

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Behavioral PT

#### **Perioperative Behavioral Therapy and Pelvic Muscle Strengthening Do Not Enhance Quality of Life After Pelvic Surgery: Secondary Report of a Randomized Controlled Trial**

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*Physical Therapy*, Volume 97, Issue 11, 1 November 2017, Pages 1075–1083,<https://doi.org/10.1093/ptj/pzx077>

#### **Background**

There is significant need for trials evaluating the long-term effectiveness of a rigorous program of perioperative behavioral therapy with pelvic floor muscle training (BPMT) in women undergoing transvaginal reconstructive surgery for prolapse.

#### **Objective**

The purpose of this study was to evaluate the effect of perioperative BPMT on health-related quality of life (HRQOL) and sexual function following vaginal surgery for pelvic organ prolapse (POP) and stress urinary incontinence (SUI).

#### **Design**

This study is a secondary report of a 2 × 2 factorial randomized controlled trial.

#### **Setting**

This study was a multicenter trial.

#### **Participants**

Participants were adult women with stage 2–4 POP and SUI.

#### **Intervention**

Perioperative BPMT versus usual care and sacrospinous ligament fixation (SSLF) versus uterosacral ligament suspension (ULS) were provided.

#### **Measurements**

Participants undergoing transvaginal surgery (SSLF or ULS for POP and a midurethral sling for SUI) received usual care or five perioperative BPMT visits. The primary outcome was change in body image and in Pelvic Floor Impact Questionnaire (PFIQ) short-form subscale, 36-item Short-Form Health Survey (SF-36), Pelvic Organ Prolapse-Urinary Incontinence Sexual Questionnaire short form (PISQ-12), Patient Global Impression of Improvement (PGII), and Brink scores.

#### **Results**

The 374 participants were randomized to BPMT (n = 186) and usual care (n = 188). Outcomes were available for 137 (74%) of BPMT participants and 146 (78%) of the usual care participants at 24 months. There were no statistically significant differences between groups in PFIQ, SF-36, PGII, PISQ-12, or body image scale measures.

#### **Limitations**

The clinicians providing BPMT had variable expertise. Findings might not apply to vaginal prolapse procedures without slings or abdominal apical prolapse procedures.

#### **Conclusions**

Perioperative BPMT performed as an adjunct to vaginal surgery for POP and SUI provided no additional improvement in QOL or sexual function compared with usual care.

## 8. VISCERA

### Inspiratory training for GERD

#### **Inspiratory muscle training improves antireflux barrier in GERD patients.**

##### **Clinical Trial**

Nobre e Souza MÂ, et al. Am J Physiol Gastrointest Liver Physiol. 2013.

The crural diaphragm (CD) is an essential component of the esophagogastric junction (EGJ), and inspiratory exercises may modify its function.

This study's goal is to verify if inspiratory muscle training (IMT) improves EGJ motility and gastroesophageal reflux (GER).

Twelve GER disease [GERD; 7 males, 20-47 yr, 9 esophagitis, and 3 nonerosive reflux disease (NERD)] and 7 healthy volunteers (3 males, 20-41 yr) performed esophageal pH monitoring, manometry, and heart rate variability (HRV) studies. A 6-cm sleeve catheter measured average EGJ pressure during resting, peak inspiratory EGJ pressures during sinus arrhythmia maneuver (SAM) and inhalations under 17-, 35-, and 70-cmH<sub>2</sub>O loads (TH maneuvers), and along 1 h after a meal. GERD patients entered a 5-days-a-week IMT program. One author scored heartburn and regurgitation before and after IMT. IMT increased average EGJ pressure ( $19.7 \pm 2.4$  vs.  $29.5 \pm 2.1$  mmHg;  $P < 0.001$ ) and inspiratory EGJ pressure during SAM ( $89.6 \pm 7.6$  vs.  $125.6 \pm 13.3$  mmHg;  $P = 0.001$ ) and during TH maneuvers. The EGJ-pressure gain across 35- and 70-cmH<sub>2</sub>O loads was lower for GERD volunteers. The number and cumulative duration of the transient lower esophageal sphincter relaxations decreased after IMT. Proximal progression of GER decreased after IMT but not the distal acid exposure. Low-frequency power increased after IMT and the higher its increment the lower the increment of supine acid exposure. IMT decreased heartburn and regurgitation scores.

In conclusion, IMT improved EGJ pressure, reduced GER proximal progression, and reduced GERD symptoms. Some GERD patients have a CD failure, and IMT may prove beneficial as a GERD add-on treatment.

**PMID** 24113771 [PubMed - indexed for MEDLINE]

## Diaphragmatic breathing helps acid reflux

### Diaphragmatic breathing reduces belching and proton pump inhibitor refractory gastroesophageal reflux symptoms

Clinical Gastroenterology and Hepatology | November 06, 2017

Ong AML, et al.

This study was performed to examine whether diaphragmatic breathing therapy was effective in reducing belching and proton pump inhibitor (PPI) refractory gastroesophageal reflux symptoms. The researchers found a standardized protocol for diaphragmatic breathing to reduce belching and PPI-refractory gastroesophageal reflux symptoms and increased quality of life (QoL) among patients with PPI-refractory gastroesophageal reflux disease (GERD) with belching, particularly those with excessive supragastric belching (SGB).

#### Methods

- From April 2015 through October 2016, the researchers performed a prospective study of 36 consecutive patients with GERD refractory to PPI therapy and a belching visual analogue scale (VAS) score of 6 or more, seen at a gastroenterology clinic at a tertiary hospital in Singapore.
- While patients were off PPIs, high-resolution manometry and 24 hr pH-impedance studies were performed.
- They placed 15 patients on a standardized diaphragmatic breathing exercise protocol (treatment group) and completed questionnaires at baseline, after diaphragmatic breathing therapy, and 4 months after the therapy ended.
- Twenty-one patients (controls) who completed the same questionnaires with an additional questionnaire after their waitlist period eventually received diaphragmatic breathing therapy.
- Reduction in belching VAS by 50% or more after treatment was the primary outcome.
- GERD symptoms (evaluated using the reflux disease questionnaire) and quality of life (QoL) scores, determined from the reflux qual short-form and EuroQoL-VAS (EQ-VAS) were included as secondary outcomes.

#### Results

- In the treatment group, 9 of the 15 patients (60%) and none of the 21 controls achieved the primary outcome ( $P < .001$ ).
- The mean belching VAS score decreased from  $7.1 \pm 1.5$  at baseline to  $3.5 \pm 2.0$  after diaphragmatic breathing therapy in the treatment group.
- The mean VAS score was  $7.6 \pm 1.1$  at baseline and  $7.4 \pm 1.3$  after the waitlist period in the control group.
- In the treatment group, 80% of patients significantly reduced belching frequency compared to 19% in controls ( $P = .001$ ).
- Treatment significantly reduced symptoms of GERD (the mean reflux disease questionnaire score increased by 12.2 in the treatment group and 3.1 in the control group;  $P = .01$ ).
- The treatment significantly increased QoL scores (the mean reflux qual short-form score increased by 15.4 in the treatment group and 5.2 in the control group,  $P = 0.04$ ) and mean EQ-VAS scores (15.7 increase in treatment group and 2.4 decrease in the control group).
- At 4 months after treatment, these changes were sustained.
- Twenty of the 36 patients who received diaphragmatic breathing therapy (55.6%), all with excessive SGB, achieved the primary outcome in the end.

**Psoriatic arthritis and IBS****Risk of uveitis and inflammatory bowel disease in people with psoriatic arthritis: A population-based cohort study**

Annals of Rheumatic Diseases | November 02, 2017

Charlton R, et al.

The risk of uveitis and inflammatory bowel disease (IBD) in patients with psoriatic arthritis (PsA) compared with the general population and patients with psoriasis was ascertained in this study. In a primary care-based incidence cohort of patients with PsA, there were substantial risks of developing uveitis and/or Crohn's disease, but not ulcerative colitis, when compared with the general population and psoriasis controls.

**Methods**

- Between 1998 and 2014, they utilizing information from the UK Clinical Practice Research Datalink for this study.
- Patients with incident PsA aged 18-89 years were identified and matched to a cohort of patients with psoriasis and a general population cohort.
- The incidence of uveitis, all IBD, Crohn's disease and ulcerative colitis was calculated for each study cohort and adjusted relative risks (RR<sub>adj</sub>) were ascertained utilizing conditional Poisson regression.

**Results**

- They identified total 6783 incident cases of PsA.
- In this study, the median age was 49 years.
- The current study showed that the risk of uveitis was significantly higher in the PsA cohort than in the general population and psoriasis cohorts (RR<sub>adj</sub>3.55, 95% CI 2.21 to 5.70 and RR<sub>adj</sub> 2.13, 95% CI 1.40 to 3.24, respectively).
- A significant increase was observed for Crohn's disease (RR<sub>adj</sub> 2.96, 95% CI 1.46 to 6.00 and RR<sub>adj</sub>3.60, 95% CI 1.83 to 7.10) but not for ulcerative colitis (RR<sub>adj</sub>1.30, 95% CI 0.66 to 2.56 and RR<sub>adj</sub>0.98, 95% CI 0.50 to 1.92).

**Crohn's disease vs. colitis**

Dig Liver Dis. 2017 Oct 19. pii: S1590-8658(17)31257-4. doi: 10.1016/j.dld.2017.10.006.

