

2. LBP

Trying to limit LBP

PLoS Med. 2019 Aug 16;16(8):e1002898. doi: 10.1371/journal.pmed.1002898. eCollection 2019 Aug.

Early occupational intervention for people with low back pain in physically demanding jobs: A randomized clinical trial.

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BACKGROUND: Occupational medicine seeks to reduce sick leave; however, evidence for an add-on effect to usual care is sparse. The objective of the GOBACK trial was to test whether people with low back pain (LBP) in physically demanding jobs and at risk of sick leave gain additional benefit from a 3-month complex intervention that involves occupational medicine consultations, a work-related evaluation and workplace intervention plan, an optional workplace visit, and a physical activity program, over a single hospital consultation and an MRI.

METHODS AND FINDINGS: We enrolled people from the capital region of Denmark to an open-label, parallel-group randomized controlled trial with a superiority design from March 2014 through December 2015. In a hospital setting 305 participants (99 women) with LBP and in physically demanding jobs were randomized to occupational intervention (n = 153) or no additional intervention (control group; n = 152) added to a single hospital consultation giving a thorough explanation of the pain (i.e., clinical examination and MRI) and instructions to stay active and continue working. Primary outcome was accumulated sick leave days due to LBP during 6 months. Secondary outcomes were changes in neuropathic pain (painDETECT questionnaire [PDQ]), pain 0-10 numerical rating scale (NRS), Fear-Avoidance Beliefs Questionnaire (FABQ), Roland-Morris Disability Questionnaire (RMDQ), Short Form Health Survey (SF-36) for physical and mental health-related quality of life (HRQoL), and self-assessed ability to continue working (range 0-10). An intention-to-treat analysis of sick leave at 6 months showed no significant difference between groups (mean difference in days suggestively in favor of no additional intervention: 3.50 [95% CI -5.08 to 12.07], P = 0.42). Both groups showed significant improvements in average pain score (NRS), disability (RMDQ), fear-avoidance beliefs about physical activities and work (FABQ), and physical HRQoL (SF-36 physical component summary); there were no significant differences between the groups in any secondary outcome. There was no statistically significant improvement in neuropathic pain (PDQ score), mental HRQoL (SF-36 mental component summary), and self-assessed ability to stay in job. Four participants could not complete the MRI or the intervention due to a claustrophobic attack or accentuated back pain. Workplace visits may be an important element in the occupational intervention, although not always needed. A per-protocol analysis that included the 40 participants in the intervention arm who received a workplace visit as part of the additional occupational intervention did not show an add-on benefit in terms of sick leave (available cases after 6 months, mean difference: -0.43 days [95% CI -12.8 to 11.94], P = 0.945). The main limitations were the small number of sick leave days taken and that the comprehensive use of MRI may limit generalization of the findings to other settings, for example, general practice.

CONCLUSIONS: When given a single hospital consultation and MRI, people in physically demanding jobs at risk of sick leave due to LBP did not benefit from a complex additional occupational intervention. Occupational interventions aimed at limiting biopsychological obstacles (e.g., fear-avoidance beliefs and behaviors), barriers in the workplace, and system barriers seem essential to reduce sick leave in patients with LBP. This study indicates that these obstacles and barriers may be addressed by thorough usual care.

Brain changes in LBP

Disrupted interhemispheric functional coordination in patients with chronic low back-related leg pain: a multiscale frequency-related homotopic connectivity study

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Objective: Chronic low back pain has been observed to decrease movement coordination. However, it is unclear whether the existing alteration of inter-hemispheric synchrony of intrinsic activity in patients with chronic low back-related leg pain (cLBLP). The present study aims to investigate the alteration of homotopic connectivity and its clinical association with the cLBLP patients.

Participants and methods: A cohort of cLBLP patients (n=25) and well-matched healthy controls (HCs) (n=27) were recruited and underwent MRI scanning and a battery of clinical tests. The voxel-mirrored homotopic connectivity (VMHC) was used to analyze the interhemispheric coordination in the typical (0.01–0.1 Hz) as well as five specific (slow-6 to slow-2) frequency bands and associated with clinical index in cLBLP patients.

