

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Waist circumference and live birth

Am J Obstet Gynecol. 2019 Feb 11. pii: S0002-9378(19)30354-0. doi: 10.1016/j.ajog.2019.02.013.

#### **Waist circumference in relation to outcomes of infertility treatment with assisted reproductive technologies.**

Li MC<sup>1</sup>, Mínguez-Alarcón L<sup>2</sup>, Arvizu M<sup>3</sup>, Chiu YH<sup>3</sup>, Ford JB<sup>2</sup>, Williams PL<sup>4</sup>, Attaman J<sup>5</sup>, Hauser R<sup>6</sup>, Chavarro JE<sup>7</sup>; EARTH Study Team.

#### *BACKGROUND:*

Many studies have documented lower likelihood of live birth with increasing body mass index (BMI) among women undergoing assisted reproductive technologies (ART), but few have examined the association with waist circumference (WC), an anthropometric measure that allows assessment of central adiposity.

#### *OBJECTIVE(S):*

To examine the relation between baseline WC and infertility treatment outcomes among women undergoing treatment with ART.

#### *STUDY DESIGN:*

We followed 264 women who underwent 445 ART cycles for infertility treatment at the Massachusetts General Hospital between 2010 and 2017. WC was assessed at enrollment. We used cluster-weighted generalized estimating equation models to estimate the probability of live birth by tertiles of waist circumference (<77, 77-86, >86 cm), while accounting for multiple treatment cycles per woman and adjusting for age, race, smoking, infertility diagnosis, day 3 follicle-stimulating hormone, BMI, and height.

#### *RESULTS:*

Mean (SD) WC and BMI were 83.6 (12.6) cm and 24.1 (4.3) kg/m<sup>2</sup>, respectively WC and BMI were positively correlated (r=0.69, p<0.0001). WC was inversely related to the probability of live birth after adjusting for BMI and other confounders. The multivariable adjusted probability of live birth (95% confidence interval) for women in increasing tertiles of WC were 53% (42-65%), 42% (32-53%), and 38% (28-50%) (p, trend=0.04). When women were classified in joint categories of BMI and WC, women with a BMI ≥ 25kg/m<sup>2</sup> and a WC ≥ 77cm had the lowest live birth rate (38% (27-50%)), while women with a BMI between 18.5 and 25kg/m<sup>2</sup> and a WC < 77cm had the highest (54% (42-66%)). The results were similar using different WC cut-off values.

#### *CONCLUSION(S):*

WC was inversely related to the probability of live birth among women undergoing assisted reproductive technology independently of BMI.

**Abortion risk**

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**Risk factors for surgical intervention of early medical abortion.**

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**BACKGROUND:**

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

**OBJECTIVE:**

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

**STUDY DESIGN:**

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

**RESULTS:**

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

**CONCLUSION:**

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

## Depression analysis

JAMA Psychiatry. 2019 Mar 1;76(3):290-296. doi: 10.1001/jamapsychiatry.2018.3667.

**Association of Maternal and Paternal Depression in the Postnatal Period With Offspring Depression at Age 18 Years.**

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**IMPORTANCE:** Paternal depression during the postnatal period has been associated with adverse child outcomes. Family environment has been reported as a pathway for risk transmission from fathers to children. The influence of paternal depression during the postnatal period on offspring depression remains to be clarified.

**OBJECTIVE:** To investigate the association between paternal depression in the postnatal period and offspring depression and explore potential mediating and moderating factors that influence any association between paternal and offspring depression.

**DESIGN, SETTING, AND PARTICIPANTS:** This prospective study of a UK community-based birth cohort (the Avon Longitudinal Study of Parents and Children) of parents and their adolescent offspring investigated associations between paternal depression during the postnatal period and offspring depression at age 18 years. We tested a hypothesized moderator (ie, sex) and conducted path analysis to examine hypothesized mediators (ie, depression in the other parent, couple conflict, and paternal involvement and emotional problems, conduct problems, and hyperactivity in offspring at age 3.5 years) of the associations between both paternal and maternal depression and offspring depression. Data collection for the Avon Longitudinal Study of Parents and Children began in 1991 and is ongoing. Data analysis for this study was conducted from June 2015 to September 2018.

**EXPOSURES:** Depression symptoms in fathers at 8 weeks after the birth of their children.

**MAIN OUTCOMES AND MEASURES:**

Offspring depression symptoms at age 18 years, using International Statistical Classification of Diseases and Related Health Problems, Tenth Revision codes.

**RESULTS:**

A total of 3176 father-offspring pairs were analyzed; of the children, 1764 were girls (55.5%) and 1412 (44.5%) were boys. Paternal mean (SD) age at delivery was 29.6 (9.6) years. The offspring of fathers who had depression during the postnatal period were at increased risk of experiencing depression symptoms at age 18 years ( $\beta = 0.053$  [95% CI, 0.02-0.09]). The association is mediated by maternal depression at 8 months after birth ( $\beta = 0.011$  [95% CI, 0.0008-0.02]; 21% [0.011/0.053]) and conduct problems at 42 months after birth ( $\beta = 0.004$ ; [95% CI, -0.00004 to 0.009]; 7.5% [0.004/0.053]). Couple conflict and paternal involvement do not mediate this association. The increased risk is seen in girls but not boys (interaction  $\beta = 0.095$ ;  $P = .01$ ).

**CONCLUSIONS AND RELEVANCE:**

The association between paternal depression in the postnatal period and depression in girls at age 18 years is partially explained by maternal depression. Couple conflict and paternal involvement were not found to play a role in the risk of transmission; this contrasts with the role that couple conflict was found to play in the risk of childhood behavior problems. Conduct problems in childhood appear to be a pathway for risk transmission between paternal depression and subsequent depression in offspring at age 18 years.

**Hysterectomy and increased risk of osteoporosis**

Am J Obstet Gynecol. 2019 Feb 12. pii: S0002-9378(19)30359-X. doi: 10.1016/j.ajog.2019.02.018

**Increased the risk of osteoporosis with hysterectomy: A longitudinal follow-up study using a national sample cohort.**

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**BACKGROUND:**

Premenopausal hysterectomy is associated with a decreased ovarian reserve, follicular atresia, and subsequently reduced long-term estrogen secretion. Therefore, women who undergo hysterectomy will experience greater gradual bone mineral loss than women with an intact uterus and have an increased risk of osteoporosis.

**OBJECTIVE:**

This study aimed to evaluate the association between hysterectomy without/with bilateral oophorectomy (BO) and the occurrence of osteoporosis using a national sample cohort from South Korea.

**STUDY DESIGN:**

Using the national cohort study from the Korean National Health Insurance Service, we extracted data for patients who had undergone hysterectomy (n = 9,082) and for a 1:4 matched control group (n = 36,328) and then analyzed the occurrence of osteoporosis. The patients were matched according to age, sex, income, region of residence, and past medical history. A Cox proportional hazards model was used to analyze the hazard ratios (HRs) and 95% confidence intervals (CIs). Subgroup analyses were performed based on age and BO status. The age of the participants was defined as the age at the time of hysterectomy.

**RESULTS:**

The adjusted HR for osteoporosis was 1.45 (95% CI = 1.37-1.53, P < .001) in the hysterectomy group. The adjusted HRs for osteoporosis in the different age subgroups of this group were 1.84 (95% CI = 1.61-2.10) for ages 40-44 years, 1.52 (95% CI = 1.39-1.66) for ages 45-49 years, 1.44 (95% CI = 1.28-1.62) for ages 50-54 years, 1.61 (95% CI = 1.33-1.96, all P < .001) for ages 55-59 years and 1.08 (95% CI = 0.95-1.23, P = .223) for ages ≥ 60 years. The adjusted HRs for osteoporosis according to hysterectomy/oophorectomy status were 1.43 (95% CI = 1.34-1.51) in the hysterectomy without BO group and 1.57 (95% CI = 1.37-1.79) in the hysterectomy with BO group.