**Histological features of ileitis differentiating pediatric Crohn disease from ulcerative colitis with backwash ileitis.**

Sahn B<sup>1</sup>, De Matos V<sup>2</sup>, Stein R<sup>3</sup>, Ruchelli E<sup>4</sup>, Masur S<sup>3</sup>, Klink AJ<sup>5</sup>, Baldassano RN<sup>3</sup>, Piccoli DA<sup>3</sup>, Russo P<sup>4</sup>, Mamula P<sup>3</sup>.

**BACKGROUND/AIM:**

Pediatric ileocolonic Crohn disease (CD) may be difficult to distinguish from ulcerative colitis (UC) with backwash ileitis (BWI). The primary aim of the study was to determine the probability of CD in children with a confluent colitis and ileitis when newly diagnosed with inflammatory bowel disease (IBD).

**METHODS:**

A retrospective observational study of 100 newly diagnosed patients with IBD was performed. Two pathologists reviewed ileal biopsy specimens for 8 histological features. Biopsy and clinical features were evaluated for predictive ability of a final diagnosis of CD.

**RESULTS:**

The presence of crypt distortion, lamina propria (LP) expansion, and acute LP inflammation combined with 4 clinical variables in multivariate regression analysis had adequate discriminative validity when comparing the mean probability of a final CD diagnosis between CD and not-CD groups (0.90 vs. 0.59, p value <0.001). When crypt distortion, LP expansion, and acute LP inflammation are present in any combination, the sensitivity and specificity for presence of CD ranges 38.4-57% and 92.9-100%, respectively.

**CONCLUSIONS:**

Combining histological features of ileitis and clinical variables can adequately discriminate between the presence and absence of Crohn disease in children who present with confluent colitis and ileitis. Combined presence of certain histological features has high specificity for CD.

**Proton pump and gastric CA**

BMJ Open. 2017 Oct 30;7(10):e017739. doi: 10.1136/bmjopen-2017-017739.

**Maintenance therapy with proton pump inhibitors and risk of gastric cancer: a nationwide population-based cohort study in Sweden.**

Brusselsaers N<sup>1</sup>, Wahlin K<sup>2</sup>, Engstrand L<sup>1</sup>, Lagergren J<sup>2,3</sup>.

*OBJECTIVE:*

Proton pump inhibitors (PPIs) are among the most commonly prescribed drugs. Concerns have been raised about a potentially increased risk of gastric cancer following long-term use. Our aim is to assess the risk of gastric cancer associated with PPI use, taking into account underlying indications.

*DESIGN:*

This is a population-based cohort study. Standardised incidence ratios (SIRs) and 95% CIs were calculated to compare the risk of gastric cancer among long-term PPI users with the corresponding background population, while taking confounding by indication into account.

*SETTING:*

Population-based study in Sweden (2005-2012).

*PARTICIPANTS:*

This study included virtually all adults residing in Sweden exposed to maintenance therapy with PPIs.

*EXPOSURE/INTERVENTION:*

Maintenance use of PPIs, defined as at least 180 days during the study period. Maintenance use of histamine 2 receptor antagonist was evaluated for comparison reasons.

*OUTCOME MEASURES:*

Gastric cancer (cardia and non-cardia), and subgroup analysis for gastric adenocarcinoma, as defined by the Swedish Cancer Registry.

*RESULTS:*

Among 797 067 individuals on maintenance PPI therapy, the SIR of gastric cancer was over threefold increased (SIR=3.38, 95% CI 3.23 to 3.53). Increased SIRs were found in both sexes and all age groups, but were especially increased among PPI users younger than 40 years (SIR=22.76, 95% CI 15.94 to 31.52). Increased SIRs were found for each indication studied, including those without an association with gastric cancer, for example, gastro-oesophageal reflux (SIR=3.04, 95% CI 2.80 to 3.31), and those with a supposedly decreased risk, for example, aspirin users (SIR=1.93, 95% CI 1.70 to 2.18). The association was similar for cardia and non-cardia gastric cancer. Analyses restricted to adenocarcinoma showed similar results to those for all gastric cancers. Long-term users of histamine 2 receptor antagonists, which have the same indications as PPIs, were not at any increased risk.

*CONCLUSIONS:*

Long-term PPI use might be an independent risk factor for gastric cancer. This challenges broad maintenance PPI therapy, particularly if the indication is weak

**BP and dementia**

BMC Geriatr. 2017 Oct 27;17(1):252. doi: 10.1186/s12877-017-0649-3.

**Blood pressure at age 60-65 versus age 70-75 and vascular dementia: a population based observational study.**

Peng M<sup>1</sup>, Chen G<sup>2</sup>, Tang KL<sup>3</sup>, Quan H<sup>4</sup>, Smith EE<sup>5</sup>, Faris P<sup>2</sup>, Hachinski V<sup>6</sup>, Campbell NRC<sup>7</sup>.

*BACKGROUND:*

Vascular dementia (VaD) is the second most common form of dementia. However, there were mixed evidences about the association between blood pressure (BP) and risk of VaD in midlife and late life and limited evidence on the association between pulse pressure and VaD.

*METHODS:*

This is a population-based observational study. 265,897 individuals with at least one BP measurement between the ages of 60 to 65 years and 211,116 individuals with at least one BP measurement between the ages of 70 to 75 years were extracted from The Health Improvement Network in United Kingdom. Blood pressures were categorized into four groups: normal, prehypertension, stage 1 hypertension, and stage 2 hypertension. Cases of VaD were identified from the recorded clinical diagnoses. Multivariable survival analysis was used to adjust other confounders and competing risk of death. All the analysis were stratified based on antihypertensive drug use status. Multiple imputation was used to fill in missing values.

*RESULTS:*

After accounting for the competing risk of death and adjustment for potential confounders, there was an association between higher BP levels in the age 60-65 cohort with the risk of developing VaD (hazard ratio [HR] 1.53 (95% confidence interval: 1.04, 2.25) for prehypertension, 1.90 (1.30, 2.78) for stage 1 hypertension, and 2.19 (1.48, 3.26) for stage 2 hypertension) in the untreated group. There was no statistically significant association between BP levels and VaD in the treated group in the age 60-65 cohort and age 70-75 cohort. Analysis on Pulse Pressure (PP) stratified by blood pressure level showed that PP was not independently associated with VaD.

*CONCLUSION:*

High BP between the ages of 60 to 65 years is a significant risk for VaD in late midlife. Greater efforts should be placed on early diagnosis of hypertension and tight control of BP for hypertensive patients for the prevention of VaD.

**Yoga and IBS**

Aliment Pharmacol Ther. 2017 Oct 27. doi: 10.1111/apt.14400.

**Randomised clinical trial: yoga vs a low-FODMAP diet in patients with irritable bowel syndrome.**

Schumann D<sup>1</sup>, Langhorst J<sup>1</sup>, Dobos G<sup>1</sup>, Cramer H<sup>1</sup>.

**BACKGROUND:**

Irritable bowel syndrome is the most frequent gastrointestinal disorder. It is assumed that lifestyle interventions might be a rational treatment approach.

**AIM:**

To examine the effect of a yoga-based intervention vs a low-FODMAP diet on patients with irritable bowel syndrome.

**METHODS:**

Fifty-nine patients with irritable bowel syndrome undertook a single-blind, randomised controlled trial involving yoga or a low-FODMAP diet for 12 weeks. Patients in the yoga group received two sessions weekly, while patients in the low-FODMAP group received a total of three sessions of nutritional counselling. The primary outcome was a change in gastrointestinal symptoms (IBS-SSS). Secondary outcomes explored changes in quality of life (IBS-QOL), health (SF-36), perceived stress (CPSS, PSQ), body awareness (BAQ), body responsiveness (BRS) and safety of the interventions. Outcomes were examined in weeks 12 and 24 by assessors "blinded" to patients' group allocation.

**RESULTS:**

No statistically significant difference was found between the intervention groups, with regard to IBS-SSS score, at either 12 ( $\Delta = 31.80$ ; 95%CI = -11.90, 75.50;  $P = .151$ ) or 24 weeks ( $\Delta = 33.41$ ; 95%CI = -4.21, 71.04;  $P = .081$ ). Within-group comparisons showed statistically significant effects for yoga and low-FODMAP diet at both 12 and 24 weeks (all  $P < .001$ ). Comparable within-group effects occurred for the other outcomes. One patient in each intervention group experienced serious adverse events ( $P = 1.00$ ) and another, also in each group, experienced nonserious adverse events ( $P = 1.00$ ).

**CONCLUSIONS:**

Patients with irritable bowel syndrome might benefit from yoga and a low-FODMAP diet, as both groups showed a reduction in gastrointestinal symptoms. More research on the underlying mechanisms of both interventions is warranted, as well as exploration of potential benefits from their combined use.



## 13 A. CRANIUM

### Facial aging

JAMA Facial Plast Surg. 2017 Sep 1;19(5):413-417. doi: 10.1001/jamafacial.2017.0743.

#### **Patterns of Change in Facial Skeletal Aging.**

Paskhover B<sup>1,2</sup>, Durand D<sup>3</sup>, Kamen E<sup>1</sup>, Gordon NA<sup>3</sup>.

#### *IMPORTANCE:*

Research in facial aging has focused on soft-tissue changes rather than bony changes despite evidence of the importance of underlying bony structural changes. Research has also been limited by comparing different patients in separate age groups rather than the same patients over time.

#### *OBJECTIVE:*

To longitudinally document patterns of change in the facial skeleton and determine a consistent methodology for measuring these changes.

