

5. SPINAL SURGERY

Lumbosacral fusion and hip dislocation

Bone Joint J. 2019 Feb;101-B(2):198-206. doi: 10.1302/0301-620X.101B2.BJJ-2018-0754.R1.

Lumbar fusion involving the sacrum increases dislocation risk in primary total hip arthroplasty.

Salib CG¹, Reina N¹, Perry KI¹, Taunton MJ¹, Berry DJ¹, Abdel MP¹.

AIMS:

Concurrent hip and spine pathologies can alter the biomechanics of spinopelvic mobility in primary total hip arthroplasty (THA). This study examines how differences in pelvic orientation of patients with spine fusions can increase the risk of dislocation risk after THA.

PATIENTS AND METHODS:

We identified 84 patients (97 THAs) between 1998 and 2015 who had undergone spinal fusion prior to primary THA. Patients were stratified into three groups depending on the length of lumbar fusion and whether or not the sacrum was involved. Mean age was 71 years (40 to 87) and 54 patients (56%) were female. The mean body mass index (BMI) was 30 kg/m² (19 to 45). Mean follow-up was six years (2 to 17). Patients were 1:2 matched to patients with primary THAs without spine fusion. Hazard ratios (HR) were calculated.

RESULTS:

Dislocation in the fusion group was 5.2% at one year versus 1.7% in controls but this did not reach statistical significance (HR 1.9; p = 0.33). Compared with controls, there was no significant difference in rate of dislocation in patients without a sacral fusion. When the sacrum was involved, the rate of dislocation was significantly higher than in controls (HR 4.5; p = 0.03), with a trend to more dislocations in longer lumbosacral fusions. Patient demographics and surgical characteristics of THA (i.e. surgical approach and femoral head diameter) did not significantly impact risk of dislocation (p > 0.05). Significant radiological differences were measured in mean anterior pelvic tilt between the one-level lumbar fusion group (22°), the multiple-level fusion group (27°), and the sacral fusion group (32°; p < 0.01). Ten-year survival was 93% in the fusion group and 95% in controls (HR 1.2; p = 0.8).

CONCLUSION:

Lumbosacral spinal fusions prior to THA increase the risk of dislocation within the first six months. Fusions involving the sacrum with multiple levels of lumbar involvement notably increased the risk of postoperative dislocation compared with a control group and other lumbar fusions. Surgeons should take care with component positioning and may consider higher stability implants in this high-risk cohort.

Lumbar radiculopathy

Spine (Phila Pa 1976). 2019 Mar 1;44(5):355-362. doi: 10.1097/BRS.0000000000002801.

Determinants and Variations of Hospital Costs in Patients With Lumbar Radiculopathy Hospitalized for Spinal Surgery.

Huysmans E^{1,2,3,4,5}, Pien K⁶, Callens L⁷, Van Loon L⁸, Ickmans K^{2,4,5}, Nijs J^{2,4,5}, Buyl R^{3,9}, Moens M^{10,11,12}, Goudman L^{2,4,10}, Van Belleghem G^{1,3}, Putman K^{1,3}.

STUDY DESIGN:

A retrospective study.

OBJECTIVE:

The aim of this study was to determine hospital costs related to surgery for lumbar radiculopathy and identify determinants of intramural costs based on minimal hospital and claims data.

SUMMARY OF BACKGROUND DATA:

Costs related to the initial hospitalization of patients undergoing surgery for lumbar radiculopathy make up the major part of direct health care expenditure in this population. Identifying factors influencing intramural costs can be beneficial for health care policy makers, and clinicians working with patients with lumbar radiculopathy.

METHODS:

The following data were collected from the University Hospital Brussels data warehouse for all patients undergoing surgery for lumbar radiculopathy in 2016 (n=141): age, sex, primary diagnosis, secondary diagnoses, type of surgery, severity of illness (SOI), admission and discharge date, type of hospital admission, and all claims incurred for the particular hospital stay. Descriptive statistics for total hospital costs were performed. Univariate analyses were executed to explore associations between hospital costs and all other variables. Those showing a significant association (P<0.05) were included in the multivariate general linear model analysis.

RESULTS:

Mean total hospital costs were &OV0556; 5016±188 per patient. Costs related to the actual residence (i.e., "hotel costs") comprised 53% of the total hospital costs, whereas 18% of the costs were claimed for the surgical procedure. Patients with moderate/major SOI had 44% higher hospital costs than minor SOI (P=0.01). Presence of preadmission comorbidities incurred 46% higher costs (P=0.03). Emergency procedures led to 72% higher costs than elective surgery (P<0.001). Patients receiving spinal fusion had 211% higher hospital costs than patients not receiving this intervention (P<0.001).

CONCLUSION:

Hospital costs in patients receiving surgery for lumbar radiculopathy are influenced by SOI, the presence of preadmission comorbidities, type of hospital admission (emergency vs. elective), and type of surgical procedure.

7. PELVIC ORGANS/WOMAN'S HEALTH

Placental growth factor

Circulation. 2019 Feb 14. doi: 10.1161/CIRCULATIONAHA.118.036632

Placental Growth Factor as an Indicator of Maternal Cardiovascular Risk After Pregnancy.

Benschop L¹, Schalekamp-Timmermans S², Broere-Brown ZA¹, Roeters van Lennep JE³, Jaddoe VVW⁴, Roos-Hesselink JW⁵, Ikram MK⁶, Steegers EAP⁷, Roberts JM⁸, Gandley RE⁹.

BACKGROUND:

Angiogenic placental growth factor (PlGF) concentrations rise during pregnancy, peaking at the end of mid-pregnancy. Low PlGF concentrations during pregnancy are associated with pregnancy complications with recognized later life cardiovascular risk. We hypothesized that low PlGF concentrations, especially in mid-pregnancy identify not only a subset of women at risk for pregnancy complications, but also women with greater cardiovascular risk factor burden after pregnancy regardless of pregnancy outcome.

METHODS:

In a population-based prospective cohort study of 5529 women, we computed gestational-age-adjusted multiple of the medians of early pregnancy and mid-pregnancy PlGF concentrations. Information on pregnancy complications (pre-eclampsia, small for gestational age and spontaneous preterm birth) was obtained from hospital registries. Six years after pregnancy we measured maternal systolic and diastolic blood pressure (SBP and DBP), cardiac structure (aortic root diameter [AOD], left atrial diameter [LAD], left ventricular mass [LV mass] and fractional shortening), carotid-femoral pulse wave velocity and central retinal arteriolar and venular calibers. Blood pressure was also measured nine years after pregnancy.

RESULTS:

Women were on average 29.8 (SD5.2) years of age in pregnancy, mostly European (55.2%) and 14.8% developed a pregnancy complication. Quartile analysis showed that especially women with mid-pregnancy PlGF in the lowest quartile (the low PlGF subset) had a larger AOD (0.40mm [95%CI; 0.08, 0.73]), LAD (0.34mm [95%CI; -0.09, 0.78]), LV mass (4.6g [95%CI; 1.1, 8.1]) and SBP (2.3mmHg [95%CI; 0.93, 3.6]) six years after pregnancy than women with the highest PlGF. Linear regression analysis showed that higher mid-pregnancy PlGF concentrations were associated with a smaller AOD (-0.24mm [95%CI; -0.39, -0.10]), LAD (-0.75mm [95%CI; -0.95, -0.56]), lower LV mass (-3.9g [95%CI; -5.5, -2.3]) and SBP (-1.1mmHg [95%CI; -1.7, -0.46]). These differences persisted after exclusion of women with complicated pregnancies.

CONCLUSIONS:

Women with low PlGF in mid-pregnancy have a greater AOD, LAD, and LV mass, and higher SBP six and nine years after pregnancy compared to women with higher PlGF, including women with uncomplicated pregnancies. The pathophysiological implications of lower PlGF concentrations in mid-pregnancy might provide insight towards identifying pathways contributing to greater cardiovascular risk factor burden.

Periodontitis increased risk of spontaneous abortion

J Periodontol. 2018 Oct 27. doi: 10.1002/JPER.18-0174.

Association between periodontitis and spontaneous abortion: A case-control study.

Chanomethaporn A¹, Chayasadom A¹, Wara-Aswapati N^{1,2}, Kongwattanakul K³, Suwannarong W¹, Tangwanichgapong K¹, Sumanonta G⁴, Matangkasombut O⁵, Dasanayake AP⁶, Pitiphat W^{2,7}.

BACKGROUND:

Spontaneous abortion, or miscarriage, is a complication of pregnancy which can severely affect women both physically and psychologically. We investigated the associations of periodontitis and periodontopathic bacteria with spontaneous abortion.

METHODS:

We conducted a matched case-control study in two tertiary hospitals in Khon Kaen, Thailand. Cases were 85 women with spontaneous abortion at <20 weeks of gestation matched to 85 controls on age, gestational age, and hospital. Full-mouth periodontal examinations were performed. Periodontitis was defined as at least one site with probing depth ≥ 5 mm and clinical attachment level ≥ 2 mm at the same site. Subgingival plaque samples were collected to determine the levels of *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Fusobacterium nucleatum* using real time polymerase chain reaction.

