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2. LBP

LBP guidelines

Eur Spine J. 2016 Jul 4.

Red flags presented in current low back pain guidelines: a review.

Verhagen AP¹, Downie A^{2,3}, Popal N⁴, Maher C², Koes BW⁴.

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OBJECTIVE:

The purpose of this study was to identify and descriptively compare the red flags endorsed in guidelines for the detection of serious pathology in patients presenting with low back pain to primary care.

METHOD:

We searched databases, the World Wide Web and contacted experts aiming to find the multidisciplinary clinical guideline in low back pain in primary care, and selected the most recent one per country. We extracted data on the number and type of red flags for identifying patients with higher likelihood of serious pathology. Furthermore, we extracted data on whether or not accuracy data (sensitivity/specificity, predictive values, etc.) were presented to support the endorsement of specific red flags.

RESULTS:

We found 21 discrete guidelines all published between 2000 and 2015. One guideline could not be retrieved and after selecting one guideline per country we included 16 guidelines in our analysis from 15 different countries and one for Europe as a whole. All guidelines focused on the management of patients with low back pain in a primary care or multidisciplinary care setting. Five guidelines presented red flags in general, i.e., not related to any specific disease. Overall, we found 46 discrete red flags related to the four main categories of serious pathology: malignancy, fracture, cauda equina syndrome and infection. The majority of guidelines presented two red flags for fracture ('major or significant trauma' and 'use of steroids or immunosuppressors') and two for malignancy ('history of cancer' and 'unintentional weight loss'). Most often pain at night or at rest was also considered as a red flag for various underlying pathologies. Eight guidelines based their choice of red flags on consensus or previous guidelines; five did not provide any reference to support the choice of red flags, three guidelines presented a reference in general, and data on diagnostic accuracy was rarely provided.

CONCLUSION:

A wide variety of red flags was presented in guidelines for low back pain, with a lack of consensus between guidelines for which red flags to endorse. Evidence for the accuracy of recommended red flags was lacking.

KEYWORDS:

Low back pain; Practice guidelines/clinical guidelines

PMID: [27376890](#)

Opioid use questioned

JAMA Intern Med. 2016 Jul 1;176(7):958-68. doi: 10.1001/jamainternmed.2016.1251.

Efficacy, Tolerability, and Dose-Dependent Effects of Opioid Analgesics for Low Back Pain: A Systematic Review and Meta-analysis.

Abdel Shaheed C¹, Maher CG², Williams KA³, Day R⁴, McLachlan AJ⁵.

IMPORTANCE:

Opioid analgesics are commonly used for low back pain, however, to our knowledge there has been no systematic evaluation of the effect of opioid dose and use of enrichment study design on estimates of treatment effect.

OBJECTIVE:

To evaluate efficacy and tolerability of opioids in the management of back pain; and investigate the effect of opioid dose and use of an enrichment study design on treatment effect.

DATA SOURCES:

Medline, EMBASE, CENTRAL, CINAHL, and PsycINFO (inception to September 2015) with citation tracking from eligible randomized clinical trials (RCTs).

STUDY SELECTION:

Placebo-controlled RCTs in any language.

DATA EXTRACTION AND SYNTHESIS:

Two authors independently extracted data and assessed risk of bias. Data were pooled using a random effects model with strength of evidence assessed using the grading of recommendations assessment, development, and evaluation (GRADE).

MAIN OUTCOMES AND MEASURES:

The primary outcome measure was pain. Pain and disability outcomes were converted to a common 0 to 100 scale, with effects greater than 20 points considered clinically important.

RESULTS:

Of 20 included RCTs of opioid analgesics (with a total of 7925 participants), 13 trials (3419 participants) evaluated short-term effects on chronic low back pain, and no placebo-controlled trials enrolled patients with acute low back pain. In half of these 13 trials, at least 50% of participants withdrew owing to adverse events or lack of efficacy. There was moderate-quality evidence that opioid analgesics reduce pain in the short term; mean difference (MD), -10.1 (95% CI, -12.8 to -7.4). Meta-regression revealed a 12.0 point greater pain relief for every 1 log unit increase in morphine equivalent dose ($P = .046$). Clinically important pain relief was not observed within the dose range evaluated (40.0-240.0-mg morphine equivalents per day). There was no significant effect of enrichment study design.

CONCLUSIONS AND RELEVANCE:

For people with chronic low back pain who tolerate the medicine, opioid analgesics provide modest short-term pain relief but the effect is not likely to be clinically important within guideline recommended doses. Evidence on long-term efficacy is lacking. The efficacy of opioid analgesics in acute low back pain is unknown.

PMID: [27213267](https://pubmed.ncbi.nlm.nih.gov/27213267/)

Predictors of LBP

Arthritis Care Res (Hoboken). 2016 Jul 7. doi: 10.1002/acr.22982

Predictors of Back Pain in Middle Aged Women: Data from the Australian Longitudinal Study on Women's Health.

Brady SR¹, Hussain SM¹, Brown WJ², Heritier S¹, Wang Y¹, Teede H^{3,4}, Urquhart DM¹, Cicuttini FM¹.

Abstract

BACKGROUND:

Back pain causes greater disability worldwide than any other condition, with women more likely to suffer from back pain than men. Our aim was to identify modifiable risk factors for back pain in middle-aged women.

METHODS:

Women born between 1946 and 1951 were randomly selected from the national health insurance scheme database to participate in The Australian Longitudinal Study of Women's Health. Self-reported data on back pain in the last 12 months, weight, physical activity and other socio-demographic factors were collected in 1998, 2001, 2004, 2007, 2010 and 2013. In 1998, 12,338 women completed the survey and 10,011 (74%) completed the 2013 survey.

RESULTS:

At baseline, median (range) age was 49.5 (44.6 - 53.5) years and 54% reported back pain. In multivariate analysis, baseline weight and depression were positive predictors of back pain over each 3 year survey interval and over the following 15 years, whereas participation in vigorous physical activity was protective. The effects of weight on back pain were most marked in women with a BMI ≥ 25 .

CONCLUSIONS:

Back pain is common in middle-aged women. Increased weight, weight gain and depression were independent predictors of back pain over 15 years, whereas participation in vigorous physical activity was protective. Targeting these lifestyle factors is an important area for future research on reducing the burden of back pain in middle-aged women. This article is protected by copyright. All rights reserved.

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KEYWORDS:

Low back pain; physical activity; weight

PMID: [27390116](#).

DISC

Sagittal alignment

BMC Musculoskelet Disord. 2016 Jul 22;17(1):305. doi: 10.1186/s12891-016-1164-y.

Spinal sagittal imbalance in patients with lumbar disc herniation: its spinopelvic characteristics, strength changes of the spinal musculature and natural history after lumbar discectomy.

Liang C¹, Sun J², Cui X¹, Jiang Z¹, Zhang W¹, Li T¹.

BACKGROUND:

Spinal sagittal imbalance is a widely acknowledged problem, but there is insufficient knowledge regarding its occurrence. In some patients with lumbar disc herniation (LDH), their symptom is similar to spinal sagittal imbalance. The aim of this study is to illustrate the spinopelvic sagittal characteristics and identify the role of spinal musculature in the mechanism of sagittal imbalance in patients with LDH.

METHODS:

Twenty-five adults with spinal sagittal imbalance who initially came to our clinic for treatment of LDH, followed by posterior discectomy were reviewed. The horizontal distance between C7 plumb line-sagittal vertical axis (C7PL-SVA) greater than 5 cm anteriorly with forward bending posture is considered as spinal sagittal imbalance. Radiographic parameters including thoracic kyphotic angle (TK), lumbar lordotic angle (LL), pelvic tilting angle (PT), sacral slope angle (SS) and an electromyography(EMG) index 'the largest recruitment order' were recorded and compared.

RESULTS:

All patients restored coronal and sagittal balance immediately after lumbar discectomy. The mean C7PL-SVA and trunk shift value decreased from (11.6 ± 6.6 cm, and 2.9 ± 6.1 cm) preoperatively to (-0.5 ± 2.6 cm and 0.2 ± 0.5 cm) postoperatively, while preoperative LL and SS increased from ($25.3^\circ \pm 14.0^\circ$ and $25.6^\circ \pm 9.5^\circ$) to ($42.4^\circ \pm 10.2^\circ$ and $30.4^\circ \pm 8.7^\circ$) after surgery ($P < 0.05$). The preoperative mean TK and PT ($24.7^\circ \pm 11.3^\circ$ and $20.7^\circ \pm 7.8^\circ$) decreased to ($22.0^\circ \pm 9.8^\circ$ and $15.8 \pm 5.5^\circ$) postoperatively ($P < 0.05$). The largest recruitment order on the level of T7-T8, T12-L1 and the herniated level all improved compared with before and after surgery ($P < 0.05$). All patients have been followed up for more than 2 years. The mean ODI was 77.8 % before surgery to 4.2 % at the final follow-up.

CONCLUSIONS:

Spinal sagittal imbalance caused by LDH is one type of compensatory sagittal imbalance. Compensatory mechanism of spinal sagittal imbalance mainly includes a loss of lumbar lordosis, an increase of thoracic kyphosis and pelvis tilt. Spinal musculature plays an important role in spinal sagittal imbalance in patients with LDH.

KEYWORDS:

Electromyography; Lumbar disc herniation; Spinal musculature; Spinal sagittal imbalance

PMID: 27444272

5. SURGERY

Stenosis

Spine (Phila Pa 1976). 2016 Jul 15;41(14):E857-68. doi: 10.1097/BRS.0000000000001635.

