Study finds significantly higher hospital costs for surgical patients who smoke

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Cigarette smoking contributes to significantly higher hospital costs for smokers undergoing elective general surgery, according to a study published in the June 2012 issue of the *Journal of the American College of Surgeons*. When researchers analyzed data on more than 14,000 patients, they found that postoperative respiratory complications help drive up these health care costs.

Study researchers estimate that approximately 30 percent of patients undergoing elective general surgery procedures smoke. Although an abundance of research exists associating smoking with an increased risk of numerous postoperative complications, especially those related to pulmonary, cardiovascular, and wound-healing outcomes, little information is avail-able comparing surgical costs for smokers versus nonsmokers, said Aparna S. Kamath, MD, MS, lead study author and clinical assistant professor of internal medicine, University of Iowa Hospitals and Clinics, Iowa City.

In this study, Dr. Kamath and colleagues analyzed data on 14,853 patients who had undergone a general surgery operation in 123 Veterans Affairs (VA) Medical Centers during a one-year period. The patients, mostly white males, were classified into one of three groups: 34 percent were current smokers (patients who smoked within the year before their operation), 39 percent were former smokers (patients with a history of smoking, but who did not smoke during the year before their operation), and 27 percent were never smokers.

Researchers then examined hospital costs in three areas: the operation, subsequent readmission within 30 days of discharge, and length of hospital stay. Because smokers often have coexisting health conditions such as hypertension, chronic obstructive pulmonary disease, diabetes, and coronary artery disease---all of which can drive up health care costs---the researchers controlled for these factors as well as other factors, including age and urgency of surgical procedure.

Study results showed that total inpatient costs were 4 percent higher for current smokers compared with patients who never smoked. That finding translated into a higher cost of approxi-mately $900 for each patient who underwent a surgical procedure, Dr. Kamath said. The same was not true for former smokers, for whom costs were not statistically significant compared with patients who never smoked. After factoring in the complexity of the operation, researchers found that hospital costs for smokers who had more complex procedures were 6 percent higher compared with hospital costs for patients who never smoked.

Another aim of the current study was to determine if the increased costs found for smokers were primarily the result of respiratory complications. Upon further analysis, the researchers found that, in fact, postoperative respiratory complications, and not length of hos- pital stay, account for the added expense for smokers undergoing elective general surgery operations. "It wasn't a surprise, but it's important to actually prove this expectation," Dr. Kamath said.

In short, the findings from this study underscore the need for preoperative behavioral interventions targeting smoking cessation, Dr. Kamath said. "This research just strengthens our belief that we should encourage patients to quit smoking before their operations because of respiratory complications, in order to improve their surgical outcomes. In addition, it provides health care stakeholders and decision makers with data to make a business case for preoperative smoking cessation

interventions," she said.

Importantly, even short periods of abstinence may be beneficial. "Although our research did not directly address this issue, evidence suggests that quitting smoking before an operation, even as little as four to six weeks prior to the procedure, improves postoperative outcomes and decreases complications in patients," Dr. Kamath said. "I think it's important to use the time before a surgical procedure as a teachable moment."

This study was conducted using two data sources, the National VA Surgical Quality Improvement Program (VASQIP) and Decision Support System (DSS). VASQIP was established in 1994 as a statistically reliable, risk-adjusted tool to help the Department of Veteran's Affairs measure its quality of care. This data-driven initiative served as the basis for the development of the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP), which now is used in hundreds of hospitals across the nation to reduce complications, improve outcomes, and decrease costs.

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