**CONCLUSION:**

The occurrence of osteoporosis was increased in patients who had undergone hysterectomy compared to that in matched control subjects regardless of BO status.

**Identifying Preeclampsia**

Am J Obstet Gynecol. 2019 Feb 7. pii: S0002-9378(19)30289-3. doi: 10.1016/j.ajog.2019.01.235.

**Prediction of Imminent Preeclampsia at 35-37 Weeks' Gestation.**

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**BACKGROUND:**

In the weeks preceding the clinical onset of preeclampsia (PE) the maternal serum level of the angiogenic placental growth factor (PLGF) is decreased and that of the antiangiogenic factor soluble fms-like tyrosine kinase-1 (sFLT) is increased. Women presenting at specialist clinics with signs or symptoms of hypertensive disorders have been stratified according to concentrations of PLGF or the ratio of concentrations of sFLT and PLGF to determine clinical management for the subsequent 1-4 weeks. An alternative approach for the prediction of PE is use of the competing risks model, a Bayes' theorem based method, to derive patient-specific risk for PE by various combinations of maternal characteristics and medical history with multiples of the median (MoM) values of biomarkers.

**OBJECTIVE:**

To compare the performance of screening for delivery with PE at  $\leq 2$  and  $\leq 4$  weeks after assessment at 35<sup>+0</sup> - 36<sup>+6</sup> weeks' gestation between the use of percentile cut-offs in PIGF alone or the sFLT / PIGF ratio and the competing risks model.

**METHODS:**

This was a prospective observational study in women attending for a routine hospital visit at 35<sup>+0</sup> - 36<sup>+6</sup> weeks' gestation in two maternity hospitals in England. The visits included recording of maternal demographic characteristics and medical history, and measurement of serum PIGF and sFLT and mean arterial pressure (MAP). The areas under the receiver operating characteristics curves (AUROC) were used to compare the predictive performance for PE with delivery at  $\leq 2$  and  $\leq 4$  weeks from assessment of screening by PIGF alone and the sFLT / PIGF ratio to that of a previously developed competing risks model with a combination of maternal factors, PIGF, sFLT and MAP (triple test).

**RESULTS:**

First, the study population of 15,247 pregnancies included 326 (2.1%) that subsequently developed PE. Second, in screening for delivery with PE at  $\leq 2$  and  $\leq 4$  weeks from assessment the performance of the triple test was superior to that of PIGF alone or the sFLT / PIGF ratio. The AUROC for PE at  $\leq 2$  weeks in screening by the triple test (0.975, 95% CI 0.964, 0.985) was higher than that of PIGF alone (0.900, 95% CI 0.866, 0.935;  $p < 0.0001$ ) and the sFLT / PIGF ratio (0.932, 95% CI 0.904, 0.960;  $p = 0.0001$ ). Similarly, the AUROC for PE at  $\leq 4$  weeks in screening by the triple test (0.907, 95% CI 0.886, 0.928) was higher than that of PIGF alone (0.827, 95% CI 0.800, 0.854;  $p < 0.0001$ ) or the sFLT / PIGF ratio (0.857, 95%, CI 0.830, 0.883;  $p < 0.0001$ ). Third, at most screen positive rates between 2% and 30% the detection rate of delivery with PE at  $\leq 2$  and  $\leq 4$  weeks achieved by the triple test was about 10% higher than that of the sFLT / PIGF ratio and 20% higher than that of PIGF alone; the negative predictive value was similar for the three tests.

**CONCLUSION:**

At 35<sup>+0</sup> - 36<sup>+6</sup> weeks' gestation the performance of screening for imminent delivery with PE by the competing risks model is superior to that of PIGF alone or the sFLT / PIGF ratio.

**Diet and in vitro fertilization success****Dietary patterns and outcomes of assisted reproduction**

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DOI: <https://doi.org/10.1016/j.ajog.2019.02.004>

**Background**

There is growing acceptance that nutrition may be related to fertility and specifically to assisted reproductive technologies success in women; however, there is still no specific dietary guidance.

**Objective**

The objective of the study was to evaluate the relationship between pretreatment adherence to various dietary patterns and outcomes of assisted reproductive technologies.

**Study Design**

We followed up 357 women enrolled in the prospective Environment and Reproductive Health (EARTH) study, who underwent 608 assisted reproductive technologies cycles (2007–2017). Using a validated food frequency questionnaire completed prior to treatment, we assessed adherence to the Mediterranean diet, the alternate Healthy Eating Index 2010, the fertility diet (developed based on risk factors for anovulatory infertility), and a profertility diet we developed based on factors previously related to assisted reproductive technologies outcomes (higher intake of supplemental folic acid, vitamin B12, vitamin D, low- rather than high-pesticide residue produce, whole grains, dairy, soy foods, and seafood rather than other meats).

**Results**

Higher adherence to the alternate Healthy Eating Index 2010 and fertility diet was not related to live birth following assisted reproductive technologies. Women in the second through the fourth quartiles of Mediterranean diet adherence had significantly higher probability of live birth (0.44, 95% confidence interval, 0.39–0.49) compared with women in the first quartile (0.31, 95% confidence interval, 0.25–0.39); however, there was no additional benefit of adherence to the Mediterranean diet above the second quartile. Increased adherence to the profertility diet was linearly associated with assisted reproductive technologies outcomes. The adjusted odds (95% confidence interval) of implantation, clinical pregnancy, and live birth were higher by 47% (21%, 77%), 43% (19%, 72%), and 53% (26%, 85%), respectively, per SD increase. The adjusted difference in the proportion of cycles resulting in live birth for women in the fourth vs first quartile of adherence to the profertility diet was 0.28 (95% confidence interval, 0.16–0.38). While the profertility diet was not related to estradiol levels, oocyte counts, or endometrial thickness, it was inversely associated with clinical pregnancy loss (odds ratio, 0.69, 95% confidence interval, 0.53–0.90 per SD increase).

**Conclusion**

Higher pretreatment adherence to the profertility diet was associated with an increased probability of live birth among women undergoing assisted reproductive technologies. Commonly recommended dietary advice such as adhering to the Mediterranean diet may not provide the most appropriate guidance for women undergoing infertility treatment in the United States.

**Diet (seafood) decreases risk of hypertension**

BJOG. 2019 Apr;126(5):663-673. doi: 10.1111/1471-0528.15593. Epub 2019 Jan 24.

**Dietary patterns and the risk of pregnancy-associated hypertension in the Danish National Birth Cohort: a prospective longitudinal study.**

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**OBJECTIVE:**

To examine the association between mid-pregnancy dietary patterns and pregnancy-associated hypertension (PAH).

**DESIGN:**

A prospective longitudinal cohort study.

**SETTING:**

Denmark.

**POPULATION:**

About 55 139 Danish women with single enrolments and recorded food frequency questionnaire dates with complete information on dietary intake.

**METHODS:**

Women were eligible if they could speak Danish and were planning to carry to term. Diet was assessed using a validated semi-quantitative 360-item food frequency questionnaire and dietary patterns were derived using factor analysis.

**MAIN OUTCOME MEASURES:**

Gestational hypertension (GH) and pre-eclampsia (PE).

**RESULTS:**

Disease prevalence was 14% for GH (5491/39 362); 2% for PE (1168/54 778), and 0.4% for severe PE (234/55 086). Seven dietary patterns were characterised in the population, of which two were associated with PAH. The Seafood diet characterised by high consumption of fish and vegetables was inversely associated with the odds of developing GH [odds ratio (OR) 0.86; 95% CI 0.77-0.95] and PE (OR 0.79; 95% CI 0.65-0.97). The Western diet characterised by high consumption of potatoes (including French fries), mixed meat, margarine and white bread increased the odds of developing GH (OR 1.18; 95% CI 1.05-1.33) and PE (OR 1.40; 95% CI 1.11-1.76). No association was seen with severe PE.