Results: We observed that cLBLP patients with lower homotopic connectivity than HCs in the inferior temporal gyrus, the superior temporal gyrus, the basal ganglia, the middle frontal gyrus, and the medial prefrontal cortex in the typical and five specific frequency bands, respectively. In the typical and five specific frequency bands, significant positive correlations were observed between the VMHC values of medial prefrontal cortex and the visual analogue scale scores, while the VMHC values of basal ganglia negative correlated with the values of two-point tactile discrimination (2PD) test for the right hand in cLBLP patients, etc. Further receiver operating characteristic curve analysis revealed that VMHC in the above regions with decreased could be used to differentiate the cerebral functional plasticity of cLBLP from healthy individuals with high sensitivity and specificity.

Conclusion: Our results imply that multiscale frequency-related interhemispheric disconnectivity may underlie the central pathogenesis of functional coordination in patients with cLBLP.

7. PELVIC ORGANS/WOMAN'S HEALTH

Breast feeding reduces obesity

PLoS Med. 2019 Aug 27;16(8):e1002889. doi: 10.1371/journal.pmed.1002889. eCollection 2019 Aug.

Breastfeeding, HIV exposure, childhood obesity, and prehypertension: A South African cohort study.

Houle B^{1,2,3}, Rochat TJ^{4,5}, Newell ML^{6,7}, Stein A^{2,8}, Bland RM^{4,7,9}.

BACKGROUND:

Evidence on the association between breastfeeding and later childhood obesity and blood pressure (BP) is inconsistent, especially in HIV-prevalent areas where, until recently, HIV-infected women were discouraged from breastfeeding, but obesity is increasingly prevalent.

METHODS AND FINDINGS:

The Siyakhula cohort (2012-2014), a population-based prospective cohort study, collected data over 3 visits on HIV-negative children ages 7 to 11 years in rural South Africa. We used weight (body mass index [BMI]), fat, and BP as outcome variables and incorporated early life (including mother's age at delivery and HIV status) and current life factors (including maternal education and current BMI). Our primary exposure was breastfeeding duration. We dichotomized 3 outcome measures using pre-established thresholds for clinical interpretability: (1) overfat: ≥ 85 th percentile of body fat; (2) overweight: >1 SD BMI z score; and (3) prehypertension: ≥ 90 th percentile for systolic BP (SBP) or diastolic BP (DBP). We modelled each outcome using multivariable logistic regression, including stopping breastfeeding, then early life, and finally current life factors. Of 1,536 children (mean age = 9.3 years; 872 girls; 664 boys), 7% were overfat, 13.2% overweight, and 9.1% prehypertensive. Over half (60%) of the mothers reported continued breastfeeding for 12+ months. In multivariable analyses, continued breastfeeding between 6 and 11 months was associated with approximately halved odds of both being overfat (adjusted odds ratio [aOR] = 0.43, 95% confidence interval [CI] 0.21-0.91, $P = 0.027$) and overweight (aOR = 0.46, CI 0.26-0.82, $P = 0.0083$), but the association with prehypertension did not reach statistical significance (aOR = 0.72, CI 0.38-1.37, $P = 0.32$). Children with a mother who was currently obese were 5 times more likely (aOR = 5.02, CI 2.47-10.20, $P < 0.001$) to be overfat and over 4 times more likely to be overweight (aOR = 4.33, CI 2.65-7.09, $P < 0.001$) than children with normal weight mothers. Differences between HIV-exposed and unexposed children on any of the outcomes were minimal and not significant. The main study limitation was that duration of breastfeeding was based on maternal recall.

CONCLUSIONS:

To our knowledge, this is the first study examining and quantifying the association between breastfeeding and childhood obesity in an African setting with high HIV prevalence. We observed that breastfeeding was independently associated with reduced childhood obesity for both HIV-exposed and unexposed children, suggesting that promoting optimal nutrition throughout the life course, starting with continued breastfeeding, may be critical to tackling the growing obesity epidemic. In the era of widespread effective antiretroviral treatment for HIV-infected women for life, these data further support the recommendation of breastfeeding for all women.

8. VISCERA

Isometric ex helps resting blood pressure

J Hypertens. 2019 Oct;37(10):1927-1938. doi: 10.1097/HJH.0000000000002105.

Effects of isometric resistance training on resting blood pressure: individual participant data meta-analysis.

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BACKGROUND:

Previous meta-analyses based on aggregate group-level data report antihypertensive effects of isometric resistance training (IRT). However, individual participant data meta-analyses provide more robust effect size estimates and permit examination of demographic and clinical variables on IRT effectiveness.