RESULTS:

The cases were significantly more likely to have periodontitis (50.6%) than the controls (21.2%; $P = 0.007$). Conditional logistic regression revealed a crude odds ratio (OR) of 4.1 for the association between periodontitis and spontaneous abortion (95% confidence interval [CI] = 1.9-8.9, $P = 0.001$). The OR decreased, but was still significant, after controlling for previous miscarriage (OR = 3.3, 95% CI = 1.4-7.8, $P = 0.006$). There was no significant association between the levels of periodontopathic bacteria and spontaneous abortion. Increased levels of *P. gingivalis* and *F. nucleatum* were associated with periodontitis in both case and control groups. Association between increased *T. forsythia* levels and periodontitis was observed only in the case women.

CONCLUSIONS:

Periodontitis was more common in women with spontaneous abortions as compared with matched controls. Levels of periodontopathic bacteria was not associated with spontaneous abortion in this population.

Sexual dysfunction

J Sex Med. 2015 Dec;12(12):2401-12. doi: 10.1111/jsm.13045. Epub 2015 Nov 23.

Effect of Intravaginal Prasterone on Sexual Dysfunction in Postmenopausal Women with Vulvovaginal Atrophy.

Labrie F¹, Derogatis L², Archer DF³, Koltun W⁴, Vachon A⁵, Young D⁶, Frenette L⁷, Portman D⁸, Montesino M¹, Côté I¹, Parent J¹, Lavoie L¹, Beaugard A¹, Martel C¹, Vaillancourt M¹, Balser J⁹, Moynour É¹⁰;

INTRODUCTION:

Previous data have shown that intravaginal dehydroepiandrosterone (DHEA, prasterone) improved all the domains of sexual function, an effect most likely related to the local formation of androgens from DHEA.

AIMS:

To confirm in a placebo-controlled, prospective, double-blind and randomized study the benefits of daily intravaginal DHEA for 12 weeks on sexual function using the Female Sexual Function Index (FSFI) questionnaire.

METHODS:

Placebo was administered daily to 157 women while 325 women received 0.50% (6.5 mg) DHEA daily for 12 weeks. All women were postmenopausal meeting the criteria of vulvovaginal atrophy (VVA), namely moderate to severe dyspareunia as their most bothersome symptom of VVA in addition to having $\leq 5\%$ of vaginal superficial cells and vaginal pH > 5.0 . The FSFI questionnaire was filled at baseline (screening and day 1), 6 weeks and 12 weeks. Comparison between DHEA and placebo of the changes from baseline to 12 weeks was made using the analysis of covariance test, with treatment group as the main factor and baseline value as the covariate.

MAIN OUTCOME MEASURES:

The six domains and total score of the FSFI questionnaire were evaluated.

RESULTS:

The FSFI domain desire increased over placebo by 0.24 unit (+49.0%, $P = 0.0105$), arousal by 0.42 unit (+56.8%, $P = 0.0022$), lubrication by 0.57 unit (+36.1%, $P = 0.0005$), orgasm by 0.32 unit (+33.0%, $P = 0.047$), satisfaction by 0.44 unit (+48.3%, $P = 0.0012$), and pain at sexual activity by 0.62 unit (+39.2%, $P = 0.001$). The total FSFI score, on the other hand, has shown a superiority of 2.59 units in the DHEA group over placebo or a 41.3% greater change than placebo ($P = 0.0006$ over placebo).

CONCLUSION:

The present data show that all the six domains of the FSFI are improved over placebo (from $P = 0.047$ to 0.0005), thus confirming the previously observed benefits of intravaginal DHEA on female sexual dysfunction by an action exerted exclusively at the level of the vagina, in the absence of biologically significant changes of serum steroids levels.

Abortion risk

Risk factors for surgical intervention of early medical abortion

Amani Meaidi, MD Sarah Friedrich, Phd , Thomas Alexander Gerds, Professor
Oejvind Lidegaard, Professor

DOI: <https://doi.org/10.1016/j.ajog.2019.02.014>

Abstract**Background**

By being non-invasive, medical termination of pregnancy has increased worldwide access to abortion and improved safety of unsafe abortion. However, secondary surgical intervention is the most frequent complication to medical abortion.

Objective

We aimed to identify and quantify risk factors for surgical intervention in women undergoing medically induced termination of pregnancy before nine completed weeks of gestation.

Study design

We conducted a nationwide cohort study, including all pregnancies terminated before 63 gestational days in women aged 15-49 years during the period 2005-2015. Induction regimen was 200 mg mifepristone followed 24-48 hours later by 0.8 mg vaginal misoprostol. All included pregnancies were followed up for eight weeks from mifepristone administration. Data were retrieved from national health registers. Multiple logistic regression provided adjusted odds ratios (ORs) of surgical intervention with 95% confidence intervals (CI). The discriminative ability of the risk factors in identifying surgical intervention was assessed by cross-validated area under the receiver operating characteristic curve (AUC).

Results

Of 86,437 early medical abortions, 5,320 (6.2%) underwent a surgical intervention within eight weeks after induction. The proportion of surgical interventions increased from 3.5% in the 5th-6th gestational week to 10.3% in week nine, OR 3.2 (95% CI 2.9-3.6). Compared to women aged 15-19 years, the risk of surgical intervention increased with increasing maternal age until the age of 30-34 years, OR 1.7 (95% CI 1.5-1.9), where after the risk decreased to an OR for age group 40-49 of 1.2 (95% CI 1.0-1.4). Compared to nulliparous women, a history of only vaginal deliveries with spontaneous delivery of placenta implied an OR of 1.1 (95% CI 1.0-1.2), women with a history of at least one cesarean section an OR of 1.5 (95% CI 1.3-1.6), and women having experienced a manual removal of placenta after a vaginal birth an OR of 2.0 (95% CI 1.7-2.4). Previous medically induced abortion decreased the risk of surgical intervention, OR 0.84 (95% CI 0.78-0.91), whereas previous early (before 56 days of gestation) surgically induced abortion implied a 53% (95% CI 1.4-1.7) increased risk of surgical intervention. Previous surgical abortion after 55 days of gestation increased the risk by 17% (95% CI 1.1-1.3). The AUC of the model including all quantified risk factors was 63% (95% CI 62-64%).

Conclusion

Gestational age, maternal age, previous deliveries, and history of medically and surgically induced abortions all had a significant influence on the risk of surgical intervention of early medical abortion. However, inclusion of all quantified risk factors still left most interventions unpredictable.

8. VISCERA

IBS in industrial countries

Trends in hospitalisation rates for inflammatory bowel disease in western vs newly industrialised countries: A population-based study of countries in the Organisation for Economic Co-operation and Development

The Lancet: Gastroenterology & Hepatology

King JA, et al. | February 14, 2019

Background

Hospitalisation rates for inflammatory bowel disease (IBD) vary across the world. We aimed to investigate temporal patterns of hospitalisation for IBD in member countries of the Organisation for Economic Co-operation and Development (OECD).

Methods

From the OECD database, we assessed IBD-related hospitalisation rates (expressed as annual rates per 100 000 inhabitants) for 34 countries from 1990 to 2016. We calculated mean hospitalisation rates for the period 2010–15 and used joinpoint regression models to calculate average annual percentage changes with 95% CIs.

Findings

Mean hospitalisation rates for IBD from 2010 to 2015 were highest in North America (eg, 33·9 per 100 000 in the USA), Europe (eg, 72·9 per 100 000 in Austria), and Oceania (eg, 31·5 per 100 000 in Australia). Hospitalisation rates for IBD were stabilising or decreasing over time in many countries in these regions but increasing in others. Countries in Asia and Latin America and the Caribbean had the lowest IBD-related hospitalisation rates but the greatest increases in rates over time. For example, Turkey had an annual hospitalisation rate of 10·8 per 100 000 inhabitants and an average annual percentage change of 10·4% (95% CI 5·2–15·9). Similarly, Chile had an annual hospitalisation rate of 9·0 per 100 000 inhabitants and an average annual percentage change of 5·9% (4·9–7·0).

Interpretation

Hospitalisation rates for IBD are high in western countries but are typically stabilising or decreasing, whereas rates in many newly industrialised countries are rapidly increasing, which reflects the known increase in IBD prevalence in these countries. Potential explanations for these trends include changes in the epidemiology of IBD, health-care delivery, and infrastructure in these countries, as well as overall country-specific patterns in hospitalisations and differences between countries in data collection methods.

13 B. TMJ/ORAL**Periodontitis increased risk of spontaneous abortion**

J Periodontol. 2018 Oct 27. doi: 10.1002/JPER.18-0174.

Association between periodontitis and spontaneous abortion: A case-control study.