**CONCLUSIONS:**

We found protective associations of Seafood diet and harmful associations of Western diet with PAH. Dietary interventions encouraging the reduction of Western diet may contribute to a decrease of PAH.

**TWEETABLE ABSTRACT:**

Western diet increases (Seafood diet decreases) the likelihood of developing pre-eclampsia among Danish pregnant women.

**Smoking and birth defects**

Am J Obstet Gynecol. 2019 Feb 18. pii: S0002-9378(19)30381-3. doi: 10.1016/j.ajog.2019.02.029.

**Influence of periconception smoking behavior on birth defect risk.**

Perry MF<sup>1</sup>, Mulcahy H<sup>1</sup>, DeFranco EA<sup>2</sup>.

**BACKGROUND:**

Smoking is one of the most modifiable risk factors for adverse maternal and neonatal outcome. Smoking during pregnancy has been associated with fetal growth restriction, adverse pregnancy outcomes and chronic adult diseases. Existing research has evaluated the risk of smoking on congenital defects. However, no studies have evaluated how periconception smoking affects birth defects.

**OBJECTIVE:**

Assess the association of maternal smoking and the timing of periconception exposure with congenital birth defects.

**STUDY DESIGN:**

This study is a population-based retrospective cohort of live births in Ohio from 2006-2015 using data from birth certificates. Rates of cardiovascular, musculoskeletal, gastrointestinal, and neural tube birth defects were compared between a referent group of women who did not smoke and those who smoked (1) during the preconception period of 3 months prior to conception only and not in the first trimester, and (2) in the preconception period + throughout the first trimester of pregnancy. Multivariate logistic regression was used to quantify the relationship between periconception smoking and the rate of birth defects after adjustment for maternal race, age, pre-gestational diabetes and socioeconomic factors.

**RESULTS:**

Of the 1,436,036 live births in the study period, 75% of mothers did not smoke during the preconception period or during pregnancy. There were 334,156 (23.3%) women who smoked during pregnancy; 6.0% of the population smoked preconception only and 17.3% smoked both during the preconception period and through the first trimester. Smoking during the preconception period only, even without first trimester exposure, was associated with a 40% increased risk of gastroschisis. Smoking limited to preconception only was not associated with any other individual birth defects. However, smoking through the first trimester was associated with a statistically significant increased risk of several defects including gastroschisis and limb reduction as well as a composite outcome of any defect, even after adjustment for coexisting factors.

**CONCLUSION:**

Smoking during the period of fetal organogenesis, during the first trimester of pregnancy, is associated with increased risk of some birth defects. In this study, we provide novel data that smoking during the few months prior to conception, even with cessation in the first trimester, may also pose risk for fetal malformation such as gastroschisis. These findings highlight the importance of preconception women's public health education efforts and warrant further investigation.



**Vestibulodynia**

Clin J Pain. 2019 Apr;35(4):335-344. doi: 10.1097/AJP.0000000000000682.

**Multidisciplinary Treatment for Provoked Vestibulodynia: Treatment Trajectories, Predictors, and Moderators of Sexual Distress and Pain.**

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Author information

Abstract

**OBJECTIVES:**

Multidisciplinary treatment programs for provoked vestibulodynia (PVD) are recommended, yet few have been evaluated. This study examined women's symptom trajectories over time, as well as baseline demographic, psychosocial and pain characteristics as predictors/ moderators of sexual pain and distress following treatment at a clinic using multidisciplinary concurrent methods. We also examined the impact of baseline variables on the probability of having low sexual distress scores following treatment.

**MATERIALS AND METHODS:**

Women attending a multidisciplinary treatment program for PVD were invited to complete questionnaires before, following, and at 6 and 18 months after program completion. Questionnaires included the Female Sexual Function Index (FSFI), Female Sexual Distress Scale (FSDS), State-Trait Anxiety Inventory (STAI), Pain Catastrophizing Scale (PCS), Painful Intercourse Self-Efficacy Scale (PISES), and Pain Vigilance and Awareness Questionnaire (PVAQ). Linear mixed-effects models evaluated the FSDS and FSFI pain subscale as criterion variables, and the other baseline variables as predictors and moderators.

**RESULTS:**

Significant improvements in sexual distress and pain were observed over time. No significant moderators were identified, but higher baseline levels of FSFI desire and arousal predicted greater improvements in sexual distress. Similarly, higher baseline levels of desire predicted greater improvements in pain. Among women distressed at baseline and with 6 month FSDS scores, 25% (n=35) were no longer sexually distressed at 6 months; higher baseline levels of desire were associated with greater probability of having low sexual distress at 6 months.

**DISCUSSION:**

Although global improvements were observed, women with poorer baseline sexual functioning were less likely to improve after multidisciplinary treatment.

## 8. VISCERA

### Red meat does not appear to exacerbate Crohns disease

#### A Diet Low in Red and Processed Meat Does Not Reduce Rate of Crohn's Disease Flares

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DOI: <https://doi.org/10.1053/j.gastro.2019.03.015>

#### Background & Aims

Diet may be an important factor in progression of Crohn's disease (CD). We performed a randomized controlled trial to determine whether reduced consumption of red and processed meats decreases the risk of symptomatic relapse of CD, analyzing results from the Food and Crohn's Disease Exacerbation Study (FACES) trial.

#### Methods

Adults with CD were recruited into the FACES trial from IBD Partners, an internet-based cohort of IBD patients, from November 2013 through June 2015. Individuals who were in remission (CD activity index (sCDAI) scores of 150 or less), had completed a biannual survey, and reported consumption of red meat at least once weekly were randomly assigned to groups that consumed a minimum of 2 servings/week of red or processed meat (high meat, n=118) or not more than 1 serving per month (low meat, n=96) for 49 weeks. The primary outcome was relapse of CD, defined as increase in sCDAI score by  $\geq 70$  points and to  $>150$  or a need for CD surgery or new CD medication. A secondary outcome, moderate or severe relapse, was based on an increase in sCDAI to  $>219$ .

#### Results

During the trial, the high-meat groups reported consumption of 2 or more servings of red or processed meat during 98.5% of observed weeks compared 18.8% of weeks for the low-meat group. Any and moderate to severe relapse occurred in 62% of participants in the high-meat group and 42% of participants in the low-meat group. There were no significant differences in time to any ( $P=.61$ ) or moderate/severe ( $P=.50$ ) relapse.

#### Conclusions

In an analysis of data from the FACES trial, we found that among patients with CD in remission, level of red and processed meat consumption was not associated with time to symptomatic relapse. ClinicalTrials.gov Identifier: NCT0192673

**Celiac disease and cognitive function**

J Clin Gastroenterol. 2019 Apr;53(4):290-294. doi: 10.1097/MCG.0000000000001018.

**A Prospective Study on Cognitive Impairment in Middle-aged Adults With Newly Diagnosed Celiac Disease.**

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**AIMS:**

Our objectives were to: (1) determine whether celiac disease (CD) patients have cognitive impairment at diagnosis; and (2) compare their cognitive performance with nonceliac subjects who have similar chronic symptoms and healthy controls.

**MATERIALS AND METHODS:**

Fifty adults (age range: 18 to 50 y) with symptoms and signs compatible with CD were enrolled in a prospective cohort irrespective of the final diagnosis. At baseline, all individuals underwent cognitive functional and psychological evaluation. CD patients were compared with subjects in whom CD was ruled out and with healthy controls matched by sex, age, and years of schooling.

**RESULTS:**

Thirty-three subjects (66%) were diagnosed with CD. Compared with the healthy controls (n=26), CD cases and disease controls (n=17; mostly irritable bowel syndrome) had impaired cognitive performance (P=0.02 and P=0.04, respectively), functional impairment (P<0.01), and higher depression (P<0.01). CD patients had similar cognitive performance and anxiety, but nonsignificant lower depression scores compared with disease controls.