Surgical Versus Nonsurgical Treatment for Lumbar Spinal Stenosis.

Zaina F¹, Tomkins-Lane C, Carragee E, Negrini S.

STUDY DESIGN:

A systematic review.

OBJECTIVES:

The aim of this study is to evaluate the effectiveness of different types of surgery compared with different types of nonsurgical interventions in adults with symptomatic lumbar spinal stenosis (LSS).

SUMMARY OF BACKGROUND DATA:

LSS is a debilitating condition associated with degeneration of the spine with aging. People with LSS experience a range of symptoms, including back pain, leg pain, numbness and tingling in the legs, and reduced physical function. Main treatment options are surgery, physical therapy, exercise, braces, and injections into the spine.

METHODS:

We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, five other databases, and two trials registries up to February 2015, reference lists, and conference proceedings related to treatment of the spine. Randomized controlled trials (RCTs) compared surgical versus nonoperative treatments in participants with LSS. Outcomes included quality of life, disability, function, pain, complication rates, and side effects.

RESULTS:

From the 12,966 citations screened, we included five RCTs (643 participants). Three studies compared spine surgery versus various types of nonsurgical treatment. It is difficult to draw conclusions from these studies because nonsurgical treatments were inadequately described. One study that compared surgery versus bracing and exercise found no differences in pain. Another study compared surgery versus spinal injections and found better physical function with injections, and better pain relief with surgery at six weeks. Still another trial compared surgery with an implanted device versus nonsurgical care. This study reported favorable outcomes of surgery for symptoms and physical function.

CONCLUSION:

We cannot conclude on the basis of this review whether surgical or nonsurgical treatment is better for individuals with LSS. Nevertheless, we can report on the high rate of effects reported in three of five surgical groups, ranging from 10% to 24%. No side effects were reported for any of the conservative treatment options.

LEVEL OF EVIDENCE: 1.PMID: 27128388

7. PELVIC ORGANS/WOMAN'S HEALTH

Am J Obstet Gynecol. 2016 Jul 1. pii: S0002-9378(16)30392-1. doi: 10.1016/j.ajog.2016.06.047.

Relationship between nongenital tender point tenderness and intravaginal muscle pain intensity: ratings in women with provoked vestibulodynia and implications for treatment.

Phillips N¹, Brown C², Bachmann G³, Wan J⁴, Wood R⁵, Ulrich D², Bachour C², Foster D⁵.

BACKGROUND: Vulvodynia is a chronic vulvar pain disorder and fibromyalgia is a chronic widespread musculoskeletal pain disorder, both of unknown etiology. Association of these conditions is well documented. Intravaginal algometer measurement of tenderness to pressure applied to the pelvic floor muscles helps define vulvodynia associated with musculoskeletal factors. Women with both vulvodynia and fibromyalgia might have increased pelvic muscle pain compared to women with vulvodynia alone, defining the possible link of these 2 conditions. **OBJECTIVE:** We sought to: (1) correlate pain intensity during the nongenital tender point tenderness examination to pain intensity with the vaginal algometer in women with provoked vestibulodynia, and (2) determine whether subjects with provoked vestibulodynia and fibromyalgia had higher pain intensity scores with the vaginal algometer than those without fibromyalgia.

STUDY DESIGN: In all, 92 subjects referred for vulvar pain were confirmed to have provoked vestibulodynia using the cotton swab test. A diagnosis of fibromyalgia was made if pain was present (numeric rating scale >1) in at least 11 sites of the 18-point nongenital tender point tenderness exam. Vaginal pain sensitivity was measured using an intravaginal pressure algometer, where 0.1, 0.3, and 0.5 kg/cm² forces were applied digitally in random assignment by force and location to the right and left iliococcygeus muscle regions and the posterior vaginal wall. Both tender point tenderness and algometer pain intensity were reported on a 0 (no pain) to 10 (worse pain) numeric rating scale. Correlations were computed between the composite pain intensity (total of rating scale from each pressure threshold at specified site) of nongenital and those of iliococcygeus regions and the posterior vaginal wall. Independent t tests were used to determine differences in iliococcygeus regions and the posterior vaginal algometer pain ratings and presence or absence of fibromyalgia. The significance level was at $P < .05$. The data were expressed as mean \pm SD.

RESULTS: A significant correlation was found between numeric rating scale pain scores on the nongenital tender point tenderness exam and algometer testing on the iliococcygeus region ($r = 0.44$, $P < .0001$) and the posterior vaginal wall ($r = 0.45$, $P < .0001$). Subjects with fibromyalgia by tender point tenderness had significantly higher iliococcygeal pain (6.14 ± 2.07 vs 3.74 ± 2.22 , $P = .0001$) and posterior vaginal wall pain (5.67 ± 2.10 vs 3.07 ± 2.16 , $P < .0001$) than women without fibromyalgia by tender point tenderness.

CONCLUSION: Women with provoked vestibulodynia who experience more severe pain with nongenital tender point palpation also experience more deep vaginal pain on pelvic exam. Those who fulfill the diagnosis of fibromyalgia show significantly more intense deep vaginal pain to palpation of iliococcygeus muscles and posterior vaginal wall. Further research using a more precise definition of fibromyalgia is necessary to confirm this relationship, but findings suggest that women with provoked vestibulodynia coexisting with fibromyalgia have greater risk of superimposed vaginal muscle pain and may be candidates for early adjunctive pelvic floor physical therapy. These findings need to be explored in women with generalized, nonprovoked vulvodynia.

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KEYWORDS: fibromyalgia; pain intensity ratings; vestibulodynia

PMID: [27377821](https://pubmed.ncbi.nlm.nih.gov/27377821/)

Diet of polyunsaturated fats

Pediatr Obes. 2016 Jul 5. doi: 10.1111/ijpo.12170.

Maternal fatty acid intake during pregnancy and the development of childhood overweight: a birth cohort study.

Hakola L¹, Takkinen HM^{1,2}, Niinistö S², Ahonen S^{1,2,3}, Erlund P², Rautanen J², Veijola R⁴, Ilonen J⁵, Toppari J^{6,7}, Knip M^{8,9,10,11}, Virtanen SM^{1,2,3,11}, Lehtinen-Jacks S^{1,2}.

BACKGROUND:

Maternal diet during pregnancy may contribute to the risk of offspring adiposity.

OBJECTIVES:

The objective of the study is to explore the associations between maternal antenatal dietary fatty acid intake and the risk of offspring overweight and obesity at the ages of 2 to 7 years.

METHODS:

In a prospective Finnish birth cohort with 3807 mother-child pairs, maternal diet in late pregnancy was assessed with a food frequency questionnaire. Intakes of total fatty acids and individual saturated, monounsaturated and polyunsaturated fatty acids (PUFAs) were calculated. Generalized estimating equation models were used to study the associations of maternal dietary variables with repeatedly measured offspring overweight and obesity.

RESULTS:

In girls, maternal intake ratio of n-6:n-3 PUFAs had a U-shaped association with obesity (adjusted OR for the lowest 2.0 [95% CI 1.27-3.20] and the highest 1.7 [1.03-2.73] vs. the two middle quartiles of n-6:n-3 PUFAs, $p = 0.01$). In boys, arachidonic acid (20:4n-6): docosahexaenoic acid + eicosapentaenoic acid ratio was associated with obesity (adjusted OR for the lowest 1.0 [0.60-1.57] and the highest 0.5 [0.26-0.88] vs. the two middle quartiles, $p = 0.02$). Saturated fatty acids and monounsaturated fatty acids were not associated with overweight or obesity in either sex.

CONCLUSIONS:

Maternal intakes of PUFAs in late pregnancy were associated with risk of later obesity differently in girls and boys.

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KEYWORDS:

Children; cohort studies; diet; fatty acids; overweight; pregnancy

PMID: 27378525

8. VISCERA

IBD increases risk of mortality

Inflammatory bowel disease is associated with risk of mortality and hospitalization in patients with heart failure

Journal of Cardiac Failure, 07/27/2016 Hugenberg DW, et al.

In a study, with aim to explore the association between inflammatory bowel disease (IBD) and heart failure (HF) in terms of HF prevalence, mortality, heart transplantation/ventricular assist device (VAD) implantation, and hospitalizations. The study suggest that patients with HF and IBD are at increased risk of mortality and hospitalization contrasted with patients with HF alone. The predominance of HF is lower in patients with IBD contrasted with the general population.

Methods In this study, the authors extracted data from the Indiana Network for Patient Care (INPC) database, a healthcare information exchange which is used in clinical applications and in research. With the aid of the Regenstrief Institute, they retrospectively collected data for IBD (Crohn Disease and Ulcerative Colitis) and HF based on ICD-9 diagnosis codes, for patients age 18 years or older from 2002–2011. 12,073 patients were identified with IBD who were age-matched with 12,073 control cases. They defined the index date for case and control by the case's 1st IBD diagnosis code during the study period. Patient data including mortality, hospitalizations, etc. from 2 years before and after the index date were analyzed.

