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Comparison of Common Minimally Invasive Operations Using Patient Safety Indicators (PSI)

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INTRODUCTION: The PSI 90, is used to monitor hospital safety, quality, and value. It is composed predominantly of PSI 9 (perioperative hemorrhage), 11 (postoperative respiratory failure), 12 (perioperative deep vein thrombosis/pulmonary embolus), and 13 (postoperative sepsis). MIS has been shown to have fewer complications. We aim to evaluate the rates of PSI between MIS in common procedures.

METHODS: Using a health system database we examined cases that underwent MIS or open appendectomy, cholecystectomy, colectomy, and hysterectomy, and compared them across the four main PSIs over a 2-year period. Operations were compared based on comorbidities, admitting service and procedure. Outcome of interest was surgical approach. Univariate and multivariate analysis was performed in R.

RESULTS: Our sample included a total of 1800 MIS and 1580 open operations. Rates of PSI were: PSI 9, 1.8%, PSI 11, 2.7%, PSI 12, 4.2%, and PSI 13, 5.6%. Patients were similar in comorbidities and demographics, with the exception of open procedures being more likely in cancer patients. Univariate analysis found no significant differences across surgical groupings of open vs MIS, or PSI type. Multivariate regression analysis did not show any significant association in MSI operative status and PSI incidence.

CONCLUSION: While minimally invasive surgery has known clinical benefits, this has not translated into a clear improvement across the AHRQ PSI. Additionally, there are still other modifiable factors that would allow for improvement of PSI 90 in minimally invasive surgery.

Diminishing Returns and the Humble Hernia: Medicare Reimbursement for Herniorrhaphy and Abdominal Wall Reconstruction Over 20 Years (2000-2020)

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INTRODUCTION: Lack of current financial data exist outlining reimbursement trends for hernia repair and abdominal wall reconstruction. We evaluated monetary trends in Medicare reimbursement rates for 30 hernia and abdominal wall reconstruction procedures from 2000-2020.

METHODS: The Centers for Medicare & Medicaid Services database was utilized for each of the 30 included current Procedural

Terminology (CPT) codes, and reimbursement data were extracted. Monetary data were adjusted for inflation to 2020 US dollars (USD) utilizing changes to the United States consumer price index (CPI). The R-squared, average annual percent change and average total percentage change in reimbursement were calculated based on these adjusted trends for all included procedures.

RESULTS: Average reimbursement for all procedures decreased by 17.8% from 2000 to 2020. The greatest mean decrease was observed for CPT code 49568 (the implantation of mesh or other prosthesis for open incisional or ventral hernia repair or mesh for closure of debridement for necrotizing soft tissue infection, -34.4%). The only procedure with an increased adjusted reimbursement rate throughout the study period was CPT code 20680 (+3.9%). The annual adjusted reimbursement rate for all included procedures decreased by an average of 0.88% each year, with an average R-squared of 0.80, indicating a stable decline throughout the study period.

CONCLUSION: A twenty-year decline in Medicare reimbursements for herniorrhaphy and abdominal wall reconstruction is evident. Increased awareness of this trend by surgeons, hospitals, and policy makers is necessary to assure continued access to optimal hernia and abdominal wall reconstruction care within the United States.

Economic Impact of Covid-19 Pandemic on Rural Surgery in the United States

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INTRODUCTION: Rural surgeons are the medical and economic cornerstones of their hospitals and communities. The COVID-19 pandemic devastated small business in the United States inclusive of rural surgeons and hospitals. We sought to estimate the financial impact of the pandemic upon rural surgery practices.

METHODS: An anonymous survey was hosted on Qualtrics. Rural surgeons were identified through the ACS rural surgery communities page and listerv. 110 surveys were completed (23% response), with subjects from 38 states.

RESULTS: Respondents were 71% male and 2/3 were 50-69 years old. Surgeons were primarily hospital-employed (51%), self-employed (27%), or group-employed (14%). Two-thirds reported decreases in income or benefits. 41% of practices terminated or reduced hours for employees. 7% of surgeons were furloughed and 3% were terminated. Surgeons estimated a mean reduction of 72% (IQR 30, range 20-100%) in overall clinical productivity. Endoscopy volumes were severely depressed, with a mean reduction of 81% (IQR 15, range 0-100%), followed by operative case volume 72% (IQR 30, range 9-100%) and outpatient visits 72% (IQR 30, range 24-100%). The pandemic affected retirement timelines for 40% of surgeons,

with 30% reporting plans to retire later than planned. The largest groups now planning later retirement were aged 50-59 (24%) and aged 60-69 (35%). Regional reductions in productivity mirrored COVID-19 community penetrance.

