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Details of Methods

Calculating the Charlson Comorbidity Index

For each patient, a comorbidity score was calculated with use of the Charlson comorbidity index (CCI), modified to fit the available data[18]. Studies have demonstrated that such modified CCIs are similar in efficiency and prognosis to the original CCI[19,20], and the modified CCI we employed has been used previously with the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database[21]. The comorbidities used to determine the modified CCI were directly available in the data set and included (followed by corresponding point values): myocardial infarction within the six months prior to surgery (1), congestive heart failure (1), peripheral vascular disease or rest pain (1), any history of transient ischemic attack or cerebrovascular accident (1), chronic obstructive pulmonary disease (1), diabetes mellitus (1), hemiplegia (2), end-stage renal disease (2), ascites or esophageal varices (3), and disseminated cancer (6). The point values were summed for a total number, to which one point was added for each decade greater than forty years of age.

Defining the Composite Adverse-Event Outcomes

The ACS NSQIP tracks patients for the occurrence of any of twenty-three individual adverse events during the first thirty postoperative days. Those twenty-three individual adverse events were used to generate two composite adverse event outcomes. Consistent with previous definition[21], a "serious adverse event" was defined as the occurrence of any of the following: death, a coma for more than twenty-four hours, ventilator for more than forty-eight hours, unplanned intubation, stroke/cerebrovascular accident, pulmonary embolism, cardiac arrest, myocardial infarction, acute renal failure, sepsis, septic shock, or return to the operating room. Similarly, "any adverse event" was defined as the occurrence of any of the following: any of the serious adverse events listed above, wound disruption, superficial surgical site infection, deep surgical site infection, organ/space infection, urinary tract infection, pneumonia, blood transfusion, progressive renal insufficiency, graft/prosthesis/flap failure, peripheral nerve injury, or deep vein thrombosis. ■