Chanomethaporn A¹, Chayasadam A¹, Wara-Aswapati N^{1,2}, Kongwattanakul K³, Suwannarong W¹, Tangwanichgapong K¹, Sumanonta G⁴, Matangkasombut O⁵, Dasanayake AP⁶, Pitiphat W^{2,7}.

BACKGROUND:

Spontaneous abortion, or miscarriage, is a complication of pregnancy which can severely affect women both physically and psychologically. We investigated the associations of periodontitis and periodontopathic bacteria with spontaneous abortion.

METHODS:

We conducted a matched case-control study in two tertiary hospitals in Khon Kaen, Thailand. Cases were 85 women with spontaneous abortion at <20 weeks of gestation matched to 85 controls on age, gestational age, and hospital. Full-mouth periodontal examinations were performed. Periodontitis was defined as at least one site with probing depth ≥ 5 mm and clinical attachment level ≥ 2 mm at the same site. Subgingival plaque samples were collected to determine the levels of *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Fusobacterium nucleatum* using real time polymerase chain reaction.

RESULTS:

The cases were significantly more likely to have periodontitis (50.6%) than the controls (21.2%; $P = 0.007$). Conditional logistic regression revealed a crude odds ratio (OR) of 4.1 for the association between periodontitis and spontaneous abortion (95% confidence interval [CI] = 1.9-8.9, $P = 0.001$). The OR decreased, but was still significant, after controlling for previous miscarriage (OR = 3.3, 95% CI = 1.4-7.8, $P = 0.006$). There was no significant association between the levels of periodontopathic bacteria and spontaneous abortion. Increased levels of *P. gingivalis* and *F. nucleatum* were associated with periodontitis in both case and control groups. Association between increased *T. forsythia* levels and periodontitis was observed only in the case women.

CONCLUSIONS:

Periodontitis was more common in women with spontaneous abortions as compared with matched controls. Levels of periodontopathic bacteria was not associated with spontaneous abortion in this population.

Tongue tied anatomy

Clin Anat. 2019 Jan 30. doi: 10.1002/ca.23343

What is a Tongue Tie? Defining the anatomy of the in-situ lingual frenulum.

Mills N^{1,2}, Pransky SM³, Geddes DT⁴, Mirjalili SA².

INTRODUCTION:

Surgical release of the lingual frenulum (frenotomy) has become an increasingly common procedure, performed from birth through to adulthood. Surprisingly, detailed anatomy of the in-situ lingual frenulum has never been described, and no anatomical basis has been proposed for the individual variability in frenulum morphology. The lingual frenulum is frequently referred to as a "cord" or "submucosal band" of connective tissue, yet there is no evidence to support this anatomical construct. This paper aims to describe the anatomy of the in-situ lingual frenulum and its relationship to floor of mouth structures.

METHODS:

Fresh tissue microdissection of the lingual frenulum and floor of mouth was performed on nine adult cadavers with photo-documentation and description of findings.

RESULTS:

The lingual frenulum is a dynamic structure, formed by a midline fold in a layer of fascia that inserts around the inner arc of the mandible, forming a diaphragm-like structure across the floor of mouth. This fascia is located immediately beneath the oral mucosa, fusing centrally with the connective tissue on the tongue's ventral surface. The sublingual glands and submandibular ducts are enveloped by the fascial layer and anterior genioglossus fibers are suspended beneath it. Lingual nerve branches are located superficially on the ventral surface of the tongue, immediately deep to the fascia.

CONCLUSION:

The lingual frenulum is not a discrete midline structure. It is formed by dynamic elevation of a midline fold in the floor of mouth fascia. With this study, the clinical concept of ankyloglossia and its surgical management warrants revision. This article is protected by copyright. All rights reserved.

Exercises for TMJ pain

J Oral Rehabil. 2019 Jan 21. doi: 10.1111/joor.12770

Effects of exercise therapy on painful temporomandibular disorders.

Shimada A^{1,2,3}, Ishigaki S⁴, Matsuka Y⁵, Komiyama O⁶, Torisu T⁷, Oono Y⁸, Sato H⁹, Naganawa T¹⁰, Mine A⁴, Yamazaki Y¹¹, Okura K⁵, Sakuma Y¹², Sasaki K¹³.

Temporomandibular disorders (TMD) are common chronic musculoskeletal pain conditions among orofacial pain. Painful temporomandibular disorders (TMD) condition such as myalgia and arthralgia can be managed by exercise therapy. However, as it is hard to access actual effect of each modality that is included in an exercise therapy program due to multiple choice of the management modality, their efficacy remains controversial.

Therefore, this review focused on the effects of exercise therapy for the management of painful TMD.

The aims of this review were to summarize the effects of exercise therapy for major symptoms of painful TMD and to establish a guideline for the management of painful TMD, resulting in higher quality and reliability of dental treatment. In this review, exercise modalities are clearly defined as follows: mobilization exercise, muscle-strengthening exercise (resistance training), coordination exercise, and postural exercise. Furthermore, pain intensity and range of movements were focused as outcome parameters in this review.

Mobilization exercise including manual therapy, passive jaw mobilization with oral appliances, and voluntary jaw exercise appeared to be a promising option for painful TMD conditions such as myalgia and arthralgia.

This review addressed not only the effects of exercise therapy on various clinical conditions of painful TMD shown in the past, but also an urgent need for consensus among dentists and clinicians in terms of the management of each condition, as well as terminology. This article is protected by copyright. All rights reserved.

13 D. SLEEP**Bipolar disorder**

JAMA Psychiatry. 2018 Dec 12. doi: 10.1001/jamapsychiatry.2018.3546.

Real-time Mobile Monitoring of the Dynamic Associations Among Motor Activity, Energy, Mood, and Sleep in Adults With Bipolar Disorder.

Merikangas KR¹, Swendsen J^{2,3}, Hickie IB⁴, Cui L¹, Shou H⁵, Merikangas AK⁶, Zhang J⁷, Lamers F⁸, Crainiceanu C⁹, Volkow ND^{10,11}, Zipunnikov V⁹.

IMPORTANCE: Biologic systems involved in the regulation of motor activity are intricately linked with other homeostatic systems such as sleep, feeding behavior, energy, and mood. Mobile monitoring technology (eg, actigraphy and ecological momentary assessment devices) allows the assessment of these multiple systems in real time. However, most clinical studies of mental disorders that use mobile devices have not focused on the dynamic associations between these systems.

OBJECTIVES: To examine the directional associations among motor activity, energy, mood, and sleep using mobile monitoring in a community-identified sample, and to evaluate whether these within-day associations differ between people with a history of bipolar or other mood disorders and controls without mood disorders.

DESIGN, SETTING, AND PARTICIPANTS: This study used a nested case-control design of 242 adults, a subsample of a community-based sample of adults. Probandes were recruited by mail from the greater Washington, DC, metropolitan area from January 2005 to June 2013. Enrichment of the sample for mood disorders was provided by volunteers or referrals from the National Institutes of Health Clinical Center or by participants in the National Institute of Mental Health Mood and Anxiety Disorders Program. The inclusion criteria were the ability to speak English, availability to participate, and consent to contact at least 2 living first-degree relatives. Data analysis was performed from June 2013 through July 2018.

MAIN OUTCOMES AND MEASURES:

Motor activity and sleep duration data were obtained from minute-to-minute activity counts from an actigraphy device worn on the nondominant wrist for 2 weeks. Mood and energy levels were assessed by subjective analogue ratings on the ecological momentary assessment (using a personal digital assistant) by participants 4 times per day for 2 weeks.

RESULTS: Of the total 242 participants, 92 (38.1%) were men and 150 (61.9%) were women, with a mean (SD) age of 48 (16.9) years. Among the participants, 54 (22.3%) had bipolar disorder (25 with bipolar I; 29 with bipolar II), 91 (37.6%) had major depressive disorder, and 97 (40.1%) were controls with no history of mood disorders. A unidirectional association was found between motor activity and subjective mood level ($\beta = -0.018$, $P = .04$). Bidirectional associations were observed between motor activity ($\beta = 0.176$; $P = .03$) and subjective energy level ($\beta = 0.027$; $P = .03$) as well as between motor activity ($\beta = -0.027$; $P = .04$) and sleep duration ($\beta = -0.154$; $P = .04$). Greater cross-domain reactivity was observed in bipolar disorder across all outcomes, including motor activity, sleep, mood, and energy.

CONCLUSIONS AND RELEVANCE: These findings suggest that interventions focused on motor activity and energy may have greater efficacy than current approaches that target depressed mood; both active and passive tracking of multiple regulatory systems are important in designing therapeutic targets.

Sleep and cognitive function**Sleep Characteristics and Cognitive Function and Decline Among Older Adults**

V. Eloesa McSorley Yu Sun Bin Diane S Lauderdale

American Journal of Epidemiology, kwz037, <https://doi.org/10.1093/aje/kwz037>

Sleep laboratory studies find that restricted sleep duration leads to worse short-term cognition, especially memory.