#### *DESIGN, SETTING, AND PARTICIPANTS:*

Case series study of university hospital system records using facial computed tomographic (CT) images timed at least 8 years apart in adults initially aged 40 to 55 years with no history of facial surgery who required repeated facial imaging that included the entire midface and cranium.

#### *MAIN OUTCOMES AND MEASURES:*

Face CTs were analyzed for 3-dimensional constructions and 2-dimensional measurements to document changes in glabellar, piriform, and maxillary angles and piriform height and width.

#### *RESULTS:*

Fourteen patients (5 men, 9 women; mean [SD] age, 51.1 [5.8] years) with mean (SD) follow-up of 9.7 (1.4) years were eligible for 2-dimensional analysis, which revealed statistically significant decreases in mean (SD) glabellar angles (from 68.8° [7.6°] to 66.5° [8.6°]) and maxillary angles on both the right (from 82.5° [6.3°] to 81.0° [7.1°]) and left (from 83.0° [5.8°] to 81.0° [7.0°]), as well as increases in mean (SD) piriform width (from 24.5 [1.6] mm to 25.5 [1.3] mm). Nine patients (3 men, 6 women; mean [SD] age, 51.4 [6.3] years) with mean (SD) follow-up imaging at 9.6 (1.5) years were eligible for 3-dimensional analysis, which revealed statistically significant decreases in mean (SD) maxillary angles (from 56.5° [6.6°] to 51.6° [7.6°]) and piriform angles (from 50.8° [3.4°] to 49.1° [3.4°]). Statistically significant differences between the sexes were also noted: Initial mean (SD) glabellar angle for men was 61.7° (5.7°) vs 72.7° (5.4°) for women, with final values of 57.9° (4.9°) vs 71.2° (6.0°). Mean (SD) maxillary angle initial values were 87.8° (6.1°) (right) and 87.1° (4.9°) (left) for men, with 79.6° (4.3°) and 80.6° (5.0°) for women, respectively. Final values were 87.0° (4.4°) and 86.9° (4.1°) for men and 77.7° (6.1°) and 77.7° (6.2°) for women, respectively. Mean (SD) piriform height for men was 35.0 (2.0) mm initially and 35.5 (2.1) mm finally, vs 31.3 (2.8) and 31.6 (3.0) mm for women, respectively.

#### *CONCLUSIONS AND RELEVANCE:*

Our pilot study of repeated CT images of patients over several years supports previous studies of bony facial aging and further characterizes these changes. This study is the first, to our knowledge, to document bony changes of the face in the same group of patients at different time points to better characterize facial aging. We also detail an improved methodology to study bony aging to contribute to additional research in the field.

**13 B. TMJ/ORAL****Loading on teeth**

Angle Orthod. 2017 Nov 3. doi: 10.2319/071017-456.1.

**Effect of incisal loading during orthodontic treatment in adults:A randomized control trial.**

Puttaravuttiorn P, Wongsuwanlert M, Charoemratrote C, Lindauer SJ, Leethanakul C.

Abstract

*OBJECTIVE:*

To measure the changes in tooth mobility, alveolar bone, and receptor activator of nuclear factor kappa-B ligand (RANKL)/osteoprotegerin (OPG) in the gingival crevicular fluid (GCF) during orthodontic treatment to regain incisal function in the presence and absence of biting exercises.

*MATERIALS AND METHODS:*

Thirty-six females ( $42.3 \pm 6.5$  years old) with periodontally compromised upper incisors received orthodontic treatment to obtain ideal incisor relationships. Eighteen subjects in the experimental biting exercise group were instructed to bite a soft plastic roll for 5 min/d; the 18 control subjects were not given plastic rolls. Alveolar bone thickness, height, and density around the upper incisors were assessed at three root levels using cone-beam computed tomography. GCF was collected at the labial and palatal sites of the upper incisors at pretreatment (T0), end of treatment (T1), 1 month after T1 (T2), and 7 months after T1 (T3). RANKL/OPG was determined using enzyme-linked immunosorbent assays.

*RESULTS:*

Labial and palatal bone thickness significantly increased (>twofold) from T1 to T3 in the experimental group at all three root levels (all  $P < .05$ ). Bone thickness correlated negatively with RANKL/OPG ratio between T1 and T2 ( $P < .05$ ). Tooth mobility, bone height, and density were not significantly different between T1 and T3.

*CONCLUSIONS:*

Biting exercises significantly increased bone thickness but did not affect tooth mobility, bone height, or density. The RANKL/OPG ratio decreased 1 month after treatment (T2) and correlated with increased bone thickness. ( ClinicalTrials.in.th TCTR20170625001).

## Low level laser helps tooth movement in orthodontics

November 2017 Volume 152, Issue 5, Pages 622–630

### Effects of low-level laser irradiation on the rate of orthodontic tooth movement and associated pain with self-ligating brackets

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Khamis Adam Husein

DOI: <http://dx.doi.org/10.1016/j.ajodo.2017.03.023>

#### Highlights

- Force application during orthodontic tooth movement (OTM) causes pain.
- Low-level laser therapy (LLLT) accelerates tooth movement and reduces pain.
- Multiple and frequent applications of low-level laser (LLL) have been attempted in past.
- We applied LLLT at 3-week intervals and used self-ligating brackets (SLB).
- LLLT every 3 weeks accelerates OTM and reduces pain when SLB are used.

#### Introduction

The aim of this study was to evaluate the effect of low-level laser irradiation applied at 3-week intervals on orthodontic tooth movement and pain associated with orthodontic tooth movement using self-ligating brackets.

#### Methods

Twenty-two patients (11 male, 11 female; mean age,  $19.8 \pm 3.1$  years) with Angle Class II Division 1 malocclusion were recruited for this split-mouth clinical trial; they required extraction of maxillary first premolars bilaterally. After leveling and alignment with self-ligating brackets (SmartClip SL3; 3M Unitek, St Paul, Minn), a 150-g force was applied to retract the canines bilaterally using 6-mm nickel-titanium closed-coil springs on 0.019 x 0.025-in stainless steel archwires. A gallium-aluminum-arsenic diode laser (iLas; Biolase, Irvine, Calif) with a wavelength of 940 nm in a continuous mode (energy density,  $7.5 \text{ J/cm}^2/\text{point}$ ; diameter of optical fiber tip,  $0.04 \text{ cm}^2$ ) was applied at 5 points buccally and palatally around the canine roots on the experimental side; the other side was designated as the placebo. Laser irradiation was applied at baseline and then repeated after 3 weeks for 2 more consecutive follow-up visits. Questionnaires based on the numeric rating scale were given to the patients to record their pain intensity for 1 week. Impressions were made at each visit before the application of irradiation at baseline and the 3 visits. Models were scanned with a CAD/CAM scanner (Planmeca, Helsinki, Finland).

#### Results

Canine retraction was significantly greater ( $1.60 \pm 0.38 \text{ mm}$ ) on the experimental side compared with the placebo side ( $0.79 \pm 0.35 \text{ mm}$ ) ( $P < 0.05$ ). Pain was significantly less on the experimental side only on the first day after application of LLLI and at the second visit ( $1.4 \pm 0.82$  and  $1.4 \pm 0.64$ ) compared with the placebo sides ( $2.2 \pm 0.41$  and  $2.4 \pm 1.53$ ).

#### Conclusions

Low-level laser irradiation applied at 3-week intervals can accelerate orthodontic tooth movement and reduce the pain associated with it.

**13 C. AIRWAYS/SWALLOWING/SPEECH**

Clin Otolaryngol. 2017 Nov 6. doi: 10.1111/coa.13027

**Evolution of soft palate surgery techniques for Obstructive Sleep Apnea patients: A comparative study for single level palatal surgeries.**

Rashwan MS<sup>1</sup>, Montevocchi F<sup>2</sup>, Cammaroto G<sup>3</sup>, Badr El Deen M<sup>1</sup>, Iskander N<sup>1</sup>, El Hennawi D<sup>1</sup>, El Tabbakh M<sup>1</sup>, Meccariello G<sup>2</sup>, Gobbi R<sup>2</sup>, Stomeo F<sup>4</sup>, Vicini C<sup>5</sup>.

*OBJECTIVES:*

to compare the results of tissue preservation techniques of soft palate surgeries including expansion sphincter pharyngoplasty (ESP) and barbed reposition pharyngoplasty (BRP) for patients suffering from obstructive sleep apnea (OSA) with the traditional uvulopalatopharyngoplasty (UPPP).

*DESIGN:*

interventional comparative study.

*SETTING:*

Morgagni- Pierantoni Hospital.

*PARTICIPANTS:*

seventy five patients were included in the study, divided into three groups with 25 patients per group: UPPP, ESP or BRP.

*MAIN OUTCOMES MEASURES:*

Polysomnography was done for all patients pre- and post-operatively, the post-operative results were recorded at least six months after surgery. All patients were assessed pre-operatively using drug induced sleep endoscopy. Epworth Sleepiness scale and body mass index were registered for all patients before and after surgery.