Results

- In this study, the prevalence of HF in the IBD group was 4.08% contrasted with 6.64% in the control group (RR 0.61, 95% CI 0.55–0.68, $P < .001$).
- As per this study, the overall mortality difference was not significant, i.e., 6.58% in the IBD group and 6.51% in the control group (RR 1.01, 95% CI 0.92–1.11, $P = .815$).
- In patients with HF and IBD the mortality was significantly higher, i.e., 29.20% compared to 23.32% for patients with HF in the control group (RR 1.25, 95% CI 1.04–1.51, $P = .018$).
- Between any of the groups there was no difference in the rate of heart transplantation and VAD implantation.
- The number of patients requiring hospitalization was significantly higher, i.e., 64.10% (316/493) in the IBD/HF group compared to 35.00% (281/803) of patients with HF in the control group (RR 1.83, 95% CI 1.63–2.06, $P < .001$), before the index date (date of first IBD diagnosis).
- The number of patients requiring hospitalization was markedly higher, i.e., 82.76% (408/493) in the IBD/HF group compared to 35.74% (287/803) in the patients with HF in the control group (RR 2.32, 95% CI 2.09–2.56, $P < .001$), after the index date.
- No change was observed in the number of patients hospitalized before or after the index date in patients with HF in the control group (RR 1.02, 95% CI 0.89–1.17, $P = .754$).
- There was a significant increase in the number of patients requiring hospitalization after the index date (RR 1.29, 95% CI 1.19–1.40, $P < .001$), in the IBD/HF group.

Gluten free diet

Aliment Pharmacol Ther. 2016 Jul 22. doi: 10.1111/apt.13725.

Symptomatic suspected gluten exposure is common among patients with coeliac disease on a gluten-free diet.

Silvester JA^{1,2}, Graff LA¹, Rigaux L³, Walker JR¹, Duerksen DR^{1,3}.

BACKGROUND:

A gluten-free diet is the only recommended treatment for coeliac disease.

AIM:

To determine the prevalence and characteristics of reactions to gluten among persons with coeliac disease on a gluten-free diet.

METHODS:

Adults with biopsy proven, newly diagnosed coeliac disease were prospectively enrolled. A survey related to diet adherence and reactions to gluten was completed at study entry and 6 months. The Coeliac Symptom Index, Coeliac Diet Assessment Tool (CDAT) and Gluten-Free Eating Assessment Tool (GF-EAT) were used to measure coeliac disease symptoms and gluten-free diet adherence.

RESULTS:

Of the 105 participants, 91% reported gluten exposure <1 per month and median CDAT score was 9 (IQR 8-11), consistent with adequate adherence. A suspected symptomatic reaction to gluten was reported by 66%. Gluten consumption was unsuspected until a reaction occurred (63%) or resulted from problems ordering in a restaurant (29%). The amount of gluten consumed ranged from cross-contact (30%) to a major ingredient (10%). Median time to symptom onset was 1 h (range 10 min to 48 h), and median symptom duration was 24 h (range 1 h to 8 days). Common symptoms included abdominal pain (80%), diarrhoea (52%), fatigue (33%), headache (30%) and irritability (29%).

CONCLUSION:

Reactions to suspected gluten exposure are common among patients with coeliac disease on a gluten-free diet. Eating at restaurants and other peoples' homes remain a risk for unintentional gluten exposure. When following individuals with coeliac disease, clinicians should include questions regarding reactions to gluten as part of their assessment of gluten-free diet adherence.

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PMID: 27443825

Pediatric abdominal pain

Clin Gastroenterol Hepatol. 2016 Jul 15. pii: S1542-3565(16)30391-3. doi: 10.1016/j.cgh.2016.07.006.

Nausea in Children with Functional Abdominal Pain Predicts Poor Health Outcomes in Young Adulthood.

Russell AC¹, Stone AL², Walker LS³.

BACKGROUND & AIMS:

Nausea is common among children with functional abdominal pain (FAP). We evaluated the relation of nausea to short- and long-term morbidity in pediatric patients with FAP.

METHODS:

We performed a prospective study of 871 children with FAP (8-17 years old) seen in a pediatric gastroenterology practice; follow-up data were collected from 396 of the patients 8.7±3.3 years later. Participants were defined as having significant nausea if they reported nausea "a lot" or "a whole lot" within the past 2 weeks. Validated questionnaires assessed abdominal pain, gastrointestinal and somatic symptoms, and depression. Baseline measures, anxiety, and the Rome III criteria were assessed in the follow-up evaluation.

RESULTS:

At baseline, 44.8% of the patients reported significant nausea. Those with nausea reported worse abdominal pain, gastrointestinal symptoms, somatic symptoms, and depression than those without nausea ($P < .001$ for all). When the children had reached young adulthood, those with nausea in childhood continued to have more severe gastrointestinal ($P < .001$) and somatic symptoms ($P = .003$) than patients without nausea in childhood, as well as higher levels of anxiety ($P = .02$) and depression ($P = .02$). In the follow-up evaluation, somatic symptoms, depression, and anxiety remained significant after controlling for baseline abdominal pain severity.

CONCLUSIONS:

Pediatric patients with FAP and nausea have more severe short- and long-term gastrointestinal and somatic symptoms than patients with FAP without nausea, as well as reductions mental health and daily function. Pediatric patients with FAP and nausea therefore need intensive treatment and follow up.

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KEYWORDS:

anxiety; functional gastrointestinal disorder; pediatric nausea

PMID: [27430661](#)

Bacteria and IBS

BMC Gastroenterol. 2016 Jul 11;16(1):67. doi: 10.1186/s12876-016-0484-6.

Small intestinal bacterial overgrowth is associated with irritable bowel syndrome and is independent of proton pump inhibitor usage.

Giamarellos-Bourboulis EJ¹, Pylaris E², Barbatzas C², Pistiki A³, Pimentel M⁴.

BACKGROUND:

Current knowledge suggests that small intestinal overgrowth participates in the pathogenesis of irritable bowel syndrome. It is questionable if this association is modulated by intake of proton pump inhibitors (PPIs).

METHODS:

In a prospective study, quantitative cultures of duodenal aspirates were performed for aerobic species in 897 consecutive patients undergoing upper GI tract endoscopy. SIBO was defined as equal to or more than 10(3) cfu/ml. The effect of PPI intake on the relationship between SIBO and IBS was the primary endpoint.

RESULTS:

Analysis among patients without any history of PPI intake (n = 713) showed that odds ratio (OR) for IBS in the event of SIBO was 5.63 (3.73-8.51, p < 0.0001); this was 4.16 (1.91-9.06) when analysis was done among patients with history of PPI intake (n = 184, p: 0.498 between patients without and with PPI intake). Multiple logistic regression analysis found that factors independently associated with SIBO were age above or equal to 60 years (OR: 2.36), body mass index more than or equal to 22 kg/m² (OR: 0.60), presence of IBS (OR: 6.29), type 2 diabetes mellitus (OR: 1.59) and gastritis (OR: 0.47).

CONCLUSIONS:

The association between IBS and SIBO was completely independent from PPI intake. Although gastritis was protective against SIBO, results show that PPI intake cannot prime SIBO.

KEYWORDS:

Irritable bowel syndrome; Proton pump inhibitors; Small intestinal overgrowth

PMID: [27402085](https://pubmed.ncbi.nlm.nih.gov/27402085/)

Development of IBS

Am J Gastroenterol. 2016 Jul 5. doi: 10.1038/ajg.2016.255.

The Development of Irritable Bowel Syndrome: A Prospective Community-Based Cohort Study.

Löwe B¹, Lohse A², Andresen V³, Vettorazzi E⁴, Rose M^{1,5}, Broicher W¹.

OBJECTIVES:

It remains controversial whether psychosocial burden is an independent predictor of irritable bowel syndrome (IBS) or occurs concurrently as an epiphenomenon. Here we prospectively examine the individual contribution of psychosocial risk factors, demographic factors, somatic symptoms, and gastrointestinal infection within a non-clinical, IBS-free population before infection occurred.

METHODS:

A prospective community-based cohort study including a consecutive sample of healthy participants with an elevated risk of developing gastrointestinal infection during long-distance travel was conducted. Potential predictive factors were investigated using validated self-report scales pre-travel, 1 week after return, and 7 months post-travel. IBS was assessed using the ROME-III Diagnostic Questionnaire.

RESULTS:

Of the 1,964 eligible long-distance travelers, 1,464 responded at follow-up directly after their journey, and 1,190 participants completed the study 7 months post-journey. Fifty-three percent of study completers were female, mean age was 39.9 (s.d.=15.7) years. The mean travel duration was 40.8 (s.d.=52.8) days, and 43.3% (95% confidence interval (CI)=40.4-46.1%) of participants experienced at least moderate infectious travelers' diarrhea. The incidence of newly developed IBS 7 months post-travel was 7.2% (95%CI=5.8-8.6%). In multivariate analyses, female gender, vulnerability to diarrhea under stress, baseline somatic symptom burden, baseline illness anxiety, diarrhea within the 4 months pre-travel, and travelers' diarrhea during the journey significantly predicted IBS post-travel.

CONCLUSION:

This study indicates that gastrointestinal infection as well as predisposing factors such as female gender, vulnerability to diarrhea under stress, illness anxiety, and somatic symptom burden predict the development of IBS. The results indicate the necessity of simultaneously addressing both somatic and psychological needs in patients with IBS as early as possible. Am J Gastroenterol advance online publication, 5 July 2016; doi:10.1038/ajg.2016.255.

PMID: [27377523](https://pubmed.ncbi.nlm.nih.gov/27377523/)

12 A. WHIPLASH

Factors in poor outcomes

Pain. 2016 Aug;157(8):1645-54. doi: 10.1097/j.pain.0000000000000564.

