

Assessment of the emergency surgical patient

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Abstract

It is well known that emergency surgical patients have a higher risk of postoperative morbidity and mortality than those having elective procedures. A systematic preoperative assessment forms an important part of identifying risk factors and reducing their impact. Patients may require simultaneous resuscitation and assessment. Further deterioration in the patient's condition must not occur as a result of delays in decision making or awaiting results of investigations. A risk assessment score is useful for both surgeons and patients to provide information on possible postoperative outcomes. It will aid discussion for informed consent and guide planning of staffing for surgery and post-operative care location.

Keywords Assessment; emergency surgery; fasting; functional capacity; optimization; risk scoring

Royal College of Anaesthetist CPD Matrix: 2A03, 2A06

Emergency surgery carries a higher risk of postoperative morbidity and mortality than elective surgery. Factors that contribute to this include the nature of the emergency and its physiological effects, poorly controlled coexisting diseases, unfasted patients, time pressure and limited preoperative information. A National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report¹ published in 2011 found delays in assessment, decision making and delivery of treatment contributed to poor outcome after emergency surgery. Appropriate preoperative assessment of patients presenting with non-cardiac surgical emergencies facilitates better planning of surgery, better communication and should contribute to improving outcome.²

In the emergency setting the time available for preoperative assessment and intervention is frequently limited. In this time, a number of decisions need to be made including:

- Which surgical procedure is indicated?
- Is surgery appropriate?
- What is the risk of morbidity and mortality?
- Is there time to improve the patient's condition before surgery?

The first decision is usually made by the admitting surgeon prior to contacting the anaesthetist. The remaining decisions are best made after multidisciplinary assessment and discussion. Futile surgery should not be performed. Alternative surgical

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Learning objectives

After reading this article, you should be able to:

- summarize the risk factors for emergency surgery
- perform an assessment of the emergency surgical patient
- use a risk score to predict morbidity and mortality for a patient
- identify patients who would benefit from high-level post-operative care

NCEPOD categories of emergency surgery

1. **Immediate.** Patient requires immediate surgery (within minutes) for life-threatening injuries such as ruptured aortic aneurysm, major trauma/haemorrhage, acute intracranial pathologies and some obstetric emergencies
2. **Urgent.** Patient requires urgent surgery (usually within hours) for potentially life- or limb-threatening conditions where deterioration is inevitable such as perforated viscus, open fractures
3. **Expedited.** Patient requires early treatment but the condition is not an immediate threat to life, limb or organ survival such as nerve or tendon repairs. Surgery is normally within days of decision

Box 1

procedures or medical options should be considered if the patient's condition is so poor that surgery is unlikely to alter outcome. The concept of damage control surgery is important with the aim to perform the shortest, simplest operation possible to save life and stabilize the patient. Definitive surgery is then performed later after a period of further resuscitation and optimization.

Preoperative assessment should be tailored to the situation. It usually consists of taking a history, examining the patient and ordering and interpreting investigations. Risk scoring can then be performed to aid treatment decisions, postoperative care planning and discussions during informed consent. These processes will need to be modified when clinical emergencies restrict the time available. An assessment of the patient's ability to consent to the surgery must also be made.

Non-elective surgery is categorized by NCEPOD into three broad groups according to urgency (Box 1).

Assessment

Patients in the most urgent group (NCEPOD-1) present the greatest challenge. They need simultaneous assessment and resuscitation, following trauma or crisis management principles. History may be very limited or non-existent. The AMPLE mnemonic is useful and provides a suitable basis for planning anaesthesia:

- A allergies
- M medication
- P past medical history
- L last meal
- E events

Examination should focus on:

Airway

- Assess patency and for potentially difficult intubation. Rapid sequence induction and endotracheal intubation may be necessary as part of this initial resuscitation.

Breathing

- Give 100% oxygen. Identify and treat respiratory failure, tension pneumothorax, haemothorax, effusion, pulmonary oedema. Induction of anaesthesia and mechanical ventilation or non-invasive ventilation may be indicated at this stage.