**CONCLUSIONS:**

Abnormal cognitive functions detected in newly diagnosed CD adult patients seem not to be disease specific. Our results suggest that cognitive dysfunction could be related to the presence of prolonged symptoms due to a chronic disease.

**Bacteria and IBS**

Aliment Pharmacol Ther. 2019 Mar;49(6):624-635. doi: 10.1111/apt.15133. Epub 2019 Feb 8.

**Systematic review with meta-analysis: the prevalence of small intestinal bacterial overgrowth in inflammatory bowel disease.**

Shah A<sup>1,2,3</sup>, Morrison M<sup>4</sup>, Burger D<sup>1,2</sup>, Martin N<sup>1,2</sup>, Rich J<sup>1,2</sup>, Jones M<sup>5</sup>, Koloski N<sup>2,4</sup>, Walker MM<sup>6</sup>, Talley NJ<sup>6</sup>, Holtmann GJ<sup>1,2,3</sup>.

**BACKGROUND:**

Current data on small intestinal bacterial overgrowth (SIBO) in patients with inflammatory bowel diseases (IBD) are controversial.

**AIM:**

To conduct a systematic review and meta-analysis to determine the prevalence of SIBO in patients with ulcerative colitis (UC) and Crohn's disease (CD).

**METHODS:**

Electronic databases were searched up to May 2018 for studies reporting prevalence of SIBO in IBD patients. The prevalence rate of SIBO among IBD patients and the odds ratio (OR) and 95% CI of SIBO in IBD patients compared with controls were calculated.

**RESULTS:**

The final dataset included 11 studies (1175 adult patients with IBD and 407 controls), all utilising breath test for diagnosis of SIBO. The proportion of SIBO in IBD patients was 22.3% (95% CI 19.92-24.68). The OR for SIBO in IBD patients was 9.51 (95% CI 3.39-26.68) compared to non-IBD controls, and high in both CD (OR = 10.86; 95% CI 2.76-42.69) and UC (OR = 7.96; 95% CI 1.66-38.35). In patients with CD, subgroup analysis showed the presence of fibrostenosing disease (OR = 7.47; 95% CI 2.51-22.20) and prior bowel surgery (OR = 2.38; 95% CI 1.65-3.44), especially resection of the ileocecal valve, increased the odds of SIBO. Individual studies suggest that combined small and large bowel disease but not disease activity may be associated with SIBO.

**CONCLUSIONS:**

Overall, there is a substantial increase in the prevalence of SIBO in IBD patients compared to controls. Prior surgery and the presence of fibrostenosing disease are risk factors for SIBO in IBD.

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**KEYWORDS:**

Crohn's disease; SIBO; bacterial overgrowth; breath tests; inflammatory bowel disease; prevalence; ulcerative colitis

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**IBS increasing**

Lancet Gastroenterol Hepatol. 2019 Feb 11. pii: S2468-1253(19)30013-5. doi: 10.1016/S2468-1253(19)30013-5.

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

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**BACKGROUND:**

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

**METHODS:**

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

**FINDINGS:**

Mean hospitalisation rates for IBD from 2010 to 2015 were highest in North America (eg, 33.9 per 100 000 in the USA), Europe (eg, 72.9 per 100 000 in Austria), and Oceania (eg, 31.5 per 100 000 in Australia). Hospitalisation rates for IBD were stabilising or decreasing over time in many countries in these regions but increasing in others. Countries in Asia and Latin America and the Caribbean had the lowest IBD-related hospitalisation rates but the greatest increases in rates over time. For example, Turkey had an annual hospitalisation rate of 10.8 per 100 000 inhabitants and an average annual percentage change of 10.4% (95% CI 5.2-15.9). Similarly, Chile had an annual hospitalisation rate of 9.0 per 100 000 inhabitants and an average annual percentage change of 5.9% (4.9-7.0).

**INTERPRETATION:**

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

## 12 B. CERVICAL SURGERIES

### Upper C spine fractures

#### Retrospective analysis of surgical outcomes for atlantoaxial subluxation

- Tsuyoshi Yamada, Toshitaka Yoshii Yoshiyasu Arai

*Journal of Orthopaedic Surgery and Research* 2019;14:75

<https://doi.org/10.1186/s13018-019-1112-2>

#### Background

Atlantoaxial subluxation (AAS) is characterized by excessive movement at the junction between the atlas (C1) and axis (C2) as a result of either a bony or ligamentous abnormality. Surgical intervention is a therapeutic choice for AAS. In addition to C1 laminectomy (LAM), surgical fixation for subluxation or instability is performed by various techniques. While surgical treatment options for AAS have increased, the outcomes of different surgical techniques remain unclear.

#### Methods

The authors conducted a retrospective analysis of the outcomes of 30 consecutive spinal surgeries performed for AAS patients, C1 LAM in 11 cases and C1/2 fixation in 19 cases. We investigated the correlation between the clinical outcomes and the surgical methods. We also examined the factors related to poor outcomes (the recovery rate of the Japanese Orthopedic Association score for cervical myelopathy < 40%) following AAS surgeries.

#### Results

From a surgical method perspective, the patients in the C1 LAM group were older than those in the C1/2 fixation group (74.6 years vs 68.0 years), and the average recovery rate from the preoperative status was as follows: the C1 LAM group, 39.4%; the C1/2 fixation group, 49.8%. The C-JOA score was significantly improved after surgery in the C1/2 fixation group (from 9.8 to 13.1 points). The fixation technique seemed to successfully reduce C1/2 displacement. Each group exhibited a slight increase in the C1/2 angle and a decrease in the C2–7 angles after the operation. A higher preoperative atlantodental interval (ADI) was associated with good outcomes after the C1/2 fixation. The postoperative ADI was significantly reduced from 8.6 mm to 3.8 mm in the good outcome group after fixation. Patients with higher C1/2 angle showed good outcomes after C1 LAM. Despite the good neurological improvement, the C1/2 fixation method showed higher complication rates compared with C1 LAM method.

#### Conclusions

The results of this study showed that the C1/2 fixation technique exhibited effectiveness in terms of neurological recovery. However, there was a high complication rate in surgeries for AAS, especially in the C1/2 fixation. C1 LAM would be considered for high-risk AAS cases such as elderly patients with multiple comorbidities.

**13 D. SLEEP****Stroke and sleep related breathing disorders**

Stroke. 2019 Mar;50(3):571-576. doi: 10.1161/STROKEAHA.118.023807.

**Sleep-Disordered Breathing Is Associated With Recurrent Ischemic Stroke.**

Brown DL<sup>1</sup>, Shafie-Khorassani F<sup>2</sup>, Kim S<sup>2</sup>, Chervin RD<sup>3</sup>, Case E<sup>1,4</sup>, Morgenstern LB<sup>1,4</sup>, Yadollahi A<sup>5,6</sup>, Tower S<sup>7</sup>, Lisabeth LD<sup>1,4</sup>.

**Background and Purpose-** Limited data are available about the relationship between sleep-disordered breathing (SDB) and recurrent stroke and mortality, especially from population-based studies, large samples, or ethnically diverse populations.

**Methods-** In the BASIC project (Brain Attack Surveillance in Corpus Christ), we identified patients with ischemic stroke (2010-2015). Subjects were offered screening for SDB with the ApneaLink Plus device, from which a respiratory event index (REI) score  $\geq 10$  defined SDB. Demographics and baseline characteristics were determined from chart review and interview. Recurrent ischemic stroke was identified through active and passive surveillance. Cause-specific proportional hazards models were used to assess the association between REI (modeled linearly) and ischemic stroke recurrence (as the event of interest), and all-cause poststroke mortality, adjusted for multiple potential confounders.