Addition of posttraumatic stress and sensory hypersensitivity more accurately estimates disability and pain than fear avoidance measures alone after whiplash injury.

Pedler A¹, Kamper SJ, Sterling M.

The fear avoidance model (FAM) has been proposed to explain the development of chronic disability in a variety of conditions including whiplash-associated disorders (WADs).

The FAM does not account for symptoms of posttraumatic stress and sensory hypersensitivity, which are associated with poor recovery from whiplash injury. The aim of this study was to explore a model for the maintenance of pain and related disability in people with WAD including symptoms of PTSD, sensory hypersensitivity, and FAM components. The relationship between individual components in the model and disability and how these relationships changed over the first 12 weeks after injury were investigated. We performed a longitudinal study of 103 (74 female) patients with WAD. Measures of pain intensity, cold and mechanical pain thresholds, symptoms of posttraumatic stress, pain catastrophising, kinesiophobia, and fear of cervical spine movement were collected within 6 weeks of injury and at 12 weeks after injury. Mixed-model analysis using Neck Disability Index (NDI) scores and average 24-hour pain intensity as the dependent variables revealed that overall model fit was greatest when measures of fear of movement, posttraumatic stress, and sensory hypersensitivity were included.

The interactive effects of time with catastrophising and time with fear of activity of the cervical spine were also included in the best model for disability. These results provide preliminary support for the addition of neurobiological and stress system components to the FAM to explain poor outcome in patients with WAD.

PMID:27007066

13. CRANIUM/TMJ**TMD**

J Headache Pain. 2016 Dec;17(1):65. doi: 10.1186/s10194-016-0656-3. Epub 2016 Jul 7.

Dopamine in plasma - a biomarker for myofascial TMD pain?

Dawson A^{1,2,3}, Stensson N⁴, Ghafouri B^{4,5}, Gerdle B⁴, List T^{6,7,8}, Svensson P^{9,10,11,8}, Ernberg M^{11,8}.

BACKGROUND:

Dopaminergic pathways could be involved in the pathophysiology of myofascial temporomandibular disorders (M-TMD). This study investigated plasma levels of dopamine and serotonin (5-HT) in patients with M-TMD and in healthy subjects.

METHODS:

Fifteen patients with M-TMD and 15 age- and sex-matched healthy subjects participated. The patients had received an M-TMD diagnosis according to the Research Diagnostic Criteria for TMD. Perceived mental stress, pain intensity (0-100-mm visual analogue scale), and pressure pain thresholds (PPT, kPa) over the masseter muscles were assessed; a venous blood sample was taken.

RESULTS:

Dopamine in plasma differed significantly between patients with M-TMD (4.98 ± 2.55 nM) and healthy controls (2.73 ± 1.24 nM; $P < 0.01$). No significant difference in plasma 5-HT was observed between the groups ($P = 0.75$). Patients reported significantly higher pain intensities ($P < 0.001$) and had lower PPTs ($P < 0.01$) compared with the healthy controls. Importantly, dopamine in plasma correlated significantly with present pain intensity ($r = 0.53$, $n = 14$, $P < 0.05$) and perceived mental stress ($r = 0.34$, $n = 28$, $P < 0.05$).

CONCLUSIONS:

The results suggest that peripheral dopamine might be involved in modulating peripheral pain. This finding, in addition to reports in other studies, suggests that dopaminergic pathways could be implicated in the pathophysiology of M-TMD but also in other chronic pain conditions. More research is warranted to elucidate the role of peripheral dopamine in the pathophysiology of chronic pain.

KEYWORDS:

5-HT; Bruxism; Dopamine; Masseter muscle; Temporomandibular joint disorders

PMID: 27386870

Chronic rhinosinusitis

Int Forum Allergy Rhinol. 2016 Jul 20. doi: 10.1002/alr.21797.

Lack of correlation between patient reported location and severity of facial pain and radiographic burden of disease in chronic rhinosinusitis.

Falco JJ¹, Thomas AJ¹, Quin X¹, Ashby S¹, Mace JC², Deconde AS³, Smith TL², Alt JA¹.

BACKGROUND:

Facial pain is a cardinal symptom of chronic rhinosinusitis (CRS) with significant impacts on patient treatment selection, quality of life, and outcomes. The association between facial pain and CRS disease severity has not been systematically evaluated with validated, facial pain-specific questionnaires. Our objective was to measure pain location, severity, and interference in patients with CRS, and correlate these to the location and severity of radiographic evidence of disease.

METHODS:

Patients with CRS were enrolled into a prospective, cross-sectional study. Patients completed the Brief Pain Inventory Short Form, which is a validated and widely used tool that measures pain location, severity, and interference with daily activities of living. The Lund-Mackay (L-M) computed tomography (CT) scoring system was used to operationalize the radiographic location and severity of inflammation. Facial pain location, severity, and interference scores were correlated to paranasal sinus opacification scores.

RESULTS:

Consecutive patients with CRS with nasal polyps (CRSwNP; n = 37) and CRS without nasal polyps (CRSsNP; n = 46) were enrolled. No significant relationship was found between the location and severity of reported facial pain and radiographic findings of disease for patients with either CRSwNP or CRSsNP. There was no difference in pain location between patients with and without radiographic disease in a given sinus.

CONCLUSION:

Facial pain in CRS is not predicted by the radiographic extent of disease. The location and severity of facial pain reported by the patient is not a reliable marker of the anatomic location and severity of sinonasal inflammation. Pain location should not necessarily be relied upon for guiding targeted therapy.

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KEYWORDS:

chronic disease; facial pain; facial pressure; quality of life; sinusitis

PMID: 27438938

Sound production

Am J Orthod Dentofacial Orthop. 2016 Jul;150(1):116-23. doi: 10.1016/j.ajodo.2015.12.015.

Malocclusion and its relationship to speech sound production: Redefining the effect of malocclusal traits on sound production.

Leavy KM¹, Cisneros GJ², LeBlanc EM³.

INTRODUCTION:

The purpose of this study was to identify variables of dental malocclusion with the greatest effect on sound production that can be easily identified during an orthodontic assessment.

METHODS:

One hundred fifteen patients (8.2-36 years of age) seeking orthodontic evaluation were assessed for speech sound production abnormalities. An orthodontic clinical examination assessed Angle classification, overjet, overbite, crowding, spacing, and crossbites. A standard speech sample was elicited from each subject.

RESULTS:

The results indicated that 71 (62%) of the subjects made a production error, particularly with the /s/ and /t/ sounds. However, auditory distortions occurred in 12 subjects (20%), and 56 (80%) subjects had visual distortions of the sound. An open bite (>2 mm) was the key malocclusal factor underlying speech sound errors. There was statistical significance between the Orthodontic Treatment Priority Index and the sound errors of /s / and /t/ (mean score of 9.54 vs 6.29 for subjects without sound errors).

CONCLUSIONS:

Predictive malocclusal traits are associated with speech sound production errors. The more severe or handicapping the malocclusion, the more likely that a speech sound error will occur. Open bites of 2 mm are associated with sound production errors. Visual inaccuracy of the sound occurs with more frequency than auditory inaccuracy and is the most common articulation error noted with occlusal irregularities.

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PMID: [27364213](#)

Eye motions

PLoS One. 2016 Jun 28;11(6):e0157825. doi: 10.1371/journal.pone.0157825. eCollection 2016.

Eye Movement Training and Suggested Gaze Strategies in Tunnel Vision - A Randomized and Controlled Pilot Study.

Ivanov IV^{1,2}, Mackeben M³, Vollmer A^{1,4}, Martus P⁵, Nguyen NX⁴, Trauzettel-Klosinski S¹.

PURPOSE:

Degenerative retinal diseases, especially retinitis pigmentosa (RP), lead to severe peripheral visual field loss (**tunnel vision**), which impairs mobility. The lack of peripheral information leads to fewer horizontal **eye** movements and, thus, diminished scanning in RP patients in a natural environment walking task. This **randomized controlled study** aimed to improve mobility and the dynamic visual field by applying a compensatory Exploratory Saccadic **Training** (EST).

METHODS:

Oculomotor responses during walking and avoiding obstacles in a **controlled** environment were studied before and after saccade or reading **training** in 25 RP patients. **Eye** movements were recorded using a mobile infrared **eye** tracker (Tobii glasses) that measured a range of spatial and temporal variables. Patients were randomly assigned to two **training** conditions: Saccade (experimental) and reading (control) **training**. All subjects who first performed reading **training** underwent experimental **training** later (waiting list control group). To assess the effect of **training** on subjects, we measured performance in the **training** task and the following outcome variables related to daily life: Response Time (RT) during exploratory saccade **training**, Percent Preferred Walking Speed (PPWS), the number of collisions with obstacles, **eye** position variability, fixation duration, and the total number of fixations including the ones in the subjects' blind area of the visual field.

RESULTS:

In the saccade **training** group, RTs on average decreased, while the PPWS significantly increased. The improvement persisted, as tested 6 weeks after the end of the **training**. On average, the **eye movement** range of RP patients before and after **training** was similar to that of healthy observers. In both, the experimental and reading **training** groups, we found many fixations outside the subjects' seeing visual field before and after **training**. The average fixation duration was significantly shorter after the **training**, but only in the experimental **training** condition.