Observational studies find associations between self-reported sleep duration or quality and cognitive function. However self-reported sleep characteristics may not be very accurate and misreporting could relate to cognition. In the Sleep Study of the National Social Life, Health, and Aging Project (NSHAP), a nationally-representative cohort of US older adults (2010–2015), we examine whether self-report and actigraph measured sleep are associated with cross-sectional cognitive function and 5-year cognitive decline.

Cognition is measured with the survey adaption of the multidimensional Montreal Cognitive Assessment (MoCA-SA). At baseline ($n = 759$), average MoCA-SA was 14.1 of 20 (SD, 3.6). In cross-sectional models, actigraph sleep disruption measures (wake after sleep onset, fragmentation, percent sleep, wake bouts) were associated with worse cognition. Sleep disruption measures were standardized, and estimates of association were similar (range, -0.37 to -0.59 MoCA-SA point per SD of disruption).

Actigraph sleep disruption measures were also associated with odds of 5-year cognitive decline (4 or more points), with wake after sleep onset having the strongest association (OR = 1.43, 95% CI: 1.04, 1.98). Longitudinal associations were generally stronger for men than women. Self-reported sleep showed little association with cognitive function.

Ischemic strokes

Stroke. 2019 Feb 12;STROKEAHA118023807. doi: 10.1161/STROKEAHA.118.023807

Sleep-Disordered Breathing Is Associated With Recurrent Ischemic Stroke.

Brown DL¹, Shafie-Khorassani F², Kim S², Chervin RD³, Case E^{1,4}, Morgenstern LB^{1,4}, Yadollahi A^{5,6}, Tower S⁷, Lisabeth LD^{1,4}.

Background and Purpose- Limited data are available about the relationship between sleep-disordered breathing (SDB) and recurrent stroke and mortality, especially from population-based studies, large samples, or ethnically diverse populations. **Methods-** In the BASIC project (Brain Attack Surveillance in Corpus Christ), we identified patients with ischemic stroke (2010-2015).

Subjects were offered screening for SDB with the ApneaLink Plus device, from which a respiratory event index (REI) ≥ 10 defined SDB. Demographics and baseline characteristics were determined from chart review and interview. Recurrent ischemic stroke was identified through active and passive surveillance. Cause-specific proportional hazards models were used to assess the association between REI (modeled linearly) and ischemic stroke recurrence (as the event of interest), and all-cause poststroke mortality, adjusted for multiple potential confounders.

Results- Among 842 subjects, the median age was 65 (interquartile range, 57-76), 47% were female, and 58% were Mexican American. The median REI was 14 (interquartile range, 6-26); 63% had SDB. SDB was associated with male sex, Mexican American ethnicity, being insured, nonsmoking status, diabetes mellitus, hypertension, lower educational attainment, and higher body mass index. Among Mexican American and non-Hispanic whites, 85 (11%) ischemic recurrent strokes and 104 (13%) deaths occurred, with a median follow-up time of 591 days. In fully adjusted models, REI was associated with recurrent ischemic stroke (hazard ratio, 1.02 [hazard ratio for one-unit higher REI, 95% CI, 1.01-1.03]), but not with mortality alone (hazard ratio, 1.00 [95% CI, 0.99-1.02]).

Conclusions- Results from this large population-based study show that SDB is associated with recurrent ischemic stroke, but not mortality. SDB may therefore represent an important modifiable risk factor for poor stroke outcomes.

15. VESTIBULAR

Questionable results from repositioning maneuvers

J Am Med Dir Assoc. 2019 Feb;20(2):224.e1-224.e23. doi: 10.1016/j.jamda.2018.11.019.

Poor Treatment Outcomes Following Repositioning Maneuvers in Younger and Older Adults With Benign Paroxysmal Positional Vertigo: A Systematic Review and Meta-analysis.

Sim E¹, Tan D², Hill K³.

OBJECTIVE:

This systematic review aimed to methodically review the available evidence on poor treatment outcomes after repositioning maneuver treatments in adults with BPPV and whether there are differences in the outcomes for older and younger adults.

DATA SOURCES:

Embase, CINAHL, Scopus, PsycINFO (Ovid), Central Register of Controlled Trials (CENTRAL), and PubMed.

REVIEW METHODS:

Studies were included if they were prospective experimental or observational studies with a minimal follow-up of 1 month; the subjects were at least 18 years old, had BPPV, and were treated with repositioning maneuvers. Studies were excluded if they were not available in English full text and if the outcomes used were confined to positional tests and subjective vertigo rating. Methodological quality was assessed using the Joanna Briggs Institute Critical Appraisal Checklists. Meta-analysis was performed to compare outcomes for younger and older (≥ 60 years) subjects where multiple studies utilized similar outcomes.

RESULTS:

Thirty-five studies were selected. The methodological quality was poor in more than 60% of the studies. Treatment efficacy, based on positional test results and symptom resolution and recurrence were the most common outcomes. Balance and quality of life measures improved after treatment but were not always normalized. Residual symptoms and psychoemotional consequences persisted in some subjects, despite BPPV resolution. Meta-analyses indicated poorer dynamic balance recovery and increased self-perceived level of handicap in the older group relative to the younger group.

CONCLUSIONS AND IMPLICATIONS:

Although repositioning maneuvers were effective in BPPV management, some patients experienced residual dizziness, postural instability, recurrences, and psychoemotional consequences at least 1 month after repositioning. Moreover, older adults experienced less improvements in dynamic balance and self-perceived handicap rating compared with younger people. These issues may further impact on older adults with BPPV physically and mentally and should be addressed by future better-quality research and interventions.

20 A. ROTATOR CUFF**Pain science helps**

Disabil Rehabil. 2019 Jan 11:1-10. doi: 10.1080/09638288.2018.1542037.

Perspectives of participants with rotator cuff-related pain to a neuroscience-informed pain education session: an exploratory mixed method study.

Sole G¹, Maćznik AK¹, Ribeiro DC¹, Jayakaran P¹, Wassinger CA².

PURPOSE:

To explore perceptions and initial outcomes of patients with rotator cuff-related pain to a pain education session.

MATERIALS AND METHODS:

Ten individuals with persistent rotator cuff-related pain (≥ 3 months duration) attended an individual pain education session. They completed patient-reported outcomes measures on a weekly basis, three weeks prior and three weeks following the session. Individual semi-structured interviews were conducted three weeks following the pain education. Interviews were recorded, transcribed verbatim, and analyzed using the General Inductive Approach.

RESULTS:

There were two over-arching key themes: firstly, 'Participants' Perspectives' of the session generated four themes: Improved understanding of 'the whole'; Mindful self-awareness; Taking charge; "The pain is still there". Their understanding of pain was reconceptualised, evident by their ability to describe the role of neurophysiological mechanisms, stress and general well-being towards their pain. The second over-arching key theme, 'Participants' Recommendations', had two themes: Integrating neuroscience with pathoanatomical knowledge and Educating other health professionals. Pain levels decreased post-pain education compared to pre-pain education.

CONCLUSIONS:

Following the pain education session, participants had greater understanding of factors influencing their shoulder pain. Pain education, in addition to pathoanatomical information may be useful as part of treatment for persistent rotator cuff-related pain.

22 A. SHOULDER IMPINGEMENT

Scapula upward rotation

J Orthop Sports Phys Ther. 2019 Jan 18:1-40. doi: 10.2519/jospt.2019.8590.

The Impact of Decreased Scapulothoracic Upward Rotation on Subacromial Proximities.

Lawrence RL¹, Braman JP², Ludewig PM¹.

BACKGROUND:

Decreased scapulothoracic upward rotation has been theorized to increase an individual's risk for rotator cuff compression by reducing the clearance for the tendons in the subacromial space (i.e. subacromial proximities). However, the impact of decreased scapulothoracic upward rotation on subacromial proximities has not been tested during dynamic in vivo shoulder motion.

OBJECTIVE:

Determine the impact of decreased scapulothoracic upward rotation on subacromial proximities.

METHODS:

Shoulder kinematics were quantified in 40 participants classified as having high or low scapulothoracic upward rotation during scapular plane abduction using single-plane fluoroscopy and 2D/3D shape-matching. Subacromial proximities were calculated as: 1) the normalized minimum distance between the coracoacromial arch and humeral rotator cuff insertion, and 2) the surface area of the humeral rotator cuff insertion in immediate proximity to the coracoacromial arch. The effect of decreased scapulothoracic upward rotation on subacromial proximities was assessed using two-factor mixed-model ANOVAs. The prevalence of contact between the coracoacromial arch and rotator cuff was also quantified.

RESULTS:

Subacromial distances were generally smallest below 70° humerothoracic elevation. With the arm at the side, the normalized minimum distance for participants in the low scapulothoracic upward rotation group was 34.8% smaller compared to those in the high upward rotation group (p=0.049). Contact between the coracoacromial arch and rotator cuff tendon occurred in 45% of participants.

