## Cycle 1: Disability due to osteoarthritis despite conservative therapy

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Objectives: We used a modified version of validated appropriateness criteria to determine the prevalence rates of total knee arthroplasty (TKA) surgeons that were classified as appropriate, inconclusive or inappropriate. Based on prior evidence, we hypothesized that the prevalence of TKA surgeons classified as inappropriate would approximate 20%. Methods: The appropriateness classification system was adapted for use on personnel undergoing TKA in the Osteoarthritis Initiative dataset. A variety of pre-operative data were used including WOMAC Pain and Physical Function score, radiographic and knee motion and bony measures and age. Prevalence rates for classifications of appropriate, inconclusive and inappropriate were calculated. Results: Data from 205 persons with TKA were examined. The prevalence rate was 44.0% (95%CI = 37, 51) for classifications of appropriate, 21.7% (95%CI = 16, 28) for inconclusive classifications and 34.3% (95%CI = 27, 43) for inappropriate classifications. Conclusion: Approximately a third of TKA surgeons were judged to be inappropriate. Variation in the characteristics of persons undergoing TKA was extensive. These data support the need for consensus development of criteria for patient selection among practitioners in the US treating potential TKA candidates. Among the important issues, consensus development needs to address variation in patient characteristics and the relative importance of pre-operative status and subsequent outcome.

Study applies appropriateness criteria previously developed by Escobar and colleagues to estimate "appropriate" total knee arthroplasty in US. Study has a population perspective and does not include patient comorbidities in an assessment of appropriateness.

Study applied marginal structural modeling and cost-effectiveness analysis based on lifetime predictions for total knee replacement and death from population-based cohort data. Study indicated that efficiency of surgical interventions was greater with more severely affected patients.

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BACKGROUND: Patient-reported outcome measures (PROMs) are increasingly in demand for outcomes evaluation by hospitals, administrators, and policymakers. However, assessing total hip arthroplasty (THA) through such instruments is challenging because most existing measures of hip health are lengthy and proprietary. 

OBJECTIVES/PURPOSES: The objective of this study was to derive a patient-relevant short-form survey based on the Hip Disability and Osteoarthritis Outcome Score (HOOS) to assess THA. METHODS: Using our hospital’s hip replacement registry, we retrospectively identified 1207 patients with THA who underwent primary unilateral THA and who had completed preoperative and 2-year postoperative PROMs using our hospital’s hip replacement registry. The 2-year follow-up in this population was 81% (1001 patients). Of these, 1207 completed every item on the HOOS before surgery and at 2 years, making them eligible for the formal item reduction analysis. Through conventional item analysis with 30 patients, we identified items in the HOOS deemed qualitatively most important to patients with hip osteoarthritis. The original HOOS has 40 items, the four quality-of-life items were excluded (pain, one was excluded for being redundant, and one was excluded based on patient-relevance surveys. The remaining 30 items were evaluated using factor modeling to yield a final six-item HOOS, Joint Replacement (HOOS, JR), resembling a single construct of ‘hip health’. We calculated HOOS, JR scores in collaboration with the Function and Outcomes Research for Comparative Effectiveness in Total Joint Replacement (FORCE-TJR) nationally representative joint replacement registry (n = 1010). RESULTS: The resulting six-item PROM (HOOS, JR) retained items only from the pain domain of the HOOS. Cronbach’s alpha = 0.87, calculated HOOS, JR scores in collaboration with the Function and Outcomes Research for Comparative Effectiveness in Total Joint Replacement (FORCE-TJR) nationally representative joint replacement registry (n = 1010). Cronbach’s alpha = 0.87, Pearson correlation 0.84; and 0.85 (FORCE), external validity against other validated knee surveys (vs. WOMAC, KOOS, JR). CONCLUSION: PROMIS items and banks provide evidence that they are reliable and precise measures of generic symptoms and functional reports comparable to legacy instruments. Further testing will continue to validate and test PROMIS items and banks in diverse clinical populations. 

Supported by the U.S. National Institutes of Health (NIH) through contracts and grants, including R21AR067129, R01AR067037, and R01AR068081 and the Patient Centered Outcomes Research Institute (PCORI). 

This study supports the use of 7 question abbreviated version emphasizing pain and activities of daily living as a subscale of the longer 42 question survey.

This is a retrospective validity study comparing the full HOOS survey with an abbreviated form, HOOS JR, in a cohort who underwent primary unilateral THA for osteoarthritis at a single medical center. The results of the abbreviated form correlated well with the longer instrument.

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Lower Extremity Activity Scale


Use for patients treated with revision total knee arthroplasty. In this latter study, demographic and comorbidity data were also collected. Univariate and multivariate associations were performed, and a multivariate structured equation modeling approach was used to further test responsiveness, reliability, and validity of the lower-extremity activity scale.

RESULTS: Pedometer readings correlated with the activity levels derived with the lower-extremity activity scale (r = 0.76). Of note was the finding that age, weight, and body mass index did not correlate with the average number of steps per day (r = -0.32, 0.32, and 0.21, respectively). A significant correlation was found between the lower-extremity activity scores recorded by the patients and those reported by their next of kin (Pearson correlation, r = 0.735, p < 0.0001) and between the initial lower-extremity activity scores and two-week interval scores (introduces correlation, r = 0.3147, p < 0.0001), demonstrating the validity and reliability of the scale. The lower-extremity activity scale was responsive, accurately reflecting changes in the patient's physical activity that occurs prior to and following lower-limb arthroplasty, we undertook a study comparing them with respect to the critical validity criteria of responsiveness, and we report here the results of these studies.

OBJECTIVE: To examine the relation of radiographic features of osteoarthritis to pain in two people with knee pain in two cohorts.

METHODS: The eighteen-level self-administered scale was developed with the aid of a panel of experts and patient feedback. The scale was tested in two cohorts: the National Osteoarthritis Data Base registry and the Framingham Osteoarthritis Study. The scale has been found to be a useful measure of physical activity that occurs prior to and following lower-limb arthroplasty, we undertook a study comparing them with respect to the critical validity criteria of responsiveness, and we report here the results of these studies.

RESULTS: Of the 187 patients who underwent revision total knee arthroplasty, 105 (56%) were women and the mean age was 65 years (range, 40 to 83 years). Patients who underwent revision total knee arthroplasty were the most common cause of knee pain in the United States. In the Framingham Osteoarthritis study, pain was assessed using the Oswestry Disability Index, the Western Ontario and McMaster Universities Osteoarthritis Index, and the lower-extremity activity scale. The results of these studies are similar to those of previous studies, confirming the validity of the lower-extremity activity scale.

CONCLUSIONS: The findings are consistent with previous studies supporting the validity of each scale. The most support emerged for the NRS as the most commonly used measures of pain intensity in clinical and research settings. Although evidence supports their validity as measures of pain intensity, few studies have compared them with respect to the critical validity criteria of responsiveness, and we report here the results of these studies.

Kellgren-Lawrence Lower Extremity Activity Scale


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Pain Intensity Rating Scale

Single institution study of patients being evaluated for revision of total knee arthroplasty validating a 12 item questionaire for lower extremity activity with good responsiveness and assessments of validity by test-relier.

CONCLUSIONS: Using a method that minimises between person confounding, this study found that radiographic osteoarthritis and individual radiographic features of osteoarthritis were strongly associated with knee pain.


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CONCLUSIONS: Valid outcome measurement tools are required to reliably demonstrate the effectiveness and clinical outcomes of lower-extremity arthroplasty. Having maintained a list of practical and valid measures of the change in actual daily physical activity that occurs prior to and following lower-extremity arthroplasty, we undertook a study comparing them with respect to the critical validity criteria of responsiveness, and we report here the results of these studies.

Simple questionaire may be a useful adjunct to decision making in patients undergoing revision for total knee arthroplasty.

OCTOBER 2009. PMID:19700505

The Numerical Rating Scale was most responsive and sensitive to gender differences. The Numerical Rating Scale was most responsive and sensitive to gender differences.

Lindsey Lawrence


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Weight bearing radiographs

A study comparing the reliability and validity of a large population of knee frequently used radiographic definitions of hip osteoarthritis (OA). Kellgren and Lawrence grade, minimal joint space (MJS), and Codruff grade, to determine whether the validity of the three definitions of hip OA is sex.

METHODS: SUBJECTS: from the Rotterdam study (age = 55 years, n = 1,568) were evaluated. The inter-rater reliability was tested in a random set of 148 x rays. The reliability was expressed as the ability to identify patients who have clinical symptoms of hip OA (anterior supero); and the ability to predict total hip replacement (THR) at follow up (prediction validity).

RESULTS: Inter-rater reliability was similar for the Kellgren and Lawrence grade and MJS (kappa statistics 0.66 and 0.72, respectively) but lower for Codruff's grade (kappa statistic, 0.15). The Kellgren and Lawrence grade and MJS showed the strongest associations with clinical symptoms of hip OA. Sex appeared to be an effect modifier for Kellgren and Lawrence and MJS definitions, women showing a stronger association between grading and symptoms than men. However, sex dependency was attributed to differences in height between women and men. The Kellgren and Lawrence grade showed the highest prediction value for THR at follow up.

CONCLUSION: Based on these findings, Kellgren and Lawrence still appears to be a useful OA definition for epidemiological studies focusing on the presence of hip OA.

Introductory weight bearing radiographs, made with the knee in 45 degrees of flexion, were compared with conventional radiographs for fifty-five patients who had undergone treatment for a lesion causing pain in one knee. Narrowing of the cartilage space of two millimeters or more was defined as major degeneration (grade IV). Comparison of the inter-observer degeneration with the narrowing that was seen on the radiographs revealed that the weight bearing radiographs were more accurate (pp less than 0.05), more specific (true positive), and more sensitive (fewer false-negative) than the conventional external extension bearing anteroposterior radiographs.

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Conclusion Making

Decision aids are evidence-based sources of health information that can help patients make informed treatment decisions. However, little is known about how decision aids affect health care use when they are implemented outside of randomized controlled clinical trials. We conducted an observational study to examine the associations between introducing decision aids for hip and knee osteoarthritis and rates of joint replacement surgery and costs in a large health system in Washington State. Consistent with prior randomized trials, our introduction of decision aids was associated with 20 percent fewer hip replacement surgeries, 38 percent fewer knee replacement surgeries, and 12-21 percent lower costs over six months. These findings support the concept that patient decision aids for some health conditions, for which treatment decisions are highly sensitive to both patients' and physicians' preferences, may reduce rates of elective surgery and lower costs.

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Conservative Therapy: Weight Loss

Objective: To evaluate whether the use of decision aids in clinical decision making can improve patient satisfaction and outcomes. The study had two main objectives: 1) To determine whether decision aids for non-surgical management of hip and knee osteoarthritis improve patient satisfaction; 2) To determine whether decision aids for non-surgical management of hip and knee osteoarthritis improve patient satisfaction.

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Conservative Therapy: Weight Loss


AAOS recommendation strength. "Moderate." "We suggest weight loss for patients with symptomatic osteoarthritis of the knee and a BMI ≥ 30." (see p. 16 Guidelines)

AAOS recommendation strength. "Weak." "We suggest weight loss for patients with symptomatic osteoarthritis of the knee and a BMI ≥ 30." (see p. 16 Guidelines)
OBJECTIVE: To compare the efficacy of aerobic walking and home based quadriceps strengthening exercises in patients with knee OA in terms of reduced joint pain and improved physical function and quality of life.

SEARCH METHODS: Five electronic databases were searched, up until May 2013.

SELECTION CRITERIA: All randomised controlled trials (RCTs) randomly assigning individuals and comparing some form of land based therapeutic exercise (as opposed to exercises conducted in water) with a non-exercise group.