CONCLUSIONS:

We conclude that the exploratory saccade **training** was beneficial for RP patients and resulted in shorter fixation durations after the **training**. We also found a significant improvement in relative walking speed during navigation in a real-world like **controlled** environment.

14. HEADACHES**Daytime sleepiness**

J Headache Pain. 2016 Dec;17(1):62. doi: 10.1186/s10194-016-0655-4. Epub 2016 Jul 1.

Excessive daytime sleepiness is associated with an exacerbation of migraine: A population-based study.

Kim J¹, Cho SJ², Kim WJ³, Yang KI⁴, Yun CH⁵, Chu MK⁶.

BACKGROUND:

Previous studies have shown that migraine and sleep disturbances are closely associated. Excessive daytime sleepiness (EDS) is a common symptom of various types of sleep disturbance. Findings from clinic-based studies suggest that a high percentage of migraineurs experience EDS. However, the prevalence and clinical impact of EDS among migraineurs at the population level have rarely been reported. The objective of this study was to investigate the prevalence and impact of EDS among migraineurs using a population-based sample in Korea.

METHODS:

We selected a stratified random sample of Koreans aged 19 to 69 years and evaluated them using a semi-structured interview designed to identify EDS, headache type, and the clinical characteristics of migraine. If the score on the Epworth Sleepiness Scale (ESS) was more than or equal to 11, the participant was classified as having EDS.

RESULTS:

Of the 2,695 participants that completed the interview, 143 (5.3 %) and 313 (11.6 %) were classified as having migraine and EDS, respectively. The prevalence of EDS was significantly higher in participants with migraine (19.6 %) and non-migraine headache (13.4 %) compared to non-headache controls (9.4 %). Migraineurs with EDS had higher scores on the Visual Analogue Scale (VAS) for headache intensity (6.9 ± 1.8 vs. 6.0 ± 1.9 , $p = 0.014$) and Headache Impact Test-6 (59.8 ± 10.2 vs. 52.5 ± 8.2 , $p < 0.001$) compared to migraineurs without EDS.

CONCLUSIONS:

Approximately 20 % of migraineurs had EDS in this population-based sample. Excessive daytime sleepiness was associated with an exacerbation of some migraine symptoms.

KEYWORDS:

Epidemiology; Excessive daytime sleepiness; Headache; Migraine; Sleep; Sleepiness

PMID: [27363413](https://pubmed.ncbi.nlm.nih.gov/27363413/)

16. CONCUSSIONS

Rehab

Phys Ther. 2016 May 19.

Physical Rehabilitation Interventions for Post-m TBI Symptoms Lasting Greater Than Two Weeks: A Systematic Review.

Quatman-Yates C1, Cupp A2, Gunsch C3, Haley T4, Vaculik S5, Kujawa D6.

BACKGROUND:

Heightened awareness of the **lasting** effects of mild traumatic brain injury (mTBI) has amplified interest in **interventions** that facilitate recovery from persistent **post-mTBI symptoms**.

PURPOSE:

The purpose of this study was to systematically **review** the literature to identify potential **physical rehabilitation interventions** that are safe, feasible, and appropriate for **physical** therapists to utilize with patients with persistent mTBI-related **symptoms**.

DATA SOURCES:

The electronic databases PubMed, Cochrane Library, CINHALL, Scopus, SPORT Discus, and Web of Science were systematically searched from study inception until June 2015.

STUDY SELECTION:

Studies were included if they utilized **physical rehabilitation interventions** and the study's participants had a diagnosis of mTBI, a mean age of 8 years or older, and **symptoms** persisting an average of 2 **weeks** or more. Exclusion criteria included blast injuries, diagnosis of moderate or severe TBI, or psychosis.

DATA EXTRACTION:

Data extraction and methodological risk of bias assessments were performed for each study.

DATA SYNTHESIS:

Eight studies with a range of study designs, intervention types, and outcome measures were included. The **interventions** investigated by the included studies were categorized into three types - physiologic, vestibulo-ocular, and cervico-genic.

LIMITATIONS:

The identified studies had several significant limitations including: small sample sizes and low-level study designs.

CONCLUSIONS:

The results of this **systematic review** indicate that several **physical rehabilitation** options with minimal risk for negative outcomes are available for treating patients experiencing persistent **post-mTBI symptoms**. These include: vestibular, manual, and progressive exercise **interventions**. Conclusions surrounding efficacy and ideal dosing parameters for these **interventions** are limited at this time due to the small number of studies, the range of interventional protocols, and lower levels of study design.

17. SHOULDER GIRDLE**OA of AC joint**

J Shoulder Elbow Surg. 2016 Jul 13. pii: S1058-2746(16)30118-5. doi: 10.1016/j.jse.2016.04.029.

The prevalence of osteoarthritis of the sternoclavicular joint on computed tomography.

Lawrence CR¹, East B², Rashid A², Tytherleigh-Strong GM².

BACKGROUND:

Symptomatic disorders around the sternoclavicular joint (SCJ) are relatively uncommon. Previous cadaveric and radiographic studies have suggested that asymptomatic osteoarthritic changes are relatively common, progressively increasing with age. The purpose of this study was to determine the prevalence of SCJ osteoarthritis in the general population using computed tomography (CT) scans.

METHODS:

We assessed 464 SCJs in 232 patients undergoing a standardized axial CT scan of the thorax including both SCJs, across a range of ages from the second to tenth decade. The scans were undertaken for multiple clinical indications; however, none were obtained to investigate SCJ pathology. The predominant changes investigated were for the features associated with osteoarthritis including the presence of osteophytes, subchondral cysts, and subcortical sclerosis.

RESULTS:

The CT scans of 244 SCJs (53%) in 137 patients (59%) showed at least 1 sign of osteoarthritis. No patients younger than 35 years had any features of osteoarthritis. Osteoarthritic changes were present in 89.6% of patients older than 50 years compared with 9.1% younger than this age. All patients above the age of 61 had at least 1 feature of osteoarthritic changes on at least 1 side of the SCJ. Increasing prevalence was noted with increasing age both in the percentage of SCJs showing any positive signs of osteoarthritis and in the severity of osteoarthritis.

CONCLUSION:

SCJ osteoarthritis is a very common incidental finding on CT scans, particularly with increasing age. This should be taken into consideration when using a CT scan to assess a patient with symptomatic SCJ pathology.

22 A. IMPINGEMENT**Kenisio tape**

Am J Phys Med Rehabil. 2016 Aug;95(8):553-60. doi: 10.1097/PHM.0000000000000492.

Effectiveness of Kinesiotaping and Subacromial Corticosteroid Injection in Shoulder Impingement Syndrome.

Şahin Onat Ş¹, Biçer S, Şahin Z, Küçükali Türkyılmaz A, Kara M, Özbudak Demir S.

OBJECTIVE:

The aim of this study was to investigate whether kinesiotaping or subacromial corticosteroid injection provides additional benefit when used with nonsteroidal anti-inflammatory drugs (NSAIDs) in patients with shoulder impingement syndrome.

DESIGN:

Patients with shoulder impingement syndrome were divided into 3 groups as follows: NSAID group (n = 33), kinesiotaping group (kinesiotaping + NSAID) (n = 33), and injection group (subacromial corticosteroid injection + NSAID) (n = 33). Outcome measures including visual analog scale, shoulder ranges of motion, Shoulder Disability Questionnaire, and University of California-Los Angeles (UCLA) scale were evaluated before and after the treatment (fourth week).

RESULTS:

A total of 99 patients (21 male and 78 female patients) were enrolled in this study. Demographic and baseline clinical characteristics of the groups (except for body mass index and visual analog scale at night, both P = 0.05) were similar between the groups (all P > 0.05). Clinical parameters were found to have improved in the 3 groups (all P < 0.001). While the kinesiotaping and injection groups showed similar improvements (all P > 0.05), each group had better outcome than did the NSAID group as regards pain (activity visual analog scale), ranges of motion, and Shoulder Disability Questionnaire and UCLA scale scores (all P < 0.05).

CONCLUSIONS:

Addition of kinesiotaping or subacromial corticosteroid injection to NSAID treatment seems to have better/similar effectiveness in patients with shoulder impingement syndrome. Therefore, kinesiotaping might serve as an alternative treatment in case (injection of) corticosteroids are contraindicated.

TO CLAIM CME CREDITS:

Complete the self-assessment activity and evaluation online at <http://www.physiatry.org/JournalCME> CME OBJECTIVES:: Upon completion of this article, the reader should be able to: (1) Delineate appropriate treatment options for shoulder impingement syndrome; (2) Identify treatment benefits of kinesiotaping and corticosteroid injections in shoulder impingement syndrome; and (3) Incorporate kinesiotaping and corticosteroid injections into the treatment plan for patients with shoulder impingement syndrome.

LEVEL: Advanced**ACCREDITATION:**

: The Association of Academic Physiatrists is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. The Association of Academic Physiatrists designates this activity for a maximum of 1.5 AMA PRA Category 1 Credit(s)TM. Physicians should only claim credit commensurate with the extent of their participation in the activity. PMID: 27088466

Changes in muscle function

J Shoulder Elbow Surg. 2016 Jun 30. pii: S1058-2746(16)30065-9. doi: 10.1016/j.jse.2016.04.010.

Relative scapular muscle activity ratios are altered in subacromial pain syndrome.

Michener LA¹, Sharma S², Cools AM³, Timmons MK⁴.

