Physical Therapy January 24, 2024

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Abstract:

Objective: To summarize and describe risk factors for running-related injuries (RRIs) among high school and collegiate cross-country runners.

Design: Descriptive systematic review.

Literature Search: Four databases (Scopus, SPORT Discus, CINAHL, Cochrane) were searched from inception to August 2023.

Study Selection Criteria: Studies assessing RRI risk factors in high school or collegiate runners using a prospective design with at least 1 season of follow-up were included.

Data Synthesis: Results across each study for a given risk factor were summarized and described. The NOS and GRADE frameworks were used to evaluate quality of each study and certainty of evidence for each risk factor.

Results: Twenty-four studies were included. Overall, study quality and certainty of evidence were low to moderate. Females or runners with prior RRI or increased RED-S (relative energy deficiency in sport) risk factors were most at risk for RRI, as were runners with a quadriceps angle of $>20^\circ$ and lower step rates. Runners with weaker thigh muscle groups had increased risk of anterior knee pain. Certainty of evidence regarding training, sleep, and specialization was low, but suggests that changes in training volume, poorer sleep, and increased specialization may increase RRI risk.



Conclusion: The strongest predictors of RRI in high school and collegiate cross-country runners were sex and RRI history, which are nonmodifiable. There was moderate certainty that increased RED-S risk factors increased RRI risk, particularly bone stress injuries. There was limited evidence that changes in training and sleep quality influenced RRI risk, but these are modifiable factors that should be studied further in this population.

