

Surgical Rescue in Medical Patients

The Role of Acute Care Surgeons as the Surgical Rapid Response Team

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KEYWORDS

• Surgical rescue • Surgical rapid response • Emergency surgery • Failure to rescue

KEY POINTS

- Surgical rescue is defined by the assessment and operative management required to prevent death in a critically ill patient.
- Failure to rescue occurs as a result of both microsystem and macrosystem factors, which encompass elements of both individual and hospital system performance.
- Partnership between medical and surgical providers is essential for the timely diagnosis and management of surgical pathology in the medical intensive care unit.

INTRODUCTION

Ward patients may deteriorate insidiously to the point of cardiopulmonary arrest. This clinical decline, on average over 6 hours, is often not recognized and frequently preventable. Rapid response systems have developed as a means to promptly provide a team to intervene and abort the downhill spiral. There are 4 elements to this response, as described in the First Consensus Conference on Medical Emergency Teams: the afferent component during which the patient is identified and the team activated; the efferent component, during which the response team provides the expertise for intervention; the process improvement component, which provides ongoing quality evolution; and the administrative component, which creates organizational and educational structure.¹ The criteria that precipitate activation generally include thresholds for heart rate, blood pressure, and mental status, as well as “gut feeling” of the staff.^{2,3} The inciting complications are usually medical and include pulmonary embolism, myocardial infarction, dysrhythmia, pneumonia, stroke, sepsis, and respiratory

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fatigue. Although the incipient complication may not be preventable, further deterioration and death often are avoidable if promptly identified and the appropriate response team activated. In the surgical population, complications are 2 to 4 times more common compared with medical patients, despite only 40% of in-hospital complications being due to surgical procedures. Surgical complications are more likely to be avoidable (from operative error), with more serious consequences of the surgical complication; such as common bile duct injury during cholecystectomy or anastomotic leak after a bowel resection. After a complication has occurred, the goal of the clinical care team is to prevent further deterioration, additional complications, and at the most extreme, death, which would be defined as *failure to rescue*.⁴ Prompt intervention and salvage of the patient after a surgical (operative or interventional) complication is defined as *surgical rescue*.⁵ In the medical population, this concept of rescue also can be applied to the 2% to 4% of intensive care unit (ICU) patients who will require surgical intervention for intra-abdominal pathology. The most frequent indications for abdominal operation in ICU patients are bowel perforation, bowel ischemia, cholecystitis, bowel obstruction or volvulus, and severe *Clostridium difficile* colitis (Box 1).^{6,7}

Surgical rescue has recently developed as an essential part of acute care surgery practice, as surgeons have become increasingly involved in emergency interventions for critically ill patients.^{5,8–10} Analysis of Centers for Disease Control and Prevention (CDC) discharge data shows that 41% of all hospital discharges are emergent, and 25% are urgent, demonstrating the overall high acuity of the care we provide. Further evaluation of the CDC data reveals that more than 1 million patient discharges are a result of “surgical and medical complications,” greater than the number discharges for the common medical admission diagnoses of septicemia, diabetes, or bronchitis.¹¹ A review of the experience in our own institution noted that 13% (320 of 2410) of our acute care surgery patients were treated for procedural complications; 85% were postoperative, but notably with 15% related to interventional or endoscopic procedures. These patients are acutely ill, 49% requiring ICU admission, and 63% requiring operative intervention. The care required for the survival of these patients necessitates the teamwork of multiple surgical subspecialties and interventionalists, support from intensivists through the management of mechanical ventilation, vasopressor and nutritional support, and careful monitoring for additional complications. All of these teams and resources represent the “efferent limb” of an institutional rapid response system (RRS), each providing an area of expertise critical to the care of the patient. *Surgical*

Box 1**Abdominal catastrophes in the intensive care unit**

Mesenteric ischemia
Perforated ulcer
Acute cholecystitis
Pancreatitis
Clostridium difficile colitis
Bowel obstruction
Abdominal compartment syndrome
Massive gastrointestinal bleeding
Ruptured visceral or aortic aneurysm

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