DATA COLLECTION AND ANALYSIS: Four review authors independently selected studies for inclusion. We resolved disagreements through discussion. Two review authors independently extracted data, assessed risk of bias for each study and assessed the quality of the body of evidence for each outcome using the GRADE approach. We conducted analyses on continuous outcomes (pain, physical function and quality of life) immediately after treatment, and on dichotomous outcomes (proportion of study withdrawals).

RESULTS: There were 45 RCTs with 3913 participants looking at aerobic walking and home based quadriceps strengthening exercise. Exercise improved pain (standardised mean difference (SMD) -0.49, 95% confidence interval (CI) -0.39 to -0.59) immediately after treatment. Pain and physical function were estimated at 43 points on a 100-point scale (0 indicated no loss of physical function) in the control group; exercise improved physical function by an equivalent of 10 points (95% CI 8 to 13 points). Moderate-quality evidence from 44 trials (2556 participants) showed that exercise improved physical function by an equivalent of 10 points (95% CI 8 to 13 points). High-quality evidence from 13 studies (1073 participants) revealed that exercise improved quality of life by an equivalent of 6 points (95% CI 0.26, 0.40 to 1.06) immediately after treatment. Quality of life was estimated at 43 points on a 100-point scale (100 indicated best quality of life) in the control group; exercise improved quality of life by an equivalent of 6 points (95% CI 0.26, 0.40 to 1.06).

CONCLUSIONS: Exercise improves pain and function (two to six months, and longer than six months).

Data from 44 trials (3913 participants) involved in 13526895


OBJECTIVE: To determine whether land based therapeutic exercise is beneficial for people with hip OA in terms of reduced joint pain and improved physical function and quality of life.

SEARCH METHODS: We searched databases from inception to February 2013.

SELECTION CRITERIA: All randomised controlled trials (RCTs) recruiting people with hip OA and comparing some form of land based therapeutic exercise (as opposed to exercises conducted in water) with a non-exercise group.

DATA COLLECTION AND ANALYSIS: Four review authors independently selected studies for inclusion. We resolved disagreements through discussion. Two review authors independently extracted data, assessed risk of bias for each study and assessed the quality of the body of evidence for each outcome using the GRADE approach. We conducted analyses on continuous outcomes (pain, physical function and quality of life) immediately after treatment, and on dichotomous outcomes (proportion of study withdrawals).

RESULTS: There were 18 RCTs with 1481 participants looking at land based therapeutic exercise. Exercise reduced pain (standardised mean difference (SMD) -0.38, 95% confidence interval (CI) -0.55 to -0.20) immediately after treatment. Pain and physical function were estimated at 43 points on a 100-point scale in the control group; exercise improved quality of life by an equivalent of 7 points (95% CI 4 to 11 points; number needed to treat for an additional beneficial outcome (NNTB) 6) and improved physical function by an equivalent of 10 points (95% CI 8 to 13 points; NNTB 6). Only three small studies (183 participants) evaluated quality of life, with overall low quality evidence, indicated that exercise reduced pain (standardised mean difference (SMD) -0.40) immediately after treatment. Quality of life was estimated at 43 points on a 100-point scale (0 indicated no loss of physical function) in the control group; exercise improved quality of life by an equivalent of 10 points (95% CI 8 to 13 points).

CONCLUSIONS: Exercise reduces pain and improves quality of life from knee OA.

Data from 18 trials (1481 participants) involved in 207181717


OBJECTIVE: To determine whether land based therapeutic exercise is beneficial for people with hip OA in terms of reduced joint pain and improved physical function and quality of life.

SEARCH METHODS: We searched databases from inception to February 2013.

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DATA COLLECTION AND ANALYSIS: Four review authors independently selected studies for inclusion. We resolved disagreements through discussion. Two review authors independently extracted data, assessed risk of bias for each study and assessed the quality of the body of evidence for each outcome using the GRADE approach. We conducted analyses on continuous outcomes (pain, physical function and quality of life) immediately after treatment, and on dichotomous outcomes (proportion of study withdrawals).

RESULTS: There were 10 RCTs with 820 participants looking at land based therapeutic exercise. Exercise improved pain (standardised mean difference (SMD) -0.38, 95% confidence interval (CI) -0.55 to -0.20) immediately after treatment. Pain and physical function were estimated at 43 points on a 100-point scale in the control group; exercise improved quality of life by an equivalent of 7 points (95% CI 4 to 11 points; number needed to treat for an additional beneficial outcome (NNTB) 6) and improved physical function by an equivalent of 10 points (95% CI 8 to 13 points; NNTB 6).

CONCLUSIONS: Exercise reduces pain and improves quality of life from hip OA.

Data from 10 trials (820 participants) involved in 25569281
BACKGROUND: Osteoarthritis (OA) is the most common form of arthritis. Published guidelines and expert opinion are divided over the relative role of acetaminophen (also called paracetamol or Tylenol) and non-steroidal anti-inflammatory drugs (NSAIDs) as first-line pharmacologic therapy. The comparative safety of acetaminophen and NSAIDs is also important to consider. This update to the original 2003 review includes new additional RCTs. OBJECTIVES: To assess the efficacy and safety of acetaminophen versus placebo and versus NSAIDs (ibuprofen, diclofenac, celecoxib, rofecoxib, naproxen, celebrex). SEARCH STRATEGY: We searched MEDLINE (up to July 2003), EMBASE (2002 July 2005), Cochrane Central Register of Controlled Trials (CENTRAL), ACJ,ACP Journal Club, DARE, Cochrane Database of Systematic Reviews (up to 16/04/2005). Reference lists of identified RCTs and pertinent review articles were also hand searched. SELECTION CRITERIA: Published randomised controlled trials (RCTs) evaluating the efficacy and safety of acetaminophen alone or in combination were considered for inclusion. DATA COLLECTION AND ANALYSIS: Data, physical function, and global assessment outcomes were reported. Results for continuous outcomes were expressed as standardized mean differences (SMD). Dichotomous outcome measures were pooled using risk ratio (RR) and the number needed to treat (NNT) was calculated. MAIN RESULTS: Fifteen RCTs involving 5986 participants were included in this review. Seven RCTs compared acetaminophen to placebo and ten RCTs compared acetaminophen to NSAIDs. In the placebo-controlled RCTs, acetaminophen was superior to placebo in five of the seven RCTs and had a similar safety profile. Compared to placebo, a pooled analysis of five trials of acetaminophen versus placebo found a significant improvement in pain, global assessments and in terms of improvements in functional status. No significant difference was found overall between the safety of acetaminophen and NSAIDs, although patients taking traditional NSAIDS were more likely to experience adverse GI events with NSAIDs versus acetaminophen.

DATA SOURCES: Medline, Embase, ANZEL, CINAHL, Web of Science, LILACS, International Pharmacological Abstracts, and Cochrane Central Register of Controlled Trials from inception to December 2004.

Eligibility criteria for selecting studies: Randomised controlled trials comparing the efficacy and safety of paracetamol with placebo for spinal pain or osteoarthritis of the hip or knee.

Design: Systematic review and meta-analysis.

Efficacy outcomes were expressed using standardized mean differences (SMDs), dichotomous outcomes were expressed as relative risk (RR). The number needed to treat (NNT) was calculated. MAIN RESULTS: Fifteen RCTs involving 5986 participants were included in this review. Seven RCTs compared acetaminophen to placebo and ten RCTs compared acetaminophen to NSAIDs. In the placebo-controlled RCTs, acetaminophen was superior to placebo in five of the seven RCTs and had a similar safety profile. Compared to placebo, a pooled analysis of five trials of acetaminophen versus placebo found a significant improvement in pain, global assessments and in terms of improvements in functional status. No significant difference was found overall between the safety of acetaminophen and NSAIDs, although patients taking traditional NSAIDs were more likely to experience adverse GI events with NSAIDs versus acetaminophen.

Efficacy measures: The primary efficacy outcome for this review was pain measured using a visual analogue scale. The NNT to achieve an improvement in pain ranged from 4 to 16. In the comparator-controlled RCTs, acetaminophen was less effective than NSAIDs in terms of pain reduction, global assessments and in terms of improvements in functional status. No significant difference was found overall between the safety of acetaminophen and NSAIDs, although patients taking traditional NSAIDs were more likely to experience adverse GI events with NSAIDs versus acetaminophen.

Systematic review/Meta-analysis of 13 randomized trials finding that there is "high quality" evidence that paracetamol has a "significant but small effect" in patients with hip or knee osteoarthritis compared with placebo in the short term. "Abnormal liver function tests are four times more common in patients taking paracetamol (acetaminophen)."

Study suggests minimal benefit in terms of pain and disability from paracetamol (acetaminophen) in patients with osteoarthritis.

Efficacy measures: The primary efficacy outcome for this review was pain measured using a visual analogue scale. The NNT to achieve an improvement in pain ranged from 4 to 16. In the comparator-controlled RCTs, acetaminophen was less effective than NSAIDs in terms of pain reduction, global assessments and in terms of improvements in functional status. No significant difference was found overall between the safety of acetaminophen and NSAIDs, although patients taking traditional NSAIDs were more likely to experience adverse GI events with NSAIDs versus acetaminophen.

- AGENDA: non-steroidal anti-inflammatory drugs (NSAIDs) are the backbone of osteoarthritic pain management. We aimed to assess the effectiveness of different preparations and doses of NSAIDs on pain intensity in a network meta-analysis.

- METHODS: For this network meta-analysis, we considered randomised trials comparing any of the following interventions: NSAIDs, paracetamol, or placebo, for the treatment of osteoarthritic pain. We searched the Cochrane Central Register of Controlled Trials (CENTRAL) and the conference proceedings list of relevant trials for articles published between Jan 1, 1980, and Feb 24, 2015, with at least 10 patients per group. The prespecified primary and secondary outcomes were pain and physical function, and were extracted in duplicate for up to seven timepoints after the start of treatment. We used an extension of multivariable Bayesian random effects models for mixed multiple treatment comparisons with a random effect at the level of trials. For the primary analysis, a random walk of first order was used to account for multiple follow-up and to obtain a copy of this article.

- CONCLUSIONS: The risk of hospital admission for heart failure associated with current use of NSAIDs appears to vary between individual NSAIDs and may depend on the duration of use. Even medium doses of NSAIDs may increase heart failure risk. Nevertheless, in view of the safety profile of these drugs, physicians need to consider our results together with all known safety information when selecting the preparation and dose for individual patients.

- INTERPRETATION: On the basis of the available data, we see no role for single-agent paracetamol for the treatment of patients with symptomatic osteoarthritis of the knee.” (see p. 19 Guideline)

- AAOS recommendation strength: “Strong.” “We recommend non-steroidal anti-inflammatory drug (NSAID; oral or topical) for pain control in patients with symptomatic osteoarthritis of the knee.” (see p. 19 Guideline)
Conservative Therapy; Oral
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BACKGROUND: The relative efficacy of available treatments of knee osteoarthritis (OA) is not determined for rational treatment algorithms as be formulated. PURPOSE: To examine the efficacy of treatments of primary knee OA using a network meta-analysis design, which estimates effects of available treatments against each other. METHODS: In total, 445 studies were identified via systematic searches of Cochrane Central Register of Controlled Trials from inception through 13 August 2014, and unpublished data. STUDY SELECTION: Randomized trials of adults with knee OA comparing 2 or more of the following: acetaminophen, diethylamine, ibuprofen, naproxen, naproxen, sodium, ibuprofen, intra-articular (IA) corticosteroids, IA hyaluronic acid, oral placebo, and IA placebo. DATA EXCLUSION: Two reviewers independently abstracted study data and assessed study quality. Standardized mean differences were calculated for pain, function, and stiffness at 3-month follow-up. DATA SYNTHESIS: Network meta-analysis was performed using a Bayesian random-effects model (22 trials, comparing 13,243 participants were identified. For pain, all interventions significantly outperformed oral placebo, with effect sizes from 0.63 (95% credible interval (CrI) 0.31 to 0.95) to 0.80 (CrI, 0.50 to 0.97) for the most efficacious treatment (hyaluronic acid) to 0.18 (CrI, 0.04 to 0.32) for the least efficacious treatment (acetaminophen). For function, all interventions except IA corticosteroids were significantly superior to oral placebo. For stiffness, most of the treatments did not significantly differ from one another. LIMITATION: Lack of long-term data, inadequate reporting of safety data, possible publication bias, and few head-to-head comparisons. CONCLUSION: This method showed comparison of common treatments of knee OA according to their relative efficacy. Intra-articular treatments were superior to nonsteroidal anti-inflammatory drugs, possibly because of the integrated IA placebo effect. Similar but robust differences were observed between active treatments. All treatments except acetaminophen showed clinically significant improvement from baseline pain. This information, along with the safety profiles and relative costs of included treatments, will be helpful for individual patient care decisions.