BACKGROUND:

Coordinated muscle activity is needed for synchronized joint motion and stability. Characterizing relative scapular muscle activity deficits in participants with shoulder pain will provide foundational knowledge to develop rehabilitation programs.

METHODS:

Participants were recruited with subacromial pain syndrome and an asymptomatic control group matched for age, gender, and dominant arm (N = 56). Surface electromyographic muscle activity was recorded from the upper, middle, and lower trapezius (UT, MT, LT) and serratus anterior (SA) during 5 repetitions of a weighted arm elevation task. Muscle activity was normalized to a reference contraction and then expressed as UT/MT, UT/LT, UT/SA, and LT/SA ratios. Ratios were compared between groups and across 3 arm angle intervals during ascending and descending elevation.

RESULTS:

A 2 × 3 mixed-model analysis of variance yielded a group main effect for the UT/LT ratio, with a higher ratio in the subacromial pain group during ascending (mean difference, 0.92; P = .008) and descending (mean difference, 0.70; P = .030). For the LT/SA ratio, there was a group effect: a lower ratio in the subacromial group during ascending (mean difference, -0.25; P = .026) and descending (mean difference, -0.51; P = .032). There were no differences for the UT/MT or UT/SA. **DISCUSSION:** There is a disruption in coordination between the LT and SA and the UT and LT during an arm elevation task in patients with subacromial pain syndrome. The LT was part of both altered ratios, indicating the relative importance of the LT. Future research should determine if exercises aimed at restoring the dysfunctional LT/SA and UT/LT force couples are beneficial to reduce shoulder pain and disability in patients with unilateral shoulder pain. **KEYWORDS:** EMG; Scapula; muscle activity; serratus anterior; shoulder impingement syndrome; shoulder pain; trapezius PMID: [27374236](#)

32 A. KNEE/ACL**Mechanoreceptors**

Knee Surg Sports Traumatol Arthrosc. 2016 Jun 23.

Lower numbers of mechanoreceptors in the posterior cruciate ligament and anterior capsule of the osteoarthritic knees.

Çabuk H¹, Kuşku Çabuk F², Tekin AÇ³, Dedeoğlu SS³, Çakar M³, Büyükkurt CD³.

PURPOSE:

Impaired proprioception accuracy of the knee has been proposed as a local factor in the onset and progression of knee osteoarthritis. Patients with decreased numbers of mechanoreceptors could be more likely to develop arthrosis due to a loss in proprioception of the joint. We aimed to identify and quantify the mechanoreceptors of the posterior cruciate ligament (PCL), the anterior capsule (AC) and the medial meniscocapsular junction (MCJ) in knee arthrosis.

METHODS:

PCLs, ACs and MCJs were harvested from 30 patients with Kellgren and Lawrence grades 3 and 4 osteoarthritis (OA), and ten knees taken from five cadavers without OA were used as a control group. PCL degeneration was evaluated with haematoxylin & eosin, and the types and numbers of mechanoreceptors were evaluated using S100 immunostaining.

RESULTS:

The patient ages in the OA and control groups (n.s.) did not differ. PCL degeneration was more severe in the gonarthrosis group than in the control group ($p = 0.04$). The numbers of Golgi corpuscles, Ruffini corpuscles, free nerve endings, total nerve endings and small vessels of the PCL were low in the OA group, as were the numbers of Golgi corpuscles, free nerve endings and total nerve endings of the AC. No significant correlation was found regarding the mechanoreceptors of the MCJ between the two groups.

CONCLUSION:

The numbers of mechanoreceptors in patients with OA were low in the PCLs and ACs. A loss in proprioception could be a local risk factor in OA. The proprioceptive impact of preserving PCL while performing total knee arthroplasty may not be exaggerated as its thought.

LEVEL OF EVIDENCE:

Prognostic study, Level I.

KEYWORDS:

Knee arthroplasty; Knee osteoarthritis; Ligament; Mechanoreceptors; Posterior cruciate; Proprioception

PMID: [27338958](https://pubmed.ncbi.nlm.nih.gov/27338958/)

Tension of the replacement

Am J Sports Med. 2016 Jul;44(7):1660-70. doi: 10.1177/0363546516638387. Epub 2016 Apr 19.

Effect of Matching or Overconstraining Knee Laxity During Anterior Cruciate Ligament Reconstruction on Knee Osteoarthritis and Clinical Outcomes: A Randomized Controlled Trial With 84-Month Follow-up.

Akelman MR¹, Fadale PD², Hulstyn MJ², Shalvoy RM³, Garcia A², Chin KE², Duryea J⁴, Badger GJ⁵, Tung GA⁶, Fleming BC⁷. **BACKGROUND:** The "initial graft tension" applied at the time of graft fixation during anterior cruciate ligament (ACL) reconstruction surgery modulates joint contact mechanics, which in turn may promote posttraumatic osteoarthritis (OA). **PURPOSE/HYPOTHESES:** The study objectives were to compare clinical, functional, patient-reported, and OA imaging outcomes between 2 different initial laxity-based graft tension cohorts and a matched uninjured control group as well as to evaluate the effects of laxity-based graft tension on OA development at 84-month follow-up. The 2 laxity-based tension protocols were (1) to restore normal anteroposterior (AP) laxity at the time of surgery relative to the contralateral uninjured knee (low-tension group) or (2) to overconstrain AP laxity by 2 mm relative to the contralateral uninjured knee (high-tension group). The hypotheses were that (1) the high-tension group would have improved outcomes and decreased OA compared with the low-tension group after 84 months, and (2) the outcomes for the high-tension group would be equivalent to those for an age-, sex-, race-, and activity-matched group of control participants with uninjured knees. **STUDY DESIGN:** Randomized controlled trial; Level of evidence, 1. **METHODS:** Patients had their ACLs reconstructed with either a bone-patellar tendon-bone or 4-stranded hamstring autograft, and outcomes were compared with a matched control group. Outcomes were evaluated preoperatively and at 60 and 84 months postoperatively and included clinical (KT-1000 arthrometer AP laxity measurement and International Knee Documentation Committee [IKDC] examination score), functional (1-legged hop for distance and knee extensor torque), patient-reported (Knee injury and Osteoarthritis Outcome Score [KOOS], Short Form-36 [SF-36], and patient satisfaction survey), and OA imaging (measurement of joint space width [JSW], Osteoarthritis Research Society International [OARSI] radiographic score, and Whole-Organ Magnetic Resonance Imaging Score [WORMS]) components. Repeated-measures analyses of variance were used to evaluate differences in outcomes between the treatment groups and the control group. **RESULTS:** There were significant differences between the 2 tension groups in 1 of 5 KOOS subscales (sports and recreation; $P = .04$) and 2 of 8 SF-36 subscales (vitality, mental health; $P < .04$) at 84 and 60 months, respectively. Both tension groups scored significantly worse than the control group in the IKDC examination ($P < .001$), 1-legged hop ($P \leq .017$), KOOS quality of life and symptoms subscales ($P < .03$), and OARSI radiographic score ($P \leq .02$) at 84 months. The low-tension group performed significantly worse than the control group on the KOOS pain subscale ($P = .03$), SF-36 general health and social functioning ($P < .04$), OARSI radiographic score ($P < .001$), and WORMS ($P = .001$), while the high-tension group had statistically different results than the control group in AP knee laxity ($P < .001$), radiographic JSW ($P = .003$), and OARSI radiographic score ($P = .02$) as well as significantly more subsequent knee injuries ($P = .02$) at 84 months. **CONCLUSION:** The results do not support the hypotheses that the high-tension group would have improved outcomes when compared with the low-tension group after 84 months of healing or that the outcomes for the high-tension group would be equivalent to those for the matched control group. While there were minor differences in patient-reported outcomes between the 2 laxity-based tension groups, all other outcomes were similar.

33. MENISCUS

ACL repair cartilage predictors

Am J Sports Med. 2016 Jul;44(7):1671-9. doi: 10.1177/0363546516644218. Epub 2016 May 9.

Meniscal and Articular Cartilage Predictors of Clinical Outcome After Revision Anterior Cruciate Ligament Reconstruction.

BACKGROUND:

Revision anterior cruciate ligament (ACL) reconstruction has been documented to have worse outcomes compared with primary ACL reconstructions.

PURPOSE/HYPOTHESIS:

The purpose of this study was to determine if the prevalence, location, and/or degree of meniscal and chondral damage noted at the time of revision ACL reconstruction predicts activity level, sports function, and osteoarthritis symptoms at 2-year follow-up. The hypothesis was that meniscal loss and high-grade chondral damage noted at the time of revision ACL reconstruction will result in lower activity levels, decreased sports participation, more pain, more stiffness, and more functional limitation at 2 years after revision surgery.

STUDY DESIGN:

Cohort study; Level of evidence, 2.

METHODS:

Between 2006 and 2011, a total of 1205 patients who underwent revision ACL reconstruction by 83 surgeons at 52 hospitals were accumulated for study of the relationship of meniscal and articular cartilage damage to outcome. Baseline demographic and intraoperative data, including the International Knee Documentation Committee (IKDC) subjective knee evaluation, Knee injury and Osteoarthritis Outcome Score (KOOS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and Marx activity score, were collected initially and at 2-year follow-up to test the hypothesis. Regression analysis was used to control for age, sex, body mass index, smoking status, activity level, baseline outcome scores, revision number, time since last ACL reconstruction, incidence of having a previous ACL reconstruction on the contralateral knee, previous and current meniscal and articular cartilage injury, graft choice, and surgeon years of experience to assess the meniscal and articular cartilage risk factors for clinical outcomes 2 years after revision ACL reconstruction.