*RESULTS:*

the mean of pre- and post-operative differences of apnea hypopnea index values were higher in BRP group than ESP:  $15.76 \pm 14.5$  Vs  $10.13 \pm 5.3$ ;  $P < 0.05$  and UPPP groups:  $15.76 \pm 14.5$  Vs  $6.08 \pm 5.5$ ;  $P < 0.0005$ . The mean of differences of oxygen desaturation index values was higher in BRP group than UPPP group:  $15.09 \pm 17.6$  Vs  $7.13 \pm 6.8$ ;  $P < 0.0005$ , but not significantly higher than ESP group:  $15.09 \pm 17.6$  Vs  $6.48 \pm 7.9$ ;  $P > 0.05$ . The mean of differences of ESS values was higher in BRP group than ESP group:  $5.52 \pm 4.1$  Vs  $4.84 \pm 3.3$ ;  $P < 0.005$  and UPPP groups:  $5.52 \pm 4.1$  Vs  $1.36 \pm 1.9$ ;  $P < 0.005$ . Finally, the pre- and post-operative mean of differences of lowest oxygen saturation values were not statistically significant among the three groups ( $P > 0.05$ ).

*CONCLUSION:*

BRP can be considered an effective procedure on the basis of the post-operative outcomes. ESP still proves to be a good technique especially when performed by experienced surgeons. Both techniques proved to be superior to UPPP. This article is protected by copyright. All rights reserved.

## 14. HEADACHES

### Reoccurrence

Headache. 2017 Nov 2. doi: 10.1111/head.13216.

#### **A Retrospective Nested Cohort Study of Emergency Department Revisits for Migraine in New York City.**

Minen MT<sup>1</sup>, Boubour A<sup>2</sup>, Wahnich A<sup>3</sup>, Grudzen C<sup>4</sup>, Friedman BW<sup>5</sup>.

#### *OBJECTIVE:*

Migraine causes more than 1.2 million visits to US emergency departments (EDs) annually. Many of these visits are revisits among patients who had already been treated in an ED for migraine. The goal of this analysis was to determine the frequency of headache revisits among patients who present to an ED for management of migraine and sociodemographic factors associated with the revisit.

#### *METHODS:*

Using the New York City Department of Health and Mental Hygiene Syndromic Surveillance database, we conducted a retrospective nested cohort study. We analyzed visits from 18 NYC EDs with discharge diagnoses in the first 6 months of 2015. We conducted descriptive analyses to determine the frequency of headache revisit within 6 months of an index ED visit for migraine and the elapsed time to revisit. Using multivariable logistic regression, we assessed associations between age, sex, poverty, and revisit.

#### *RESULTS:*

Of 1052 ED visits with an ED discharge diagnosis of migraine during the first 6 months of 2015, 277 (26.3%) had a headache revisit within 6 months of their initial migraine visit and 131 (12.5%) had two or more revisits at the same hospital. Of the revisits for headache, 9% occur within 72 hours and 46% occur within 90 days of the initial migraine visit. Sex, age, and poverty level were not associated with an ED revisit.

#### *CONCLUSION:*

More than a quarter of initial ED visits for migraine are followed by headache revisits in <6 months. Future work should target interventions to decrease the frequency of headache revisits.

### Caffeine helps HA's

The Journal of Headache and Pain  
December 2017, 18:107

#### **Caffeine in the management of patients with headache**

Richard B. Lipton Email author Hans-Christoph Diener Matthew S. Robbins Sandy Yacoub Garas  
Ketu Patel

#### **Abstract**

Caffeinated headache medications, either alone or in combination with other treatments, are widely used by patients with headache.

Clinicians should be familiar with their use as well as the chemistry, pharmacology, dietary and medical sources, clinical benefits, and potential safety issues of caffeine. In this review, we consider the role of caffeine in the over-the-counter treatment of headache. The MEDLINE and Cochrane databases were searched by combining “caffeine” with the terms “headache,” “migraine,” and “tension-type.” Studies that were not placebo-controlled or that involved medications available only with a prescription, as well as those not assessing patients with migraine and/or tension-type headache (TTH), were excluded. Compared with analgesic medication alone, combinations of caffeine with analgesic medications, including acetaminophen, acetylsalicylic acid, and ibuprofen, showed significantly improved efficacy in the treatment of patients with TTH or migraine, with favorable tolerability in the vast majority of patients. The most common adverse events were nervousness (6.5%), nausea (4.3%), abdominal pain/discomfort (4.1%), and dizziness (3.2%).

This review provides evidence for the role of caffeine as an analgesic adjuvant in the acute treatment of primary headache with over-the-counter drugs, caffeine doses of 130 mg enhance the efficacy of analgesics in TTH and doses of  $\geq 100$  mg enhance benefits in migraine. Additional studies are needed to assess the relationship between caffeine dosing and clinical benefits in patients with TTH and migraine.

## 15. VESTIBULAR

### CG dizziness case study

#### CASE REPORT

#### **Clinical Decision Making in the Management of Patients With Cervicogenic Dizziness: A Case Series**

**Authors:** Francis C. Jung, DPT, OCS, FAAOMPT<sup>1-3</sup>, Sherin Mathew, PT, DPT<sup>4</sup>, Andrew E. Littmann, PT, PhD<sup>5</sup>, Cameron W. MacDonald, DPT, OCS, FAAOMPT<sup>5,6</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2017 **Volume:**47 **Issue:**11 **Pages:**874–884 **DOI:**10.2519/jospt.2017.7425

#### **Study Design**

Case series.

#### **Background**

Although growing recognition of cervicogenic dizziness (CGD) is emerging, there is still no gold standard for the diagnosis of CGD. The purpose of this case series is to describe the clinical decision making utilized in the management of 7 patients presenting with CGD.

#### **Case Description**

Patients presenting with neck pain and accompanying subjective symptoms, including dizziness, unsteadiness, light-headedness, and visual disturbance, were selected. Clinical evidence of a temporal relationship between neck pain and dizziness, with or without sensorimotor disturbances, was assessed. Clinical decision making followed a 4-step process, informed by the current available best evidence. Outcome measures included the numeric rating scale for dizziness and neck pain, the Dizziness Handicap Inventory, Patient-Specific Functional Scale, and global rating of change.

#### **Outcomes**

Seven patients (mean age, 57 years; range, 31–86 years; 7 female) completed physical therapy management at an average of 13 sessions (range, 8–30 sessions) over a mean of 7 weeks. Clinically meaningful improvements were observed in the numeric rating scale for dizziness (mean difference, 5.7; 95% confidence interval [CI]: 4.0, 7.5), neck pain (mean difference, 5.4; 95% CI: 3.8, 7.1), and the Dizziness Handicap Inventory (mean difference, 32.6; 95% CI: 12.9, 52.2) at discontinuation. Patients also demonstrated overall satisfaction via the Patient-Specific Functional Scale (mean difference, 9) and global rating of change (mean, +6).

#### **Discussion**

This case series describes the physical therapist decision making, management, and outcomes in patients with CGD. Further investigation is warranted to develop a valid clinical decision-making guideline to inform management of patients with CGD.

#### **Level of Evidence**

Diagnosis, therapy, level 4. *J Orthop Sports Phys Ther* 2017;47(11):874–884. Epub 9 Oct 2017. doi:10.2519/jospt.2017.7425

**20 A. ROTATOR CUFF****Changing shoulder angle**

Arthroscopy. 2017 Oct 31. pii: S0749-8063(17)31067-8. doi: 10.1016/j.arthro.2017.08.255.

**Arthroscopic Correction of the Critical Shoulder Angle Through Lateral Acromioplasty: A Safe Adjunct to Rotator Cuff Repair.**

Gerber C<sup>1</sup>, Catanzaro S<sup>2</sup>, Betz M<sup>2</sup>, Ernstbrunner L<sup>3</sup>.

**PURPOSE:**

To investigate whether arthroscopic lateral acromioplasty reliably decreases the critical shoulder angle (CSA) and whether it is associated with damage to the deltoid or other complications.

**METHODS:**

Patients undergoing arthroscopic rotator cuff repair (RCR) with lateral but without anterior acromioplasty for degenerative, full-thickness rotator cuff tears and a CSA of 34° or greater were retrospectively reviewed. Patients with traumatic or irreparable rotator cuff tears, osteoarthritis, or previous surgery were excluded. Clinical and radiographic outcomes were assessed at a minimum of 12 months' follow-up.

**RESULTS:**

We reviewed 49 consecutive patients (mean age, 56 years; age range, 39-76 years) at a mean of 30 months (range, 12-47 months). There were 7 RCR failures (14%). The mean CSA was reduced from 37.5° preoperatively (95% confidence interval [CI], 36.7°-38.3°) to 33.9° postoperatively (95% CI, 33.3°-34.6°;  $P < .001$ ). There were no cases of dehiscence, increases in fatty infiltration, or significant atrophy of the deltoid. Scarring at the deltoid origin was noted in 18 patients (37%). The mean absolute and relative Constant scores increased from 59 points (95% CI, 54-64 points) to 74 points (95% CI, 70-78 points) and from 66% (95% CI, 61%-71%) to 83% (95% CI, 79%-87%) respectively, and the Subjective Shoulder Value increased from 45% (95% CI, 39%-50%) to 80% (95% CI, 74%-86%) ( $P < .001$  for all 3 improvements). The postoperative CSA was significantly larger in failed than in healed repairs ( $P = .026$ ). Patients with a healed RCR and a CSA corrected to 33° or less ( $n = 22$ ) had 25% more abduction strength than patients with a healed cuff and a CSA corrected to 35° or greater ( $n = 14$ ,  $P = .04$ ).

**CONCLUSIONS:**

Arthroscopic lateral acromioplasty performed in addition to arthroscopic RCR can reduce the CSA without significantly compromising the deltoid origin, deltoid muscle, or function. It is not associated with any additional complications of arthroscopic RCR. Insufficiently corrected, abnormally large CSAs are associated either with a higher retear rate or with inferior strength of abduction if the tears heal.