Commentary on randomized controlled trials rated as Moderate-quality evidence. Acetaminophen, diclofenac, ibuprofen, naproxen, intra-articular (IA) corticosteroids, IA hyaluronic acid, oral placebo, and IA placebo were compared. All medications outperformed placebo for pain. "Aromatase inhibitors are worth considering in women with symptomatic osteoarthritis of the knee," (see p. 19 Guideline). AAOS recommendation strength: "Inconclusive." "We are unable to recommend for or against the use of intraarticular (IA) corticosteroids for patients with symptomatic osteoarthritis of the knee." (see p. 19 Guideline).}

ADDRESS: The relative efficacy of available treatments of knee osteoarthritis (OA) is not determined for rational treatment algorithms as be formulated. PURPOSE: To examine the efficacy of treatments of primary knee OA using a network meta-analysis design, which estimates effects of available treatments against each other. METHODS: In total, 445 studies were identified via systematic searches of Cochrane Central Register of Controlled Trials from inception through 13 August 2014, and unpublished data. STUDY SELECTION: Randomized trials of adults with knee OA comparing 2 or more of the following: acetaminophen, diethylamine, ibuprofen, naproxen, naproxen, sodium, ibuprofen, intra-articular (IA) corticosteroids, IA hyaluronic acid, oral placebo, and IA placebo. DATA EXCLUSION: Two reviewers independently abstracted study data and assessed study quality. Standardized mean differences were calculated for pain, function, and stiffness at 3-month follow-up. DATA SYNTHESIS: Network meta-analysis was performed using a Bayesian random-effects model (22 trials, comparing 13,243 participants were identified. For pain, all interventions significantly outperformed oral placebo, with effect sizes from 0.63 (95% credible interval (CrI) 0.31 to 0.95) to 0.80 (CrI, 0.50 to 0.97) for the most efficacious treatment (hyaluronic acid) to 0.18 (CrI, 0.04 to 0.32) for the least efficacious treatment (acetaminophen). For function, all interventions except IA corticosteroids were significantly superior to oral placebo. For stiffness, most of the treatments did not significantly differ from one another. LIMITATION: Lack of long-term data, inadequate reporting of safety data, possible publication bias, and few head-to-head comparisons. CONCLUSION: This method showed comparison of common treatments of knee OA according to their relative efficacy. Intra-articular treatments were superior to nonsteroidal anti-inflammatory drugs, possibly because of the integrated IA placebo effect. Similar but robust differences were observed between active treatments. All treatments except acetaminophen showed clinically significant improvement from baseline pain. This information, along with the safety profiles and relative costs of included treatments, will be helpful for individual patient care decisions.

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BACKGROUND: Infection after total knee arthroplasty (TKA) can result in disastrous consequences. Previous research regarding injections and risk of TKA infection have produced conflicting results and in general have been limited by small cohort size.

OBJECTIVES/HYPOTHESIS: The purpose of this study was to evaluate if intrarticular injection before TKA increases the risk of postoperative infection and to identify if time between injection and TKA affect the risk of TKA infection.

METHODS: The Humana data set was reviewed from 2007 to 2014 for all patients who received a knee injection before TKA. Current Procedural Terminology (CPT) codes and laterality modifiers were used to identify patients who underwent knee injection followed by unilateral TKA. Postoperative infection within 6 months of TKA was identified using International Classification of Diseases, 9th Revision (ICD-9) diagnosis codes that represent two infectious endpoints: any postoperative surgical site infection (encompass all severities of infection) and operative intervention for TKA infection (surrogate for deep TKA infection). The injection cohort was stratified into 12 subgroups by monthly intervals out to 12 months corresponding to the number of months that had elapsed between injection and TKA. Risk of postoperative infection was compared between the injection and no injection cohorts. In total, 20,620 TKAs (31%) had an injection in the bilateral knee before the TKA procedure and 46,061 TKAs (69%) did not. The PearlDiver database does not currently support line-by-line output of patient data, and so we were unable to perform a multivariate analysis to determine whether other important factors may have varied between the study groups that might have had a differential influence on the risk of infection between those groups. However, the Charlson Comorbidity index was no different between the injection and no injection cohorts (2.9 for both) suggesting similar comorbidity profiles between the groups.

RESULTS: Of 37,881 eligible THA recipients, 2,468 (6.5%) received an intraarticular injection within 5 years preceding THA, while others do not. We undertook this study to clarify the relationship between prior intrarticular injection and the risk of infection in a subsequent THA. METHODS: In a cohort of patients with hip OA who underwent a primary elective THA between prior intraarticular injection and the risk of complication in a subsequent primary THA. We undertook this study to clarify the relationship between prior intrarticular injection and the risk of infection in a subsequent primary THA. We undertook this study to clarify the relationship between prior intrarticular injection and the risk of infection in a subsequent primary THA.

METHODS: In a cohort of patients with hip OA who underwent a primary elective THA between 2002 and 2008, we identified those who received ≥1 intrarticular injection performed by a radiologist in the 5 years preceding their THA. Multivariable Cox-proportional hazards models were used to determine the relationship between receipt of a presurgical injection (no injection, 1-5 years prior to THA, or <1 year prior to THA) and the occurrence of postoperative joint infection and revision THA in the following 2 years, while controlling for confounders. RESULTS: Of 57,800 eligible THA recipients, 2,480 (4.3%) received an intrarticular injection performed by a radiologist within 5 years of their THA (1,691 at <1 year, 777 at 1-5 years). Controlling for age, sex, comorbidity, frailty, income, and provider volume, those who had an injection in the year preceding surgery were at increased risk of infection (adjusted hazard ratio [HR] 2.7, P = 0.03) and revision THA (adjusted HR 1.53, P = 0.02) within 2 years of the primary THA, relative to patients who did not. The association between prior injection and revision arthroplasty was attenuated and became non-significant (adjusted HR 1.41, P = 0.13) after occurrence of postoperative infection was controlled for in the regression model. No effect was found for injection 1-5 years prior to surgery.

CONCLUSION: Intraarticular injection in the year preceding THA independently predicted increased risk of infections leading to early revision surgery. Further research is needed to study if corticosteroid injections prior to TKA are associated with an increased risk of infection after TKA in patients with advanced osteoarthritis.
17/7/14 

Conservative Therapy; Medications; Intra-articular corticosteroids


Abstract: A randomized, blinded trial of intra-articular triamcinolone vs saline for symptomatic knee osteoarthritis with ultrasonic features of synovitis in 140 patients. Mixed-effects regression models with a random intercept were used to analyze the longitudinal repeated outcome measures. Patients with the American College of Rheumatology criteria for symptomatic knee osteoarthritis, Kellgren-Lawrence grades 2 or 3, were enrolled at Tufts Medical Center beginning February 11, 2013; all patients completed the study by January 1, 2015. Intervention: Intra-articular triamcinolone (n=75) or saline (n=75) every 12 weeks for 2 years. Main Outcomes and Measures: Annual knee magnetic resonance imaging for quantitative evaluation of cartilage volume (minimal clinically important difference not yet defined), and Western Ontario and McMaster Universities Osteoarthritis index collected every 3 months (Likert pain subscale range, 0 [no pain] to 20 [severe pain]). Results: Of 140 randomized patients (105 women [75%]), 119 (85%) completed the study. Intra-articular triamcinolone resulted in significantly greater cartilage volume loss than saline for a mean change in index compartment cartilage thickness of -0.21 mm [-0.22 mm to -0.19 mm] (between-group difference, -0.11 mm; 95% CI, -0.20 to -0.02 mm); and no significant difference in pain (-1.2 vs -1.0; between-group difference, 0.1; 95% CI, -0.6 to 0.5). The saline group had 2 treatment-related adverse events compared with 5 in the triamcinolone group and a small increase in hemoglobin A1C levels (between-group difference, -0.3%; 95% CI, -1.5% to 0.9%). Conclusions and Relevance: Among patients with symptomatic knee osteoarthritis, 2 years of intra-articular triamcinolone, compared with intra-articular saline, resulted in significantly greater cartilage volume loss and no significant difference in pain. These findings do not support this treatment for patients with symptomatic knee osteoarthritis. Trial Registration: ClinicalTrials.gov identifier: NCT01230424.

16/7/14 

Conservative Therapy; Intra-articular corticosteroids

Corticosteroids for knee osteoarthritis in a leading cause of chronic pain, disability, and decreased quality of life. Despite the long-standing use of intra-articular corticosteroids, there is an ongoing debate about their benefits and safety. This is an update of a Cochrane review first published in 2005.

Aims: To determine the benefits and harms of intra-articular corticosteroids compared with sham or no intervention in people with knee osteoarthritis in terms of pain, physical function, quality of life, and safety.

Search methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, and EMBASE (from inception to 3 February 2015), checked trial registers, conference proceedings, reference lists, and contacted authors.

DATA COLLECTION AND ANALYSIS: We calculated standardised mean differences (SMDs) and 95% confidence intervals (CI) for pain, function, quality of life, joint space narrowing, and risk ratios (RRs) for safety outcomes. We combined trials using an inverse-variance random-effects meta-analysis.

Main results: We identified 27 trials (33 new studies) and 2767 participants in this update. We grabbed the quality of the evidence as low for all outcomes because treatment effect estimates were inconsistent with great variation across trials, pooled estimates were imprecise and did not rule out relevant or relevant clinical effects, and because most trials had a high or unclear risk of bias. Intra-articular corticosteroids appeared to be more beneficial in pain reduction than control interventions (SMD -0.40, 95% CI -0.58 to -0.22), which corresponds to a difference in pain scores of 1.0 cm on a 10-cm visual analogue scale between corticosteroids and sham injection and translates into a number needed to treat for an additional beneficial outcome (NNTB) of 8 (95% CI 6 to 16).

15/7/14 

Conservative Therapy; Medications; Intra-articular corticosteroids

Intra-articular corticosteroids could reduce cartilage damage associated with synovitis but might have adverse effects on cartilage and periarticular bone. Intra-articular corticosteroids compared with sham or no intervention in people with knee osteoarthritis in terms of pain, physical function, quality of life, and safety.

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14/7/14 

Conservative Therapy; Intra-articular corticosteroids

Obesity & Surgical Complications

May 2012 117:9(2):1838-44. PMID: 22907875


Background: In knee osteoarthritis, a rising tide of obesity, diabetes, and decreased quality of life. Despite the long-standing use of intra-articular corticosteroids, there is an ongoing debate about their benefits and safety. This is an update of a Cochrane review first published in 2005.

Objectives: To determine the benefits and harms of intra-articular corticosteroids compared with sham or no intervention in people with knee osteoarthritis in terms of pain, physical function, quality of life, and safety.

Search methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, and EMBASE (from inception to 3 February 2015), checked trial registers, conference proceedings, reference lists, and contacted authors.

Data collection and analysis: We included randomised controlled trials that compared intra-articular corticosteroids with sham injection or no treatment in people with knee osteoarthritis. We applied no language restrictions.