CONCLUSION:

Decreased scapulothoracic upward rotation shifts the range of risk for subacromial rotator cuff compression to lower angles. However, the low prevalence of contact suggests subacromial rotator cuff compression may be less common than traditionally presumed. J Orthop Sports Phys Ther, Epub 18 Jan 2019. doi:10.2519/jospt.2019.8590.

Subacromial decompression guidelines

BMJ. 2019 Feb 6;364:l294. doi: 10.1136/bmj.l294.

Subacromial decompression surgery for adults with shoulder pain: a clinical practice guideline.

Vandvik PO^{1,2}, Lähdeoja T^{3,4}, Ardern C^{5,6}, Buchbinder R⁷, Moro J⁸, Brox JJ⁹, Burgers J^{10,11}, Hao Q^{12,13}, Karjalainen T⁷, van den Bekerom M¹⁴, Noorduyn J¹⁴, Lytvyn L¹³, Siemieniuk RAC¹³, Albin A¹⁵, Shunjie SC¹⁶, Fisch F¹⁷, Proulx L¹⁸, Guyatt G¹³, Agoritsas T¹⁹, Poolman RW²⁰.
CLINICAL QUESTION:

Do adults with atraumatic shoulder pain for more than 3 months diagnosed as subacromial pain syndrome (SAPS), also labelled as rotator cuff disease, benefit from subacromial decompression surgery? This guideline builds on to two recent high quality trials of shoulder surgery.

CURRENT PRACTICE:

SAPS is the common diagnosis for shoulder pain with several first line treatment options, including analgesia, exercises, and injections. Surgeons frequently perform arthroscopic subacromial decompression for prolonged symptoms, with guidelines providing conflicting recommendations.

RECOMMENDATION:

The guideline panel makes a strong recommendation against surgery.

HOW THIS GUIDELINE WAS CREATED:

A guideline panel including patients, clinicians, and methodologists produced this recommendation in adherence with standards for trustworthy guidelines and the GRADE system. The recommendation is based on two linked systematic reviews on (a) the benefits and harms of subacromial decompression surgery and (b) the minimally important differences for patient reported outcome measures. Recommendations are made actionable for clinicians and their patients through visual overviews. These provide the relative and absolute benefits and harms of surgery in multilayered evidence summaries and decision aids available in MAGIC (www.magicapp.org) to support shared decisions and adaptation.

THE EVIDENCE:

Surgery did not provide important improvements in pain, function, or quality of life compared with placebo surgery or other options. Frozen shoulder may be more common with surgery.

UNDERSTANDING THE RECOMMENDATION:

The panel concluded that almost all informed patients would choose to avoid surgery because there is no benefit but there are harms and it is burdensome. Subacromial decompression surgery should not be offered to patients with SAPS. However, there is substantial uncertainty in what alternative treatment is best.

Subacromial decompression surgery not effective

Br J Sports Med. 2019 Jan 15. pii: bjsports-2018-100486. doi: 10.1136/bjsports-2018-100486.

Subacromial decompression surgery for adults with shoulder pain: a systematic review with meta-analysis.

Lähdeoja T^{1,2}, Karjalainen T^{1,3}, Jokihaara J^{1,4}, Salamh P⁵, Kavaja L^{6,7}, Agarwal A⁸, Winters M⁹, Buchbinder R³, Guyatt G¹⁰, Vandvik PO^{11,12}, Arden CL^{13,14}.

OBJECTIVE:

To determine the benefits and harms of subacromial decompression surgery in adult patients with subacromial pain syndrome lasting for more than 3 months.

DESIGN:

Systematic review with meta-analysis.

MAIN OUTCOME MEASURES:

Pain, physical function and health-related quality of life.

DATA SOURCES:

Systematic searches for benefits and harms were conducted to 23 July 2018 in MEDLINE, Embase, PubMed, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Cumulative Index to Nursing and Allied Health Literature, Physiotherapy Evidence Database, ClinicalTrials.gov, WHO International Clinical Trials Registry Platform, Database of Abstracts of Reviews of Effects, and Health Technology Assessment.

ELIGIBILITY CRITERIA FOR SELECTING STUDIES:

Randomised controlled trials comparing subacromial decompression surgery for subacromial pain syndrome with any other treatment(s). For harms, we included prospective cohort studies.

REVIEW METHODS:

Two reviewers independently determined eligibility, extracted the data and assessed the risk of bias of eligible studies. Thirty patients seeking primary or outpatient care for subacromial pain syndrome and a parallel guideline committee (*BMJ* Rapid Recommendations) provided input regarding systematic review design and interpretation.

RESULTS:

There was high certainty evidence of no additional benefit of subacromial decompression surgery over placebo surgery in reducing pain at 1 year following surgery (mean difference [MD] -0.26, 95% CI -0.84 to 0.33, minimally important difference [MID] 1.5) or improving physical function at 1-2 years (MD 2.8, 95% CI -1.4 to 6.9, MID 8.3). There was moderate certainty evidence for no additional benefit of subacromial decompression surgery on health-related quality of life at 1 year (MD -0.03 points, 95% CI -0.11 to 0.06, MID 0.07). There was moderate certainty evidence for six serious harms per 1000 (95% CI 5 to 7) patients undergoing subacromial decompression.

CONCLUSION:

Subacromial decompression surgery provided no important benefit compared with placebo surgery or exercise therapy, and probably carries a small risk of serious harms.

28. HIP REPLACEMENTS

How long will they last – 25 years

How long does a hip replacement last? A systematic review and meta-analysis of case series and national registry reports with more than 15 years of follow-up

Jonathan T Evans, Jonathan P Evans, Robert W Walker, Ashley W Blom, Michael R Whitehouse, Adrian Sayers**

Summary

Background Total hip replacement is a common and highly effective operation. All hip replacements would eventually fail if in situ long enough and it is important that patients understand when this might happen. We aimed to answer the question: how long does a hip replacement last?

Methods We did a systematic review and meta-analysis with a search of MEDLINE and Embase from the start of records to Sept 12, 2017. We included articles reporting 15-year survival of primary, conventional total hip replacement constructs in patients with osteoarthritis. We extracted survival and implant data and used all-cause construct survival as the primary outcome. We also reviewed reports of national joint replacement registries, and extracted data for a separate analysis. In the meta-analyses, we weighted each series and calculated a pooled survival estimate for each source of data. This study was registered with PROSPERO (CRD42018085642).

Findings We identified 140 eligible articles reporting 150 series, and included 44 of these series (13 212 total hip placements). National joint replacement registries from Australia and Finland provided data for 92 series (215 676 total hip replacements). The 25-year pooled survival of hip replacements from case series was 77·6% (95% CI 76·0–79·2) and from joint replacement registries was 57·9% (95% CI 57·1–58·7).

Interpretation Assuming that estimates from national registries are less likely to be biased, patients and surgeons can expect a hip replacement to last 25 years in around 58% of patients.

32 A. KNEE/ACL

Long term problems

Arthritis Care Res (Hoboken). 2019 Feb 14. doi: 10.1002/acr.23854.

Patient-reported outcomes 1 to 5 years after ACL reconstruction: effect of combined injury, and associations with MRI-defined osteoarthritis features.

Patterson BE¹, Culvenor AG^{1,2}, Barton CJ¹, Guermazi A³, Stefanik JJ⁴, Crossley KM¹.

OBJECTIVE:

Persistent symptoms and poor quality of life (QoL) are common following anterior cruciate ligament reconstruction (ACLR). We aimed to determine the influence of a combined ACL injury (i.e., concomitant meniscectomy and/or arthroscopic chondral defect at the time of ACLR and/or secondary injury/surgery to ACLR knee) and MRI-defined cartilage defects, bone marrow lesions (BMLs) and meniscal lesions on patient-reported outcomes (PROs) 1- to 5-years post-ACLR. **METHODS:** 80 participants (50 men) aged 32±14 years completed the Knee injury and OA Outcome Score (KOOS) and International Knee Documentation Committee (IKDC) questionnaire, and 3T MRI assessment at 1- and 5-years post-ACLR. Median PRO scores were compared between isolated and combined ACL injuries, and with published normative values. Multivariate regression evaluated the association between compartment-specific MRI cartilage, BMLs and meniscal lesions, and PROs at 1- and 5-years.

RESULTS:

Individuals with a combined injury had significantly worse KOOS-Sport, and IKDC scores at 1-year, and worse KOOS-Pain, KOOS-Symptoms, KOOS-QoL, and IKDC scores at 5-years, compared to those with an isolated injury. Whilst no feature on MRI was associated with PROs cross-sectionally at 1-year, patellofemoral cartilage defects at 1-year were significantly associated with worse 5-year KOOS-Symptoms (β : -9.79; 95%CI:-16.67, -2.91), KOOS-Sport (β : -7.94; 95%CI:-15.27, -0.61), KOOS-QoL (β : -8.29; 95%CI:-15.28, -1.29) and IKDC (β : -4.79; 95%CI:-9.34, -0.24). Patellofemoral cartilage defects at 5-years were also significantly associated with worse 5-year KOOS-Symptoms (β : -6.86; 95%CI:-13.49, -0.24) and KOOS-QoL (β : -11.71; 95%CI:-19.08, -4.33).