## Early setting

1. Clin Rehabil. 2017 Oct;31(10):1332-1339. doi: 10.1177/0269215517694931. Epub 2017 Feb 1.

**Early active rehabilitation after arthroscopic rotator cuff repair: a prospective randomized pilot study.**

Raschhofer R<sup>1</sup>, Poulos N<sup>2</sup>, Schimetta W<sup>3</sup>, Kisling R<sup>1</sup>, Mittermaier C<sup>1</sup>.

**OBJECTIVE:** To compare two different rehabilitation strategies, primary passive motion versus early isometric loading of the rotator cuff.

**DESIGN:** Prospective randomized controlled observer-blinded pilot study.

**SETTING:** Institute of Physical Medicine and Rehabilitation.

**SUBJECTS:** Thirty patients after rotator cuff surgery.

**INTERVENTION:** All participants were randomly assigned to one of the two outpatient treatment groups: primary passive motion versus early isometric loading of the rotator cuff. Both groups were treated for 12 weeks and performed additionally a home exercise program.

**MAIN MEASURES:** The primary outcome measure for functional assessment was the Constant Murley score. The secondary outcome measures were the Disabilities of the Arm, Shoulder and Hand score (DASH), active range of motion, pain level and strength. Patients were assessed before, 6, 12 and 24 weeks after surgery.

**RESULTS:** Repeatedly measured metric variables were compared by the Quade rank analysis of covariance and revealed substantially better Constant Murley scores in the early activated group at all 3 assessments (6 weeks: 41 [31;45] versus 30 [23;37]; 12 weeks: 68 [56;77] versus 59 [53;62]; 24 weeks: 79 [76;81] versus 66 [62;74]; data as median [25%;75%]). Postoperative changes of Constant score were in favour of the active group with the biggest difference at week 12 (28 [38;12] versus 9 [27;-4]). Maximal pain levels showed clear more reduction 6 and 24 weeks after surgery in the early activated group.

**CONCLUSIONS:** This pilot study with early isometric loading of the rotator cuff shows better function and less maximal pain. Further research is warranted to confirm our results.

PMID: 28933605

**32 A. KNEE/ACL****PT and revision rate****Influence of Demographics and Utilization of Physical Therapy Interventions on Clinical Outcomes and Revision Rates Following Anterior Cruciate Ligament Reconstruction**

**Authors:** Caitlin J. Miller, PT, DPT<sup>1,2</sup>, Jesse C. Christensen, PT, DPT, PhD, SCS<sup>1</sup>, Ryan D. Burns, PhD<sup>3</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2017 **Volume:**47 **Issue:**11 **Pages:**834–844 **DOI:**10.2519/jospt.2017.7048

**Study Design** Retrospective cohort from the Intermountain Healthcare system, January 2007 to December 2014.

**Background** Recent evolutions in health care delivery are putting physical therapists in the forefront to be more responsible for providing high-quality rehabilitation care in a more cost-effective manner. Studies investigating the association between physical therapy visit utilization and outcomes in vulnerable patient populations following anterior cruciate ligament (ACL) reconstruction may provide useful insights.

**Objectives** To examine the relationship between patient age, sex, physical therapy visit utilization, and physical therapy intervention charges with revision rates and patient-reported outcomes in individuals following primary ACL reconstruction.

**Methods** A sample of 660 patients who had an ACL reconstruction was identified through an electronic medical record database. Age and physical therapy visit utilization were categorized to examine effects between groups (20 years of age or younger, 21 to 34 years of age, 35 years of age or older; fewer than 9 visits, 9 to 14 visits, 15 or more visits). Multilevel mixed-effects linear models were conducted to compare differences between revision rates and patient-reported outcomes during the episode of care. Receiver operating characteristic curve analyses were also used to determine visit-number and charge-per-visit cut points to discriminate patients who achieved at least a minimal clinically important difference on the patient-reported outcomes.

**Results**

Of 660 patients, 22 (3.3%) had revision surgery. Compared with patients 20 years and younger, the incidence rate ratio of ACL reconstruction revision was lower in patients who were 35 years and older (85%) and 21 to 34 years (59%). Of 470 patients who attended physical therapy for longer than 3 months, change in Knee Outcome Survey activities of daily living subscale score was significantly lower among patients 20 years of age and younger and in the lowest visit category.

**Conclusion**

Achievement of favorable outcomes following ACL reconstruction may require categorization of patients beyond surgical diagnosis alone. Younger patients (aged 20 years or less) attending fewer physical therapy visits (fewer than 9) were more likely to have ACL revision surgery and had inferior patient-reported outcomes compared to older patients and those with higher physical therapy visit utilization. The study design of a retrospective cohort limits the ability to identify causal relationships. Additionally, this study was conducted in only 1 geographic region within a single health care delivery system, which may limit the generalizability of the results.

**Level of Evidence**

Prognosis, level 2c. *J Orthop Sports Phys Ther* 2017;47(11):834–844. Epub 9 Oct 2017.  
doi:10.2519/jospt.2017.7048

[Return to sports](#)

## **Young Athletes Cleared for Sports Participation After Anterior Cruciate Ligament Reconstruction: How Many Actually Meet Recommended Return-to-Sport Criterion Cutoffs?**

**Authors:** Allison R. Toole, PT, DPT, OCS<sup>1</sup>, Matthew P. Ithurnburn, PT, PhD, DPT, OCS<sup>2</sup>, Mitchell J. Rauh, PT, PhD, MPH, FACSM<sup>3</sup>, Timothy E. Hewett, PhD, FACSM<sup>4</sup>, Mark V. Paterno, PT, PhD, SCS<sup>5-7</sup>, Laura C. Schmitt, PT, PhD<sup>8-10</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2017 **Volume:**47 **Issue:**11 **Pages:**825–833 **DOI:**10.2519/jospt.2017.7227

**Study Design** Prospective cohort study.

**Background** While meeting objective criterion cutoffs is recommended prior to return to sports following anterior cruciate ligament (ACL) reconstruction, the number of young athletes who meet recommended cutoffs and the impact of cutoffs on longitudinal sports participation are unknown.

### **Objectives**

To test the hypothesis that a higher proportion of young athletes who meet recommended cutoffs will maintain the same level of sports participation over the year following return-to-sport clearance compared to those who do not meet recommended cutoffs.

### **Methods**

At the time of return-to-sport clearance, the International Knee Documentation Committee Subjective Knee Evaluation Form (IKDC), quadriceps and hamstring strength limb symmetry index (LSI), and single-leg hop test LSI were assessed. Proportions of participants who met individual (IKDC score of 90 or greater; strength and hop test LSIs of 90% or greater) and combined cutoffs were calculated. Proportions of participants who continued at the same level of sports participation over the year following return-to-sport clearance (assessed using the Tegner activity scale) were compared between those who met and did not meet cutoffs.

### **Results**

Participants included 115 young athletes (88 female). The proportions meeting individual cutoffs ranged from 43.5% to 78.3%. The proportions meeting cutoffs for all hop tests, all strength tests, and all combined measures were 53.0%, 27.8%, and 13.9%, respectively. A higher proportion of participants who met cutoffs for both strength tests maintained the same level of sports participation over the year following return-to-sport clearance than those who did not (81.3% versus 60.2%,  $P = .02$ ).

### **Conclusion**

The proportions of young athletes after ACL reconstruction recently cleared for return to sports who met the combined criterion cutoffs were low. Those who met the criterion cutoffs for both strength tests maintained the same level of sports participation at higher proportions than those who did not.

**Level of Evidence** Prognosis, level 2b. *J Orthop Sports Phys Ther* 2017;47(11):825–833. Epub 7 Oct 2017. doi:10.2519/jospt.2017.7227

**37. OSTEOARTHRITIS/KNEE****Sleep helps**

Pain. 2017 Nov;158(11):2189-2195. doi: 10.1097/j.pain.0000000000001023.

**Psychological interventions that target sleep reduce pain catastrophizing in knee osteoarthritis.**

Lerman SF<sup>1</sup>, Finan PH, Smith MT, Haythornthwaite JA.

Pain catastrophizing is a significant risk factor for patients with knee osteoarthritis (KOA) and thus is a target for many psychological interventions for pain.

This study examined if interventions targeting sleep found to be effective in improving sleep in KOA also reduce pain catastrophizing measured as a trait through the pain catastrophizing scale and measured as a daytime and nocturnal state through daily diaries. Secondary analyses were conducted on data collected as part of a randomized controlled trial assessing the effectiveness of cognitive behavioral therapy for insomnia in patients with KOA at 5 different time points: pretreatment, midtreatment and posttreatment and at 3- and 6-month follow-up. One hundred patients diagnosed with KOA and insomnia were randomized to receive either 8 sessions of cognitive behavioral therapy for insomnia or a placebo intervention of behavioral desensitization. Multilevel modeling revealed that both intervention groups showed a significant reduction pretreatment to posttreatment in all 3 measures of pain catastrophizing and maintained stable levels through the 6-month follow-up. Increased sleep continuity early in treatment (pretreatment to midtreatment), but not reductions in pain, was associated with a reduction in trait and nocturnal catastrophizing later in treatment (midtreatment to posttreatment).

These results suggest that short interventions focusing on sleep can significantly reduce pain catastrophizing even in a clinical population with low baseline levels of catastrophizing, possibly through improving sleep continuity.

**Weight is a factor**

Arch Orthop Trauma Surg. 2017 Oct 27. doi: 10.1007/s00402-017-2825-5.

