

day and time spent in moderate-to-vigorous physical activity (ie, at least 2,020 counts/minute). Multivariable logistic regression analysis was conducted to determine the association between steps/day at 6 weeks and clinically meaningful improvement in disability at 1 year, controlling for age, body mass index (BMI), education, race, sex, previous surgery, spinal procedure, baseline ODI score, and back and leg pain. Receiver operating characteristic curves were used to identify steps/day and moderate-to-vigorous physical activity/week that best discriminated the likelihood of achieving clinical improvement.

RESULTS: Of 248 participants, 216 participants (mean [SD]; age= 63[11] years, BMI= 32[7] kg/m², 52% female) had physical activity for at least 3 valid days. Of 216 patients, 43% (n=93) achieved clinical improvement in ODI at 1-year following spine surgery. Each additional 1000 steps/day and additional 1 minute of moderate-to-vigorous physical activity/day were associated with 27% (OR=1.27, 95% CI=1.07, 1.51) and 4% (OR=1.04, 95% CI=1.01, 1.08) higher odds of achieving clinically meaningful improvement in ODI, respectively. At 6 weeks following spine surgery, walking less than 3000 steps/day (sensitivity = 68%, specificity = 52%) was associated with 66% (OR=0.34, 95% CI=0.16, 0.69) lower odds of achieving clinical improvement in disability compared to those who walked at least 3000 steps/day. In addition, engaging in less than 21 minutes of moderate-to-vigorous physical activity/week (sensitivity = 62%, specificity = 48%) was associated with a 46% (OR=0.54, 95% CI=0.29, 1.02) lower odds of achieving clinical improvement in disability at 1-year postoperative compared to those who engaged in at least 21 minutes of moderate-to-vigorous physical activity/week.

CONCLUSIONS: Walking at least 3,000 steps/day or engaging in at least 21 minutes of moderate-to-vigorous physical activity/week may serve as an initial recommendation for patients early after spine surgery. Results suggest that these early postoperative thresholds may optimize clinical improvement in disability at 1 year following spine surgery.

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288. Recent trends in spinal surgery performed by American Board of Orthopaedic Surgery (ABOS) part II candidates (2008-2017)

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BACKGROUND CONTEXT: Orthopedic surgeons are eligible to take the ABOS Part II examination 20 months following fellowship completion. Despite previous studies utilizing ABOS Part II data in other subspecialties, there is a paucity of information regarding complications of spine surgeons in their first 2 years of independent practice. Such data can help trainees anticipate case composition they might see in early practice and provide insight for fellowship programs in understanding emerging trends in practice within the field.

PURPOSE: We sought to evaluate trends of spine surgery cases using American Board of Orthopaedic Surgeons (ABOS) Part II examination data from 2008-2017.

STUDY DESIGN/SETTING: We performed a retrospective review of surgical cases submitted to the ABOS by candidates taking the Part II Spine examination between 2008-2017. Procedures and indications for surgery were determined using a hierarchical restrictive algorithm based on candidate-reported International Classification of Diseases 9th and 10th Revision (ICD-9 and 10) codes and Current Procedural Terminology (CPT) codes.

PATIENT SAMPLE: Patient sample included all eligible cases with data reported to the ABOS by candidates extracted between 2008-2017.

OUTCOME MEASURES: Outcome measures included surgical diagnosis and procedure; a logic-based hierarchical algorithm was employed to characterize these parameters. Diagnosis was stratified as degenerative

(including disc herniation, stenosis, spondylolisthesis and degenerative disc disease), trauma, infection/tumor, scoliosis/deformity or other.

METHODS: Diagnosis and procedure were analyzed independent of the candidate who reported the event. Bivariate testing was performed using chi-squared tests for categorical data and Student's t-test for continuous variables, with a p-value of < 0.05 considered statistically significant.