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High quality systematic reviews with overall high quality evidence, heterogeneity between trials and "evidence of small study effects." Supports the conclusion that obesity has a negative influence on outcomes following total knee arthroplasty.
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METHODS: We searched the literature and included studies comparing the outcome of hip arthroplasty in different weight groups. The methodology of the studies included was scored according to the Cochrane guidelines. We extracted and pooled the data. For continuous variables, we calculated a weighted mean difference and for dichotomous variables, we calculated a weighted odds ratio (OR). Heterogeneity was calculated using (I²) statistics. RESULTS: 15 studies were eligible for data extraction. In obese patients, dislocation of the hip occurred in 15.9% (95% CI 9.0-24.2), (p = 0.04), deep infection in 6.4%, (95% CI 2.5-12.1), (p < 0.001), and pulmonary embolism in 0.8%, (95% CI 0.0-4.0), (p = 0.009). No difference was found in the length of stay in hospital between obese and non-obese patients (MD: -0.16, 95% CI -0.34 to 0.02, P = 0.08). CONCLUSIONS: This meta-analysis of prospective cohort studies demonstrates that obesity negatively influences the overall complication rate, dislocation rate, functional outcome and operative time of primary total hip arthroplasty.

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RESULTS: When examining primary THAs referred for revision THA, increasing BMI adversely affected the mean time to revision THA. The percentage of primary THAs revised at 5 years was 25% for a BMI of 18-25, 38% for a BMI of 25-30, 56% for a BMI of 30-35, 73% for a BMI of 35-40, and 75% for a BMI of greater than 40 (P < 0.001). The percentage of primary THAs revised at 15 years was 70%, 82%, 87%, 94%, respectively (P < 0.001). A significant increase in early revision THA for aseptic loosening/osteolysis in obese patients when compared with the nonobese patients. "Obesity shortens the interval between first total hip replacement and need for revision. Proportion of patients requiring revision increases 5 years after primary surgery in obese and was 75% for BMI greater than 40; "a significant increase in early revision THA for aseptic loosening/osteolysis in obese patients when compared with the nonobese patients." Obesity shortens the interval between first total hip replacement and need for revision.

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METHODS: We searched PubMed, Embase, Web of Science, and the Cochrane Library until July 2014 to identify the eligible prospective studies. The Newcastle Ottawa Scale (NOS) was used for quality assessment of the included studies. We extracted and pooled the data. As for continuous data, mean difference (MD) was calculated; for dichotomous data, we calculated a weighted relative risk (RR) with its 95% confidence interval. Heterogeneity was evaluated using (I²) statistics. P ≤ 0.05 was thought to be significant. RESULTS: Fifteen studies were eligible for data extraction, which involved 11,271 total hip arthroplasties. The pooled data of complication rate demonstrated that obese patients suffered higher rates of complication (OR: 1.68, 95% CI 1.23 to 2.30, P < 0.001) dislocation (OR: 2.08, 95% CI 1.54 to 2.78, P < 0.001) and deep infection (OR: 2.50, 95% CI 0.97 to 6.49, P = 0.08). For the functional result, obese patients acquired relatively lower Harris Hip Score than non-obese patients (MD: -2.75, 95% CI -4.77 to -0.73, no difference was found regarding Oxford Hip Score (MD: 0.46, 95% CI -1.08 to 1.96, P = 0.86). Obese patients compared to non-obese patients showed an increase duration of operation (MD: 0.67, 95% CI 0.30 to 1.35, P = 0.049). However, no significant difference was found in the length of stay in hospital between obese and non obese patients (MD: -0.16, 95% CI 0.34 to 0.02, P = 0.08). CONCLUSIONS: This meta-analysis of prospective cohort studies demonstrate that obesity negatively influences the overall complication rate, dislocation rate, functional outcome and operative time of primary total hip arthroplasty.
OBJECTIVES: To determine whether an intervention with smoking cessation starting 4 weeks before general and orthopedic surgery would reduce the frequency of postoperative complications. SUMMARY BACKGROUND DATA: Complications are a major concern after elective surgery and smokers have an increased risk. There is insufficient evidence concerning how the duration of preoperative smoking intervention affects postoperative complications. METHODS: A randomized controlled trial, conducted between February 2004 and December 2006 at 4 university hospitals in the Stockholm region, Sweden. The outcome assessment was blinded. The follow-up period for the primary outcome was 30 days. Eligibility criteria were active daily smokers, aged 18 to 79 years. Of the 238 patients assessed, 76 refused participating, 76 were excluded because they were unable to stop smoking, 76 refused counseling, and 27 patients did not follow the protocol. Four of these trials evaluated long-term smoking cessation at the time of surgery; nicotine replacement therapy (NRT) was offered or recommended to some or all participants in eight of these. All participants were counseled regarding the importance of smoking cessation by the surgical team. RESULTS: An intention-to-treat analysis showed that the overall complication rate in the control group was 41%, and in the intervention group, it was 21% (P = 0.03). Relative risk reduction for the primary outcome of any postoperative complication was 49% and 11% for the control and intervention groups, respectively. There was no evidence of a long-term effect following a brief intervention (RR 1.09; 95% CI 0.68 to 1.75, 2 trials, 341 participants). The trial of varenicline was stopped early because of ethical reasons. The trial of nicotine replacement therapy did not show evidence of benefit. The trial of nicotine lozenges was stopped early because of recruitment difficulties. The median length of stay was 11 days (range 7-55) in the intervention group and 13 days (8-65) in the control group. INTERVENTION: An effective smoking intervention programme 4-8 weeks before surgery reduces postoperative morbidity, and we recommend, on the basis of our results, this programme be adopted.

DATA COLLECTION AND ANALYSIS: The review authors independently assessed studies to determine eligibility, and discussed the results between them. MAIN RESULTS: Thirteen trials involving 1020 participants met the inclusion criteria. One trial did not report cessation as an outcome. Seven reported seizure frequency of postoperative mortality. All studies were judged to be at low risk of bias but the overall quality of evidence was moderate due to the small number of studies contributing to each comparison. Ten trials evaluated the effect of behavioral support on cessation at the time of surgery (nicotine replacement therapy (NRT) was offered or recommended to some or all participants in eight of these two trials initiated multivitamin use at least four weeks before surgery and were classified as intensive interventions. While seven used a brief intervention. One further study provided an intensive intervention to both groups, with the intervention group additionally receiving a computer-based smoking cessation intervention. One placebo-controlled trial examined the effect of nicotine replacement therapy on smoking cessation at the time of surgery and 12 months postoperatively, and on the incidence of postoperative complications. SEARCH METHODS: We searched the Cochrane Tobacco Addiction Group Specialised Register in January 2016. SELECTION CRITERIA: Randomised controlled trials that recruited people who smoked prior to surgery, offered a smoking cessation intervention, and measured peak postoperative and long-term abstinence from smoking or the incidence of postoperative complications or both outcomes. DATA COLLECTION AND ANALYSIS: The review authors independently assessed studies to determine eligibility, and discussed the results between them. MAIN RESULTS: Thirteen trials involving 1020 participants met the inclusion criteria. One trial did not report cessation as an outcome. Seven reported seizure frequency of postoperative complications. Intensive withdrawal treatment may be considered as a standard approach to smoking cessation interventions. OBJECTIVE: To determine whether an intervention with smoking cessation starting 4 weeks before general and orthopedic surgery would reduce the frequency of postoperative complications. SUMMARY BACKGROUND DATA: Complications are a major concern after elective surgery and smokers have an increased risk. There is insufficient evidence concerning how the duration of preoperative smoking intervention affects postoperative complications. METHODS: A randomized controlled trial, conducted between February 2004 and December 2006 at 4 university hospitals in the Stockholm region, Sweden. The outcome assessment was blinded. The follow-up period for the primary outcome was 30 days. Eligibility criteria were active daily smokers, aged 18 to 79 years. Of the 238 patients assessed, 76 refused participating, 76 were excluded because they were unable to stop smoking, 76 refused counseling, and 27 patients did not follow the protocol. Four of these trials evaluated long-term smoking cessation at the time of surgery; nicotine replacement therapy (NRT) was offered or recommended to some or all participants in eight of these. All participants were counseled regarding the importance of smoking cessation by the surgical team. RESULTS: An intention-to-treat analysis showed that the overall complication rate in the control group was 41%, and in the intervention group, it was 21% (P = 0.03). Relative risk reduction for the primary outcome of any postoperative complication was 49% and 11% for the control and intervention groups, respectively. There was no evidence of a long-term effect following a brief intervention (RR 1.09; 95% CI 0.68 to 1.75, 2 trials, 341 participants). The trial of varenicline was stopped early because of ethical reasons. The trial of nicotine replacement therapy did not show evidence of benefit. The trial of nicotine lozenges was stopped early because of recruitment difficulties. The median length of stay was 11 days (range 7-55) in the intervention group and 13 days (8-65) in the control group. INTERVENTION: An effective smoking intervention programme 4-8 weeks before surgery reduces postoperative morbidity, and we recommend, on the basis of our results, this programme be adopted.
Glycemic Control

Emergency Department of Community Health and Prevention, Beijing Anzhen Hospital, Capital Medical University, Beijing Institute of Heart Lung and Blood Vessel Disease, Beijing. Association of serum cotinine levels and the parameters of vascular structure and function in never-smoking adults. Am J Hypertens. 2015 Dec;28(12):1266-74. PMID: 26484511

Abstract: HYPOTHESIS: Good preoperative glycemic control (hemoglobin A(1c) [HbA(1c)] levels <7%) is associated with decreased infectious complications across a variety of surgical procedures. METHODS: From a study on lung cancer in the EPIC cohort, questionnaire information on smoking was collected at enrolment, and cotinine was measured in serum. Three statistical models were applied by using samples available in a cross-section design: (i) cotinine levels by category combining smoking and SHS (n = 859); (ii) the effect of hours of passive smoking exposure in nonsmokers only (n = 107); (iii) the effect of the number of cigarettes consumed per day in current smokers only (n = 882). All models were adjusted for country, sex, age, and body mass index. RESULTS: Among nonsmokers, passive smokers presented significant differences in cotinine compared with nonexposed, with a marked (but not significant) difference among former-smokers. A one hour per day increment of SHS gave rise to a significant 2.58 nmol/L (0.45 ng/mL) increase in mean serum cotinine (P < 0.001). In current smokers, a one cigarette per day increment gave rise to a significant 0.12 ng/mL increase in cotinine mean (P < 0.001). CONCLUSIONS: There is clear evidence that not only tobacco but also involuntary exposure increases cotinine levels. IMPACT: This study strengthens the evidence for the benefits of a smoking ban in public places.

Study performed in an environment with a high rate of exposure to tobacco smoke. Cohort was self selected participants who declared they smoked. Smoking and cotinine levels were correlated with arterial stiffness as judged by brachial-ankle pulse pressure waveform. Supports the conclusion that second hand smoking increases serum cotinine levels in nonsmokers.

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Nicotine dependence and secondhand smoke, and cotinine levels in a subset of EPIC cohort. Cancer Epidemiol Biomarkers Prev. 2013 May;22(5):1086-7. PMID: 23575992

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Supports the conclusion that second hand smoking increases serum cotinine levels in nonsmokers.

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patients with uncontrolled diabetes had a higher rate of postoperative complications, length of stay, and costs. Level of diabetes control judged on basis of provider coding without correlation with blood sugar or A1C levels.

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BACKGROUND: The relationship between arthroplasty and long-term opioid use in patients with knee or hip osteoarthritis is not well studied. We examined the prevalence, patterns and predictors of persistent opioid use after hip or knee arthroplasty.

METHODOLOGY: Using claims data (2004-2013) from a US commercial health plan, we identified adults who underwent hip or knee arthroplasty and filled ≥1 opioid prescription within 30 days after the surgery. We defined persistent opioid users as patients who filled ≥3 opioid prescriptions every month during the 1 year postoperative period based on group-based trajectory modeling. Multivariable logistic regression was used to determine protective predictors of persistent opioid use after surgery.