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

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

## 14. HEADACHES

### Migraines relationship to dry eye syndrome

JAMA Ophthalmol. 2019 Mar 7. doi: 10.1001/jamaophthalmol.2019.0170.

#### **Association Between Dry Eye Disease and Migraine Headaches in a Large Population-Based Study.**

Ismail OM<sup>1</sup>, Poole ZB<sup>1</sup>, Bierly SL<sup>2</sup>, Van Buren ED<sup>3</sup>, Lin FC<sup>3</sup>, Meyer JJ<sup>4</sup>, Davis RM<sup>1</sup>.

#### **IMPORTANCE:**

Reports in the literature have conflicting findings about an association between dry eye disease (DED) and migraine headaches.

#### **OBJECTIVE:**

To determine the strength of the association between DED and migraine headaches.

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

This retrospective case-control study included 72 969 patients older than 18 years from University of North Carolina-affiliated health care facilities from May 1, 2008, through May 31, 2018. Deidentified aggregate patient data were queried; data were analyzed from June 1 through June 30, 2018.

#### **EXPOSURES:**

Diagnosis of migraine headache.

#### **MAIN OUTCOMES AND MEASURES:**

Odds ratios calculated between DED and migraine headaches for participants as a whole and stratified by sex and age group.

#### **RESULTS:**

The base population consisted of 72 969 patients, including 41 764 men (57.2%) and 31 205 women (42.8%). Of these, 5352 patients (7.3%) carried a diagnosis of migraine headache, and 9638 (13.2%) carried a diagnosis of DED. The odds of having DED given a diagnosis of migraine headaches was 1.72 (95% CI, 1.60-1.85) times higher than that of patients without migraine headaches. After accounting for multiple confounding factors, the odds of having DED given a diagnosis of migraine headaches was 1.42 (95% CI, 1.20-1.68) times higher than that of patients without migraine headaches.

#### **CONCLUSIONS AND RELEVANCE:**

These findings suggest that patients with migraine headaches are more likely to have comorbid DED compared with the general population. Although this association may not reflect cause and effect if unidentified confounders account for the results, these data suggest that patients with migraine headaches may be at risk of carrying a comorbid diagnosis of DED.



## 23. SHOULDER SURGERY

### Biceps tenodesis

#### **Predictive Factors and the Duration to Pre-Injury Work Status Following Biceps Tenodesis**

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M.B.A.<sup>a</sup></sup>Anthony A.Romeo<sup>M.D.<sup>a</sup></sup>Nikhil N.Verma<sup>M.D.<sup>a</sup></sup>BrianForsythe<sup>M.D.<sup>a</sup></sup>  
<https://doi.org/10.1016/j.arthro.2018.10.144>Get rights and content

#### Purpose

To determine when patients return to work after biceps tenodesis stratified by the preinjury level of work-intensity and to identify predictive measures of return to work.

#### Methods

Patients undergoing biceps tenodesis between 2014 and 2017 were reviewed. Patients receiving concomitant rotator cuff repair or arthroplasty, revision biceps tenodesis, or unemployment before the procedure were excluded. Patient-acceptable symptom state (PASS), substantial clinical benefit, and minimal clinically important difference were calculated for the American Shoulder Elbow Society (ASES) score, subjective Constant-Murley score (CMS), and Single Assessment Numerical Evaluation (SANE) using the anchor-based and distribution-based approach. Preoperative outcome scores were analyzed to determine their predictive power of return to work using receiver operator curve area under the curve (AUC) analysis. Multivariate logistical analysis assessed predictive variables of return to work.

#### Results

Seventy-nine percent of patients were able to return to work without permanent restrictions at an average of  $5.4 \pm 2.8$  months after biceps tenodesis. Return to work status for sedentary, light, moderate, and heavy duties were 100%, 85%, 71%, and 69%, respectively. Return to work was associated with achieving PASS for the ASES and SANE questionnaires ( $P = .006, .003$ , respectively) but not for the CMS ( $P = .768$ ). On multivariate analysis, there were no preoperative or intraoperative variables that were predictive of return to work in full capacity. The preoperative Short Form-12 mental component score ( $>59.4$ , AUC = 71.2%) was predictive of returning to work.

#### Conclusions

After biceps tenodesis, most patients were able to return to work at an average of  $5.4 \pm 2.8$  months. Furthermore, there were no demographic or intraoperative variables that were predictive of return to work. Work intensity was not correlated with an increased duration of return to work. Achieving PASS on the ASES and SANE questionnaires was predictive of return to work.

## 28. HIP REPLACEMENTS

### Weight and complications

#### The Effect of Body Mass Index on 30-day Complications After Revision Total Hip and Knee Arthroplasty

Alexander Roth, MD<sup>a</sup> Carlos A. Higuera, MD<sup>c</sup>  
DOI: <https://doi.org/10.1016/j.arth.2019.02.005>

#### Background

We aimed to explore the effect of body mass index (BMI) on 30-day complications after aseptic revision total knee arthroplasty (rTKA) and aseptic revision total hip arthroplasty (rTHA), considering BMI as both a categorical and continuous variable.

#### Methods

A total of 18,866 patients (9093 rTHA and 9773 rTKA) patients were included for analysis using the American College of Surgeons National Surgical Quality Improvement Project database. Thirty-day rates of readmissions, reoperations, and major and minor complications were compared between different weight categories (overweight: BMI >25 and ≤30 kg/m<sup>2</sup>; obese: BMI >30 and ≤40 kg/m<sup>2</sup>; morbidly obese: BMI >40 kg/m<sup>2</sup>) and the normal weight category (BMI >18.5 and ≤25 kg/m<sup>2</sup>) using multivariate regression models. Spline regression models were created to study BMI as a continuous variable.

#### Results

Both readmission rates and reoperation rates increased for rTKA as BMI increased ( $P < .005$ ). There was a linear relationship between BMI and readmission rates for rTKA. Morbid obesity was associated with an increased reoperation rate for rTHA on univariate analysis ( $P = .022$ ); however, multivariate analysis showed no statistically significant increase in readmission or reoperation rates as BMI increased for rTHA.

#### Conclusions

The relationship between BMI and complications after revision total joint arthroplasty is a J-shaped curve with the lowest rates of complications occurring around a BMI of 30 kg/m<sup>2</sup>. The relationship between BMI and perioperative complications is stronger for revision TKA as opposed to revision THA.

## Younger replacements

**Primary Total Hip Arthroplasty in Patients Less than 50 Years of Age at a Mean of 16 Years: Highly Crosslinked Polyethylene Significantly Reduces the Risk of Revision**

Andrew J. Bryan, MD Tyler E. Calkins, B.S. Vasili Karas, MD Chris Culvern, M.S. ,  
Denis Nam, MD, MSc Craig J. Della Valle, M  
DDOI: <https://doi.org/10.1016/j.arth.2019.02.025>

**Background**

The purpose of this study was to evaluate clinical and radiographic outcomes of patients less than 50 years of age undergoing primary THA at a minimum of 10 years.

**Methods**

309 Consecutive THAs performed on 273 patients were reviewed. At a minimum of 10-years, 13 were deceased, and 23 were lost to follow-up leaving 273 THAs in 237 patients who were followed for a mean of 16 years (range 10 to 19.9 years). The cohort consisted of 116 females (49%) and 121 males (51%), with a mean age of 42.3 years at the time of surgery (range, 19 to 49 years old). The majority of preoperative diagnoses included osteoarthritis in 149 (63%) and avascular necrosis in 55 (23%). 216 Had highly crosslinked polyethylene (HXLPE) and 57 non-HXLPE acetabular liners. The femoral stems were cementless in 98% (266/273) and the acetabular components were cementless in all cases. Femoral head composition was CoCr in all cases and the majority of sizes in the non-HXLPE cohort were 28 mm (52/57; 91%) while the HXLPE group primarily consisted of 28 mm (141/216; 65%) and 32 mm (74/216; 34%) heads. Analysis involved Kaplan-Meier survivorship with a log-rank test for equivalence, Fischer's exact test for pairwise comparisons and a paired t-test for Harris Hip Score both with alpha = 0.05 being statistically significant.