**Maximum lifetime body mass index is the appropriate predictor of knee and hip osteoarthritis.**

Singer SP<sup>1</sup>, Dammerer D<sup>2</sup>, Krismer M<sup>3</sup>, Liebensteiner MC<sup>3</sup>.

*INTRODUCTION:*

In light of inconsistencies in the literature, this study aimed to investigate the relationship between obesity (current and historic) and osteoarthritis (OA) of the knee or hip.

*MATERIALS AND METHODS:*

We examined 99 people (knee OA, hip OA and controls), age > 50 years, in a case-control study. The current weight, height and waist circumference were measured on site, and detailed weight changes over their lifetime were based on questionnaires and standardized interviews. We used binomial logistic regression to determine the predictive value for an osteoarthritis group membership of each derived indicator.

*RESULTS:*

An increase in 'maximum-BMI' increased the odds ratio for both knee OA (OR 1.2; CI 1.1-1.4;  $p = 0.005$ ;  $R^2 = 0.36$ ) and hip OA (OR 1.2; CI 1.0-1.3;  $p = 0.027$ ;  $R^2 = 0.16$ ). Current BMI was significantly associated with knee OA but not with hip OA. A high "minimum-BMI" (over the age of 18 years) had the highest odds ratio of all calculated indicators for both osteoarthritis groups.

*CONCLUSIONS:*

Based on our findings, it is concluded that the maximum BMI over one's lifespan is a better predictor of OA of the hip or the knee than the current BMI. The knee joint seems to be more sensitive to obesity as current BMI was associated only with knee OA but not with hip OA.

**41 A. ACHILLES TENDON AND CALF****Surgical approach to Tendon rupture****A novel minimally invasive surgery combined with early exercise therapy promoting tendon regeneration in the treatment of spontaneous Achilles tendon rupture**

Ayidaer Jialihasi<sup>1</sup> Jianati Wuerliebieke Jiasharete Jielile

DOI: <http://dx.doi.org/10.1016/j.injury.2017.10.046>

**Objective**

Acute closed spontaneous Achilles tendon rupture often occurs in elderly individuals and is usually accompanied with many complications. Conventional surgical approaches to remove the tendon lesions and enthesophytes are highly traumatic and cause complications. In this study, a previously established minimally invasive surgical approach was modified and combined with a Kazakh exercise therapy to reduce trauma, improve wound healing, and promote tendon regeneration in the management of acute closed spontaneous Achilles tendon rupture.

**Methods**

Fifty-two patients with acute closed spontaneous Achilles tendon rupture were randomly classified into 2 groups. Group A included 23 patients that were treated with the novel approach. Group B included 29 patients that were treated with a continuous medial oblique surgical approach. Follow-up examinations were performed at post-operative weeks 12 and 24, and year 2.

Outcomes were assessed by Achilles tendon rupture score (ATRS), a heel-rise endurance test, and ultrasonographic and multislice spiral computerized tomography.

**Results**

Mean ATRS in Group A was 68.6 and 86.0 at post-operative week 12 and 24, respectively, significantly higher than that in Group B (55.9 and 72.0, respectively). Recovery of patients in Group A was significantly better compared to Group B ( $p < 0.01$ ), allowing them to participate in early rehabilitating kinesiotherapy. Patients in Group A rarely experienced complications after surgery, such as infection and Achilles tendon exposure, while in Group B, the wound healing was slower, the inside flaps were prone to necrosis and infection, and Achilles tendon exposure occurred in 10% of patients.

**Conclusions**

The novel minimally invasive surgery is more advantageous in the treatment of acute closed spontaneous Achilles tendon rupture over previous approaches by promoting wound healing and tendon regeneration.

**43. HALLUX VALGUS****Minimally invasive surgery****Two year outcomes of minimally invasive hallux valgus surgery**

Chloe Xiaoyun Chan Jonathan Zhi-Wei Gan Hwei Chi Chong Inderjeet Rikhraj Singh Sean Yung Chuan Ng Kevin Koo

**Highlights**

- The MICA technique is effective in correcting mild to moderate hallux valgus.
- Post-operative radiographical measurements (HVA, IMA) significantly improved ( $p < 0.05$ ).
- Post-operative clinical outcomes (AOFAS, SF-36, VAS) significantly improved ( $p < 0.05$ ).
- Minimal complications were associated with MICA technique.

**Abstract****Background**

We report our experience with the Minimally Invasive Chevron Akin (MICA) technique for correcting hallux valgus, and evaluate its effectiveness and associated complications.

**Methods**

Case series of 13 feet with mild to moderate symptomatic hallux valgus treated surgically from July 2013 to December 2014, with at least 48-months follow-up. Patients were assessed pre-operatively and post-operatively with radiographical measurements (Hallux Valgus Angle (HVA) and Intermetatarsal Angle (IMA)) and clinical scores (American Orthopaedic Foot and Ankle Society (AOFAS), 36-Item Short Form Health Survey (SF-36), Visual Analog Scale (VAS)).

**Results**

Mean HVA and IMA decreased from  $30.4^\circ$  and  $13.9^\circ$ – $10.9^\circ$  and  $10.2^\circ$  respectively ( $p < 0.05$ ). The mean AOFAS score improved from an average of 59.0–93.7 ( $p < 0.05$ ). All patients reported a VAS score of 0 post-operatively, and the 4 SF-36 domains improved significantly ( $p < 0.05$ ).

**Conclusions**

The MICA technique is a safe and effective method in the surgical correction of mild to moderate hallux valgus deformity, and continued use is justified.

**44. RHUMATOID ARTHRITIS****Resisted exercise and anti-inflammatory effects****Acute effect of a resistance exercise session on markers of cartilage breakdown and inflammation in women with rheumatoid arthritis**

Ana Carolina Pereira Nunes Pinto, Jamil Natour, Charles Heldan de Moura Castro, Marina Eloi, Império Lombardi Junior

DOI: 10.1111/1756-185X.13204 [View/save citation](#)

**Abstract****Aim**

To assess the acute effect of resistance exercise (RE) on circulating biomarkers of cartilage breakdown and inflammation in women with rheumatoid arthritis (RA).

**Methods**

Thirty-four volunteers (17 with and 17 without RA), participated in a 25 min RE session (knee extension, knee flexion, hip abduction and hip adduction) with one set of 12 repetitions at 50% of one repetition maximum (1RM) and one set of eight repetitions at 75% of 1RM. Blood samples were collected 30 and 5 min before, immediately after and 1, 2 and 24 h after the session. We used analysis of variance for repeated-measures with Bonferroni adjustments to assess differences between groups over time.

**Results**

In both groups we found significant changes in interleukin (IL)-1 beta ( $P = 0.045$ ), IL-1 receptor antagonist (IL-1ra) ( $P < 0.001$ ), IL-10 ( $P = 0.004$ ), IL-6 ( $P < 0.001$ ) and cartilage oligomeric matrix protein (COMP) ( $P < 0.001$ ) in response to exercise, but no changes in tumor necrosis factor- $\alpha$  and C-reactive protein levels. We found no differences in the responses of the two groups to the session, except for COMP levels, which are more sensitive to exercise and rest effects in RA patients.

**Conclusion**

Women with and without RA have similar changes in response to a RE session in levels of inflammation biomarkers, but not of cartilage breakdown. IL-10 and IL-1ra increased after the RE session, indicating that RE may have an acute anti-inflammatory effect. Additional studies are necessary to clarify if repeated RE sessions can have long-term anti-inflammatory effects and the possible clinical repercussions of this cartilage breakdown characteristic in response to exercise in RA patients



### 45 A. MANUAL THERAPY LUMBAR & GENERAL

#### Beyond the joint

#### **Beyond the Joint: The Role of Central Nervous System Reorganizations in Chronic Musculoskeletal Disorders**

**Authors:** Jean-Sébastien Roy, PT, PhD<sup>1,2</sup>, Laurent J. Bouyer, PhD<sup>1,2</sup>, Pierre Langevin, PT, MCISc<sup>1,3</sup>, Catherine Mercier, OT, PhD<sup>1,2</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2017 **Volume:**47 **Issue:**11 **Pages:**817–821 **DOI:**10.2519/jospt.2017.0608

#### **Abstract**

To a large extent, management of musculoskeletal disorders has traditionally focused on structural dysfunctions found within the musculoskeletal system, mainly around the affected joint.

While a structural-dysfunction approach may be effective for musculoskeletal conditions in some populations, especially in acute presentations, its effectiveness remains limited in patients with recurrent or chronic musculoskeletal pain. Numerous studies have shown that the human central nervous system can undergo plastic reorganizations following musculoskeletal disorders; however, they can be maladaptive and contribute to altered joint control and chronic pain.

In this Viewpoint, the authors argue that to improve rehabilitation outcomes in patients with chronic musculoskeletal pain, a global view of the disorder that incorporates both central (neural) and peripheral (joint-level) changes is needed. The authors also discuss the challenge of evaluating and rehabilitating central changes and the need for large, high-level studies to evaluate approaches incorporating central and peripheral changes and emerging therapies.

*J Orthop Sports Phys Ther* 2017;47(11):817–821. doi:10.2519/jospt.2017.0608

**50 A. MOTOR CONTROL****Balance training in cutting activity****Balance Training Enhances Motor Coordination During a Perturbed Sidestep Cutting Task**

**Authors:** Anderson Souza Oliveira, PhD<sup>1,2</sup>, Priscila Brito Silva, PhD<sup>2</sup>, Morten Enemark Lund, PhD<sup>1</sup>, Dario Farina, PhD<sup>3,4</sup>, Uwe Gustav Kersting, PhD<sup>2</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2017 **Volume:**47 **Issue:**11 **Pages:**853–862 **DOI:**10.2519/jospt.2017.6980

**Study Design**

Controlled laboratory study.

