

# New American College of Surgeons risk calculator determines colorectal surgery risk

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New research published in the June issue of the *Journal of the American College of Surgeons* shows that a risk calculator developed by the American College of Surgeons (ACS) can help surgeons provide patients with more detailed and accurate preoperative information about the risk of death and complications following colorectal surgery. The tool will also allow surgeons to adjust risk probabilities for patients based on their hospital's performance during prior years.

Accurately predicting risk of postoperative adverse outcomes is central to the delivery of high-quality surgical care. Although clinical decision-making and patient consent have historically been informed by clinical experience, physicians and patients are in need of more detailed, customized information about the postoperative risk of infection, cardiovascular events and other adverse outcomes. Currently available risk-estimating tools have one or more limitations associated with lack of specificity to operation type, reliability, and range of outcomes predicted. Furthermore, although other risk-assessment tools have focused almost exclusively on individual patient risk factors, it is well understood that hospitals influence surgical outcomes.

"This novel predictive tool will help surgeons and patients more accurately weigh the risks and potential benefits of colorectal operations," said Mark E. Cohen, PhD, Division of Research and Optimal Patient Care, American College of Surgeons. "The calculator provides a comprehensive assessment of risk based on both patient and hospital factors and may serve as a template for the development of

similar tools for other types of operations."

"In addition to improving informed decision making, this tool could also improve resource planning and could highlight concerns for potential risk modification," said Karl Y. Bilimoria, MD, MS, a surgical resident at the Feinberg School of Medicine at Northwestern University in Chicago.

Using the ACS National Surgical Quality Improvement Program (NSQIP) database, data on 28,863 patients who underwent colorectal operations at 182 hospitals in 2006 to 2007 were analyzed to generate three logistic prediction models for 30-day morbidity, serious morbidity and mortality. The models considered more than 30 predictive variables such as patient age, gender, extent of disease, body mass index, shortness of breath and comorbidities such as chronic obstructive pulmonary disorder (COPD), high blood pressure, pneumonia, cardiovascular or neurologic diseases, diabetes and cancer. Outcomes were assessed at 30 days, regardless of whether the patient was discharged, remained hospitalized or was admitted to a different institution. The models were validated against 2005 data from 3,037 colorectal operations conducted at 37 hospitals, and similar model discrimination was shown. Results for these three models were used to construct a universal multivariable model to predict risk for all three outcomes.

Application of the variable selection process for the universal model yielded 13 variables that appeared in models for all three outcomes and two variables that appeared for two outcomes. Odds ratios for variables selected in the universal model showed findings generally consistent with clinical expectations.

The 15 predictive variables selected for the universal model were age; body mass index; extent of disease; sepsis (bloodstream infection); functional health status; preoperative laboratory values of albumin,

creatinine and partial thromboplastin time (a measure of blood clotting); indication for operation (for example, cancer or obstruction); disseminated cancer; surgical extent for example, partial or total removal of the colon); whether the operation was associated with an emergent condition; shortness of breath; COPD; and type of wound (for example, clean versus infected).

The results reported here were for a prototype risk calculator. However, it is expected that an updated online version of the colorectal calculator, as well as calculators for several other surgical procedures, will be available by the end of the year.

Source: Weber Shandwick Worldwide ([news](#) : [web](#))

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