**Results**

There were six revisions for wear in the non-HXLPE group (10.5%) compared to none in the HXLPE group ( $p < 0.001$ ). Similarly, survivorship with revision for any reason as the endpoint at 16 years was significantly higher in the XLPE group 93.0% (95% CI 88.7 to 95.7%) compared to 85.7% (95% CI 73.5 to 92.6%) in the non-HXLPE group ( $p = 0.023$ ). Additional revisions in the HXLPE group included 6 for instability (2.8%), 5 secondary to infection (2.4%), and 3 stem failures (1.4%). Non-wear related revisions in the non-HXLPE group included 5 due to instability (8.8%) and 3 stem failures (5.3%). The Mean Harris Hip Scores for the entire cohort improved from a mean of 46.2 points preoperatively to 89.8 points at most recent follow-up ( $p < .001$ ).

**Conclusions**

The use of HXLPE has led to a significant reduction in the risk of failure in patients < 50 years old, with over 93% survivorship at 16 years. Instability and infection, however, remain substantial causes of failure.

**Level of Evidence**

Therapeutic Level III.

**30 A. HIP IMPINGEMENT****Labral tears in shoulder and hip common in same person****Higher Prevalence of Concomitant Shoulder Labral Tears in Patients With Femoroacetabular Impingement**

Author links open overlay panel Hamed Vahedi M.D. Andrew N. Fleischman M.D. John

P. Salvo Jr. M.D. Javad Parvizi M.D., F.R.C.S.

<https://doi.org/10.1016/j.arthro.2018.10.128> Get rights and content

**Purpose**

To examine the prevalence of concomitant symptomatic glenoid labral tears in patients with femoroacetabular impingement (FAI) in comparison to a control group of patients undergoing anterior cruciate ligament (ACL) reconstruction.

**Methods**

We retrospectively identified 1,644 patients who underwent femoroacetabular osteoplasty (FAO) and labrum repair from January 2007 to September 2016 and 1,055 patients who underwent arthroscopic ACL reconstruction from January 2012 to December 2014, which acted as our control group. An electronic questionnaire, including 8 questions regarding history of shoulder pathology, was sent to all patients in both groups. Symptomatic shoulder labral tears were identified on the basis of a positive magnetic resonance imaging scan or history of labral repair by reviewing patients' medical records and the filled questionnaire. Continuous variables were compared by use of a Mann-Whitney U test, and categorical variables were compared using Fisher's exact test. The Holm-Bonferroni sequential correction method was used to adjust *P* values for multiple comparisons of the presence of shoulder pathology.

**Results**

A total of 443 patients (405 cam lesion) in the FAO group and 307 patients in the ACL reconstruction group completed the prepared questionnaire and were included in the study. Patients in the FAO group were slightly older (36.3 years [range, 15.4-61.7] vs 32.3 years [range, 16.3-75.7]) and more commonly female in the FAO group (58.0%, *n* = 257) compared with those in the ACL group (48.9%, *n* = 150). The prevalence of shoulder labral tear was 12.0% (95% confidence interval [CI], 9.3%-15.3%) for the FAO group compared with only 3.3% (95% CI, 1.8%-5.9%) for the ACL group. This represents a 3.7-fold (95% CI, 1.9-7.1) increase in the risk of shoulder labral tear for patients in the FAO group. Furthermore, shoulder labral tears were reported to be traumatic in only 43.4% of patients in the FAO group compared with 80.0% of patients in the ACL group. A similar proportion of patients in both groups (66.0% for FAO vs 60.0% for ACL) underwent a shoulder labral repair procedure.

**Conclusion**

There appears to be an association between acetabular labral tear caused by FAI and shoulder labral lesions. Patients in the FAI group had a 3.7-fold increase in the risk of shoulder labral tear compared with the ACL group. Future studies are needed to examine a possible cause behind the current findings.

[Return to dance](#)

### **Return to Dance and Predictors of Outcome After Hip Arthroscopy for Femoroacetabular Impingement Syndrome**

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<https://doi.org/10.1016/j.arthro.2018.10.121> Get rights and content

#### **Purpose**

To investigate the rate of return to dance and factors influencing this primary outcome after hip arthroscopy for the treatment of femoroacetabular impingement syndrome.

#### **Methods**

A consecutive series of self-identified dancers with femoroacetabular impingement syndrome was included. To assess for the impact of hypermobility on outcomes, patients were classified as having either generalized joint laxity (GJL) or no GJL based on the Beighton-Horan Joint Mobility Index. A return-to-dance survey, the modified Harris Hip Score, and the Hip Outcome Score (HOS)–Activities of Daily Living and HOS–Sports-Specific subscales were collected preoperatively and postoperatively at 6, 12, 24, and 36 months. The preoperative-to-postoperative outcome score change was compared using the minimal clinically important difference and patient acceptable symptomatic state. Return to dance was evaluated regarding (1) return to any dance activity, (2) return to prior level of dance, and (3) number of hours of dance participation after surgery. Clinical and demographic predictors and return to dance were analyzed using univariate or bivariate analysis where appropriate.

#### **Results**

The study included 64 consecutive dancers (62 female and 2 male patients) (mean age,  $22.3 \pm 9.4$  years; body mass index,  $22.8 \pm 4.1$ ) with a mean follow-up period of 23.0 months. Postoperatively, 62 patients (97%) returned to dance at an average of  $6.9 \pm 2.9$  months; 40 patients (62.5%) reported that they returned to a better level of participation, whereas 20 dancers (31%) returned to the same level of participation. Statistically significant increases were observed for the HOS–Activities of Daily Living subscale ( $60.5 \pm 19.5$  vs  $92.4 \pm 11.8$ ,  $P < .001$ ), HOS–Sports-Specific subscale ( $40.3 \pm 20.3$  vs  $83.5 \pm 19.4$ ,  $P < .001$ ), and modified Harris Hip Score ( $57.0 \pm 13.6$  vs  $86.6 \pm 13.9$ ,  $P < .001$ ). There was, however, a significant decrease in the number of hours of dance postoperatively:  $11.5 \pm 8.2$  h/wk preoperatively versus  $9.0 \pm 7.3$  h/wk postoperatively ( $P = .041$ ). All postoperative hip outcome measures showed statistically significant ( $P < .001$ ) and clinically relevant improvements. Patient-reported outcomes and return time showed no significant differences between the patient groups with GJL and without GJL ( $P = .1$  and  $P = .489$ , respectively). For competitive dancers, a correlation was shown with a shorter time to return to dance ( $r^2 = 0.45$ ,  $P = .001$ ), but there were no significant differences by skill level in patient-reported outcomes or dance hours.

#### **Conclusions**

After hip arthroscopy, 97% of dancers returned to dance at an average of 6.9 months, with most dancers dancing at a level higher than their preoperative status. Dance experience level was the only significant factor influencing return-to-dance outcomes, with competitive dancers showing a faster return to dancing.

**32 A. KNEE/ACL****MCL surgery or not****Outcomes of Grade III Medial Collateral Ligament Injuries Treated Concurrently With Anterior Cruciate Ligament Reconstruction: A Multicenter Study**Kurt P. Spindler M.D.<sup>c</sup> Laura J. Huston M.S.<sup>d</sup><https://doi.org/10.1016/j.arthro.2018.10.138> Get rights and content**Purpose**

To evaluate differences in repair and nonoperatively managed grade III medial collateral ligament (MCL) injuries during anterior cruciate ligament (ACL) reconstruction.