METHODS:

We conducted a systematic search and individual participant data (IPD) analysis, using both a one-step and two-step approach, of controlled trials investigating at least 3 weeks of IRT on resting systolic, diastolic and mean arterial blood pressure.

RESULTS:

Anonymized individual participant data were provided from 12 studies (14 intervention group comparisons) involving 326 participants (52.7% medicated for hypertension); 191 assigned to IRT and 135 controls, 25.2% of participants had diagnosed coronary artery disease. IRT intensity varied (8-30% MVC) and training duration ranged from 3 to 12 weeks. The IPD (one-step) meta-analysis showed a significant treatment effect for the exercise group participants experiencing a reduction in resting SBP of -6.22mmHg (95% CI -7.75 to -4.68; P<0.00001); DBP of -2.78mmHg (95% CI -3.92 to -1.65; P=0.002); and mean arterial blood pressure (MAP) of -4.12mmHg (95% CI -5.39 to -2.85; P<0.00001). The two-step approach yielded similar results for change in SBP -7.35mmHg (-8.95 to -5.75; P<0.00001), DBP MD -3.29mmHg (95% CI -5.12 to -1.46; P=0.0004) and MAP MD -4.63mmHg (95% CI -6.18 to -3.09; P<0.00001). Sub-analysis revealed that neither clinical, medication, nor demographic participant characteristics, or exercise program features, modified the IRT treatment effect.

CONCLUSION:

This individual patient analysis confirms a clinically meaningful and statistically significant effect of IRT on resting SBP, DBP and mean arterial blood pressure.

12 B. CERVICAL SURGERIES

Fusions good results

Spine J. 2019 Aug 9. pii: S1529-9430(19)30903-9. doi: 10.1016/j.spinee.2019.08.003

Reoperation rate after anterior cervical discectomy and fusion using standalone cages in degenerative disease: a study of 2078 cases.

Shousha M¹, Alhashash M², Allouch H³, Boehm H³.

BACKGROUND CONTEXT:

Over the last two decades, there has been a rapid increase in the use of cervical spine interbody fusion cages. Reoperation rate remains an important determinant of procedural efficacy and safety.

PURPOSE:

To evaluate the rate and reasons for reoperations in cervical spondylosis patients undergoing anterior decompression and fusion using stand-alone cervical interbody fusion cages.

STUDY DESIGN:

A retrospective study of 2078 consecutive cases of degenerative cervical spine disease undergoing fusion using stand-alone cages.

PATIENT SAMPLE:

Between January 2005 and December 2014, 2078 patients underwent anterior cervical decompression and fusion using stand-alone cages in our institution.

OUTCOME MEASURES:

The reoperations were analyzed and classified into early (during the first 90 days postoperatively) and late (after 90 days) reoperations. The rate and the causes of reoperation in both groups were reported and the results were compared.

METHODS:

In 1558 patients, a short segment fusion (≤ 2 levels) was performed while the remaining 520 patients underwent a long segment fusion (≥ 3 levels).

RESULTS:

The overall incidence of reoperation was 5.63%. The rate of early reoperations was 2.07%, mostly due to postoperative hematoma, and the rate of late reoperations was 3.56%, mostly due to adjacent segment disease. Revision due to pseudarthrosis was performed in 0.58% of cases. The early reoperation rate was significantly higher in the group with a long segment fusion, while the late reoperation rate was significantly higher in patients undergoing a short segment fusion.

CONCLUSION:

Following anterior cervical decompression and fusion with a stand-alone cage, the overall incidence of symptomatic pseudarthrosis is low. Patients undergoing long segment fusion should be closely observed in the early postoperative period as they have a higher early complication rate. On the other hand, long segment fusions have a lower incidence of adjacent segment disease over the years.

13 D. SLEEP

Endometrial CA and sleep

Supportive Care in Cancer pp 1–9| Cite as

Sleep, quality of life, and depression in endometrial cancer survivors with obesity seeking weight loss

- Nora L. Nock Anastasia Dimitropoulos Kristine M. Zanotti Steven Waggoner hrista Nagel Mladen Golubic Chad M. Michener John P. Kirwan Jay Alberts

Purpose

Incidence and mortality rates of uterine cancer are increasing and, obesity, which is also rising, has been associated with uterine cancer development and mortality. A recent study found that poor sleep quality is common among endometrial cancer survivors and those with obesity had more sleep disturbances than those having normal weight. However, it is unclear if higher levels of obesity (Class III, BMI ≥ 40 kg/m²), which are rising rapidly, are differentially associated with sleep as well as depression and quality of life in endometrial cancer survivors.