RESULTS:

At 2-year follow-up, 82% (989/1205) of the patients returned their questionnaires. It was found that previous meniscal injury and current articular cartilage damage were associated with the poorest outcomes, with prior lateral meniscectomy and current grade 3 to 4 trochlear articular cartilage changes having the worst outcome scores. Activity levels at 2 years were not affected by meniscal or articular cartilage pathologic changes.

CONCLUSION:

Prior lateral meniscectomy and current grade 3 to 4 changes of the trochlea were associated with worse outcomes in terms of decreased sports participation, more pain, more stiffness, and more functional limitation at 2 years after revision surgery, but they had no effect on activity levels.

KEYWORDS: anterior cruciate ligament; articular cartilage; chondrosis; meniscus; outcomes; predictors; revision ACL reconstruction PMID: [27161867](#)

35. KNEE/TOTAL**Increase fx rate and loss of muscle post**

Osteoporos Int. 2016 Aug;27(8):2567-76. doi: 10.1007/s00198-016-3546-2. Epub 2016 Feb 26.

A study investigating short- and medium-term effects on function, bone mineral density and lean tissue mass post-total knee replacement in a Caucasian female post-menopausal population: implications for hip fracture risk.

Hopkins SJ¹, Toms AD², Brown M², Welsman JR³, Ukoumunne OC⁴, Knapp KM³.

Significant increased hip fracture incidence has been reported in the year following total knee replacement. This study demonstrates that bone and muscle loss is a post-surgical consequence of total knee replacement, alongside poor outcomes in function and activity potentially contributing to reduced quality of life and increased hip fracture risk.

INTRODUCTION:

A significant increase in hip fracture incidence in the year following total knee replacement (TKR) surgery has been reported. This study investigated function and activity following TKR and the effects of limited mobility on bone and muscle loss and their potential contribution to hip fracture risk.

METHODS:

Changes in dual-energy X-ray absorptiometry (DXA) (GE Lunar Prodigy, Bedford MA), bone mineral density (BMD) at the neck of femur (NOF), total hip region (TH) and lumbar spine were measured alongside leg lean tissue mass (LLTM) in post-menopausal Caucasian females following TKR (N = 19) compared to controls (N = 43). Lumbar spine trabecular bone scores (TBSs) were calculated. Ipsilateral/contralateral weight bearing, lower limb function, 3-day pedometer readings, pain levels and falls were also recorded. Measurements were obtained at pre-surgery baseline and at 6 weeks, 6 months and 12 months post-surgery.

RESULTS:

No statistically significant differences were demonstrated between groups at baseline bilaterally in LLTM or BMD at the NOF and TH. Losses in ipsilateral NOF and TH BMD and contralateral LLTM were significantly higher in the TKR group at 6 months. Impairment in function and weight bearing persisted in the TKR group 12 months post-operatively alongside deficits in bilateral muscle mass and ipsilateral NOF and TH BMD. Falls incidence was not significantly higher in the TKR group.

CONCLUSIONS:

Bone loss at the hip with associated muscle loss is a consequence of TKR that, in addition to poor patient outcomes in function and activity, potentially contributes to increased hip fracture risk in the year following surgery.

KEYWORDS:

Activity; Bone mineral density; Function; Lean tissue mass; Total knee replacement; Trabecular bone score MID: [2691995](#)

37. OSTEOARTHRITIS/KNEE**Muscle strength and progression****Role of thigh muscle cross-sectional area and strength in progression of knee cartilage degeneration over 48 months - Data from the Osteoarthritis Initiative**

Osteoarthritis and Cartilage , 07/27/2016

Goldman LH, et al.

In a 48-month longitudinal study to determine the association of thigh muscle cross-sectional area (CSA) and strength on progression of morphologic knee cartilage degeneration using 3T magnetic resonance imaging (MRI). Results show that higher extensor and VM CSA may increase patellofemoral cartilage loss, and on the other hand, maintenance of proper extensor to flexor muscle balance about the knee through decreased E/F ratios may slow patellofemoral cartilage deterioration.

Methods

- As measured by isometric knee extension testing, seventy Osteoarthritis Initiative (OAI) subjects aged 50-60 years, with no radiographic evidence of osteoarthritis (OA) and constant muscle strength over 48 months were included.
- In this work, extensor to flexor CSA ratios were calculated and baseline right thigh muscle CSAs were assessed on axial T1-weighted MR images.
- By using a modified whole organ MRI score (WORMS), degenerative knee abnormalities at baseline and 48-months were graded on right knee 3T MRIs.
- Further to this, statistical analysis employed Student's t-tests and multivariable regression models adjusted for age, body mass index and gender.

Results

- Results revealed that extension strength was significantly and positively correlated with baseline thigh muscle CSA ($r=0.65$, $p<0.001$).
- Over 48 months in patellar ($p=0.027$) and trochlear ($p=0.038$) compartments, but not in other knee compartments, greater baseline total thigh muscle CSA was significant associated with increase of cartilage WORMS scores.
- It was reported that among specific muscle groups, CSA of extensors ($p=0.021$) and vastus medialis (VM) ($p=0.047$) were associated with patellar cartilage increase in WORMS.
- Further to this, baseline E/F ratio had a significant positive association with patellar WORMS cartilage score increase over 48 months, $p=0.0015$.
- It was concluded that between muscle CSA/ratios and increase in WORMS scores, there were no other significant associations.

Medication for

Pain. 2016 Aug;157(8):1634-44. doi: 10.1097/j.pain.0000000000000562.

Evidence for a central mode of action for etoricoxib (COX-2 inhibitor) in patients with painful knee osteoarthritis.

Arendt-Nielsen L¹, Egsgaard LL, Petersen KK.

The COX-2 inhibitor etoricoxib modulates the peripheral and central nociceptive mechanisms in animals. This interaction has not been studied in patients with pain. This randomized, double-blind, placebo-controlled, 2-way crossover, 4-week treatment study investigated the pain mechanisms modulated by etoricoxib in patients with painful knee osteoarthritis. Patients were randomized to group A (60 mg/d etoricoxib followed by placebo) or B (placebo followed by 60 mg/d etoricoxib). The quantitative, mechanistic pain biomarkers were pressure pain thresholds, temporal summation (TS), and conditioning pain modulation. Clinical readouts were Brief Pain Inventory, WOMAC, painDETECT questionnaire (PD-Q), and time and pain intensity during walking and stair climbing. Etoricoxib as compared with placebo significantly modulated the pressure pain thresholds ($P = 0.012$, localized sensitization) at the knee and leg (control site) ($P = 0.025$, spreading sensitization) and TS assessed from the knee ($P = 0.038$) and leg ($P = 0.045$). Conditioning pain modulation was not modulated. The Brief Pain Inventory (pain scores), PD-Q, WOMAC, and walking and stair climbing tests were all significantly improved by etoricoxib. Based on a minimum of 30% or 50% pain alleviation (day 0-day 28), responders and nonresponders were defined. The nonresponders showed a significant association between increased facilitation of TS and increased pain alleviation. None of the other parameters predicted the degree of pain alleviation. Generally, a responder to etoricoxib has the most facilitated TS.

In conclusion, etoricoxib (1) modulated central pain modulatory mechanisms and (2) improved pain and function in painful osteoarthritis. Stronger facilitation of TS may indicate a better response to etoricoxib, supporting the central mode-of-action of the drug.

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Tibial slope

BMC Musculoskelet Disord. 2016 Jul 19;17(1):299. doi: 10.1186/s12891-016-1158-9.

Coronal tibial slope is associated with accelerated knee osteoarthritis: data from the Osteoarthritis Initiative.

Driban JB¹, Stout AC², Duryea J³, Lo GH^{4,5}, Harvey WF², Price LL^{6,7}, Ward RJ⁸, Eaton CB⁹, Barbe MF¹⁰, Lu B¹¹, McAlindon TE².

BACKGROUND:

Accelerated knee osteoarthritis may be a unique subset of knee osteoarthritis, which is associated with greater knee pain and disability. Identifying risk factors for accelerated knee osteoarthritis is vital to recognizing people who will develop accelerated knee osteoarthritis and initiating early interventions. The geometry of an articular surface (e.g., coronal tibial slope), which is a determinant of altered joint biomechanics, may be an important risk factor for incident accelerated knee osteoarthritis. We aimed to determine if baseline coronal tibial slope is associated with incident accelerated knee osteoarthritis or common knee osteoarthritis.

METHODS:

We conducted a case-control study using data and images from baseline and the first 4 years of follow-up in the Osteoarthritis Initiative. We included three groups: 1) individuals with incident accelerated knee osteoarthritis, 2) individuals with common knee osteoarthritis progression, and 3) a control group with no knee osteoarthritis at any time. We did 1:1:1 matching for the 3 groups based on sex. Weight-bearing, fixed flexion posterior-anterior knee radiographs were obtained at each visit. One reader manually measured baseline coronal tibial slope on the radiographs. Baseline femorotibial angle was measured on the radiographs using a semi-automated program. To assess the relationship between slope (predictor) and incident accelerated knee osteoarthritis or common knee osteoarthritis (outcomes) compared with no knee osteoarthritis (reference outcome), we performed multinomial logistic regression analyses adjusted for sex.