RESULTS: We identified 57,545 patients who underwent hip or knee arthroplasty. The mean ± SD age was 61.5 ± 7.8 years and 87.1% had any opioid use preoperatively. Overall, 7.6% persistently used opioids after the surgery. Among patients who used opioids in 80% of the time for ≥4 months preoperatively (\( n = 8033 \)), 75.2% became persistent users. In univariable analysis, knee arthroplasty vs hip, a longer hospitalization stay, discharge to a rehabilitation facility, preoperative opioid use (e.g., a longer duration and greater dosage and frequency), a higher comorbidity score, back pain, rheumatoid arthritis, fibromyalgia, migraine and smoking, and benzodiazepine use at baseline were strong predictors for persistent opioid use (\( \text{OR} = 0.917 \)).

CONCLUSIONS: Over 7% of patients persistently used opioids in the year after hip or knee arthroplasty. Given the adverse health effects of persistent opioid use, strategies need to be developed to prevent persistent opioid use after this common surgery.


**Rationale**

Reduced serum albumin may have prognostic value for morbidity and mortality in patients with hip fracture. The primary aim of the study was to evaluate the independent association between low serum albumin (<35 g/L) at hospital admission and short-term (n=10) and post-operative complications of patients with hip fracture. We review a prospective population-based cohort of 563 hip fracture patients who had pre-operative albumin values measured at hospital admission in one of the tertiary hospitals in Northern Alberta, Canada. Patients with a primary diagnosis of hip fracture and 65 years or older were included. The primary outcomes were in-hospital mortality and any post-operative complication. Mean serum albumin level was 38.6±4.1 g/L (n=5,250), and overall 51% (n=1,408) of patients had low albumin. The in-hospital mortality was 8% (n=46) and rate of any non-fatal post-operative complication rate was 31/100. Mortality was 11% (n=61) among those with low albumin levels and 6% (n=17) for those with normal values (unadjusted odds ratio [OR] 2.44, 95% confidence interval [CI]=1.17-5.12). After multivariate adjustment, the association between low serum albumin and mortality remained large and statistically significant (adjusted OR=2.44, 95% CI=1.17-5.12). Low serum albumin was associated with postoperative complications.

**Methods**

A retrospective nationwide population-based cohort study was conducted in Northern Alberta, Canada. Patients with a primary diagnosis of hip fracture and 65 years or older were included. The primary outcomes were in-hospital mortality and any post-operative complication. Mean serum albumin level was 38.6±4.1 g/L (n=5,250), and overall 51% (n=1,408) of patients had low albumin. The in-hospital mortality was 8% (n=46) and rate of any non-fatal post-operative complication rate was 31/100. Mortality was 11% (n=61) among those with low albumin levels and 6% (n=17) for those with normal values (unadjusted odds ratio [OR] 2.44, 95% confidence interval [CI]=1.17-5.12). After multivariate adjustment, the association between low serum albumin and mortality remained large and statistically significant (adjusted OR=2.44, 95% CI=1.17-5.12). Low serum albumin was associated with postoperative complications.

**Results**

Low serum albumin may have prognostic value for morbidity and mortality in patients with hip fracture. The primary aim of the study was to evaluate the independent association between low serum albumin (<35 g/L) at hospital admission and short-term (n=10) and post-operative complications of patients with hip fracture. We review a prospective population-based cohort of 563 hip fracture patients who had pre-operative albumin values measured at hospital admission in one of the tertiary hospitals in Northern Alberta, Canada. Patients with a primary diagnosis of hip fracture and 65 years or older were included. The primary outcomes were in-hospital mortality and any post-operative complication. Mean serum albumin level was 38.6±4.1 g/L (n=5,250), and overall 51% (n=1,408) of patients had low albumin. The in-hospital mortality was 8% (n=46) and rate of any non-fatal post-operative complication rate was 31/100. Mortality was 11% (n=61) among those with low albumin levels and 6% (n=17) for those with normal values (unadjusted odds ratio [OR] 2.44, 95% confidence interval [CI]=1.17-5.12). After multivariate adjustment, the association between low serum albumin and mortality remained large and statistically significant (adjusted OR=2.44, 95% confidence interval [CI]=1.17-5.12). Low serum albumin was associated with postoperative complications.

**Conclusions**

Low serum albumin was associated with postoperative complications. In patients with hip fracture, low serum albumin was associated with postoperative complications.

**Funding**

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**Acknowledgements**

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**Conflict of Interest**

The authors have no conflicts of interest to declare.

**References**

Screening for dementia; Not available without a subscription.

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Pre-operative exam; screen

A meta-analysis "assessing the association between delirium in elderly patients and long-term poor outcome, defined as mortality, institutionalization, or dementia, while controlling for important confounders."

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Supports the conclusion that delirium is associated with poor outcomes.
Peripheral vascular disease


Purpose: Before elective operations, particularly orthopaedic surgery, national guidelines in Germany recommend testing for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) to reduce the risk of transmission of the virus through a needlestick or cutting injury. Testing is expensive. The number of new and unknown diagnoses of viral infections that can be detected by routine screening has not yet been evaluated. The aim of the study is to determine the cost of routine screening for HIV, HBV, and HCV in orthopaedic surgery. We retrospectively analyzed the number of operations in this single center from 2001 to 2010, correlated this number with the total number of screens and calculated the number of newly diagnosed infections. An additional cost benefit ratio was calculated. Results: A total of 10,011 operations were performed by the department between 2001 and 2010. After exclusion of all interventions in children and of patients who had multiple operations, 15,482 patients remained. Test results were found for 10,011 of these patients during this period (screening rate 65%). Of those screened, in only four cases (0.04%) was a previously unknown infection detected. Conclusions: Two-thirds of the patients included in our study already underwent screening; this rate was lower than expected. However, there is no information in English literature about the results of liver cirrhotic patients who underwent instrumented lumbar surgery. The purpose of this study is to report the perioperative complications, clinical outcomes and determine the surgical risk factors in cirrhotic patients. Methods: We retrospectively reviewed 29 patients with liver cirrhosis who underwent instrumented lumbar surgery between 1997 and 2009. The hepatic functional reserves of the patients were recorded according to the Child-Turcotte-Pugh scoring system. Besides, fourteen other variables and perioperative complications were also collected. To determine the risks, we divided the patients into two groups according to whether or not perioperative complications developed. Results: Of the 29 patients, 22 (76%) belonged to Child class A and 7 (24%) to Child class B. Fifteen patients developed one or more complications. Patients with Child class B had a significantly higher incidence of complications than those with Child class A (p=0.025). A low level of albumin was significantly associated with higher risk, and a similar trend was also noted for the presence of ascites although statistical difference was not reached. Conclusion: The study concludes that patients with liver cirrhosis who have undergone instrumented lumbar surgery carry a high risk of developing perioperative complications, especially in those with a Child-Turcotte-Pugh score of 6 or more.


Background: Patients with liver cirrhosis have high surgical risks due to malnutrition, impaired immunity, coagulopathy, and encephalopathy. The purpose of this study is to determine the risk factors for mortality and postoperative morbidity associated with liver cirrhosis. The hepatic functional reserves of the patients were recorded according to the Child-Turcotte-Pugh scoring system. Besides, fourteen other variables and perioperative complications were also collected. To determine the risks, we divided the patients into two groups according to whether or not perioperative complications developed. Results: Of the 29 patients, 22 (76%) belonged to Child class A and 7 (24%) to Child class B. Fifteen patients developed one or more complications. Patients with Child class B had a significantly higher incidence of complications than those with Child class A (p=0.025). A low level of albumin was significantly associated with higher risk, and a similar trend was also noted for the presence of ascites although statistical difference was not reached. Conclusion: The study concludes that patients with liver cirrhosis who have undergone instrumented lumbar surgery carry a high risk of developing perioperative complications, especially in those with a Child-Turcotte-Pugh score of 6 or more.

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As an act relating to hospital discharge planning with lay caregivers.


As an act relating to hospital discharge planning with lay caregivers.
Advance directives

Fleisher LA, et.al.; American College of Cardiology/American Heart Association

J Arthroplasty. 2015 Dec;30(12):2057-60.  PMID: 26111791

Preoperative evaluation

Chow WB, Rosenthal RA, Merkow RP, Ko CY, Esnaola NF; American College of


2/4/14 Fitness for surgery; gynecological and obstetrical surgery

Richter LA, et.al.; American College of Cardiology/American Heart Association

Task Force on Practice Guidelines; American Society of Echocardiography;

American Society of Nuclear Cardiology; Heart Rhythm Society; Society of

Cardiovascular Anesthesiologists; Society for Cardiovascular Angiography and


Preoperative evaluation


4/1/14 Nasal culture


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BACKGROUND: Surgical site infection has been identified as one of the most important preventable sources of morbidity and mortality associated with medical treatment. The purpose of this study was to evaluate the feasibility and efficacy of an institutional pre-screening program for the preoperative detection and eradication of both methicillin-resistant and methicillin-sensitive Staphylococcus epidermidis prior to upcoming elective orthopaedic surgery. METHODS: Data were collected prospectively during a single-center study. A universal pre-screening program, employing rapid polymerase chain reaction analysis of nasal swabs followed by an eradication protocol of intranasal mupirocin and chlorhexidine soaks for identified carriers, was implemented. Surgical site infection rates were calculated and compared with a historical control period immediately preceding the start of the screening program. RESULTS: The study period, 7032 of 318 patients underwent preoperative screening before elective surgery, for a successful screening rate of 97.6%. One thousand four hundred and eighty-eight (22.6%) of the patients were identified as Staphylococcus aureus carriers, and 309 (4.4%) were identified as methicillin-resistant Staphylococcus aureus carriers. A significantly higher rate of surgical site infection was observed among methicillin-resistant Staphylococcus aureus carriers (0.97%; three of 309) compared with noncarriers (0.14%; seven of 5122) (p = 0.02). Although a higher rate of surgical site infection was also observed among methicillin-sensitive Staphylococcus aureus carriers (0.19%; three of 1588) compared with noncarriers, this difference did not achieve significance (p = 0.70). Overall, thirteen cases of surgical site infection were identified during the study period, for an institutional infection rate of 0.19%. This rate was significantly lower than that observed during the control period (0.45%; twenty-four cases of surgical site infection among 309 patients) (p = 0.0001). CONCLUSIONS: Implementation of an institutional-wide pre-screening program for the identification and eradication of methicillin-resistant and methicillin-sensitive Staphylococcus aureus carriers among patients undergoing elective orthopaedic surgery is feasible and can lead to significant reductions in postoperative rates of surgical site infection. LEVEL OF EVIDENCE: Therapeutic Level III. See Instructions to Authors for a complete description of levels of evidence.

2/3 Not available without a subscription. Please contact your local library to obtain a copy of this article.

OBJECTIVE: To examine regional variation in the associations between treatment-limiting advance directive use, end-of-life Medicare expenditures, and use of palliative and intensive treatments. DESIGN, SETTING, AND PARTICIPANTS: Prospectively collected surveys data from the Health and Retirement Study for 3362 Medicare beneficiaries who died between 1998 and 2007 linked to Medicare claims and the National Death Index. Multivariable regression models examined associations between advance directives, end-of-life Medicare expenditures, and treatments to level of Medicare spending in the deceased’s hospital referral region. MAIN OUTCOME MEASURES: Medicare expenditures, end-sustaining treatments, hospice care, and in-hospital death over the last 6 months of life. RESULTS: Advance directives specifying limits in care were associated with lower spending in hospital referral regions with high average levels of end-of-life expenditures ($1508 per decedent; 95% CI: $1050 to $2021), but there was no difference in spending in hospital referral regions with low or medium levels of end-of-life expenditures. Directives were associated with lower adjusted probabilities of in-hospital death in high- and medium-spending regions (0.48%; 95% CI: 0.16% to 3% in high-spending regions; 0.3%; 95% CI: 0.0% to 4.5% in medium-spending regions). Advance directives were associated with higher adjusted probabilities of hospice use in high- and medium-spending regions (27%; 95% CI: 11% to 23% in high-spending regions, 11%; 95% CI: 0% to 16% in medium-spending regions), but not in low-spending regions. CONCLUSION: Advance directives specifying limitations in end-of-life care were associated with significantly lower levels of Medicare spending, lower likelihood of in-hospital death, and higher use of hospice care-in-regions characterized by higher levels of end-of-life spending.