Methods

We evaluated sleep, depression, and quality of life in 100 Stage I endometrial cancer survivors with obesity seeking weight loss enrolled in a lifestyle intervention (NCT01870947) at baseline.

Results

The average age was 60 years and mean BMI was 42.1 kg/m² with 58% having a BMI ≥ 40 kg/m². Most survivors (72.3%) had poor sleep quality and most (71.2%) reported sleeping < 7 h/night. Survivors with class III compared with class I obesity had significantly more sleep disturbances and daytime dysfunction; and, those with poor sleep had higher depression and lower quality of life. Survivors with a BMI ≥ 50 kg/m² (~25%) had the highest levels of depression and lowest physical and emotional well-being.

Conclusions

Our results reveal that endometrial cancer survivors with class III compared with class I obesity have poorer sleep quality, higher depression, and lower quality of life. Given the rising rates of obesity and uterine cancer mortality, interventions to combat both obesity and poor sleep are needed.

14. HEADACHES

B12 and Migraines

Headache. 2019 Aug 31. doi: 10.1111/head.13618

Serum Vitamin B12 and Methylmalonic Acid Status in Migraineurs: A Case-Control Study.

The Impact of Shift Work on Migraine: A Case Series and Narrative Review.

Sandoe CH¹, Sasikumar S¹, Lay C¹, Lawler V¹.

OBJECTIVE:

We present a case report of 2 migraine patients engaged in shift work, followed by a narrative review, to assess whether shift work influences headache-related disability and chronification of migraine.

BACKGROUND:

Numerous modifiable factors can lead to chronification of migraine and to higher headache-related disability. These include, among others, obesity, depression, overuse of acute medications, ineffective acute treatments, and stressful life events. Sleep disruptions and disorders are also felt to increase the risk of transitioning from episodic to chronic migraine. We hypothesize that shift work, which by definition leads to atypical or irregular sleep cycles, along with poor quality sleep, is a risk factor for chronification of migraine.

METHODS:

We present the case histories of 2 shift workers with migraine as per International Classification of Headache Disorders 3 criteria, seen at a large, busy academic headache center, followed by a narrative review of the literature.

RESULTS:

Previous literature regarding the relationship between shift work and migraine is sparse and conflicting, with more recent studies suggesting that shift work may be a risk factor for migraine-related disability. In our case series, both patients initially reported severe migraine headache-related disability and both patients had noted a worsening of their headaches after beginning night shift work. Both improved when switched back to day shifts, then worsened upon being put back on night shifts. Their headache patterns finally reverted from chronic to episodic migraine after eliminating night shifts completely and maintaining a good sleep routine.

CONCLUSIONS:

In the 2 cases presented, shift work appeared to be associated with chronification of migraine and higher headache-related disability despite optimal headache management and good patient adherence. A switch to only day shifts promoted transition to an episodic, less disabling pattern of migraine. It is clinically important to take a detailed sleep history in headache patients, and when appropriate, provide support for workplace accommodations. Further larger-scale, rigorous studies are needed to more clearly delineate the relationship between shift work and migraine.

Brain changes**Structural changes of cerebellum and brainstem in migraine without aura**

- Zhaoxia Qin, Yan-Hui Shi, Shiyu Ban, Yue Hu, Yi-Sheng Liu, Mei-Ting Zhuang, Rong Zhao, Xiao-Lei Shen, Jianqi Li, Jian-Ren Liu & Xiaoxia Du

The Journal of Headache and Pain volume **20**, Article number: 93 (2019) |

Background

Increasing evidence has suggested that the cerebellum is associated with pain and migraine. In addition, the descending pain system of the brainstem is the major site of trigeminal pain processing and modulation and has been discussed as a main player in the pathophysiology of migraine. Cerebellar and brainstem structural changes associated with migraineurs remain to be further investigated.

Methods

Voxel-based morphometry (VBM) (50 controls, 50 migraineurs without aura (MWOAs)) and diffusion tensor imaging (DTI) (46 controls, 46 MWOAs) were used to assess cerebellum and brainstem anatomical alterations associated with MWOAs. We utilized a spatially unbiased infratentorial template toolbox (SUIT) to perform cerebellum and brainstem optimized VBM and DTI analysis. We extracted the average diffusion values from a probabilistic cerebellar white matter atlas to investigate whether MWOAs exhibited microstructure alterations in the cerebellar peduncle tracts.