RESULTS:

The mean baseline slope for incident accelerated knee osteoarthritis, common knee osteoarthritis, and no knee osteoarthritis were 3.1(2.0), 2.7(2.1), and 2.6(1.9); respectively. A greater slope was associated with an increased risk of incident accelerated knee osteoarthritis (OR = 1.15 per degree, 95 % CI = 1.01 to 1.32) but not common knee osteoarthritis (OR = 1.04, 95 % CI = 0.91 to 1.19). These findings were similar when adjusted for recent injury. Among knees with varus malalignment a greater slope increases the odds of incident accelerated knee osteoarthritis; there is no significant relationship between slope and incident accelerated knee osteoarthritis among knees with normal alignment.

CONCLUSIONS:

Coronal tibial slope, particularly among knees with malalignment, may be an important risk factor for incident accelerated knee osteoarthritis.

KEYWORDS:

Alignment; Bone; Knee; Osteoarthritis; Radiography

PMID: [27432004](https://pubmed.ncbi.nlm.nih.gov/27432004/)

52. EXERCISE**Exercise and prostate CA**

Cancer Epidemiol Biomarkers Prev. 2016 Jul 7. pii: cebp.0223.2016. [Epub ahead of print]

Exercise and prostate cancer: evidence and proposed mechanisms for disease modification.

Hayes BD¹, Brady L², Pollak MN³, Finn S⁴.

Exercise has many potential benefits in relation to cancer.

Apart from primary prevention these include improvement of non-specific cancer-related symptoms, amelioration of symptoms and cardiovascular risk factors related to cancer treatment, and improvements in various quality-of-life-related factors. Increasing evidence also points towards improved cancer-free and overall survival in cancer patients who undertake regular exercise, findings which should encourage further research in this area. Obesity is known to be associated with a pro-inflammatory, pro-thrombotic humoral milieu, which may promote aggressiveness in prostate cancer through interactions with NK-cell mediated killing of circulating tumour cells, through platelet-circulating tumour cell interactions, and through alterations in adipokine and myokine profile among others.

Physical activity reduces levels of systemic inflammatory mediators and so exercise may represent an accessible and cost-effective means of ameliorating the pro-inflammatory effects of obesity in cancer patients. This review outlines the evidence for the benefits of exercise in these patients, focussing on prostate cancer, and delineates current theories of the underlying biological mechanisms.

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PMID: 27389872

59. PAIN

No increase in mortality with chronic pain

The mortality associated with chronic widespread musculoskeletal complaints: A systematic review of the literature

Musculoskeletal Care, 07/20/2016

Åsberg AN, et al.

Pooled data gave no evidence of a higher mortality rate among individuals with chronic widespread musculoskeletal complaints (CWMSC), in this systematic review, based on a limited number of studies. In the adjusted pooled analyses, the non-significant tendency for a higher mortality rate in unadjusted pooled analyses was nearly eliminated, taking in consideration lifestyle factors such as physical activity smoking.

Further to this, clinicians suggest that both unadjusted and adjusted analyses should be presented, in population-based studies evaluating the relationship between CWMSC and mortality rate.

60. COMPLEX REGIONAL PAIN**Cold and warm CRP**

Pain. 2016 Aug;157(8):1674-81. doi: 10.1097/j.pain.0000000000000569.

Complex regional pain syndrome: evidence for warm and cold subtypes in a large prospective clinical sample.

Bruehl S¹, Maihöfner C, Stanton-Hicks M, Perez RS, Vatine JJ, Brunner F, Birklein F, Schlereth T, Mackey S, Mailis-Gagnon A, Livshitz A, Harden RN.

Limited research suggests that there may be Warm complex regional pain syndrome (CRPS) and Cold CRPS subtypes, with inflammatory mechanisms contributing most strongly to the former.

This study for the first time used an unbiased statistical pattern recognition technique to evaluate whether distinct Warm vs Cold CRPS subtypes can be discerned in the clinical population. An international, multisite study was conducted using standardized procedures to evaluate signs and symptoms in 152 patients with clinical CRPS at baseline, with 3-month follow-up evaluations in 112 of these patients. Two-step cluster analysis using automated cluster selection identified a 2-cluster solution as optimal. Results revealed a Warm CRPS patient cluster characterized by a warm, red, edematous, and sweaty extremity and a Cold CRPS patient cluster characterized by a cold, blue, and less edematous extremity. Median pain duration was significantly ($P < 0.001$) shorter in the Warm CRPS (4.7 months) than in the Cold CRPS subtype (20 months), with pain intensity comparable. A derived total inflammatory score was significantly ($P < 0.001$) elevated in the Warm CRPS group (compared with Cold CRPS) at baseline but diminished significantly ($P < 0.001$) over the follow-up period, whereas this score did not diminish in the Cold CRPS group (time \times subtype interaction: $P < 0.001$).

Results support the existence of a Warm CRPS subtype common in patients with acute (<6 months) CRPS and a relatively distinct Cold CRPS subtype most common in chronic CRPS. The pattern of clinical features suggests that inflammatory mechanisms contribute most prominently to the Warm CRPS subtype but that these mechanisms diminish substantially during the first year postinjury.

PMID: 27023422

61. FIBROMYALGIA**Pain responses impacted**

Pain. 2016 Aug;157(8):1704-10. doi: 10.1097/j.pain.0000000000000573.

Pain facilitation and pain inhibition during conditioned pain modulation in fibromyalgia and in healthy controls.

Potvin S¹, Marchand S.

Although fibromyalgia (FM) is associated with a deficit in inhibitory conditioned pain modulation (CPM), the discriminative power of CPM procedures is unknown. Moreover, the high intersubject heterogeneity in CPM responses in FM raises the possibility that a sizeable subgroup of these patients may experience pain facilitation during CPM, but the phenomenon has not been explicitly studied.

To address these issues, 96 patients with FM and 71 healthy controls were recruited. Thermal stimuli were used to measure pain thresholds. Pain inhibition was elicited using a tonic thermal test (Peltier thermode) administered before and after activation of CPM mechanisms using a cold pressor test. Thermal pain thresholds were lower in patients with FM than in healthy controls. Pain ratings during the cold pressor test were higher in patients with FM, relative to controls. The CPM inhibitory efficacy was lower in patients with FM than in controls. The CPM procedure had good specificity (78.9%) but low sensitivity (45.7%), whereas a composite pain index had good sensitivity (75.0%) and specificity (78.9%).

Finally, the rate of patients with FM who reported pain facilitation during the CPM procedure was found to be significantly increased compared with that of controls (41.7% vs 21.2%). The good discriminative power of the composite pain index highlights the need for further validation studies using mechanistically relevant psychophysical procedures in FM. The low sensitivity of the CPM procedure, combined with the large proportion of patients with FM experiencing pain facilitation during CPM, strongly suggests that endogenous pain inhibition mechanisms are deeply impaired in patients with FM, but only in a subgroup of them.

PMID:27045524

63. PHARMACOLOGY**Opioid use questioned**

JAMA Intern Med. 2016 Jul 1;176(7):958-68. doi: 10.1001/jamainternmed.2016.1251.

Efficacy, Tolerability, and Dose-Dependent Effects of Opioid Analgesics for Low Back Pain: A Systematic Review and Meta-analysis.

Abdel Shaheed C¹, Maher CG², Williams KA³, Day R⁴, McLachlan AJ⁵.

IMPORTANCE:

Opioid analgesics are commonly used for low back pain, however, to our knowledge there has been no systematic evaluation of the effect of opioid dose and use of enrichment study design on estimates of treatment effect.

OBJECTIVE:

To evaluate efficacy and tolerability of opioids in the management of back pain; and investigate the effect of opioid dose and use of an enrichment study design on treatment effect.

DATA SOURCES:

Medline, EMBASE, CENTRAL, CINAHL, and PsycINFO (inception to September 2015) with citation tracking from eligible randomized clinical trials (RCTs).

STUDY SELECTION:

Placebo-controlled RCTs in any language.

DATA EXTRACTION AND SYNTHESIS:

Two authors independently extracted data and assessed risk of bias. Data were pooled using a random effects model with strength of evidence assessed using the grading of recommendations assessment, development, and evaluation (GRADE).

MAIN OUTCOMES AND MEASURES:

The primary outcome measure was pain. Pain and disability outcomes were converted to a common 0 to 100 scale, with effects greater than 20 points considered clinically important.

RESULTS:

Of 20 included RCTs of opioid analgesics (with a total of 7925 participants), 13 trials (3419 participants) evaluated short-term effects on chronic low back pain, and no placebo-controlled trials enrolled patients with acute low back pain. In half of these 13 trials, at least 50% of participants withdrew owing to adverse events or lack of efficacy. There was moderate-quality evidence that opioid analgesics reduce pain in the short term; mean difference (MD), -10.1 (95% CI, -12.8 to -7.4). Meta-regression revealed a 12.0 point greater pain relief for every 1 log unit increase in morphine equivalent dose ($P = .046$). Clinically important pain relief was not observed within the dose range evaluated (40.0-240.0-mg morphine equivalents per day). There was no significant effect of enrichment study design.

CONCLUSIONS AND RELEVANCE:

For people with chronic low back pain who tolerate the medicine, opioid analgesics provide modest short-term pain relief but the effect is not likely to be clinically important within guideline recommended doses. Evidence on long-term efficacy is lacking. The efficacy of opioid analgesics in acute low back pain is unknown.