**Background**

Balance training may improve motor coordination. However, little is known about the changes in motor coordination during unexpected perturbations to postural control following balance training.

**Objectives**

To study the effects of balance training on motor coordination and knee mechanics during perturbed sidestep cutting maneuvers in healthy adults.

**Methods**

Twenty-six healthy men were randomly assigned to a training group or a control group. Before balance training, subjects performed unperturbed, 90° sidestep cutting maneuvers and 1 unexpected perturbed cut (10-cm translation of a movable platform). Participants in the training group participated in a 6-week balance training program, while those in the control group followed their regular activity schedule. Both groups were retested after a 6-week period. Surface electromyography was recorded from 16 muscles of the supporting limb and trunk, as well as kinematics and ground reaction forces. Motor modules were extracted from electromyography by nonnegative matrix factorization. External knee abduction moments were calculated using inverse dynamics equations.

**Results**

Balance training reduced the external knee abduction moment ( $33\% \pm 25\%$ ,  $P < .03$ ,  $\eta_p^2 = 0.725$ ) and increased the activation of trunk and proximal hip muscles in specific motor modules during perturbed cutting. Balance training also increased burst duration for the motor module related to landing early in the perturbation phase ( $23\% \pm 11\%$ ,  $P < .01$ ,  $\eta_p^2 = 0.532$ ).

**Conclusion**

Balance training resulted in altered motor coordination and a reduction in knee abduction moment during an unexpected perturbation. The previously reported reduction in injury incidence following balance training may be linked to changes in dynamic postural stability and modular neuromuscular control. *J Orthop Sports Phys Ther* 2017;47(11):853–862. Epub 23 Sep 2017. doi:10.2519/jospt.2017.6980

**59. PAIN****Prevalence of neuropathic pain****The prevalence of probable neuropathic pain in the US: results from a multimodal general-population health survey**

**Authors** DiBonaventura MD, Sadosky A, Concialdi K, Hopps M, Kudel I, Parsons B, Cappelleri JC, Hlavacek P, Alexander AH, Stacey BR, Markman JD, Farrar JT

**Published** 1 November 2017 Volume 2017:10 Pages 2525—

25 <https://doi.org/10.2147/JPR.S127014>

**Background:** The prevalence of neuropathic pain (NeP) has been estimated within specific health conditions; however, there are no published data on its broad prevalence in the US. The current exploratory study addresses this gap using the validated PainDetect questionnaire as a screener for probable NeP in a general-population health survey conducted with a multimodal recruitment strategy to maximize demographic representativeness.

**Materials and methods:** Adult respondents were recruited from a combination of Internet panels, telephone lists, address lists, mall-based interviews, and store-receipt invitations using a random stratified-sampling framework, with strata defined by age, sex, and race/ethnicity. Older persons and minorities were oversampled to improve prevalence estimates. Results were weighted to match the total adult US population using US Census data. Demographic information was collected, and respondents who experienced physical pain in the past 12 months completed the PainDetect and provided additional pain history. A cutoff score of 19 or greater on the PainDetect was used to define probable NeP.

**Results:** A total of 24,925 respondents (average response rate 2.5%) provided demographic data (52.2% female, mean age 51.5 years); 15,751 respondents reported pain (63.7%), of which 2,548 (15.7%, 95% confidence interval 14.9%–16.5%) had probable NeP based on the PainDetect, which was 10% (95% confidence interval 9.5%–10.5%) of all respondents. Among those reporting pain, the prevalence of probable NeP among Blacks and Hispanics was consistently higher than Whites in each age- and sex group. The highest prevalence among those with pain was among male Hispanics 35–44 years (32.4%) and 45–54 years (24.2%) old. The most commonly used medications reported by those with probable NeP were nonsteroidal anti-inflammatory drugs (44.2%), followed by weak opioids (31.7%), antiepileptics (10.9%), and strong opioids (10.9%).

**Conclusion:** This is the first study to provide an estimate of the prevalence of probable NeP in the US, showing significant variation by age and ethnicity.

**Anti-inflammatory salts**

Med Hypotheses. 2005;65(6):1136-41. Epub 2005 Aug 24.

**Elimination of arthritis pain and inflammation for over 2 years with a single 90 min, topical 14% gallium nitrate treatment: case reports and review of actions of gallium III.**

Eby G<sup>1</sup>.

Arthritis is inflammation in a joint often with joint damage, usually accompanied by pain, swelling and stiffness, resulting from infection, trauma, degenerative changes, metabolic disturbances, autoimmune or other causes

It occurs in various forms, including rheumatoid arthritis, osteoarthritis, bacterial arthritis and gout. Gallium III can inhibit the production of inflammatory cytokines, such as IL-1beta, produced by macrophage-like cells in vitro. A dose-dependent inhibition of IL-1beta and TPA stimulated MMP activity by gallium nitrate at increasing concentrations occurs, demonstrating that gallium nitrate can be a useful modulator of inflammation in arthritis. Gallium III is an inhibitor of bone resorption and is an effective treatment for hypercalcemia. Gallium III has been reported to be effective in the treatment of mycobacterium butyricum-induced arthritis in rats by antagonism of iron III. Long-term elimination of pain from arthritis by gallium III was first observed in horses primarily being treated for navicular disease. Several people treating their horses with gallium nitrate coincidentally found that arthritis pain in their fingers ended and did not return after soaking their hands in 14% gallium nitrate solution. Therefore, the severely arthritic hands of a 60-year-old woman were topically treated with a 14% aqueous solution of gallium nitrate for 90 min. Pain and inflammation from rheumatoid arthritis diminished rapidly, and neither pain nor inflammation returned during the following 2 years from that single treatment. A 61-year-old woman who had osteoarthritis in her left knee, shoulders and wrists was treated orally with 50 ml of a 1% gallium nitrate solution (120 mg elemental gallium) daily using a two week on and two week off protocol, resulting in almost total elimination of pain while on gallium nitrate, while pain partially returned during the two week off periods. Treatment of frozen shoulder with topical 40% gallium nitrate for 120 min resulted in greatly reduced pain and crepitus almost immediately with complete restoration of range of motion, with pain remaining essentially absent for over 1 year.

Mechanisms of action are hypothesized to include anti-inflammatory, bone density improvements, antibacterial, anti-iron III and anti-aluminum III effects. Proper use of gallium III may be effective in terminating pain and inflammation of arthritis for years, often with a single treatment.

**Assisted suicide**

JAMA Oncol. 2017 Oct 1;3(10):1403-1406. doi: 10.1001/jamaoncol.2017.0243.

**Characterizing 18 Years of the Death With Dignity Act in Oregon.**

Blanke C<sup>1,2</sup>, LeBlanc M<sup>2</sup>, Hershman D<sup>2</sup>, Ellis L<sup>2</sup>, Meyskens F<sup>2</sup>.

*IMPORTANCE:*

Numerous states have pending physician-aided dying (PAD) legislation. Little research has been done regarding use of PAD, or ways to improve the process and/or results.

*OBJECTIVES:*

To evaluate results of Oregon PAD, the longest running US program; to disseminate results; and to determine promising PAD research areas.

*DESIGN, SETTING, AND PARTICIPANTS:*

A retrospective observational cohort study of 991 Oregon residents who had prescriptions written as part of the state's Death with Dignity Act. We reviewed publicly available data from Oregon Health Authority reports from 1998 to 2015, and made a supplemental information request to the Oregon Health Authority.

*MAIN OUTCOMES AND MEASURES:*

Number of deaths from self-administration of lethal medication versus number of prescriptions written.

*RESULTS:*

A total of 1545 prescriptions were written, and 991 patients died by using legally prescribed lethal medication. Of the 991 patients, 509 (51.4%) were men and 482 (48.6%) were women. The median age was 71 years (range, 25-102 years). The number of prescriptions written increased annually (from 24 in 1998 to 218 in 2015), and the percentage of prescription recipients dying by this method per year averaged 64%. Of the 991 patients using lethal self-medication, 762 (77%) recipients had cancer, 79 (8%) had amyotrophic lateral sclerosis, 44 (4.5%) had lung disease, 26 (2.6%) had heart disease, and 9 (0.9%) had HIV. Of 991 patients, 52 (5.3%) were sent for psychiatric evaluation to assess competence. Most (953; 96.6%) patients were white and 865 (90.5%) were in hospice care. Most (118, 92.2%) patients had insurance and 708 (71.9%) had at least some college education. Most (94%) died at home. The estimated median time between medication intake and coma was 5 minutes (range, 1-38 minutes); to death it was 25 minutes (range, 1-6240 minutes). Thirty-three (3.3%) patients had known complications. The most common reasons cited for desiring PAD were activities of daily living were not enjoyable (89.7%) and losses of autonomy (91.6%) and dignity (78.7%); inadequate pain control contributed in 25.2% of cases.

*CONCLUSIONS AND RELEVANCE:*

The number of PAD prescriptions written in Oregon has increased annually since legislation enactment. Patients use PAD for reasons related to quality of life, autonomy, and dignity, and rarely for uncontrolled pain. Many questions remain regarding usage and results, making this area suitable for cancer care delivery research.

**62 A. NUTRITION/VITAMINS****Vit C decreases hip fx rate**

Osteoporos Int. 2017 Nov 3. doi: 10.1007/s00198-017-4284-9.