Results

MWOAs showed decreased fractional anisotropy (FA) in the vermis VI extending to the bilateral lobules V and VI of the cerebellum. We also found higher axial diffusivity (AD), mean diffusivity (MD), and radial diffusivity (RD) in the right inferior cerebellum peduncle tract in MWOAs. MWOAs exhibited both reduced gray matter volume and increased AD, MD and RD in the spinal trigeminal nucleus (SpV).

Conclusion

MWOAs exhibited microstructural changes in the cerebellum and the local brainstem. These structural differences might contribute to dysfunction of the transmission and modulation of noxious information, trigeminal nociception, and conduction and integration of multimodal information in MWOAs. These findings further suggest involvement of the cerebellum and the brainstem in the pathology of migraine without aura.

16. CONCUSSIONS

Aerobic ex helps

Clin J Sport Med. 2019 Sep;29(5):353-360. doi: 10.1097/JSM.0000000000000663.

A Preliminary Study of the Effect of Early Aerobic Exercise Treatment for Sport-Related Concussion in Males.

Leddy JJ¹, Haider MN¹, Hinds AL¹, Darling S¹, Willer BS².

OBJECTIVE:

To study the effect of early prescribed aerobic exercise versus relative rest on rate of recovery in male adolescents acutely after sport-related concussion (SRC).

DESIGN:

Quasi-experimental design.

SETTING:

University sports medicine centers.

PARTICIPANTS:

Exercise group (EG, n = 24, 15.13 ± 1.4 years, 4.75 ± 2.5 days from injury) and rest group (RG, n = 30, 15.33 ± 1.4 years, 4.50 ± 2.1 days from injury).

INTERVENTIONS:

Exercise group performed a progressive program of at least 20 minutes of daily subthreshold aerobic exercise. Rest group was prescribed relative rest (no structured exercise). Both groups completed daily online symptom reports (Postconcussion Symptom Scale) for 14 days.

MAIN OUTCOME MEASURES:

Days to recovery after treatment prescription. Recovery was defined as return to baseline symptoms, exercise tolerant, and judged recovered by physician examination.

RESULTS:

Recovery time from initial visit was significantly shorter in EG (8.29 ± 3.9 days vs 23.93 ± 41.7 days, P = 0.048). Mixed-effects linear models showed that all symptom clusters decreased with time and that there was no significant interaction between treatment group and time. No EG participants experienced delayed recovery (>30 days), whereas 13% (4/30) of RG participants experienced delayed recovery.

CONCLUSIONS:

These preliminary data suggest that early subthreshold aerobic exercise prescribed to symptomatic adolescent males within 1 week of SRC hastens recovery and has the potential to prevent delayed recovery.

32 B. KNEE/PCL**Knee surface shape influence PCL injury**

Bone Joint J. 2019 Sep;101-B(9):1058-1062. doi: 10.1302/0301-620X.101B9.BJJ-2018-1567.R1.

Posterior cruciate ligament injury is influenced by intercondylar shape and size of tibial eminence.

van Kuijk KSR^{1,2}, Reijman M¹, Bierma-Zeinstra SMA³, Waarsing JH¹, Meuffels DE¹.

AIMS:

Little is known about the risk factors that predispose to a rupture of the posterior cruciate ligament (PCL). Identifying risk factors is the first step in trying to prevent a rupture of the PCL from occurring. The morphology of the knee in patients who rupture their PCL may differ from that of control patients. The purpose of this study was to identify any variations in bone morphology that are related to a PCL.

PATIENTS AND METHODS:

We compared the anteroposterior (AP), lateral, and Rosenberg view radiographs of 94 patients with a ruptured PCL to a control group of 168 patients matched by age, sex, and body mass index (BMI), but with an intact PCL after a knee injury. Statistical shape modelling software was used to assess the shape of the knee and determine any difference in anatomical landmarks.

RESULTS:

We found shape variants on the AP and Rosenberg view radiographs to be significantly different between patients who tore their PCL and those with an intact PCL after a knee injury. Overall, patients who ruptured their PCL have smaller intercondylar notches and smaller tibial eminences than control patients.

