

Author/Year	Morbidity Definition
Gawande (2007)	Acute renal failure, bleeding requiring ≥ 4 U red cell transfusion within 72 hours after operation, cardiac arrest requiring CPR, coma for 24 hours or longer, deep venous thrombosis, septic shock, MI, unplanned intubation, ventilator use for 48 hours or longer, pneumonia, pulmonary embolism, stroke, wound disruption, deep or organ space surgical site infection, sepsis, systemic inflammatory response syndrome, and vascular graft failure, according to NSQIP's established definitions. All deaths were considered major complications. (Superficial surgical site infection and urinary tract infection were not major complications.)
Regenbogen (2009)	As per Gawande et al. 2007
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Wuerz (2011)	Deep venous thrombosis, bleeding requiring equal or, more than 4 units of PRBC, pneumonia, acute renal failure, pulmonary embolism, myocardial infarction, unplanned intubation, cardiac arrest, systemic inflammatory response syndrome, surgical site infection, ventilator dependence, stroke, septic shock, sepsis, coma, wound disruption.
Haynes (2011)	As per Gawande et al. 2007
Ohlsson (2011)	Acute renal failure requiring dialysis, bleeding requiring ≥ 4 units of red cell transfusion within 72 hours, cardiac arrest requiring CPR, coma for ≥ 24 hours, deep venous thrombosis, septic shock, myocardial infarction, unplanned intubation, ventilator use ≥ 48 hours, pneumonia, pulmonary embolism, stroke, wound disruption, deep or organ space surgical site infection, sepsis, systemic, inflammatory response syndrome, vascular graft failure, death.
Roghman (2012)	N/A
Thorn (2012)	As per Gawande et al. 2007
Urrutia (2012)	As per Gawande et al. 2007
Dullo (2013)	As per Copland et al. 1991. Br. J. Surg. 1991;78(3)355-360.
Sobol (2013)	N/A
Miki (2014)	The severity of complication was graded using the Clavien–Dindo classification. Patients with a Clavien–Dindo classification of grade IIIa or higher were defined as having severe complications.
Glass (2015)	N/A
Jering (2015)	Acute renal failure, cardiac arrest requiring cardiopulmonary resuscitation, coma for 24 hours or longer, deep venous thrombosis, septic shock, myocardial infarction, pneumonia, pulmonary embolism, stroke, deep or organ-space surgical site infection, sepsis, systemic inflammatory response syndrome, vascular graft failure, bleeding requiring transfusion with ≥ 4 units red cells within 72 hours after operation, unplanned intubation.
Sakan (2015)	The major complications were defined as the development of the following: postoperative bleeding that required transfusion of four units or more of packed red blood cells within 72 hours, cardiac arrest, myocardial infarction, deep venous thrombosis, pulmonary embolism, stroke or transient ischemic attack, unplanned intubation, mechanical ventilation for 48 h or more, pneumonia, sepsis, septic shock, and acute renal failure.
Urrutia (2015)	As per Gawande et al. 2007
Eto (2016)	Regarding the definition of morbidities, we applied the definitions of risk-adjusted morbidity and mortality for esophagectomy as a cancer treatment in accordance with the Society of Thoracic Surgeons General Thoracic Surgery Database guidelines. Morbidity was defined as Clavien–Dindo classification III in the current study which indicated a morbidity requiring surgical, endoscopic, or radiological intervention under general anesthesia.
Wied (2016)	As per Gawande et al. 2007
Ejaz (2016)	Morbidity included minor infections (urinary tract infection, surgical site infection, and Clostridium difficile infection), major infections (sepsis, ventilator-associated pneumonia, and drug-resistant infections), transient ischemic attack, cerebrovascular attack, myocardial infarction, deep vein thrombosis, pulmonary embolism, and disseminated intravascular coagulation. Deaths that occurred within 30 days of the index operation were categorized as a perioperative death.
House (2016)	N/A
Cihoric (2016)	Primary outcome measure for this study was death within 30 days after the surgery. Secondary outcomes were postoperative major complications within 30 days as well as admittance to the ICU. Complications were defined according to the Clavien-Dindo <i>Classification of Surgical Complications</i> (CDC). The CDC defines a complication as any deviation from a normal postoperative course, grading complications according to the treatment necessary to correct these, with Clavien III, IV, and V (death) characterized as major complications. A CDC grade 4 complication is defined as a “life-threatening complication requiring IC/ICU-management” and is therefore indirectly dependent on and associated with the availability of ICU beds. Complications were graded in subsequent categories: surgical complications (postoperative abdominal wall dehiscence, surgical site bleeding, upper gastrointestinal bleeding, ileus, wound infection, intra-abdominal infection/abscess, or anastomotic leakage) and medical complications according to involved organ systems (central nervous system, pulmonary, cardiac, gastrointestinal malfunction, urogenital, and thromboembolic). The CDC does not define pneumonia, pulmonary embolism, and deep venous thrombosis as major complications when treated exclusively with medication. We did, however, include these in accordance with the American College of Surgeons' National Surgical Quality Improvement Program. This was done to facilitate direct comparison with previous studies of the SAS.