CONCLUSION: The economic impact of the pandemic on rural healthcare has been significant. Rural surgery practices experienced significant reductions in clinical productivity. This likely had far-reaching economic consequences with most practices forced to reduce staffing or compensation.

Health System Affiliation with an American College of Surgeons-accredited Cancer Center Is Associated with Reduction in Mortality or Serious Morbidity in Surgically Treated Cancer Patients

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INTRODUCTION: Hospitals with cancer center accreditation from the American College of Surgeons' Commission on Cancer (CoC) have demonstrated superior outcomes compared to non-CoC-accredited hospitals. The effect of health system affiliation with a CoC-accredited cancer center on outcomes remains unexamined.

METHODS: We performed a retrospective observational study using the Healthcare Cost and Utilization Project State Inpatient Databases for oncologic resections of breast or digestive organ tumors in ten states from 2013 to 2016. Hospitals were classified as CoC-accredited cancer centers, hospitals in health systems containing a CoC-accredited cancer center, and non-CoC-affiliated hospitals. Multivariable logistic regression was used to examine risk-adjusted mortality or serious morbidity.

RESULTS: Of 82,969 patients identified, 19.7% were treated at CoC-accredited cancer centers, 69.6% at hospitals in health systems containing a CoC-accredited cancer center, and 10.8% in non-CoC-affiliated hospitals. There was a significantly reduced risk-adjusted odds of mortality or serious morbidity associated with treatment at CoC-accredited cancer centers (OR: 0.91, 95% CI: 0.86-0.97), or at hospitals in health systems containing a CoC-accredited cancer center (OR: 0.91, 95% CI: 0.86-0.96) when compared with non-CoC-affiliated hospitals.

CONCLUSION: CoC-accredited cancer centers and hospitals in health systems with a CoC-accredited cancer center exhibited similarly superior surgical outcomes vs non-CoC-affiliated hospitals. These findings imply that patients without direct access to a CoC-accredited hospital may experience comparable benefits at

hospitals in systems affiliated with a CoC-accredited center. Potential explanations include shared providers, resources, and quality standards among hospitals in health systems.

Identifying Disparities in Access to Surgery for Operable Carcinoma of the Lung in North Carolina

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INTRODUCTION: We sought to determine whether a vulnerable population undergoes an expected rate of lobectomy for operable lung cancer.

METHODS: We calculated the Proportional Surgical Ratio (PSR) (<https://doi.org/10.1001/jamasurg.2020.5668>) to identify disparities in lobectomy rates. The reference point was the 5 healthiest counties (RC). We compared lobectomy rates in the 5 least healthy counties (LC) to the RC.

RESULTS: In 2016, 3,452 individuals with Stage I-3A lung cancer were diagnosed in North Carolina. 246,854 individuals resided in the LC while 1,865,588 individuals resided in RC. 509 operable lung cancers were diagnosed in the RC and 129 in the LC. The age adjusted prevalent cancer rate in the RC was 27 per 100,000 (range 0-31) and 52 per 100,000 (range 32-61) in the LC. The mean household income for LC was \$32,560 (SD \$1,552) and \$62,671 (SD \$3,649) for RC ($p=0.015$). The mean percent of AA was 39.1% (SD 12.4%) for LC and 17.4% (SD 8.4%) for RC ($p=0.031$). The mean percent uninsured for LC was 19.8% (SD 3.3%) and 16% (SD 2.2%) for RC ($p=0.08$). The observed lobectomy rate in RC was 35% (range 17%- 53%) of early stage lung cancer and 19% (range 12% -36%) for LC. The PSR was 0.54 (95% CI 0.35,0.80).

CONCLUSION: Individuals residing in LC are 46% less likely to undergo lobectomy for operable lung cancer despite nearly a two-fold increase in cancer prevalence. This disparity does not appear to be due to insurance status. Further research is necessary to understand the drivers of this disparity.

Identifying Low-value Inpatient Hospitalizations Following Emergency Department Requests for Surgical Consultations

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INTRODUCTION: Inpatient surgical consultation is sometimes requested for complaints safe for outpatient evaluation and treatment. We hypothesized that exploring inpatient consultations requested within 48 hours of discharge would reveal opportunities