CONCLUSION:

This study shows that differences in the shape of the knee are associated with the presence of a PCL rupture after injury. A smaller and more sharply angled intercondylar notch and a more flattened tibial eminence are related to PCL rupture. This suggests that the morphology of the knee is a risk factor for sustaining a PCL rupture. Cite this article: *Bone Joint J* 2019;101-B:1058-1062.

33. MENISCUS

Partial meniscectomy increases risk of total knee

The Bone & Joint Journal VOL. 101-B, NO. 9 | Knee normal
Long-term rates of knee arthroplasty in a cohort of 834 393 patients with a history of arthroscopic partial meniscectomy

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<https://doi.org/10.1302/0301-620X.101B9.BJJ-2019-0335.R1>

Aims

The aim of this study was to determine the long-term risk of undergoing knee arthroplasty in a cohort of patients with meniscal tears who had undergone arthroscopic partial meniscectomy (APM).

Patients and Methods

A retrospective national cohort of patients with a history of isolated APM was identified over a 20-year period. Patients with prior surgery to the same knee were excluded. The primary outcome was knee arthroplasty. Hazard ratios (HRs) were adjusted by patient age, sex, year of APM, Charlson comorbidity index, regional deprivation, rurality, and ethnicity. Risk of arthroplasty in the index knee was compared with the patient's contralateral knee (with vs without a history of APM). A total of 834 393 patients were included (mean age 50 years; 37% female).

Results

Of those with at least 15 years of follow-up, 13.49% (16 256/120 493; 95% confidence interval (CI) 13.30 to 13.69) underwent subsequent arthroplasty within this time. In women, 22.07% (95% CI 21.64 to 22.51) underwent arthroplasty within 15 years compared with 9.91% of men (95% CI 9.71 to 10.12), corresponding to a risk ratio (RR) of 2.23 (95% CI 2.16 to 2.29). Relative to the general population, patients with a history of APM were over ten times more likely (RR 10.27; 95% CI 10.07 to 10.47) to undergo arthroplasty rising to almost 40 times more likely (RR 39.62; 95% CI 27.68 to 56.70) at a younger age (30 to 39 years). In patients with a history of APM in only one knee, the risk of arthroplasty in that knee was greatly elevated in comparison with the contralateral knee (no APM; HR 2.99; 95% CI 2.95 to 3.02).

Conclusion

Patients developing a meniscal tear undergoing APM are at greater risk of knee arthroplasty than the general population. This risk is three-times greater in the patient's affected knee than in the contralateral knee. Women in the cohort were at double the risk of progressing to knee arthroplasty compared with men. These important new reference data will inform shared decision making and enhance approaches to treatment, prevention, and clinical surveillance.

Cite this article: *Bone Joint J* 2019;101-B:1071–1080.

35. KNEE/TOTAL

Increase future rates

J Rheumatol. 2019 Sep;46(9):1134-1140. doi: 10.3899/jrheum.170990. Epub 2019 Apr 15.

Rates of Total Joint Replacement in the United States: Future Projections to 2020-2040 Using the National Inpatient Sample.

Singh JA^{1,2}, Yu S^{3,4}, Chen L^{3,4}, Cleveland JD^{3,4}.

OBJECTIVE:

To project future total hip and knee joint arthroplasty (THA, TKA) use in the United States to 2040.

METHODS:

We used the 2000-2014 US National Inpatient Sample (NIS) combined with Census Bureau data to develop projections for primary THA and TKA from 2020 to 2040 using polynomial regression to account for the nonlinearity and interactions between the variables, assuming the underlying distribution of the number of THA/TKA to be Poisson distributed. We performed sensitivity analyses using a negative binomial regression to account for overdispersion.

RESULTS:

Predicted total annual counts (95% prediction intervals) for THA in the United States by 2020, 2025, 2030, and 2040 are (in thousands): 498 (475, 523), 652 (610, 696), 850 (781, 925), and 1429 (1265, 1615), respectively. For primary TKA, predicted total annual counts for 2020, 2025, 2030, and 2040 are (in thousands): 1065 (937, 1211), 1272 (1200, 1710), 1921 (1530, 2410), and 3416 (2459, 4745), respectively. Compared to the available 2014 NIS numbers, the percent increases in projected total annual US use for primary THA and TKA in 2020, 2025, 2030, and 2040 are as follows: primary THA, by 34%, 75%, 129%, and 284%; and primary TKA, 56%, 110%, 182%, and 401%, respectively. Primary THA and TKA use is projected to increase for both females and males, in all age groups.