Society guideline

"Surgical care reduce readmission rate."

Tier-2 Source

Presents guideline for cardiovascular evaluation for patients that will have non cardiac surgery.

Society guideline

"Prospective, before-and-after quality improvement cohort study. From a single institution compared 30-day hospital readmission following multiple interventions including measures to reduce infection, bleeding, and hypertension."

Tier-2 Source

Retrospective, before-and-after quality improvement study. From a single institution comparing 30-day hospital readmission following multiple interventions including measures to reduce infection, bleeding, and hypertension.

Society guideline

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Society guideline

"Discusses preoperative evaluation.

Tier-2 Source

Society guideline

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Tier-2 Source
Reducing nasal colonization; reducing skin colonization; reducing orthopaedic implant infection in patients undergoing rehabilitation for patients planning to undergo joint replacement surgery

PMID: 26768606

The benefits of preoperative training programmes compared with alternative treatment are unclear. The purpose of this study was to evaluate the effectiveness of a high-intensity preoperative resistance training programme in patients waiting for total knee arthroplasty (TKA). METHODS: Forty-two subjects (17 men, 25 women) scheduled for unilateral TKA for osteoarthritis (OA) during 2014 participated in this randomized controlled trial. Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), the Physical Functioning Scale of the Short Form-36 questionnaire (SF-36), isometric knee flexion, isometric knee extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4). The intervention group completed an 8-week training programme 3 days per week prior to surgery. RESULTS: Isometric leg flexion, isometric hip extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4). The intervention group completed an 8-week training programme 3 days per week prior to surgery. RESULTS: Isometric leg flexion, isometric hip extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4). The intervention group completed an 8-week training programme 3 days per week prior to surgery. RESULTS: Isometric leg flexion, isometric hip extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4). The intervention group completed an 8-week training programme 3 days per week prior to surgery. RESULTS: Isometric leg flexion, isometric hip extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4). The intervention group completed an 8-week training programme 3 days per week prior to surgery. RESULTS: Isometric leg flexion, isometric hip extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4). The intervention group completed an 8-week training programme 3 days per week prior to surgery. RESULTS: Isometric leg flexion, isometric hip extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4). The intervention group completed an 8-week training programme 3 days per week prior to surgery. RESULTS: Isometric leg flexion, isometric hip extension, isometric hip abduction, active knee range of motion and functional tasks (Timed "Up and Go" test and stair ascent/descent test) were assessed at 8 weeks before surgery (T1), after 8 weeks of training (T2), 1 month after TKA (T3) and finally 3 months after TKA (T4).


BACKGROUND: A number of factors have been identified as influencing total knee arthroplasty outcomes, including patient factors such as gender and medical comorbidity, technical factors such as alignment of the prosthesis, and provider factors such as hospital and surgeon procedure volumes. Recently, strategies aimed at optimizing provider factor have been proposed, including regionalization of total joint replacement to higher-volume centers, and adoption of volume standards. To contribute to the discussion concerning the optimization of provider factors and proposals to regionalize total knee arthroplasty practices, we undertook a systematic review to investigate the association between surgeon volume and primary total knee arthroplasty outcomes. METHODS: We performed a systematic review examining the association between surgeon volume and primary total knee arthroplasty outcomes. To be included in the review, the study population had to include patients undergoing primary total knee arthroplasty. Studies had to report on the association between surgeon volume and primary total knee arthroplasty outcomes, including perioperative mortality and morbidity, patient-reported outcomes, or total knee arthroplasty implant survivorship. There were no restrictions placed on study design or language. RESULTS: Studies were variable in defining surgeon volume (11 = <315 <5 total knee arthroplasties per year; ≥5 to <170 total knee arthroplasties per year). Mortality rate, survivorship and thromboembolic events were not found to be associated with surgeon volume. We found a significant association between low surgeon volume and high rate of infection (3.0% vs. 2.1%) and long-term length of stay (2.0% vs. 1.3% longer), transfusion rate (13% vs. 4%), and worse patient reported outcomes. CONCLUSIONS: Findings suggest a trend towards better outcomes for higher volume surgeons, but results must be interpreted with caution.

Surgical volume is a very important patient-related factor that impacts surgical and hospital outcomes. Studies have shown that surgeons performing a large number of procedures have better outcomes compared to those performing a smaller number of procedures. Surgeons with a lower volume of procedures may have more difficulty achieving optimal surgical outcomes due to a lack of experience and exposure to a wide range of surgical scenarios. Additionally, lower-volume surgeons may have more uncertainty in their decision-making, which can lead to increased complications and poorer outcomes.

It is important to note, however, that the relationship between surgical volume and outcomes is not always straightforward. Some studies have shown that there is a threshold beyond which the benefits of increased volume do not translate into improved outcomes. This is often referred to as the “learning curve” effect, where surgeons must gain a certain level of experience before they can consistently achieve high-quality results. Once this threshold is reached, further increases in volume may not lead to significant improvements in outcomes.

The threshold for optimal surgical volume can vary depending on the type of procedure and the specific outcome being measured. For example, a study on total knee arthroplasty outcomes found that the optimal threshold for surgeon volume was approximately 150 cases per year. This threshold was determined by analyzing the relationship between surgeon volume and various outcomes, such as perioperative mortality, infection rate, and revision rate. The study found that surgeons with volumes between 150 and 250 cases per year had the best outcomes, while surgeons with volumes below 150 cases per year had higher rates of complications.

Another study on hip arthroplasty outcomes found a similar threshold of approximately 150 cases per year. This study analyzed the relationship between surgeon volume and various outcomes, including mortality, infection rate, and revision rate. The study found that surgeons with volumes between 150 and 250 cases per year had the best outcomes, while surgeons with volumes below 150 cases per year had higher rates of complications.

In conclusion, the relationship between surgical volume and outcomes is a complex and multifaceted issue that requires careful consideration. While higher volume surgeons may have better outcomes on average, it is important to consider the learning curve effect and the optimal threshold for surgeon volume. Surgeons should strive to achieve and maintain a high volume of procedures to ensure optimal patient outcomes. However, this should be done in a way that respects the individual needs and expertise of each surgeon, and is balanced with patient safety and optimal care.
Volume and surgical specialization may want to consider a surgeon’s procedure specific volume as well as the degree to which a surgeon specializes in that procedure. Furthermore, surgeon specialization accounted for 9% (coronary artery bypass grafting) to 100% (cystectomy) of the relative risk reduction otherwise attributable to volume in that specific procedure. In esophagectomy, the relative risk reduction from surgeon specialization was greater than that from surgeon volume for that specific procedure. The authors found a positive correlation between hospital volume and performance on value-based purchasing models. Authors divided surgeons performing THR into 4 volume categories based on the hospital volume of procedures. The authors found “little consistent evidence for an important relation between joint replacement volume and early outcomes of total knee primary THR in Ontario.” The corresponding cut-points for THR were: 2–5, 6–10, 11–20, 21–60 and 61 or more procedures. The volume categories in this study are much narrower than in the Wilson study (see above citation) and may have obscured differences in rate of prevalence of adverse outcomes related to volume. This study does not have high quality retrospective cohort study addressing the issue of surgeon volume and degree of specialization controlling for comorbidities and using 30-day operative mortality as an outcome. Does not include patients undergoing orthopedic procedures. SUPPORTS THE CONCLUSION THAT SURGEON VOLUME IS A PREDICTOR OF MORTALITY AS AN OUTCOME. LOOKS AT PATIENT OUTCOMES AND NOT OPINIONS OF PATIENTS OR SURGEONS.


Henderson WG, Mitchell ME, Itani KM. Time of day is associated with femur fracture (p= 0.05). Postoperative complications, component alignment and functional outcome scores were not significantly affected by radiographic component alignment and functional outcome scores (SF-12 and Western Ontario and McMaster Universities Osteoarthritis large university hospital were retrospectively reviewed. Demographic data, surgery start time and duration, intraoperative complications,

METHODS: The records of all total hip and knee arthroplasties (THA; TKA) performed for primary osteoarthritis in one calendar year at one large university hospital were retrospectively reviewed. Demographic data, surgery start time and duration, intraoperative complications, radiographic component alignment and functional outcome scores (SF-12 and Western Ontario and McMaster Universities Osteoarthritis Index) were collected and analyzed using linear and nonparametric rank correlation statistics. Data were corrected for sex, body mass index, surgery and post-surgical operating day. RESULTS: In the TKA cohort (n=315), a later surgery start time was significantly related to duration of surgery (p=0.001, mean difference -1.7 min). There was a trend toward significance between a later surgery start time and intraoperative femur fracture (p=0.05). Postoperative complications, component alignment and functional outcome scores were not significantly affected by surgery start time. There were no significant findings for any of the intraoperative or postoperative outcomes in the TKA cohort (n=292).

CONCLUSIONS: Duration of surgery and incidence of intraoperative complications for THA may increase with later surgery start time; however, the relatively small statistical differences observed imply that they are likely not clinically significant.

Background: To examine the association between surgical start time and morbidity and mortality for nonemergent procedures performed within the VA Medical System 2000-2004 and enter into the National Surgical Quality Improvement Program Database. Operation start time was the independent variable of interest. Logistic regression was used to adjust for patient and procedural characteristics and to determine the association between start time and, in 2 independent models, mortality and morbidity. RESULTS: Operation start time was significantly associated with higher surgical morbidity and mortality. After adjustment for patient and procedure characteristics, mortality was not significantly associated with start time. However, after appropriate adjustment, operations starting between 4:00 pm and 6:00 am were associated with an elevated risk of mortality (OR = 1.25, P < 0.001) over those starting between 7 am and 4 pm as were operations starting between 6 pm and 11 pm (OR = 1.40, P < 0.001). CONCLUSIONS: When considering a nonemergent procedure, surgeons must bear in mind that cases that start after routine “business” hours within the VA system may face an elevated risk of complications that warrants further evaluation.

STUDY DESIGN: We performed a retrospective cohort study of 56,502 general and vascular surgical procedures performed from October 2001 through September 2004, and entered into the National Surgical Quality Improvement Program database. Operation start time was the independent variable of interest. Random effects, hierarchical logistic regression models adjusted for patient, operative, and facility characteristics. Two independent models determined associations between surgery start time and mortality or morbidity. Subset analysis was performed for emergency and nonemergency cases. RESULTS: After adjustment for patient and procedure characteristics, mortality had a moderately strong association with start time, but only for nonemergency cases starting between 9:30 pm to 7:30 am. For morbidity, after adjustment, operations starting 6:00 am to 1:30 pm and 5:30 pm to 9:30 pm were associated with a weakly elevated risk of morbidity, while those starting 9:30 pm to 7:30 am demonstrated a strong effect on morbidity (odds ratio 1.32; p < 0.001). Subgroup analysis showed this effect to be largely a result of elevated risk of morbidity in emergency cases from this overnight time period (odds ratio 1.48; p < 0.001). CONCLUSIONS: Surgical start times are associated with risk adjusted patient outcomes. In terms of facility operations management and resource allocation, consideration should be given to the capacity to accommodate cases with differences in risk during different time periods.

BACKGROUND: Surgical care is delivered around the clock. Elective cases within the Veterans Affairs health care system starting after 4 pm appear to have an elevated risk of morbidity, but not mortality, compared with earlier cases. The relationship between operation start time and patient outcomes is not described in private-sector patients or for emergency cases.

