

Insurance status is associated with complex presentation among emergency general surgery patients

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Background. The Affordable Care Act has the potential to significantly affect access to care for previously uninsured patients in need of emergency general surgical care. Our objective was to determine the relationship between insurance status and disease complexity at presentation among a national sample of emergency general surgical patients.

Methods. Data from the National Emergency Department Sample from 2006–2009 were queried to identify all patients aged 18–64 years old admitted through the emergency department with a primary diagnosis of appendicitis, diverticulitis, inguinal hernia, or bowel obstruction. Primary outcome of complex presentation was defined as also presenting with generalized peritonitis, intra-abdominal abscess, perforated bowel, intestinal gangrene, or other disease-specific measures of complexity. We used multivariable logistic regression to determine the independent association between insurance status and complex presentation. Models accounted for patient- and hospital-level covariates. Counterfactual models were used to estimate the risk of complex presentation attributable to lack of insurance.

Results. A total of 1,373,659 patients were included, with an overall uninsured rate of 12.3%. Uninsured patients had significantly higher, unadjusted rates of complex presentation, and uninsured payer status was independently associated with complex presentation (odds ratio 1.38, 95% confidence interval: 1.34–1.42). Counterfactual models suggest that having insurance would result in a 22.37% (95% confidence interval: 22.35–22.39%) relative decline in risk of complex emergency general surgical presentation among the uninsured population.

Conclusion. Insurance status is independently associated with severity of disease at presentation among emergency general surgical conditions nationally. In light of recently reaffirmed Affordable Care Act insurance expansion provisions, these results anticipate increased timely access to operative care for newly insured patients and a corresponding decline in complex, emergency general surgical presentations. (*Surgery* 2016;■:■-■.)

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EMERGENCY GENERAL SURGERY (EGS) represents >11% of all surgical admissions and one-half of all surgical mortality.^{1,2} Timely access to care is paramount to reducing morbidity and mortality associated

with these conditions that are often characterized by acute onset and relatively rapid progression. For many EGS conditions, delays in diagnosis and management are often associated with more

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complex presentation characterized by abscess formation, generalized peritonitis, mechanical obstruction, bowel perforation, or other related complications.³⁻⁸ The primary drivers among patients who knowingly delay or forgo necessary care are perceived inability to pay for care, lack of familiarity with ways to access care early, and insurance-related delays.⁹

In several focused studies, lack of insurance has been associated with more complex presentation among a variety of acute surgical conditions.³⁻⁸ Uninsured patients are more likely to delay seeking care, have a more difficult time reaching care, have more complex disease at time of presentation, require more costly care, and have greater morbidity and mortality.^{3-5,10-15} One of the central goals of the 2010 Affordable Care Act (ACA) is to reduce the number of uninsured individuals in the country. Analysis of early insurance expansion efforts demonstrate that gaining insurance is associated with being more likely to have a usual source of care,^{13,16} being less likely to forgo necessary care for fear of inability to pay,^{13,17} and population-level improvements in the complexity of presentation for care-sensitive conditions,¹⁸ such as acute appendicitis.¹⁹ As such, it is possible that ongoing insurance expansion efforts may reduce barriers to care for the sickest general surgery patients, which could result in less complex EGS disease at presentation due to better access to care.

Currently, little is known regarding nationally representative trends concerning the relationship between insurance coverage and the complexity of disease presentation among patients with access-sensitive EGS conditions. Characterizing the degree to which lack of insurance impacts disease presentation among EGS patients is necessary in order to understand the ways in which coverage expansion policies may mitigate some of the effects of insufficient access to timely care among the currently uninsured.

Because full-scale implementation of ACA-related coverage expansion only started in 2015 and pre/post analyses are not yet possible, nationally representative analyses of pre-ACA data are required to provide insight into the population-level changes surgeons should anticipate with ongoing health reform. As such, the aims of the current study were (1) to determine the impact of insurance status on the rates of complex presentation among patients admitted with EGS diagnoses thought to be sensitive to delays in access to care and (2) to estimate the upper bound of the possible impact of reductions in the national

uninsured rate on the risk of complex EGS presentation.

METHODS

Data set and analytic sample. We performed a retrospective analysis of 2006–2009 data from the Healthcare Cost and Utilization Project's (HCUP) Nationwide Emergency Department Sample (NEDS), the largest, publically available data set of all-payer emergency department presentations in the United States. We used data through 2009 as to predate any of the insurance expansion efforts of the ACA, and we used the emergency department discharge weights supplied by the NEDS to allow for nationally representative analyses.

Our analytic sample included all nonelderly adults, aged 18–64 years, presenting to the emergency department with 1 of 4 common EGS primary diagnoses: appendicitis, diverticulitis, small bowel obstruction (SBO), or groin hernia. These diagnoses were drawn from a list of commonly accepted diagnoses that may require emergency surgery¹ and were specifically chosen because they may each progress to a more complex state in the absence of timely access to care.

Patients without insurance have been shown to rely on the emergency department for routine, nonemergent care in the absence of a usual source of care.^{20,21} As such, to isolate our sample to include EGS presentations, we included only those patients admitted through the emergency department.

Outcome variable. The primary outcome of interest was complex disease presentation. Patients presenting with a primary diagnosis of 1 of the 4 EGS conditions of interest were identified using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis codes. A patient was considered to have a complex presentation if any of the secondary diagnosis codes included generalized peritonitis or intra-abdominal abscess (569.5, 567.21, 567.22, 567.23, 567.29), intestinal perforation or gangrene (569.83, 557.0), or disease-specific ICD-9-CM codes for more complex disease presentation, such as perforated appendicitis (540.0, 540.1), obstruction due to mural thickening in diverticulitis (560.89, 560.9), feculent emesis in the setting of an SBO (569.87), or incarcerated or obstructing groin hernia (550.10, 550.01, 550.02, 550.03, 550.10, 550.11, 550.12, 550.13).

This method of using ICD-9-CM codes in administrative data to identify more complex disease presentation is derived from the Agency for Healthcare Research and Quality Prevention

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