CONCLUSION:

Combined injury, and patellofemoral cartilage defects on MRI are associated with poorer long-term outcomes. Clinicians should be vigilant to these individuals, who may benefit from targeted interventions to improve QoL and optimise symptoms. This article is protected by copyright. All rights reserved.

35. KNEE/TOTAL

How long will they last?

How long does a knee replacement last? A systematic review and meta-analysis of case series and national registry reports with more than 15 years of follow-up

Jonathan T Evans, Robert W Walker, Jonathan P Evans, Ashley W Blom, Adrian Sayers, Michael R Whitehouse**

Summary

Background Knee replacements are the mainstay of treatment for end-stage osteoarthritis and are effective. Given time, all knee replacements will fail and knowing when this failure might happen is important. We aimed to establish how long a knee replacement lasts.

Methods In this systematic review and meta-analysis, we searched MEDLINE and Embase for case series and cohort studies published from database inception until July 21, 2018. Articles reporting 15 year or greater survival of primary total knee replacement (TKR), unicondylar knee replacement (UKR), and patellofemoral replacements in patients with osteoarthritis were included. Articles that reviewed specifically complex primary surgeries or revisions were excluded. Survival and implant data were extracted, with all-cause survival of the knee replacement construct being the primary outcome. We also reviewed national joint replacement registry reports and extracted the data to be analysed separately. In the meta-analysis, we weighted each series and calculated a pooled survival estimate for each data source at 15 years, 20 years, and 25 years, using a fixed-effects model. This study is registered with PROSPERO, number CRD42018105188.

Findings From 4363 references found by our initial search, we identified 33 case series in 30 eligible articles, which reported all-cause survival for 6490 TKRs (26 case series) and 742 UKRs (seven case series). No case series reporting on patellofemoral replacements met our inclusion criteria, and no case series reported 25 year survival for TKR. The estimated 25 year survival for UKR (based on one case series) was 72·0% (95% CI 58·0–95·0). Registries contributed 299291 TKRs (47 series) and 7714 UKRs (five series). The pooled registry 25 year survival of TKRs (14 registries) was 82·3% (95% CI 81·3–83·2) and of UKRs (four registries) was 69·8% (67·6–72·1).

Interpretation Our pooled registry data, which we believe to be more accurate than the case series data, shows that approximately 82% of TKRs last 25 years and 70% of UKRs last 25 years. These findings will be of use to patients and health-care providers; further information is required to predict exactly how long specific knee replacements will last.

37. OSTEOARTHRITIS/KNEE**Hip exercise helps knee OA**

Br J Sports Med. 2019 Feb 6. pii: bjsports-2018-099683. doi: 10.1136/bjsports-2018-099683.

Does adding hip exercises to quadriceps exercises result in superior outcomes in pain, function and quality of life for people with knee osteoarthritis? A systematic review and meta-analysis.

Hislop AC^{1,2}, Collins NJ², Tucker K³, Deasy M², Semciw AI^{2,4,5,6}.

OBJECTIVES:

To determine, in people with knee osteoarthritis (KOA): i) the effectiveness of adding hip strengthening exercises to quadriceps exercises and ii) the type of hip strengthening exercise with the greatest evidence for improving pain, function and quality of life.

DESIGN:

Systematic review with meta-analysis.

DATA SOURCES:

Medline, Embase, Cochrane, CINAHL and SportDiscus databases were searched from inception to January 2018.

ELIGIBILITY CRITERIA FOR SELECTING STUDIES:

Randomised controlled trials investigating the effect of adding hip exercises to quadriceps exercises in people with KOA on pain, function and/or quality of life were included. *Three subgroups of hip exercises were included:* resistance, functional neuromuscular or multimodal exercise.

RESULTS:

Eight studies were included. Pooled data provide evidence that combined hip and quadriceps exercise is significantly more effective than quadriceps exercise alone for improving walking function (standardised mean difference -1.06, 95% CI -2.01 to -0.12), but not for outcomes of pain (-0.09, 95% CI -0.96 to 0.79), patient-reported function (-0.74, 95% CI -1.56 to 0.08) or stair function (-0.7, 95% CI -1.67 to 0.26). Subgroup analyses reveal that hip resistance exercises are more effective than functional neuromuscular exercises for improving pain ($p < 0.0001$) and patient-reported function ($p < 0.0001$). Multimodal exercise is no more effective than quadriceps strengthening alone for pain (0.13, 95% CI -0.31 to 0.56), patient-reported function (-0.15, 95% CI -0.58 to 0.29) or stair function (0.13, 95% CI -0.3 to 0.57).

CONCLUSION:

Walking improved after the addition of hip strengthening to quadriceps strengthening in people with KOA. The addition of resistance hip exercises to quadriceps resulted in greater improvements in patient-reported pain and function.

45 A. MANUAL THERAPY LUMBAR & GENERAL**MDT for LBP**

J Orthop Sports Phys Ther. 2019 Feb 13:1-40. doi: 10.2519/jospt.2019.8734.

Treatment Effect Sizes for Pain and Disability Are Moderated by the Delivery Approach for Mechanical Diagnosis and Therapy in a Population With Low Back Pain: A Systematic Review With a Meta-Regression Approach.

Halliday MH^{1,2}, Garcia AN³, Amorim AB², Machado GC⁴, Hayden JA⁵, Pappas E², Ferreira PH², Hancock MJ⁶.

STUDY DESIGN:

Systematic review.

BACKGROUND:

Mechanical Diagnosis and Therapy (MDT) is a treatment-based classification system founded on three core principles; classification into diagnostic syndromes, classification-based intervention and appropriate application of force. Many randomized controlled trials have investigated the efficacy of MDT for low back pain (LBP); however, results have varied. The inconsistent delivery of MDT across trials may explain the different findings.

OBJECTIVES:

To compare treatment effect sizes for pain or disability between trials that delivered MDT consistent with the core principles of the approach to trials that met some or none of these principles.

METHODS:

Databases were searched from inception to June-2018, using a sensitive search strategy for studies that delivered MDT compared to a non-pharmacological conservative control in patients with LBP and reported outcomes of pain or disability. Studies were classified as 'adherent' meeting the core principles, or 'non-adherent' delivery of MDT using some or none of the principles. Data were extracted by two independent reviewers. Meta-regression procedures were used to analyze the effect of delivery mode on clinical outcomes adjusting for covariates of symptom duration (less than or greater than three-months) and control intervention (minimal or active).

RESULTS:

Studies classified as 'adherent' to the MDT approach showed greater reduction in pain and disability of 15.2 [95% CI 7.6 to 22.7] and 11.7 [95% CI 5.4 to 18.0] points respectively on a 100-point scale compared to 'non-adherent' trials.

CONCLUSION:

This review provides preliminary evidence that treatment effects of MDT are greater when the core principles are followed.

LEVEL OF EVIDENCE:

Therapy, level 1a. J Orthop Sports Phys Ther, Epub 13 Feb 2019. doi:10.2519/jospt.2019.8734.

45 D. MANUAL THERAPY EXTREMITIES**MT and Pain Science for LE tendinopathies**

J Orthop Sports Phys Ther. 2019 Feb 13:1-26. doi: 10.2519/jospt.2019.8600

Potential Nervous System Sensitization in Patients With Persistent Lower Extremity Tendinopathies: 3 Case Reports.

Jayaseelan DJ¹, Weber MJ¹, Jonely H¹.

STUDY DESIGN:

Case report.

BACKGROUND:

Tendinopathy is a condition often associated with pain, functional and sport performance limitations. While targeted exercise prescriptions are often effective, many patients with tendinopathy develop persistent symptoms. Emerging evidence suggests a possible link between nervous system sensitization and tendinopathy. If so, identifying and treating specific pain mechanisms may improve outcomes.

CASE DESCRIPTION:

Three patients were seen in physical therapy for complaints of ongoing chronic tendon pain and self-reported disability, despite being treated previously and receiving evidence-informed care. Upon examination, each demonstrated signs consistent with possible dysfunction of central pain mechanisms. Joint mobilization, pain neuroscience education, and aerobic exercise were primary interventions in each case to decrease pain and improve function.

OUTCOMES:

Each of the patients were treated for five sessions over the course of eight weeks. Clinically significant improvement was noted in measures of pain, self-reported function and pressure pain thresholds. At discharge all patients were able to run without symptoms and improvement was maintained at a one-year follow up period.

DISCUSSION:

Tendinopathy, while often described as local pain and dysfunction, may be associated with dysfunction of the nervous system. Identifying and treating pain mechanisms in addition to relevant impairments may be an appropriate intervention approach for individuals with tendinopathy.