**Methods**

Patients enrolled in a multicenter prospective longitudinal group who underwent unilateral primary ACL reconstruction between 2002 and 2008 were evaluated. Patients with concomitant grade III MCL injuries treated either operatively or nonoperatively were identified. Concurrent injuries, subsequent surgeries, surgical chronicity, and MCL tear location were analyzed. Patient-reported outcomes were measured at time of ACL reconstruction and 2-year follow-up.

**Results**

Initially, 3,028 patients were identified to have undergone primary ACL reconstruction during the time frame; 2,586 patients completed 2-year follow-up (85%). Grade III MCL tears were documented in 1.1% (27 of 2,586): 16 operatively managed patients and 11 nonoperatively treated MCLs during ACL reconstruction. The baseline Knee Injury and Osteoarthritis Outcome Score (KOOS) and International Knee Documentation Committee scores were lower in patients who underwent operative MCL treatment. Reoperation rates for arthrofibrosis were 19% after repair and 9% after conservative management ( $P = .48$ ). At 2 years, both groups significantly improved; however, the nonoperative MCL group maintained superior patient-reported outcomes in terms of minimal clinically important differences, but these differences did not reach statistical significance (KOOS sports/recreation [88.2 vs 74.4,  $P = .10$ ], KOOS knee-related quality of life [81.3 vs 68.4,  $P = .13$ ], and International Knee Documentation Committee [87.6 vs 76.0,  $P = .14$ ]). Tibial-sided MCL injuries were associated with clinically inferior baseline scores compared with femoral-sided MCL (KOOS knee-related quality of life, 34.4 vs 18.5,  $P = .09$ ), but these differences resolved by 2 years. Surgical chronicity did not influence 2-year outcome.

**Conclusions**

Both operative and nonoperative management of MCL tears in our patient group demonstrated clinical improvements between study enrollment and 2-year follow-up. MCL surgery during ACL reconstruction was assigned to patients with worse symptoms at enrollment and was associated with worse outcomes at 2 years. A subset of patients with severe combined ACL and medial knee injuries may benefit from operative management; however, that population has yet to be defined.

**41 A. ACHILLES TENDON AND CALF****Non-repair of Achilles tear****Non-Operative Functional Treatment for Acute Achilles Tendon Ruptures: The Leicester Achilles Management Protocol (LAMP)**

Randeep S.AujlaShakilPatelAnnetteJonesManeeshBhatia

<https://doi.org/10.1016/j.injury.2019.03.007>Get rights and content

## Highlights

- An 8-week dynamic functional immediate full-weight bearing regime can be used for the majority of acute Achilles tendon ruptures.
- Re-rupture rate of 2% and functional scores of 76/100.
- Low complications can be expected.

## ABSTRACT

## Objectives

The purpose of this study is to present outcomes and objective measures of assessment for acute Achilles tendon (AT) ruptures treated with an eight-week functional dynamic treatment protocol in a VACOped<sup>®</sup> boot with immediate full weight bearing mobilisation, the Leicester Achilles Management Protocol (LAMP).

## Methods

A prospective study of all patients treated with the LAMP with minimum 12-month follow-up was performed. Patients completed the Achilles Tendon Rupture Score (ATRS) and in the latter part of the study, objective measures of the calf muscle girth and heel raise height were obtained.

## Results

442 patients were treated with the LAMP. There were nine (2%) re-ruptures in the 442 non-operative treated group of patients throughout the study period. ATRS at twelve months or more were available in 234 patients and objective measures in 77 patients. The mean age was 50 years. The mean ATRS was 75.5 at an average of 23 months post injury. Men had a statistically significant higher ATRS score when compared to women ( $p < 0.05$ ). There was statistically significant difference in the calf muscle girth and the heel raise height when compared to the uninjured side at 12-months post-injury ( $p < 0.05$ ). These differences did not correlate with the ATRS ( $p > 0.05$ ).

## Conclusions

The LAMP is a simple yet effective regime for the non-operative treatment of acute AT ruptures, which can be universally adopted without the need for many resources. Compared to other studies, the overall time in the boot is less with low complication rates and similar patient reported outcomes.

**45 A. MANUAL THERAPY LUMBAR & GENERAL****Active treatment good for LBP**

Am J Lifestyle Med. 2019 Mar-Apr; 13(2): 190–203.

. doi: 10.1177/1559827617697273PMCID: PMC6378502 PMID: 30800026

**The Influence of an Active Treatment Approach in Patients With Low Back Pain: A Systematic Review**

Emiangeliz Gonzalez Luna, BS, William J. Hanney, DPT, PhD, Carey E. Rothschild, DPT, Morey J. Kolber, PT, PhD, Xinliang Liu, PhD, and Michael Masaracchio, DPT, PhD

*Introduction.* Low back pain (LBP) is one of the most common medical conditions in the United States. Clinical practice guidelines recommend active treatment approaches; however, there continues to be a significant disparity in how patients with LBP are treated. Therefore, the purpose of this systematic review is to evaluate the reported efficacy of active treatment approaches as recommended by clinical practice guidelines on LBP treatment on patient outcomes.

*Methods.* Between the months of June and August 2015, a comprehensive search of the PubMed, Medline (EBSCO Host), and CINAHL (EBSCO Host) databases was performed. The search was restricted to articles that were published in a peer-reviewed journal, published in the English language, examined patient outcomes with a determined scale, determined the usage of an established clinical practice guideline for LBP treatment, reported at least one outcome measure, and specified either nonspecific or acute LBP.

*Results.* Fifty-three articles were initially identified, with 4 articles ultimately meeting the criteria after screening. Articles scored between 17 and 20 points based on a maximum total score of 26 on the modified Downs and Black checklist.

*Conclusion.* Studies identified in this review indicate that adherence to an active treatment approach as recommended by clinical practice guidelines may result in improved patient outcomes.



## Benefits of SMT

**Benefits and harms of spinal manipulative therapy for the treatment of chronic low back pain: systematic review and meta-analysis of randomised controlled trials**

BMJ 2019; 364 doi: <https://doi.org/10.1136/bmj.l689> (Published 13 March 2019) Cite this as: BMJ 2019;364:l689

Sidney M Rubinstein Annemarie de Zoete, Marienke van Middelkoop, associate professor<sup>2</sup>, Willem J J Assendelft, professor<sup>3</sup>, Michiel R de Boer, associate professor<sup>1</sup>, Maurits W van Tulder,

**Objective** To assess the benefits and harms of spinal manipulative therapy (SMT) for the treatment of chronic low back pain.

**Design** Systematic review and meta-analysis of randomised controlled trials.

**Data sources** Medline, PubMed, Embase, Cochrane Central Register of Controlled Trials (CENTRAL), CINAHL, Physiotherapy Evidence Database (PEDro), Index to Chiropractic Literature, and trial registries up to 4 May 2018, including reference lists of eligible trials and related reviews.

**Eligibility criteria for selecting studies** Randomised controlled trials examining the effect of spinal manipulation or mobilisation in adults ( $\geq 18$  years) with chronic low back pain with or without referred pain. Studies that exclusively examined sciatica were excluded, as was grey literature. No restrictions were applied to language or setting.

**Review methods** Two reviewers independently selected studies, extracted data, and assessed risk of bias and quality of the evidence. The effect of SMT was compared with recommended therapies, non-recommended therapies, sham (placebo) SMT, and SMT as an adjuvant therapy. Main outcomes were pain and back specific functional status, examined as mean differences and standardised mean differences (SMD), respectively. Outcomes were examined at 1, 6, and 12 months. Quality of evidence was assessed using GRADE. A random effects model was used and statistical heterogeneity explored.