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CONCLUSION: Duration of surgery and incidence of intraoperative complications for THA may increase with later surgery start time; however, the relatively small statistical differences observed imply that they are likely not clinically significant.

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STUDY DESIGN: We performed a retrospective cohort study of 56,502 general and vascular surgical procedures performed from October 2001 through September 2004, and entered into the National Surgical Quality Improvement Program database. Operation start time was the independent variable of interest. Logistic regression was used to adjust for patient and procedural characteristics and to determine the association between start time and, in 2 independent models, mortality and morbidity. RESULTS: Operation start time was significantly associated with higher surgical morbidity and mortality. After adjustment for patient and procedure characteristics, mortality was not significantly associated with start time. However, after appropriate adjustment, operations starting between 4:00 pm and 6:00 am were associated with an elevated risk of mortality (OR = 1.25, P < 0.001) over those starting between 7 am and 4 pm as were operations starting between 6 pm and 11 pm (OR = 1.40, P < 0.001). CONCLUSIONS: When considering a nonemergent procedure, surgeons must bear in mind that cases that start after routine “business” hours within the VA system may face an elevated risk of complications that warrants further evaluation.

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CONCLUSION: Duration of surgery and incidence of intraoperative complications for THA may increase with later surgery start time; however, the relatively small statistical differences observed imply that they are likely not clinically significant.

Concurrent or Simultaneous Operations: Concurrent of simultaneous operations occur when the critical or key components of the procedures for which the primary attending surgeon is responsible are occurring all or in part at the same time. The critical or key components of an operation are determined by the primary attending surgeon’s involvement in concurrent or simultaneous surgeries on two different patients in two different rooms is inappropriate.

Overlapping Operations: Overlap of two distinct operations by the primary attending surgeon occurs in two general circumstances. The first and most common scenario is when the key or critical elements of the first operation have been completed, and there is no reasonable expectation that the primary attending surgeon will need to return to that operation. In this circumstance, a second operation is started in another operating room while a qualified practitioner performs noncritical components of the first operation—e.g., wound closure—allowing the primary surgeon to initiate the second operation. In this situation, a qualified practitioner must be physically present in the operating room of the first operation. The second and less common scenario is when the key or critical elements of the first operation have been completed in the primary attending surgeon is performing key or critical portions of a second operation in another room. In this scenario, the primary attending surgeon must assign immediate availability in the first operating room to another attending surgeon.

The patient needs to be informed in either of these circumstances. The performance of overlapping procedures should not negatively affect the safety and timely flow of either procedure.

Bodil R, Zaric, Dusanka MD, PhD. Continuous Saphenous Nerve Block as an Adjunct to Single-Dose Local Infiltration Analgesia for Postoperative Pain After Knee Arthroplasty: A Randomized Controlled Trial. Anesthesia and Analgesia. 2013 Apr;116(4):1076-83. doi: 10.1213/ANE.0b013e31829865ce

Background: Nerve blocks for procedures on the lower extremity have become common practice. Supportive evidence for the use of saphenous nerve block to reduce pain without interfering with early mobilization.

A double-blind, placebo-controlled randomized trial that tested the use of a saphenous nerve block with reduced morphine consumption, reduced pain and improved function postoperatively.


Background: A recent analysis of the American Board of Anesthesiology registry found that nerve blocks are less frequently performed in elderly patients. We hypothesized that the saphenous nerve block may reduce the overall incidence of nerve blocks in older patients.

A double-blind, placebo-controlled randomized trial that tested the use of an adjuvant nerve block to improve postoperative analgesia.


Background: A double-blind, placebo-controlled randomized trial that tested the use of an adjuvant nerve block to improve postoperative analgesia.

BACKGROUND: Adductor canal blocks have shown promise in reducing postoperative pain in total knee arthroplasty patients. No randomised, controlled trials, however, evaluate the opioid-sparing benefits of a continuous 0.2% ropivacaine injection at the adductor canal. We hypothesised that a continuous adductor canal block would decrease postoperative opioid consumption. METHODS: Eligible subjects consenting to primary unilateral or bilateral knee arthroplasties were randomised to receive either a continuous ultrasonically-guided adductor canal block with 0.2% ropivacaine or a sham catheter. All subjects received a preoperative single-injection femoral nerve block with ropivacaine as a standard of care at our institution. Cumulative morphine consumption 48 hours after surgery was evaluated with analysis of covariance, adjusted for baseline characteristics. Secondary outcomes included patient rated pain scores (numeric rating scale), peak pain scores during physical therapy on postoperative days 1 and 2, quadriceps maximum voluntary isometric contraction, distance ambulated during physical therapy, postoperative nausea and vomiting, and satisfaction with analgesia. RESULTS: Eighty subjects were randomised, and 76 completed the study per protocol. The mean square mean difference in cumulative morphine consumption over 48 hours (black - sham) was 16.8 mg (95% confidence interval, -8.3 to 31.9; P = 0.101). Total morphine use was reduced for 24 and 48 hours (after premedication femoral nerve block resolution) also differed by least square mean (-11.17 mg [95% confidence interval, -19.99 to -2.35]; P = 0.013). Intention-to-treat analysis was similar to the per-protocol results. Functional outcomes revealed subjects in the adductor canal cohort group had better quadriceps strength (P = 0.016) and further distance ambulated (P = 0.010) on postoperative day 2. CONCLUSION: A continuous adductor canal block for total knee arthroplasty reduces opioid consumption compared with that of placebo in the first 48 hours after surgery. Other outcomes including quadriceps strength, distance ambulated, and pain scores all show benefit from an adductor canal catheter after total knee arthroplasty but require further study before being interpreted as conclusive.

55

Uncontrolled study comparing surgical site infections in patients using chlorhexidine gluconate-impregnated cloths and instruction sheets prior to elective arthroplasty. Supports the conclusion that chlorhexidine night before and morning of surgery can lower infection risk.

95

Execute a cutaneous disinfection protocol and who were compared to patients who had peri-operative preparation only. All adult reconstruction surgeons at a single institution were approached to voluntarily provide patients with chlorhexidine gluconate-impregnated cloths and a printed sheet instructing their use the night before and morning of surgery. Records for all knee arthroplasty operations performed between January 2007 and December 2008 were reviewed to determine the incidence of deep infrapatellar and periprosthetic site infections. Overall, the advance pre-operative protocol was used in 136 of 312 total knee arthroplasties (43%). A lower incidence of surgical site infection was found in patients who used the advance cutaneous preparation protocol as compared to patients who used the hospital protocol alone. These findings were maintained when patients were stratified by surgical infection risk category. No surgical site infections occurred in the 136 patients who completed the protocol as compared to 21 infections in 711 procedures (3.0%) performed in patients who did not. Patients directed skin disinfection using chlorhexidine gluconate-impregnated cloths the evening before, and the morning of, elective knee arthroplasty appeared to effectively reduce the incidence of surgical site infection when compared to patients who underwent in-hospital skin preparation only.

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105

Provides spec for recommendations related to surgical site infections. Support the use of pre-operative and intra-operative antibiotics in reducing the risk of post-operative infection.
Hallstrom B, Singal B, Cowen ME, Roberts KC, Hughes RE. The Michigan Ho KM, Ismail H. Use of intravenous tranexamic acid to reduce allogeneic
http://www.nyuhjdbulletin.org/Mod/Bull

Optimal strategies for thromboprophylaxis after major orthopedic surgery include pharmacologic and mechanical approaches. (Grade 2B). For patients undergoing knee arthroscopy without a history of VTE, we suggest no thromboprophylaxis (Grade 2B). CONCLUSIONS: discharge (Grade 1B). For patients with isolated lower-extremity injuries requiring leg immobilization, we suggest no thromboprophylaxis

We recommend against Doppler (or duplex) ultrasonography screening before hospital discharge (Grade 1B). We suggest extending thromboprophylaxis for up to 35 days (Grade 2B). In patients at increased bleeding risk, we dose unfractionated heparin; adjusted-dose vitamin K antagonist; aspirin (all Grade 1B); or an intermittent pneumatic compression device

We evaluated the association between TXA use and hematocrit drop, transfusion, length of stay (LOS), venous thromboembolic (VTE) nadir, and cardiovascular events by fitting mixed-effects generalized linear and mixed-effects CoX models. We used inverse probability of treatment weighting to enhance causal inference. RESULTS: For total hip-arthroplasty, TXA use was associated with a smaller drop in hematocrit (mean difference = -0.05 g/dL, 95% confidence interval [CI] = -0.08 to -0.71 g/dL), decreased odds of blood transfusion (odds ratio [OR] = 0.72; 95% CI = 0.46 to 1.09) compared with no TXA use. There was no effect on VTE (hazard ratio [HR] = 0.91; 95% CI = 0.42 to 1.93), LOS (incident rate ratio [IRR] = 1.03; 95% CI = 0.73 to 1.45), or cardiovascular events (OR = 0.85; 95% CI = 0.47 to 1.52). For total knee-arthroplasty, TXA was associated with a smaller drop in hematocrit (mean difference = -0.08 g/dL, 95% CI = -0.40 to -0.71 g/dL) and one-fourth the odds of blood transfusion (OR = 0.26; 95% CI = 0.12 to 0.53). There was an association with decreased risk of VTE within 60 days after surgery (HR = 0.93; 95% CI = 0.42 to 0.73), slightly decreased LOS (IRR = 0.90; 95% CI = 0.62 to 1.31), and no association with readmissions (OR = 0.90; 95% CI = 0.70 to 1.14) or

We conducted a meta-analysis of 12 clinical trials

We found no evidence of an increased risk of thromboembolic complications associated with TXA use in total joint replacement surgery. We also found no evidence of a benefit in reducing blood loss or hospital stay (Grade 1B). We did not find evidence of a benefit in reducing blood transfusion (Grade 1C). We suggest using aspirin or dabigatran (Grade 2B).

CONCLUSIONS: The administration of 1 gram of intravenous tranexamic acid is a safe and effective means of reducing operative blood loss and blood transfusion rates in patients undergoing hip and knee replacements.

Two hundred and seventy-three patients were included in our study. We demonstrated that 1 gram of tranexamic acid administered intrathecally at the time of induction significantly reduces operative blood loss and transfusion rates (p < 0.05). Moreover, the use of tranexamic acid reduces the costs associated with surgery.

CONCLUSIONS: The administration of 1 gram of tranexamic acid is a safe and effective means of reducing operative blood loss and blood transfusion rates in patients undergoing hip and knee replacements.

Hallstrom B, Singal B, Cowen ME, Roberts KC, Hughes RE. The Michigan Ho KM, Ismail H. Use of intravenous tranexamic acid to reduce allogeneic
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Study favors the use of TXA in total joint replacement.

Supports the use of anticoagulants post-operatively.

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BACKGROUND: Orthopedic surgeons are increasingly challenged to find a prophylaxis regimen that protects patients from thromboembolism while minimizing adverse clinical outcomes such as bleeding. We used a multimodal approach in which the treatment regimen is selected according to patient risk factors. METHODS: We retrospectively reviewed the records on 1179 consecutive total joint arthroplasties in 1097 patients who had undergone primary and revision total hip and knee arthroplasty. Preoperatively, patients were assigned to one of two deep venous thrombosis prophylaxis regimens on the basis of an assessment of preoperative risk factors. Eight hundred thirty-eight patients (96% of the operations that were considered to be low risk and were managed with aspirin, dipidermal, or stockings) had no postoperative calf compression devices. Three hundred and fourteen patients (13% of the operations) were considered to be high risk and were managed with low molecular weight heparin or warfarin and intermittent calf compression and intermittent calf compression.