LEVEL OF EVIDENCE:

Therapy, Level 4. J Orthop Sports Phys Ther, Epub 13 Feb 2019. oi:10.2519/jospt.2019.8600.

MT for frozen shoulder

J Orthop Sports Phys Ther. 2019 Jan 18:1-24. doi: 10.2519/jospt.2019.8194.

A 12-Week Tailored Manual Therapy and Home Stretching Program Based on Level of Irritability and Range of Motion Impairments in Patients With Primary Frozen Shoulder Contracture Syndrome: A Case Series With 9-Months Follow-Up.

Dueñas L¹, Balasch-Bernat M¹, Aguilar-Rodríguez M¹, Struyf F², Meeus M^{2,3}, Lluch E^{1,3,4}.

STUDY DESIGN:

Case series.

BACKGROUND:

Manual therapy has been demonstrated to reduce pain and improve function in patients with frozen shoulder contracture syndrome (FSCS), but no evidence exists to support one form of manual therapy over another. The purpose of this case series was to describe both short and long-term outcomes after a manual therapy program and home stretching exercises based on specific impairments in shoulder mobility and level of tissue irritability in patients with FSCS.

CASE DESCRIPTION:

Eleven patients with primary FSCS were treated with an individually tailored multimodal manual therapy approach once weekly for 12 visits coupled with home stretching exercises once a day, five days per week. Pain, disability, range of motion (ROM) and muscle strength of the affected shoulder were assessed at baseline, post-treatment, 6-months and 9-months.

OUTCOMES:

Significant improvements in self-reported pain, disability, shoulder ROM (active abduction and active abduction with overpressure, active external rotation and active external rotation with overpressure and isolated glenohumeral active abduction) and strength (shoulder flexion and internal rotation) were reported following treatment with impairment- and tissue irritability-based manual physical therapy and stretching exercises. Additionally, 4 of 11 of the patients showed pain improvements exceeding the minimal clinically important difference (MCID) on visual analogue scale (VAS) post-intervention and 8 of 11 on VAS at 6 and 9-months. Moreover, 7 of 11 of the patients showed improvements in Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire scores exceeding the MCID post-intervention and at 6-months, and 8 of 11 exceeded the MCID at 9-months.

DISCUSSION:

Clinically meaningful changes in shoulder pain and disability, ROM, or muscle strength were observed in eleven patients with primary FSCS treated with an individually tailored approach of both manual therapy techniques and stretching exercises, while accounting for tissue irritability. Randomized controlled trials are required to determine the effectiveness of this multimodal approach for the management of individuals with FSCS.

LEVEL OF EVIDENCE:

Therapy, level 4. J Orthop Sports Phys Ther, Epub 16 Jan 2019. doi:10.2519/jospt.2019.8194.

MT helps impingement syndrome

Physiother Res Int. 2019 Jan 25:e1768. doi: 10.1002/pri.1768.

Effect of manual physiotherapy in homogeneous individuals with subacromial shoulder impingement: A randomized controlled trial.

Land H¹, Gordon S², Watt K³.

OBJECTIVE:

To compare the effect of specific interventions aimed at (1) the upper thoracic spine (passive mobilization) and (2) the posterior shoulder (massage, passive mobilization, and stretching) to (3) an active control intervention in a homogeneous group with extrinsic subacromial shoulder impingement (SSI).

STUDY DESIGN:

Single-centre, prospective, double-blinded, randomized controlled trial.

METHOD:

Eligible individuals with clearly defined extrinsic SSI were randomized to each group. Treatment duration was 12 consecutive weeks consisting of nine treatments over 6 weeks, followed by 6 weeks when one home exercise was performed daily. Outcomes included (1) active thoracic flexion/extension range of motion, (2) passive glenohumeral internal rotation and posterior shoulder range, (3) pain rating, and (4) shoulder pain and function disability index. Data were analysed at baseline, 6 and 12 weeks. Shoulder pain and function disability index scores were investigated via email 6 months after commencement of treatment.

RESULTS:

Twenty participants completed treatment in each group. No differences were identified between groups at baseline. Upper thoracic and posterior shoulder interventions, with a targeted home exercise, both significantly decreased pain and increased function scores and increased posterior shoulder range compared with active control at 12 weeks, and 6 months following cessation of the trial.

CONCLUSION:

Manual therapy treatment that addresses these extrinsic factors, of thoracic spine or posterior shoulder tightness, decreases the signs and symptoms of SSI. The trial is registered with the Australian New Zealand Clinical Trials Registry (ANZCTR; 12615001303538).

49. STRETCHING

Endogenous factors in stretching

Scand J Pain. 2019 Jan 30. pii: /j/sjpain.ahead-of-print/sjpain-2018-0334/sjpain-2018-0334.xml.
doi: 10.1515/sjpain-2018-0334.

Muscle stretching - the potential role of endogenous pain inhibitory modulation on stretch tolerance.

Støve MP¹, Hirata RP², Palsson TS².

Background and aims The effect of stretching on joint range of motion is well documented and is primarily related to changes in the tolerance to stretch, but the mechanisms underlying this change are still largely unknown. The aim of this study was to investigate the influence of a remote, painful stimulus on stretch tolerance.

Methods Thirty-four healthy male subjects were recruited and randomly assigned to an experimental pain group (n=17) or a control group (n=17). Passive knee extension range of motion, the activity of hamstring muscles and passive resistive torque were measured with subjects in a seated position. Three consecutive measures were performed with a 5-min interval between. A static stretch protocol was utilized in both groups to examine the effect of stretching and differences in stretch tolerance between groups. Following this, the pain-group performed a cold pressor test which is known to engage the endogenous pain inhibitory system after which measurements were repeated.

Results A significant increase in knee extension range of motion was found in the pain group compared with controls (ANCOVA: $p < 0.05$). No difference was found in muscle activity or passive resistive torque between groups (ANCOVA $p > 0.091$).

Conclusions Passive knee extension range of motion following stretching increased when following a distant, painful stimulus, potentially engaging the endogenous pain inhibitory systems. Current findings indicate a link between increased tolerance to stretch and endogenous pain inhibition.

Implications The current findings may have implications for clinical practice as they indicate that a distant painful stimulus can influence range of motion in healthy individuals. This implies that the modulation of pain has significance for the efficacy of stretching which is important knowledge when prescribing stretching as part of rehabilitation.

50 B. PNF**Vs. normal stretching**

Physiother Theory Pract. 2019 Feb;35(2):109-129. doi: 10.1080/09593985.2018.1440677. Epub 2018 Feb 23.

Efficacy of proprioceptive neuromuscular facilitation compared to other stretching modalities in range of motion gain in young healthy adults: A systematic review.

Wanderley D¹, Lemos A¹, Moretti E¹, Barros MMB¹, Valença MM², de Oliveira DA¹.
The objective of this study was to evaluate the efficacy of proprioceptive neuromuscular facilitation (PNF) on range of motion (ROM) gain in young healthy adults.

We performed a systematic review of randomized controlled trials and quasi-randomized trials, including young healthy adults. The interventions were: PNF compared with different PNF techniques, control, other muscle stretching exercises and musculoskeletal manipulations. The outcome measures were: articular ROM and adverse effects. The final number of included studies was 46, involving 1,864 adults. There was difference on ROM comparing assisted hold-relax (HR) on diagonal plane to control, based on very low-quality evidence. There was also difference on ROM comparing assisted HR to self-HR; self-contract-relax (CR) to control; assisted CR contract to control; and assisted HR contract to control, based on low-quality evidence.

Moderate-quality evidence shows that results differ between self HR and control (SMD: 0.95; 95%CI 0.03, 1.86; I²49%; P = 0.16) in terms of ROM gain. When performing the other comparisons, the results were based on low or very low-quality evidence and do not allow to state if PNF is more or less effective than other stretches for improving ROM in healthy young adults. No adverse effects were mentioned.

57. GAIT**PFM gait retraining**

Phys Ther Sport. 2019 Jan 18;36:92-100. doi: 10.1016/j.pts.2019.01.006.

Effects of three gait retraining techniques in runners with patellofemoral pain.

Dos Santos AF¹, Nakagawa TH², Lessi GC³, Luz BC³, Matsuo HTM³, Nakashima GY⁴, Maciel CD⁴, Serrão FV³.

OBJECTIVES:

Analyze the effects of 3 gait retraining: forefoot landing (FFOOT), 10% step rate increase (SR10%) and forward trunk lean (FTL) on lower limb biomechanics and clinical measurements in patellofemoral pain (PFM) runners.

DESIGN:

Case series report.

SETTINGS:

Biomechanical laboratory and treadmill running.

PARTICIPANTS:

Eighteen recreational PFM runners randomized in 3 groups.