Circulation

- Assess for signs of hypovolaemia or shock (Table 1). Obtain intravenous or intraosseous access and give a fluid bolus or blood if required. Consider inserting an arterial line. Plan for ongoing transfusion requirements.

Disability

- Record using the AVPU scale (Alert, Voice, Pain, Unresponsive) or the Glasgow Coma Score. GCS <8 is an indication for early endotracheal intubation in trauma patients. Check pupils. Check temperature and prevent hypothermia using warmed fluids and forced air warming devices.

Investigations performed as part of the initial assessment and resuscitation include trauma X-rays, full blood count, coagulation screen and electrolytes. The results of blood tests may not be available before surgery and should not delay transfer of the patient to the operating room. Arterial blood gases can be rapidly performed and point of care testing (Haemocue®, Rotem®) may be useful if available.

In the other groups of patients (NCEPOD-2 and 3) there is time for a more detailed assessment. A review of previous anaesthetic records, if available, will give valuable information. Expand the history to include a more detailed medical and surgical history,

and a systems review to elicit other medical conditions that influence anaesthesia or postoperative recovery. Of particular interest are:

Cardiovascular

- Poorly controlled cardiac failure, hypertension, ischaemic heart disease and arrhythmias.

Respiratory

- Symptomatic asthma and chronic pulmonary disease, current upper and lower respiratory tract infections.

Gastrointestinal

- Gastro-oesophageal reflux, hiatus hernia. Mechanical bowel obstruction is a frequent indication for emergency surgery.

Other conditions that may influence anaesthesia

- Diabetes or other endocrine disorders (thyroid, adrenal), renal failure, neurological disease.

Review the patient's medication and document when the last doses were taken. Consider whether reversal of anticoagulation is needed. Guidance on the emergency management of the non-vitamin K antagonist oral anticoagulant agents is available.³ Idarucizumab (Praxbind), a monoclonal antibody specific for reversal of dabigatran, may be useful.

Perform a comprehensive examination and search for signs of undiagnosed or poorly managed disease and complications of chronic diseases. There is usually time for blood tests (full blood count, coagulation, renal function, magnesium, cross-match) and an electrocardiograph. Other investigations such as echocardiogram or chest X-ray should only be performed if they will alter management and not delay treatment.

Patients can be categorized into one of five groups using the American Society of Anaesthetists physical status system based on the severity of their pre-existing comorbidities (Table 2).

Optimization

If time permits, measures can be instituted to improve the condition of the patient in the lead up to surgery. If they are unstable consider transferring to a critical care location for invasive monitoring and circulatory support. Whatever the cause of the emergency, the aim is to prevent worsening of the 'lethal triad' of hypothermia, acidosis and coagulopathy.

Prescribe intravenous fluids, electrolyte correction, blood transfusion and oxygen therapy. Insert a urinary catheter and

Symptoms and signs of shock

Class	I	II	III	IV
Blood loss	<750 ml	750–1500 ml	1500–2000 ml	>2000 ml
% Volume loss	<15%	15–30%	30–40%	>40%
Pulse rate	<100	100–120	120–140	>140
Blood pressure	Normal	Normal	Decreased	Decreased
Pulse pressure	Normal or increased	Decreased	Decreased	Decreased
Capillary refill	Normal	Delayed	Delayed	Delayed
Respiratory rate	14–20	20–30	30–40	>40
Urine output	>30 ml/hr	20–30 ml/hr	5–20 ml/hr	<5 ml/hr
CNS status	Mildly anxious	Anxious	Anxious & confused	Confused & lethargic

Table 1

The American Society of Anesthesiologist's Classification of Physical Status (ASA) score

Category	Definition
I	Healthy patient
II	Mild systemic disease, no functional limitation
III	Moderate systemic disease
IV	Severe systemic disease, a constant threat to life
V	Moribund patient, unlikely to survive 24 hours with or without operation

The suffix "E" is added for emergency cases

Table 2

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