

DERIVATION AND VALIDATION OF A CLINICAL PREDICTION RULE FOR NOSOCOMIAL PNEUMONIA AFTER CORONARY ARTE

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About this article:"In this large population study authors derived and validated a predictive rule to develop pneumonia in coronary artery by pass graft surgery patients. The AUCs for the derivation and validation cohorts were 0.78 and 0.75, respectively. This study allows to detect patients with a high risk to develop VAP after this type of surgery and consequently to implement special measures of prevention."

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BACKGROUND: Nosocomial pneumonia is an important cause of morbidity and mortality among surgical patients in the United States. The emergence of effective but potentially costly or risky preventive interventions makes perioperative risk stratification desirable. We sought to develop a prediction rule for pneumonia after coronary artery bypass grafting (CABG), a common surgical procedure.

METHODS: Data on individuals undergoing CABG at 32 hospitals in 6 states were extracted from Tenet Healthcare's Quality and Resource Management System. A logistic regression-based prediction rule was developed in half of the study sample and validated in the remaining patients.

RESULTS: Of 17,143 individuals undergoing CABG from January 1999 through February 2004, 361 (2%) developed pneumonia without a known aspiration etiology. Thirteen independent predictors of pneumonia were identified in the derivation subset of the sample: body mass index <18.5 (defined as the weight in kilograms divided by the square of the height in meters), smoking history, admission from a nonresidential setting, cancer history, chronic obstructive pulmonary disease, Canadian Cardiovascular Society score 3, prior internal mammary artery CABG, emergency status, serum creatinine level >1.2 mg/dL, percutaneous transluminal coronary angioplasty, blood transfusion, preoperative vancomycin administration, and receipt of mechanical ventilation for >1 day. The model-based rule was well calibrated (Hosmer-Lemeshow [Formula: see text]; [Formula: see text]) and demonstrated good discrimination (area under the receiver-operating characteristic curve [ROC AUC], 0.78) in the derivation group. Discriminatory ability was also reasonable in the validation cohort (ROC AUC, 0.75; [Formula: see text], for difference in ROC AUC between groups).

CONCLUSIONS: Using a large cohort of patients treated at community and teaching hospitals, we derived and validated a prediction rule for pneumonia after CABG. This index may prove to be useful in prioritizing receipt of preventive interventions.