MAIN OUTCOME MEASURES:

Lower limb kinematics and muscle activation were assessed at baseline and 2-week post-training. Pain intensity and function limitation, measured by AKPS (Anterior Knee Pain Scale) and LEFS (Lower Extremity Functional Scale) assessed at baseline, post-training and 6-month follow-up. Repeated measures analysis of variance was used to compare the effects of gait retraining.

RESULTS:

FFOOT and FTL increased the AKPS score at post-training ($P = .001$; $P = .008$) and 6-month follow-up ($P < .001$; $P < .001$). SR10% increased the AKPS score from baseline to 6-month follow-up ($P = .006$). Pain and LEFS score were improved after gait retraining regardless group. FFOOT presented greater gastrocnemius ($P = .037$) and rectus femoris pre-activation ($P = .006$) at post-retraining session. Gait retraining reduced the muscle activity during stance phase and increased during the late-swing regardless group.

CONCLUSION:

The three techniques presented clinical benefits, improvement of pain symptoms and functional scores, was not accompanied with significant biomechanics differences that could entirely explain this clinical improvement after the intervention.

59. PAIN**Central sensitization**

J Psychosom Res. 2019 Feb;117:32-40. doi: 10.1016/j.jpsychores.2018.12.010. Epub 2018 Dec 25.

Central sensitization in chronic pain and medically unexplained symptom research: A systematic review of definitions, operationalizations and measurement instruments.

den Boer C¹, Dries L², Terluin B², van der Wouden JC², Blankenstein AH², van Wilgen CP³, Lucassen P⁴, van der Horst HE².

OBJECTIVE:

Central sensitization (CS), a mechanism explaining the persistence of symptoms, has been the focus of many research projects. Explanations given to patients with chronic pain are often based on this mechanism. It is hypothesized that CS also plays an important role in the persistence of medically unexplained symptoms (MUS). However, definitions and operationalizations of CS vary. We conducted a systematic review of definitions, operationalizations and measurement instruments of CS.

METHODS:

We searched in PubMed, EMBASE, PsycINFO, Cinahl and The Cochrane Library till September 2017 and included papers that addressed CS in relation to chronic pain and/or MUS. Two reviewers independently selected, analysed and classified information from the selected publications. We performed a thematic analysis of definitions and operationalizations. We listed the measurement instruments.

RESULTS:

We included 126 publications, 79 publications concerned chronic pain, 47 publications concerned MUS. Definitions of CS consistently encompass the theme hyperexcitability of the central nervous system (CNS). Additional themes are variably present: CNS locations, nature of sensory input, reduced inhibition and activation and modulation of the NDMA receptor. Hyperalgesia and allodynia are widely mentioned as operationalizations of CS. Quantitative sensory testing (QST) and (f)MRI are the most reported measurement instruments.

CONCLUSIONS:

There is consensus that hyperexcitability is the central mechanism of CS. Operationalizations are based on this mechanism and additional components. There are many measurement instruments available, whose clinical value has still to be determined. There were no systematic differences in definitions and operationalizations between the publications addressing MUS and those addressing chronic pain.

Laterality judgements

Physiother Theory Pract. 2019 Jan 27:1-21. doi: 10.1080/09593985.2019.1570575

Laterality judgment performance between people with chronic pain and pain-free individuals. A systematic review and meta-analysis.

Ravat S PT, MSc¹, Olivier B PT, PhD¹, Gillion N PT, MSc¹, Lewis F PT, MSc¹.

BACKGROUND:

Treatment of chronic pain is challenging and there is often failure of recovery, with the need to look at different approaches in its management. Central mechanisms may contribute to chronicity (i.e. disturbance in body schema). Laterality judgment is dependent on body schema and can determine affected central mechanisms.

OBJECTIVE:

This review aimed to determine whether there are laterality judgment differences between chronic pain and pain-free individuals.

METHODS:

A search was done of various databases, using combinations of keywords, and reference lists of full-text articles. Articles were considered from inception until February 2018. Eighteen studies were included. Methodological quality was assessed by two reviewers using the JBI Critical Appraisal Checklist. Studies were analyzed broadly then divided into subgroups. A meta-analysis or narrative review was done.

RESULTS:

There was high heterogeneity for broad outcome measures, complex regional pain syndrome (CRPS1), and upper limb pain. Analysis for accuracy in lower limb conditions showed a medium significant effect size (0.59) and significant 95%CI (0.11-1.07). Low back and cervical pain results could not be pooled into meta-analysis (due to different methods of reporting).

CONCLUSIONS:

Laterality judgment impairment was shown in CPRS1, upper limb pain, hand and wrist pain, carpal-tunnel syndrome, facial pain, knee osteoarthritis, and leg pain. No conclusions could be drawn in low back pain, due to the low-quality evidence and differing results. There was no impairment in whiplash-associated disorders and nonspecific cervical pain showed conflicting evidence.

Kensio taping helps

Clin Rehabil. 2019 Feb 4;269215519826267. doi: 10.1177/0269215519826267

Evidence for kinesio taping in management of myofascial pain syndrome: a systematic review and meta-analysis.

Zhang XF¹, Liu L², Wang BB¹, Liu X³, Li P⁴.

OBJECTIVE::

The aim of this study was to evaluate the effectiveness of kinesio taping for managing myofascial pain syndrome in terms of pain intensity, pressure pain threshold, range of motion, muscle strength and disability.

DATA SOURCES::

PubMed, EBSCO, ScienceDirect, Web of Science, Cochrane Library and Physiotherapy Evidence Databases were searched from database inception to November 2018.

METHODS::

Randomized controlled trials (RCTs) that used kinesio taping as the main treatment protocol for participants diagnosed with myofascial pain syndrome were included. Two reviewers independently screened articles, scored methodological quality using Cochrane risk-of-bias tool and extracted data. The primary outcomes were pain intensity, pressure pain threshold and range of motion at post-intervention and follow-up. The secondary outcomes were muscle strength and disability at post-intervention and follow-up.

DATA SYNTHESIS::

Meta-analyses of 20 RCTs involving 959 patients showed that kinesio taping was more effective than other treatments in reducing pain intensity (mean difference (MD) = 1.06 cm, 95% confidence interval (CI): -1.66 to -0.46 cm, P = 0.006) and increasing range of motion (standardized mean difference (SMD) = 0.26, 95% CI: 0.09 to 0.43, P = 0.003) at post-intervention. Kinesio taping was also superior to other non-invasive techniques in relieving pain intensity at follow-up (MD = -0.68 cm, 95% CI: -1.22 to -0.13 cm, P = 0.02). However, there was no detectable effect on disability or function.

CONCLUSION::

Statistical evidence showed that kinesio taping could be recommended to relieve pain intensity and range of motion for patients with myofascial pain syndrome at post-intervention.

62 A. NUTRITION/VITAMINS**Impact of artificially sweetened beverages****Artificially Sweetened Beverages and Stroke, Coronary Heart Disease, and All-Cause Mortality in the Women's Health Initiative****Yasmin Mossavar-Rahmani Barbara V. Howard**2019<https://doi.org/10.1161/STROKEAHA.118.023100>Stroke. 2019;0**Background and Purpose—**

We examine the association between self-reported consumption of artificially sweetened beverages (ASB) and stroke and its subtypes, coronary heart disease, and all-cause mortality in a cohort of postmenopausal US women.

Methods—

The analytic cohort included 81 714 women from the Women's Health Initiative Observational Study, a multicenter longitudinal study of the health of 93 676 postmenopausal women of ages 50 to 79 years at baseline who enrolled in 1993 to 1998. This prospective study had a mean follow-up time of 11.9 years (SD of 5.3 years.) Participants who completed a follow-up visit 3 years after baseline were included in the study.

Results—

Most participants (64.1%) were infrequent consumers (never or <1/week) of ASB, with only 5.1% consuming ≥ 2 ASBs/day. In multivariate analyses, those consuming the highest level of ASB compared to never or rarely (<1/wk) had significantly greater likelihood of all end points (except hemorrhagic stroke), after controlling for multiple covariates. Adjusted models indicated that hazard ratios and 95% confidence intervals were 1.23 (1.02–1.47) for all stroke; 1.31 (1.06–1.63) for ischemic stroke; 1.29 (1.11–1.51) for coronary heart disease; and 1.16 (1.07–1.26) for all-cause mortality. In women with no prior history of cardiovascular disease or diabetes mellitus, high consumption of ASB was associated with more than a 2-fold increased risk of small artery occlusion ischemic stroke hazard ratio =2.44 (95% confidence interval, 1.47–4.04.) High consumption of ASBs was associated with significantly increased risk of ischemic stroke in women with body mass index ≥ 30 ; hazard ratio =2.03 (95% confidence interval, 1.38–2.98).

Conclusions—

Higher intake of ASB was associated with increased risk of stroke, particularly small artery occlusion subtype, coronary heart disease, and all-cause mortality. Although requiring replication, these new findings add to the potentially harmful association of consuming high quantities of ASB with these health outcomes.