**Dietary vitamin C intake and the risk of hip fracture: a dose-response meta-analysis.**

Sun Y<sup>1</sup>, Liu C<sup>2</sup>, Bo Y<sup>1</sup>, You J<sup>1</sup>, Zhu Y<sup>1</sup>, Duan D<sup>1</sup>, Cui H<sup>1</sup>, Lu Q<sup>3</sup>.

**Abstract**

The meta-analysis suggested that dietary vitamin C was statistically inversely associated with the risk of hip fracture (overall OR = 0.73, 95% CI = 0.55-0.97,  $I^2 = 69.1\%$ ) and with the increase of 50 mg/day vitamin C intake, the risk of hip fracture will reduce by 5% (OR = 0.95, 95% CI 0.91-1.00, P = 0.05).

**INTRODUCTION:**

Previous studies had inconsistent findings regarding the association between vitamin C intake and the risk of hip fracture. Therefore, we conducted a meta-analysis to evaluate the association of dietary vitamin C intake and the risk of hip fracture.

**METHODS:**

Relevant studies were identified by searching PubMed, Embase, and Web of Science up to December 2016. Additional articles were identified from reviewing the reference lists of relevant articles. The summary relative risks (RRs) or odds ratios (ORs) and 95% confidence intervals (CIs) were estimated by random effects model. Funnel plot and Egger's test were used to test publication bias.

**RESULTS:**

The total six articles containing 7908 controls and 2899 cases of hip fracture were included in this meta-analysis. By comparing the highest versus the lowest categories of vitamin C intake, we found that dietary vitamin C was statistically correlated with the risk of hip fracture [overall OR = 0.73, 95% CI = 0.55-0.97,  $I^2 = 69.1\%$ ]. A linear dose-response association showed that the increase with vitamin C intake of 50 mg/day statistically reduced by 5% (OR = 0.95, 95% CI 0.91-1.00, P = 0.05) the risk of hip fracture.

**CONCLUSIONS:**

In conclusion, the results of current meta-analysis strongly support that increasing dietary vitamin C intake can decrease the risk of hip fracture. In order to verify the association of vitamin C intake and hip fracture risk, further well-designed largely randomized controlled trials (RCTs) are needed.

**Vit D and obesity**

Endocr Connect. 2017 Oct 31. pii: EC-17-0304. doi: 10.1530/EC-17-0304.

**Cardiometabolic healthy and unhealthy obesity: does vitamin D play a role?**

Piantanida E<sup>1</sup>, Gallo D<sup>2</sup>, Veronesi G<sup>3</sup>, Dozio E<sup>4</sup>, Trotti E<sup>5</sup>, Lai A<sup>6</sup>, Ippolito S<sup>7</sup>, Sabatino J<sup>8</sup>, Tanda ML<sup>9</sup>, Toniolo A<sup>10</sup>, Ferrario M<sup>11</sup>, Bartalena L<sup>12</sup>.

The aim of this observational study was to clarify the link between vitamin D status and metabolic syndrome (MetS) in people with visceral obesity.

**Design and methods** One-hundred-ninety-six consecutive patients (152 women; mean age 51±13 years) with visceral obesity [mean body weight 103±20 Kg, mean waist circumference (WC) 119±13 cm] were enrolled at the Obesity Outpatient Clinic of the University of Insubria in Varese. Anthropometric measurements were recorded. Laboratory tests, including vitamin D [25(OH)D], fasting blood glucose (FBG), lipid profile, liver and kidney function tests were assessed. Vitamin D status was defined according to the European Society of Endocrinology guidelines, MetS to the 2009 harmonized definition.

An inverse association emerged among [25(OH)D], body mass index (BMI) (p=0.001) and WC (all p=0.003). Serum [25(OH)D] levels were inversely related to FBG and systolic blood pressure (SBP) (respectively, p=0.01 and 0.02). Median serum [25(OH)D] levels were 13.3 ng/ml (CI 95% 12;15) in MetS and 16 ng/ml (CI 95% 14;18) (p=0.01) in non-MetS patients.

Among patients with MetS, lower [25(OH)D] concentrations were related to higher risk of hypertension (HT) [Odds Ratio (OR) 1.7, CI 95%, 0.7;4] and hyperglycemia (IFG)/ type 2 diabetes (OR 5.5, CI 95% 2;14). Vitamin D status and MetS are inversely correlated in visceral obesity, particularly with regard to glucose homeostasis and BP. More extensive studies are required to investigate the potential for causality.

**62 B. CRYOTHERAPY****Intraoral**

*J Endod.* 2017 Oct 24. pii: S0099-2399(17)31039-7. doi: 10.1016/j.joen.2017.08.038. [Epub ahead of print]

**Intracanal Cryotherapy Reduces Postoperative Pain in Teeth with Symptomatic Apical Periodontitis: A Randomized Multicenter Clinical Trial.**

Vera J<sup>1</sup>, Ochoa J<sup>2</sup>, Romero M<sup>3</sup>, Vazquez-Carcaño M<sup>4</sup>, Ramos-Gregorio CO<sup>5</sup>, Aguilar RR<sup>6</sup>, Cruz A<sup>7</sup>, Sleiman P<sup>8</sup>, Arias A<sup>9</sup>.

**Author information****Abstract****INTRODUCTION:**

A prospective, multicentered, randomized clinical trial was designed to assess if controlled irrigation with cold saline could result in less incidence and intensity of postoperative pain in patients presenting with pulp necrosis and symptomatic apical periodontitis.

**METHODS:**

A total of 210 patients (presenting with necrotic uniradicular teeth with a diagnosis of symptomatic apical periodontitis and a preoperative visual analog scale (VAS) score higher than 7) were randomly allocated in the control or experimental group after the completion of shaping and cleaning procedures. The experimental group received a final irrigation with 20 mL sterile cold (2.5°C) saline solution delivered to the working length with a sterile, cold (2.5°C) Endovac microcannula (Kerr Endo, Orange Country, CA) for 5 minutes. The same protocol was used in the control group with room temperature saline solution. Patients were instructed to record the presence, duration and level of postoperative pain, and analgesic medication intake. A logistic regression was used to compare the incidence of postoperative pain and the need for painkillers between groups. Differences in general pain intensity between groups were analyzed using the ordinal (linear) chi-square test. Postoperative pain after 6, 24, and 72 hours (recorded in a VAS scale) and the need for analgesic medication intake between the 2 groups were assessed using the Mann-Whitney U test.

**RESULTS:**

Patients in the control group presented a significantly higher incidence of postoperative pain, intensity, and need for medication intake ( $P < .05$ ).

**CONCLUSIONS:**

Cryotherapy reduced the incidence of postoperative pain and the need for medication intake in patients presenting with a diagnosis of necrotic pulp and symptomatic apical periodontitis.



**63. PHARMACOLOGY****Narcotic use post fusions**

Clin Spine Surg. 2017 Nov;30(9):E1190-E1200. doi: 10.1097/BSD.0000000000000518.

**Narcotic Consumption Following Anterior and Lateral Lumbar Interbody Fusion Procedures.**

Bohl DD<sup>1</sup>, Narain AS, Hijji FY, Ahn J, Mayo BC, Massel DH, Long WW, Modi KD, Singh K.

*STUDY DESIGN/SETTING:*

This is a retrospective analysis of a prospectively maintained surgical registry.

*OBJECTIVE:*

To characterize postoperative narcotic consumption in patients undergoing either an anterior lumbar interbody fusion (ALIF) or a lateral lumbar interbody fusion (LLIF).

*BACKGROUND CONTEXT:*

There is substantial interest in evaluating the safety, efficacy, and outcomes following minimally invasive techniques for lumbar fusion procedures. However, few studies have characterized postoperative narcotic consumption in patients undergoing ALIF or LLIF procedures.

*METHODS:*

Consecutive patients who underwent either an ALIF or LLIF during 2007-2014 were identified. Inpatient narcotic consumption was recorded in oral morphine equivalents and dichotomized as greater or less than the 75th percentile total consumption (elevated or normal inpatient consumption). Demographic, comorbidity, and perioperative characteristics were tested for independent association with inpatient narcotic consumption and with continued narcotic usage during the months following surgery.

*RESULTS:*

A total of 169 patients met inclusion criteria. Of these, 118 (69.8%) underwent ALIF and 51 (30.2%) underwent LLIF procedures. The risk for elevated inpatient narcotic consumption was greater in patients whose body mass index was  $\geq 30$  kg/m [relative risk (RR), 2.8; 95% confidence interval (CI), 1.6-4.8;  $P < 0.001$ ]. The risk for continued narcotic usage at the first postoperative visit was elevated in patients with worker's compensation payment status (RR, 2.0; 95% CI, 1.5-2.7;  $P < 0.001$ ). The risk for continued narcotic usage at the second postoperative visit was elevated in patients with worker's compensation payment status (RR, 2.6; 95% CI, 1.7-4.1;  $P < 0.001$ ) and in patients with preoperative narcotic utilization (RR, 2.2; 95% CI, 1.4-3.5;  $P < 0.001$ ).

*CONCLUSIONS:*

The present study suggests that while patients with greater body mass index have increased narcotic consumption as inpatients, preoperative narcotic consumption and worker's compensation payment status are the best predictors of continued narcotics usage during the months following surgery. Worker's compensation patients and patients who utilize narcotics preoperatively should be the targets of efforts to reduce continued postoperative narcotic usage.