CONCLUSION:

Significant increases in use of THA and TKA are expected in the United States in the future, if the current trend continues. The increased use is evident across age groups in both females and males. A policy change may be needed to meet increased demand.

Consider partial

Lancet. 2019 Aug 31;394(10200):746-756. doi: 10.1016/S0140-6736(19)31281-4. Epub 2019 Jul 17.

The clinical and cost-effectiveness of total versus partial knee replacement in patients with medial compartment osteoarthritis (TOPKAT): 5-year outcomes of a randomised controlled trial.

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BACKGROUND:

Late-stage isolated medial knee osteoarthritis can be treated with total knee replacement (TKR) or partial knee replacement (PKR). There is high variation in treatment choice and little robust evidence to guide selection. The Total or Partial Knee Arthroplasty Trial (TOPKAT) therefore aims to assess the clinical effectiveness and cost-effectiveness of TKR versus PKR in patients with medial compartment osteoarthritis of the knee, and this represents an analysis of the main endpoints at 5 years.

METHODS:

Our multicentre, pragmatic randomised controlled trial was done at 27 UK sites. We used a combined expertise-based and equipoise-based approach, in which patients with isolated osteoarthritis of the medial compartment of the knee and who satisfied general requirements for a medial PKR were randomly assigned (1:1) to receive PKR or TKR by surgeons who were either expert in and willing to perform both surgeries or by a surgeon with particular expertise in the allocated procedure. The primary endpoint was the Oxford Knee Score (OKS) 5 years after randomisation in all patients assigned to groups. Health-care costs (in UK 2017 prices) and cost-effectiveness were also assessed. This trial is registered with ISRCTN (ISRCTN03013488) and ClinicalTrials.gov (NCT01352247).

FINDINGS:

Between Jan 18, 2010, and Sept 30, 2013, we assessed 962 patients for their eligibility, of whom 431 (45%) patients were excluded (121 [13%] patients did not meet the inclusion criteria and 310 [32%] patients declined to participate) and 528 (55%) patients were randomly assigned to groups. 94% of participants responded to the follow-up survey 5 years after their operation. At the 5-year follow-up, we found no difference in OKS between groups (mean difference 1·04, 95% CI -0·42 to 2·50; $p=0\cdot159$). In our within-trial cost-effectiveness analysis, we found that PKR was more effective (0·240 additional quality-adjusted life-years, 95% CI 0·046 to 0·434) and less expensive (-£910, 95% CI -1503 to -317) than TKR during the 5 years of follow-up. This finding was a result of slightly better outcomes, lower costs of surgery, and lower follow-up health-care costs with PKR than TKR.

INTERPRETATION:

Both TKR and PKR are effective, offer similar clinical outcomes, and result in a similar incidence of re-operations and complications. Based on our clinical findings, and results regarding the lower costs and better cost-effectiveness with PKR during the 5-year study period, we suggest that PKR should be considered the first choice for patients with late-stage isolated medial compartment osteoarthritis.

52. EXERCISE

Exercise and glycemic control

Med Sci Sports Exerc. 2019 Aug 30. doi: 10.1249/MSS.0000000000002139

The Impact of Exercise Timing on Glycemic Control: A Randomized Clinical Trial.

Teo SYM¹, Kanaley JA², Guelfi KJ³, Marston KJ¹, Fairchild TJ¹.

Despite the acknowledgement of exercise as a cornerstone in the management of Type 2 Diabetes (T2D), the importance of exercise timing has only recently been considered.

PURPOSE:

This study sought to determine the effect of diurnal exercise timing on glycemic control in individuals enrolled in a 12-week supervised multi-modal exercise training program. A secondary aim was to determine the effect of diurnal exercise timing on the circadian rhythm of wrist skin temperature.

METHODS:

Forty sedentary, overweight adults (age: 51[SD 13]years; BMI: 30.9[SD 4.2]kg/m; women: n=23) with and without (n=20) T2D diagnosis were randomly allocated to either a morning (amEX) or evening (pmEX) exercise training group. The supervised 12-week (3 days/week) program, comprised 30 minutes of moderate intensity walking and 4 resistance-based exercises (3 sets, 12-18 repetitions each). Glycemic outcomes (glycated haemoglobin, HbA1c; fasting glucose, FG; postprandial glucose, PPG) wrist skin temperature were assessed at baseline and post-intervention.