**Results** 47 randomised controlled trials including a total of 9211 participants were identified, who were on average middle aged (35-60 years). Most trials compared SMT with recommended therapies. Moderate quality evidence suggested that SMT has similar effects to other recommended therapies for short term pain relief (mean difference  $-3.17$ , 95% confidence interval  $-7.85$  to  $1.51$ ) and a small, clinically better improvement in function (SMD  $-0.25$ , 95% confidence interval  $-0.41$  to  $-0.09$ ). High quality evidence suggested that compared with non-recommended therapies SMT results in small, not clinically better effects for short term pain relief (mean difference  $-7.48$ ,  $-11.50$  to  $-3.47$ ) and small to moderate clinically better improvement in function (SMD  $-0.41$ ,  $-0.67$  to  $-0.15$ ). In general, these results were similar for the intermediate and long term outcomes as were the effects of SMT as an adjuvant therapy. Evidence for sham SMT was low to very low quality; therefore these effects should be considered uncertain. Statistical heterogeneity could not be explained. About half of the studies examined adverse and serious adverse events, but in most of these it was unclear how and whether these events were registered systematically. Most of the observed adverse events were musculoskeletal related, transient in nature, and of mild to moderate severity. One study with a low risk of selection bias and powered to examine risk ( $n=183$ ) found no increased risk of an adverse event (relative risk  $1.24$ , 95% confidence interval  $0.85$  to  $1.81$ ) or duration of the event ( $1.13$ ,  $0.59$  to  $2.18$ ) compared with sham SMT. In one study, the Data Safety Monitoring Board judged one serious adverse event to be possibly related to SMT.

**Conclusion** SMT produces similar effects to recommended therapies for chronic low back pain, whereas SMT seems to be better than non-recommended interventions for improvement in function in the short term. Clinicians should inform their patients of the potential risks of adverse events associated with SMT.

## 49. STRETCHING

### Dynamic stretching pre exercise good

J Sports Sci Med. 2019 Feb 11;18(1):13-20. eCollection 2019 Mar.

#### **Dynamic Stretching Has Sustained Effects on Range of Motion and Passive Stiffness of the Hamstring Muscles.**

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Abstract

Dynamic stretching (DS) is often performed during warm-up to help avoid hamstring muscle injuries, increase joint flexibility, and optimize performance.

We examined the effects of DS of the hamstring muscles on passive knee extension range of motion (ROM), passive torque (PT) at the onset of pain (as a measure of stretch tolerance), and passive stiffness of the muscle-tendon unit over an extended period after stretching.

Twenty-four healthy subjects participated, with 12 each in the experimental and control groups. Stretching was performed, and measurements were recorded using an isokinetic dynamometer pre-intervention, and at 0, 15, 30, 45, 60, 75, and 90 min post-intervention. DS consisted of ten 30-s sets of 15 repetitions of extension and relaxation of the hamstrings.

ROM increased significantly (range, 7%-10%) immediately after DS, and the increase was sustained over 90 min. PT at the onset of pain also increased immediately by 10% but returned to baseline by 30 min. Passive stiffness decreased significantly (range, 7.9%-16.7%) immediately after DS, and the decrease was sustained over 90 min. Post-DS values were normalized to pre-DS values for the respective outcomes in both groups. ROM was significantly higher (range, 7.4%-10%) and passive stiffness was significantly lower (range, 5.4%-14.9%) in the experimental group relative to the control group at all time points. Normalized PT values at the onset of pain were significantly higher in the experimental group at 0-15 min than in the controls, but the differences were smaller at 30-45 min and not significant thereafter. We conclude that DS increases ROM and decreases passive stiffness in a sustained manner, and increases PT at the onset of pain for a shorter period.

Overall, our results indicate that when performed prior to exercise, DS is beneficial for the hamstring muscles in terms of increasing flexibility and reducing stiffness.

**53. CORE****Tests not effective for assessing stabilization programs**

Arch Phys Med Rehabil. 2019 Feb 26. pii: S0003-9993(19)30111-X. doi: 10.1016/j.apmr.2019.01.019.

**Association between clinical tests related to motor control dysfunction and changes in pain and disability after lumbar stabilization exercises in patients with chronic low back pain.**

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**OBJECTIVE:**

To investigate whether clinical tests used to detect motor control dysfunction can predict improvements in pain and disability in patients with chronic nonspecific LBP who have undergone an 8-week lumbar stabilization exercise program.

**STUDY DESIGN:**

A prospective cohort study.

**SETTING:**

Outpatient physical therapy university clinic.

**PARTICIPANTS:**

Seventy people with chronic nonspecific LBP were recruited, and 64 completed the exercise program.

**INTERVENTIONS:**

The lumbar stabilization program was provided twice a week for eight weeks.

**MAIN OUTCOME MEASURE(S):**

Pain intensity (11-point numerical rating scale) and disability (Roland Morris Disability Questionnaire) and clinical tests, such as the Deep Muscle Contraction scale, Clinical Test of Thoracolumbar Dissociation and Passive Lumbar Extension test. Univariate and multivariate linear regression models were used in the prediction analysis.

**RESULTS:**

Mean changes in pain intensity and disability following the 8-week stabilization program were -3.8 (95% CI: -3.2 to -4.4) and -7.4 (95% CI: -6.3 to -8.5), respectively. Clinical test scores taken at baseline did not predict changes in pain and disability at 8-week follow-up.

**CONCLUSION:**

Our findings revealed that the DMC scale, CTTD, PLE test, clinical tests used to assess motor control dysfunction, do not predict improvements in pain and disability in patients with chronic non-specific LBP following an 8-week lumbar stabilization exercise program

**62 A. NUTRITION/VITAMINS****Vegan diet helps BP**

Am J Med. 2019 Mar 6. pii: S0002-9343(19)30171-8. doi: 10.1016/j.amjmed.2019.01.044.

**THE EFFECT OF VEGAN DIETS ON BLOOD PRESSURE IN ADULTS: A META-ANALYSIS OF RANDOMIZED, CONTROLLED TRIALS.**

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**BACKGROUND:**

Vegan diets are increasing in popularity and have beneficial effects on glycemia and blood lipids, but the evidence is inconclusive regarding their effect on blood pressure. The purpose of this study was to review the effect of vegan diets on blood pressure in adults.

**METHODS:**

We searched MEDLINE, EMBASE, CENTRAL and ClinicalTrials.gov for records that compared a vegan diet to any less restrictive diet and reported pre- and post-intervention systolic and diastolic blood pressures. Two reviewers independently screened abstracts for randomized, controlled clinical trials in individuals  $\geq 18$  years of age and older. We used the PRISMA guidelines to select 11 clinical trials from 1673 records. Data synthesis was performed through a random-effects model.

**RESULTS:**

The pooled data included 983 participants. Compared to less restrictive diets, a vegan diet did not result in a significant change in systolic (-1.33mmHg; 95% CI -3.50 to 0.84;  $p=0.230$ ) or diastolic (-1.21mmHg; 95% CI -3.06 to 0.65;  $p=0.203$ ) blood pressure. A pre-specified subgroup analysis of studies with baseline systolic blood pressure  $\geq 130$ mmHg revealed that a vegan diet resulted in a mean decrease in the systolic (-4.10mmHg; 95% CI -8.14 to -0.06;  $p=0.047$ ) and diastolic (-4.01mmHg; 95% CI -5.97 to -2.05;  $p=0.000$ ) blood pressures.

**CONCLUSION:**

The changes in blood pressure induced by a vegan diet without caloric restrictions are comparable to those induced by dietary approaches recommended by medical societies and portion-controlled diets.

**Artificially sweetened beverages increase risk of stroke****Artificially Sweetened Beverages and Stroke, Coronary Heart Disease, and All-Cause Mortality in the Women's Health Initiative**

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2019<https://doi.org/10.1161/STROKEAHA.118.023100>Stroke. 2019;50:555–562

**Background and Purpose—**

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

**Methods—**

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

**Results—**

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

**Conclusions—**

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