The US Department of Veterans Affairs provides patient care and federal benefits to veterans and their dependents.

Surgical site infection (SSI) complicates approximately 2% of surgeries in the Veterans Affairs (VA) hospitals. Surgical site infections are responsible for increased morbidity, length of hospital stay, cost, and mortality. Surgical site infection can be minimized by modifying risk factors. In this study, we identified risk factors and developed accurate predictive surgical specialty-specific SSI risk prediction models for the Veterans Health Administration (VHA) surgery population.

In a retrospective observation study, surgical patients who underwent surgery from October 2013 to September 2016 from 136 VA hospitals were included. The Veteran Affairs Surgical Quality Improvement Program (VASQIP) database was used for the pre-operative demographic and clinical characteristics, intra-operative characteristics, and 30-day post-operative outcomes. The study population represents 11 surgical specialties: neurosurgery, urology, podiatry, otolaryngology, general, orthopedic, plastic, thoracic, vascular, cardiac coronary artery bypass graft (CABG), and cardiac valve/other surgery. Multivariable logistic regression models were developed for the 30-day post-operative SSIs.

Among 354,528 surgical procedures, 6,538 (1.8%) had SSIs within 30 days. Surgical site infection rates varied among surgical specialty (0.7%-3.0%). Surgical site infection rates were higher in emergency procedures, procedures with long operative duration, greater complexity, and higher relative value units. Other factors associated with increased SSI risk were high level of American Society of Anesthesiologists (ASA) classification (level 4 and 5), dyspnea, open wound/infection, wound classification, ascites, bleeding disorder, chemotherapy, smoking, history of severe chronic obstructive pulmonary disease (COPD), radiotherapy, steroid use for chronic conditions, and weight loss. Each surgical specialty had a distinct combination of risk factors. Accurate SSI risk-predictive surgery specialty-specific models were developed with number of variables ranging from 9 to 21 and the C-index ranging from 0.63 to 0.81, indicating acceptable discrimination. The decile plot of predicted versus observed SSI rates showed strong calibration.

Surgery specialty-specific risk factors of 30-day post-operative SSI rates have been identified for a variety of surgery specialties. Accurate SSI risk-predictive surgery specialty-specific SSI predictive models have been developed and validated for the VHA surgery population. These models can be used to develop optimal preventive measures for high-risk patients, patient-centered care planning, and surgical quality improvement <sup>1)</sup>.

## 1)

Li X, Nylander W, Smith T, Han S, Gunnar W. Risk Factors and Predictive Model Development of Thirty-Day Post-Operative Surgical Site Infection in the Veterans Administration Surgical Population. Surg Infect (Larchmt). 2018 Feb 1. doi: 10.1089/sur.2017.283. [Epub ahead of print] PubMed PMID: 29389252.

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