RESULTS: A total of 37,539 cases were analyzed, with an average of 3,754 cases performed each year and an average of 49 cases (standard deviation [SD] 29) per candidate per 6-month collection period. There were 760 candidates total with an average of 76 candidates (SD 11) sitting for the examination per year. Average age was 54.7 years (SD 15.9); approximately half (51.8%, n=19,444) were male. Average reported follow-up was 9 weeks (SD 6.5). Degenerative disorders were the most common diagnostic category, representing 87.2% of the cohort; 4.7% of cases were for trauma, 1.3% for infection/tumor, 2.2% for deformity and 4.6% for other categories. Lumbar discectomy was the most common procedure (22.4% of all cases). Posterior spinal instrumented fusions (PSIF) represented 18.9% of all cases; anterior cervical discectomy and fusion (ACDF) 18.5%, transforaminal lumbar interbody fusions 7.3%, anterior or extended lateral lumbar interbody fusions (ALIF/XLIF) represented 6.5%, and cervical disc arthroplasty 0.8%. Single-level PSIFs decreased from 2008 to 2017 (19.4% vs 8.3%, p<0.001), as did lumbar discectomies (27.5% vs 18.3%, p<0.001). Single- and multi-level ALIF/XLIF, TLIF, and ACDF cases did not significantly change. Single- and multi-level CDA cases increased significantly (0.5% to 1.0%, p=0.008; and 0.0% to 0.3%, p=0.001).

CONCLUSIONS: Recent spine fellowship graduates are performing more cervical disc arthroplasties and fewer single-level PSIFs and lumbar discectomies. Techniques such as ALIF/XLIFs, ACDFs, and multi-level PSIFs have not changed significantly in recent years.

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289. Risk of spinal surgery among individuals who have been revascularized for coronary artery disease

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BACKGROUND CONTEXT: For patients with coronary artery disease, the two most common options for intervention are a cardiac stent or a coronary artery bypass graft. Although less invasive, stents may pose a long-term risk for patients undergoing further invasive procedures such as elective spine surgery. This study aimed to provide surgeons with insight on possible major complications for elective spine surgery patients with a history of coronary artery disease.

PURPOSE: Investigate outcomes of elective spine fusion patients with prior history of cardiac intervention

STUDY DESIGN/SETTING: Retrospective review of the PearlDiver database between the years 2006-2013

PATIENT SAMPLE: A total of 731,173 elective spine fusion patients

OUTCOME MEASURES: Comorbidity burden, 30-day and 90-day complications, readmission

METHODS: Elective spine fusion patients were isolated with ICD-9 and CPT procedure codes in the PearlDiver database. Patients were stratified

by having previous history of a coronary stent (Stent), coronary artery bypass graft (CABG), and no previous heart procedure (No-HP). Means comparison tests (chi-squared and independent samples t-tests, as appropriate) compared differences in demographics, diagnoses, and comorbidities. Logistic regression assessed the odds of 30-day and 90-day postoperative (postop) complications associated with each heart procedure (Odds Ratio [95% confidence interval]). Statistical significance was set $p < 0.05$.

RESULTS: A total of 731,173 elective spine fusion patients were included. Overall, 8,401 pts underwent a CABG, 24,037 patients Stent, and 698,735 had No-HP prior to spine fusion surgery. Compared to Stent and No-HP patients, CABG patients had higher rates of morbid obesity, chronic kidney disease and diabetes ($p < 0.001$ for all). Stent patients had higher rates of peripheral vascular disease, hypertension, and hyperlipidemia (all $p < 0.001$). Within 30 days postoperatively of index surgery, CABG patients had significantly higher complication rates including pneumonia, cerebrovascular accident (CVA), myocardial infarction (MI), sepsis, and death compared to No-HP (all $p < 0.001$). Stent patients vs No-HP also had higher 30-day postoperative complication rates including pneumonia, CVA, MI, sepsis, and death. Adjusting for age, comorbidities and sex, Stent was significantly predictive of a MI 30-days post-op (OR: 1.90 [1.53-2.34], $P < 0.001$). Additionally, Stent patients compared to CABG patients had 1.99x greater odds of a MI within 30-days (OR: 1.99 [1.26-3.31], $p = 0.005$) and 2.02x greater odds of readmission within 90-days postop (OR: 2.2 [1.53-2.71], $p < 0.001$).

CONCLUSIONS: With regards to spine surgery, coronary artery bypass graft remains the gold standard for risk reduction. Stenting does not appear to minimize risk as significantly as CABG. When assessing patients with a history of coronary artery disease for elective spine fusion surgery, surgeons should be cautious of the significant risk of major complications associated with stents compared to coronary artery bypass grafting.