Stroyer (2017)	Patient outcomes were followed in the electronic patient chart and complications within 30 days after the esophagectomy were identified and classified using the Clavien–Dindo Classification.

Ngarambe (2017)	The primary outcomes were in-hospital mortality and major complications. Only in-hospital outcomes were assessed due to resource limitations making 30-day outcomes difficult to assess. Major complications were classified based on American College of Surgeons-National Surgical Quality Improvement Program (ACS NSQIP) modified to the local environment based on treating physician assessment.
Ou (2017)	As per Gawande et al. 2007
Hsu (2017)	As per Gawande et al. 2007
Kurata (2017)	In this study, major postoperative complications were defined as more than Grade 3 based on Clavien-Dindo classification version 2.0, such as unplanned admission to the ICU, reoperation, fistula, anastomotic leak, pulmonary embolus, death, and unplanned readmission to the hospital within 30 days of the index operation.
Mastalerz (2018)	The primary end points were analyses of the occurrence of complications within 30 days, death within 30 days and 12 months follow-up after surgery. Complications were defined as any event occurring within 30 days of surgery that requires treatment not routinely applied in the post-operative period. The predefined complications were documented prospectively, allowing the complete accrual of data. The severity of complications was classified according to the Clavien-Dindo scale.
Day (2018)	Finally, 30-day postoperative morbidity and mortality events and hospital length of stay were manually extracted from the EMR. Morbidities were gathered per the common postoperative head and neck complications listed in the study by Ettinger (2016). Ettinger (49): All surgical complications necessitating a return to the operating room (OR) were classified as 'major' complications. Any partial flap failures or complete flap failures were recorded as major complications regardless of whether a return to the OR was necessitated. Mortality was recorded as a major complication. Any surgical complications not necessitating a return to the OR (excluding partial and complete flap failures) were categorized as 'minor' complications. The medical complications were intentionally chosen (with minor additions and modifications) to mirror those set forth by the American College of Surgeons' National Surgical Quality Improvement Program, which is the most widely recognized quality measurement system for noncardiac surgery in the United States.
Kotera (2018)	As per Gawande et al. 2007
Goel (2018)	The primary outcome of interest was SC (serious complication). Patients who experienced any of the following occurrences, as defined by ACS NSQIP and regardless of cause, within 30 days after EMCS were defined as having a postoperative SC: deep incisional superficial site infection (not present at the time of surgery [not PATOS]), organ space superficial site infection (not PATOS), wound disruption, myocardial infarction, cardiac arrest, unplanned intubation, pneumonia (not PATOS), pulmonary embolus, progressive renal insufficiency, acute renal failure, urinary tract infection (not PATOS), venous thrombosis requiring therapy, systemic sepsis (not PATOS), or return to the operating room.
Kenig (2018/1)	The primary end-points were: the occurrence of major complications within 30 days, death within 30 days, and twelve-month follow-up after surgery. Complications were defined as any event occurring within 30 days of surgery that required treatment not routinely applied in the post-operative period. The severity of complications was classified according to the Clavien-Dindo scale.
Kenig (2018/2)	The primary end points were major complications and death within 30 days after surgery. Complications were defined as any event occurring within 30 days of surgery that requires treatment not routinely applied in the post-operative period. The predefined complications were documented prospectively, allowing the complete accrual of data. The severity of complications was classified according to the Clavien-Dindo scale.
Tomimaru (2018)	We defined postoperative complications as any complication rated grade II in the Clavien-Dindo classification system.
Prince (2018)	Included morbidities were defined as previously established by Ettinger et al, which reflects that established by the American College of Surgery. Ettinger (49): All surgical complications necessitating a return to the operating room (OR) were classified as 'major' complications. Any partial flap failures or complete flap failures were recorded as major complications regardless of whether a return to the OR was necessitated. Mortality was recorded as a major complication. Any surgical complications not necessitating a return to the OR (excluding partial and complete flap failures) were categorized as 'minor' complications. The medical complications were intentionally chosen (with minor additions and modifications) to mirror those set forth by the American College of Surgeons' National Surgical Quality Improvement Program, which is the most widely recognized quality measurement system for noncardiac surgery in the United States. (J Oral Maxillofac Surg -1-10, 2016)
Ding (2018)	As per Gawande et al. 2007
Singh (2018)	Major complications were classified according to the NSQIP. They included acute renal failure, bleeding that required a red blood cells transfusion of 4 U or more within 72 hours after surgery, cardiac arrest requiring cardiopulmonary resuscitation, coma lasting 24 hours or longer, deep venous thrombosis, myocardial infarction, unplanned intubation, ventilator use for 48 hours or more, pneumonia, pulmonary embolism, stroke, wound disruption, deep or organ space surgical site infection, sepsis, septic shock, systemic inflammatory response syndrome and vascular graft failure. Other complications were assessed on a case-by-case basis by the authors, and complications reaching a Clavien-Dindo score of III or IV were counted as major complications.
Abbreviations: CPR = cardio-pulmonary resuscitation, ICU = intensive care unit, MI = myocardial infarction, NSQIP = national surgery quality improvement program, VASQIP = veterans affairs surgical quality improvement program	