RESULTS:

Exercise training improved (main effect of time: all $p < 0.01$) all glycemic outcomes, however, this was independent of allocation to either the amEX (Hedge's g : 0.23-0.90) or pmEX (Hedge's g : 0.16-0.90) group. Accordingly, the adopted exercise training program did not alter the circadian rhythm of skin temperature. When only T2D individuals were compared, amEX demonstrated greater effects (all Hedge's g) on HbA1c (amEX: 0.57; pmEX: 0.32), FG (amEX: 0.91; pmEX: 0.53) and PPG (amEX: 1.12; pmEX: 0.71) but was not statistically different.

CONCLUSIONS:

Twelve weeks of multi-modal exercise training improved glycemic control and postprandial glycemic responses in overweight non-T2D and T2D individuals. However, no distinct glycemic benefits or alterations in circadian rhythm were associated with morning versus evening exercise, when performed three times per week in this cohort.

59. PAIN**Pain expression****The influence of patient race, sex, pain-related body postures, and anxiety status on pain management: a virtual human technology investigation****Authors** Clark J, Robinson ME**Published** 30 August 2019 Volume 2019:12 Pages 2637—2650**DOI** <https://doi.org/10.2147/JPR.S209510>

Purpose: The purpose of this study was to examine mechanisms underlying disparities in pain management among patients with psychological comorbidities. Studies have consistently shown that health care providers, health care trainees, and laypeople are susceptible to biased assessment and treatment decisions for patients presenting with pain. Further, psychological factors may influence the use of demographic and behavioral cues in pain assessment and treatment decisions. The present study employed innovative virtual human technology to capture decision-making approaches at both the group- and individual-level to better elucidate the influence of psychological factors, demographic cues, and pain-related body postures on pain assessment and treatment decisions.

Patients and methods: One hundred and thirty-two providers and trainees in the areas of nursing, physical therapy, and medicine viewed separate, empirically validated virtual human profiles that systematically varied across pain behaviors, anxiety status, race, and sex. Participants provided pain assessment and treatment ratings using a visual analog scale for each virtual human profile.

Results: Idiographic analyses revealed that participants used patient pain-related body postures most consistently and reliably across ratings. Nomothetic analyses showed anxious virtual humans were identified as having more anxiety and more likely to be recommended anti-anxiety medications, especially by female participants.

Conclusion: This innovative study successfully explored the influence of patient pain-related body postures, anxiety status, and demographic characteristics on pain management decisions with virtual human technology and a Lens model design. Results of this study can be used to better inform clinical practice, research, and education regarding the influence of patient variables on pain assessment and treatment decisions.

Sex difference for pain

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An Evaluation of Sex Differences in Patients With Chronic Pain Undergoing an Interdisciplinary Pain Treatment Program.

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OBJECTIVES:

To determine if there are sex differences in a sample of patients participating in a 4-week interdisciplinary pain treatment program in (1) pretreatment pain intensity, physical function, psychological function, pain beliefs, kinesiophobia, pain catastrophizing, and activity management patterns; and (2) treatment response.

METHODS:

Seventy-two men and 130 women with chronic pain completed study measures. Analyses of covariance (ANCOVAs) were performed to compare men and women on pretreatment measures. Repeated-measures ANCOVAs were used to compare both sexes on 3 treatment outcomes (pain intensity, physical function, and depressive symptoms).

RESULTS:

Before treatment, compared to women, men reported higher levels of kinesiophobia, were more likely to view their pain as being harmful, and used more activity pacing when doing daily activities. Women were more likely to use an overdoing activity pattern than men. No sex differences emerged for pretreatment pain intensity, physical function, psychological function, catastrophizing, activity avoidance, or measures of other pain-related beliefs. At posttreatment, women reported more improvements in pain intensity and physical function compared to men, while both sexes reported similar reductions in depressive symptoms. All effect sizes for statistically significant findings were of small to moderate magnitude.

DISCUSSION:

The results of this study suggest that men and women have a comparable profile with respect to the overall burden of chronic pain. Nevertheless, sex differences were found for certain pain beliefs and coping styles. Women appear to reap more benefits from the interdisciplinary pain management program than men. These findings indicate that further research to develop sex-specific assessment procedures and tailored pain treatments may be warranted.