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290. The impact of insurance payor on hospital length of stay and discharge time in adult patients undergoing elective spine surgery

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BACKGROUND CONTEXT: ERAS pathways are evidence-based protocols designed to reduce the surgical stress response and facilitate return to function, which typically results in a significant decrease in length of stay. After implementation of such a program at our institution, length of stay only transiently decreased.

PURPOSE: This study looks to identify barriers to timely discharge, and to assess a causal relationship with clearance from insurance payors.

STUDY DESIGN/SETTING: This is a retrospective cohort study of 105 consecutive patients undergoing elective spinal surgery on an ERAS pathway at a tertiary academic center.

PATIENT SAMPLE: N/A

OUTCOME MEASURES: N/A

METHODS: Prior to admission, all patients were assigned to intermediate ($n=31$) or complex ($n=74$) ERAS pathways according to their scheduled operation. Demographic data and variables related to comorbidities, insurance payor, length of stay, intra- and postoperative complications, discharge destination, and the date of medical clearance to discharge home or to a rehabilitation facility were recorded. The days stayed beyond medical clearance was calculated as the difference between the date of medical clearance and the actual date of discharge. Each operation was categorized according to the involvement of spinal fusion and by the number of vertebral levels. After

patients were classified by payor type, Private Insurance, Medicare, and Triwest, the contracted payor for the Veterans Administration, were compared.

RESULTS: In complex pathway patients, there was no significant difference between the demographics, complication rates, or operative parameters in any of the groups. When compared overall and individually, there was a significant difference in mean length of stay between all groups (Private vs Medicare vs Triwest, 6.5 vs 5.1 vs 15.5 days, $p = 0.002$) that was mirrored in the days stayed beyond medical clearance (1.4 vs 0.3 vs 10, $p = 0.001$). This delay can translate into additional costs ranging between \$14,000 and \$140,000 per patient. In the intermediate pathway, Medicare patients were significantly older than Private Insurance or Triwest patients (72.7 vs 54.1 vs 54.6 years, $p = 0.001$), and the incidence of comorbid cancer was greater in the Private Insurance and Triwest cohorts compared to Medicare (50% vs 38% vs 0%, $p = 0.007$), but the remaining demographics were not different. There was no difference in length of stay (4 vs 3.15 vs 4.1 days, Private vs Medicare vs Triwest, $p = 0.747$), but the days beyond medical clearance was significant (0.7 vs 0 vs 1.5, $p = 0.031$), and it mirrored the complex group. The levels involved and fusion in each cohort were not different. 49% of patients on the complex pathway were discharged to inpatient rehabilitation facilities compared to 16% on the intermediate pathway.

CONCLUSIONS: Insurance payors can influence length of stay by delaying discharge authorization after spine surgery. The days stayed beyond medical clearance followed a regular pattern regardless of the pathway, with Medicare having less of a delay than Private Insurance, which had less of a delay than Triwest. When involving discharge to inpatient rehabilitation, this delay can significantly affect the total length of stay. Hospital stay beyond what is medically required represents a delay in appropriate patient care and unnecessary expenses that can be draining on our healthcare system, and that represents an opportunity for improvement across multiple procedures and specialties.

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291. Adjustment of the global alignment and proportion scores accounting for frailty in adult spinal deformity surgical patients

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BACKGROUND CONTEXT: Frailty is a baseline measure of disability that transcends age alone and has been determined a strong predictor of outcomes following adult spinal deformity (ASD) surgery. This postop impact calls for investigation of unique adjustment of Global Alignment and Proportion (GAP) scores accounting for frailty. This adjustment in spinal proportion may help surgical planning for individualized, optimal postop outcomes.

PURPOSE: Modify the GAP score with frailty to optimize outcomes in surgical ASD patients.

STUDY DESIGN/SETTING: Retrospective review of a single-surgeon comprehensive ASD database

PATIENT SAMPLE: A total of 140 ASD patients

OUTCOME MEASURES: Frailty-adjusted GAP scores; Health Related Quality of Life scores (HRQLs): ODI, SRS-22