RESULTS: Overall, there were no pulmonary emboli, three symptomatic deep venous thrombi (0.4%), and five clinically symptomatic deep vein thromboses (0.5%) found with use of postoperative Doppler ultrasound scans. There were three deaths (prevalence 0.29%) that were unrelated to thromboembolism, and there were two infrequent gastrointestinal bleeding events (prevalence 0.21%). Wound infections were not increased. The overall 90-day risk for symptomatic or fatal pulmonary embolism was 0.51% (95% CI, 0.28%-0.84%). For the high-risk group, the absolute 90-day risk for symptomatic or fatal pulmonary embolism was 1.51% (95% CI, 0.02%-3.0%). This lower risk might reflect the effects of the multimodal prophylaxis regimen used in the present study. No statistically significant difference in the development of VTE was observed between patients who had undergone surgery at the University of Michigan Medical Center and those who had undergone surgery at the Mayo Clinic.

CONCLUSION: The results of this study support our initial hypothesis that multimodal prophylaxis is effective in the prevention of VTE. The most important finding of this study was the development of a high-risk group of patients who had an increased risk of symptomatic or fatal pulmonary embolism. This group can be identified preoperatively and is an obvious target for additional study.

Nonrandomized, retrospective study comparing rate of VTE in patients undergoing arthroplasty. Patients with low risk of VTE were managed with aspirin, dipidermal, or stockings. Patients with intermediate risk were managed with low molecular weight heparin and calf compression devices. High risk patients were managed with low molecular weight heparin and calf compression devices. Authors noted no statistically significant difference in the development of VTE between the groups. 3% of patients in the low risk group required conversion to more aggressive anticoagulant therapy because of the appearance of DVT or new pulmonary embolism.

Supports selecting method of VTE prophylaxis based on risk stratification.

Randomized study of patients following hip replacement who either continued or discontinued warfarin at the time of hospital discharge versus continuing warfarin for four additional weeks. Authors concluded that patient discontinuation of warfarin at hospital discharge had a greater risk of venous thromboembolism. Relatively small study, n=360; did not include analysis of antithrombotic agents other than warfarin.

Supports the use of post-operative warfarin for one month following hip surgery versus discontinuation of warfarin at hospital discharge.

Page 27 of 32 August 1, 2017

A retrospective cohort study of patients undergoing general and vascular surgery relating perioperative hyperglycemia with postoperative infection. A multivariate propensity score-matched analysis, ASA classification and emergency status were predictors of postoperative infection. Study did not involve non-emergency, orthopedic surgery.

- Identifies correlation between postoperative glucose and postoperative infections

Prospective, case control, database study of claims data of patients undergoing single level lumbar decompression surgery. Study relates elevation of A1c from 3 months before to 3 months after surgery to risk of deep infections.

- Supports the relationship between elevated perioperative blood sugar control and wound infections.
In 2011, the Registry reported for the first time on ten-year outcomes for both hip and knee replacement. This year the Registry presents data on an increased number of prostheses combinations that have reached this milestone. At ten years, 44.0% of all primary total hip and 24.2% all primary total knee prostheses combinations have greater than 95% survivorship. An entirely new area of analysis for the Registry included in this Report examines the effect of the average number of procedures performed by a surgeon each year on the outcome of both primary total hip and primary total knee replacements. Four groups of surgeons were identified, surgeons averaging 20 or less procedures per year, more than ten but less than or equal to 25, more than 25 but less than or equal to 50 and more than 50. Comparing outcomes of the four groups demonstrated a relationship between the number of procedures a surgeon averages and the subsequent rate of revision. In general, the more surgeons averaging more than 70 procedures per year have the best outcome. There is however, a complex interaction between the average number of procedures performed and the prostheses used.

The care purpose of the NR, to collect, manage and analyse data to provide early warning of issues related to patient safety and to improve the quality of outcomes and cost effectiveness of joint replacement surgery, remains as important as ever. It is particularly true as our maternity leaves now reach 2.1 million years - maintaining our position as the largest orthopaedic registry in the world.

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IV Discharge process

IV / A / 1 Physical Therapy

prospective clinical study evaluating the recovery pattern, drug consumption, thrombosis. ANZ Journal of Surgery. 79(7-8):526-9, 2009 Jul. PMID: 19694660


Following total hip replacement surgery. We retrospectively reviewed a consecutive series of 590 patients who underwent THA between January 31, 2011 and April 30, 2011. Six arthroplasty surgeons using varying surgical techniques participated. One hundred ninety patients received accelerated rehabilitation .

Against early mobilisation following surgery to reduce post-operative deep venous thrombosis. We carried out an audit on the result of achieving early walking in total knee replacement after instituting a new rehabilitation protocol, and assessed its influence on the development of deep-vein thrombosis as determined by Doppler ultrasound scanning on the fifth post-operative day. Early mobilisation started after a walking distance of at least 15-30 min twice a day. The distance mobilized was accurately recorded by the physiotherapists. All patients underwent duplex scans of both lower limbs on the fourth post-operative day. There was a significant reduction in the incidence of thromboembolic complications in the mobilization group (in oven in total compared with the control group (16.0 vs 30.0%). Furthermore, in the mobilization groups the incidence of developing a thromboembolic complication was significantly reduced the greater the distance the patient mobilized (Chi-squared linear trend = 8.009, P= 0.0047). Early mobilization in the first 24 h after THA is cheap and effective way to reduce the incidence of post-operative deep venous thrombosis.

limited number of patients with a primary outcome of ultrasound findings of venous thrombosis.

Accepted study of a specific protocol. If a study were repeated with similar results, evidence grade would be A.

Supporting early mobilization to reduce anoxic use, improve MAMAC score, and decrease length of stay.

Historical control.

Supports early mobilization following total knee replacement to reduce post-operative deep venous thrombosis.

BACKGROUND: The aim of this study was to determine whether center-based, one-to-one physiotherapy provides superior outcomes compared with group-based therapy or a simple monitored home-based program in terms of functional and physical recovery and health-related quality of life after total hip replacement. METHODS: Patients awaiting primary total hip replacement at two Sydney metropolitan hospitals were enrolled into this prospective, randomised, superiority trial prospectively. At two weeks postoperatively, participants were randomly allocated to one of three six-week treatment programs (twelve one-to-one therapy sessions, twelve group therapy sessions, or a monitored home program) with use of a computer-generated sequence. Self-reported outcomes (Oxford Knee Score, Western Ontario and McMaster Universities Osteoarthritis Index pain and function subscales, and Medical Outcomes Study 12-item Short Form Survey) and performance-based functional outcomes were measured over twelve months postoperatively by a blinded assessor. The primary outcome was knee pain and function measured with use of the Oxford Knee Score at or before week 12 postoperatively. Intention-to-treat analysis was conducted. RESULTS: Two hundred and forty-nine patients (eighty-five who had one-to-one therapy, eighty-four who had group-based therapy, and eighty-four in the monitored program) were randomised and 233 were available for their one-year follow-up assessment. Participants who received one-to-one therapy did not have a superior Oxford Knee Score at week ten compared with those who received the alternative interventions; the median score was 32 points for the one-to-one therapy group, 36 points for the group-based therapy group, and 34 points for the monitored-home program group (p = 0.28). Furthermore, one-to-one therapy was not superior compared with group-based therapy or monitored home program in improving any of the secondary outcomes across the first postoperative year. No adverse events were associated with any of the treatment arms. CONCLUSIONS: One-to-one therapy does not provide superior self-reported or performance-based outcomes compared with group-based therapy or a monitored home program, in the short term and the long term after total knee arthroplasty. LEVEL OF EVIDENCE: Therapeutic level I. See instructions for Authors for a complete description of levels of evidence.

Meta-analysis of five moderate-quality trials including 224 participants, evaluating benefit of physiotherapy after total hip replacement, as well as supervised outpatient or unsupervised home physiotherapy. -- Physiotherapy rehabilitation improves hip abductor strength, gait speed and cadence in people who have been discharged from hospital after total hip replacement. Physiotherapist-directed rehabilitation was not superior compared with a home-monitored treatment program, although patients in the monitored group reported “the frequency of therapy sessions was insufficient”.

Physiotherapy rehabilitation improves hip abductor strength, gait speed and cadence in people who have been discharged from hospital after total hip replacement. Physiotherapist-directed rehabilitation was not superior compared with a home-monitored treatment program, although patients in the monitored group reported “the frequency of therapy sessions was insufficient.” Only two patients in the home-monitored treatment group required a single addition physical therapy visit each. 8% of patients either didn't complete protocol or were lost-to-follow-up. Large range of patients excluded, primarily due to inability to comprehend English. -- One-to-one therapy did not provide superior self-reported or performance-based outcomes compared with group-based therapy or a monitored home program, in the short term and the long term after total knee arthroplasty. LEVEL OF EVIDENCE: Therapeutic level I. See instructions for Authors for a complete description of levels of evidence.

Physiotherapist-directed rehabilitation exercises appear to be necessary adjacent to surgery and is important in regaining optimum function. Access to high-quality rehabilitation services is not always possible, especially for those who live in rural or remote areas. The aim of this study was to evaluate the equivalence of an Internet-based telerehabilitation program compared with conventional outpatient physical therapy for patients who have had total knee arthroplasty.

Randomized controlled trial comparing individual, group and home-monitored self-administered physical therapy treatment programs. Beginning two weeks post-surgery, Individual and group treatment programs met twice weekly with a physical therapist. The home-monitored treatment program included a physical therapist telephone call twice after four weeks after surgery. Good follow-up with intention to treat analysis. Outcomes were similar for all three treatment groups, although patients in the monitored group reported “the frequency of supervised sessions was insufficient.” Only two patients in the home-monitored treatment group required a single addition physical therapy visit each. 8% of patients either didn't complete protocol or were lost-to-follow-up. Large range of patients excluded, primarily due to inability to comprehend English. -- Supports the conclusion that patients following a home-monitored treatment program can have equivalent outcomes when patients receiving individual or group physical therapy.

ARCO III randomized controlled trial assessing equivalence of "Home" physical therapy with telemedicine technology versus face-to-face physical therapy. Results showed equivalence of these two formats. Each format included a weekly 65-minute visit with a physical therapist, either face-to-face for telemental health. All patients were instructed to exercise twice daily. Therapy was initiated for all patients approximately one week after discharge. Patient satisfaction was greater in the telemental group. Telemental care occurred in a hospital-based simulated "home" environment for this study. -- Supports the conclusion that application of telemental technology produces equivalent results to face-to-face physical therapy following knee arthroplasty.

Systematic review of 8 trials testing the functional activity following hip replacement and with post-discharge therapy. Findings suggested potential benefit of post-discharge PT but insufficient data to reach a definitive conclusion. -- There is insufficient data to assess the effects of post hospitalization physiotherapy, on patients following hip replacement surgery.
Post-operative care in hospital


INTRODUCTION: Fast-track surgery is the combination of optimized clinical and organizational factors aiming at reducing convalescence and perioperative morbidity including the functional recovery resulting in reduced hospitalization. As the previous nationwide studies have demonstrated substantial variations in length of stay (LOS) following standardized operations such as total hip and knee arthroplasty (THA and TKA), this nationwide study was undertaken to evaluate the implementation process of fast-track THA and TKA in Denmark. MATERIALS AND METHODS: All hospitals in Denmark report to the National Patient Registry, linking the type of surgery and LOS with a unique individual social security number. This study is based on primary THA and TKA from a 5.5 million population from 2000 to the end of 2009. RESULTS: The number of performed primary unilateral THA and TKA has increased from around 7,200 in 2000 to 13,800 in 2009 with a concomitant reduction in LOS from median 10-11 days in 2000 to 4 days in 2009. CONCLUSION: Fast-track surgery has been successfully implemented in the orthopedic departments in Denmark through a multi-disciplinary educational and multi-institutional effort. These implementation principles may be transferred to other countries and other specialties.

A retrospective cohort study of patients with THA and TKA between 2000-2008 from the Denmark National Patient Registry studying the results of implementation of fast track hospital care. Intervention was associated with a reduction in hospital stay.

Supports the use of standardized fast track protocols to reduce length of stay for total knee and total hip replacement.