EMERGENCIES/ENHANCED RECOVERY AFTER SURGERY

12 Tips for Mastering Emergencies

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Challenges of emergencies: emotions include feelings of stress and panic; each emergency unique event; “worse-case scenarios” rare; no provider has vast experience with any particular emergency

Principles of management: incorporating “best practices” reduces cognitive load on individuals; cognitive performance declines during periods of stress (when time pressure present and high-stakes decisions must be made); reduce risk and vulnerability of environment and increase preparedness and effectiveness of practices

Framework: paradigm in Stanford University emergency manual (emergencymanual.stanford.edu) useful for crisis management; elements include calling for help early and using all available information; analysis of root causes — according to Joint Commission data, most common root causes of sentinel events include human factors, communication, leadership, management of information, and physical environment

Communication failures: reasons include pride, culture of environment, attitude, lack of time, and fear; tools for effective communication — employ closed-loop technique, ie, assign, and identify by name, person to execute specific task (rather than general call); requested person should acknowledge that instructions heard and task will be carried out

Five key points of communication: request must be made to appropriate target or audience — person must have authority to make decision or execute task as well as adequate expertise; explicitly identify target; timing — communication must occur early enough to be actionable (eg, inability to crossmatch blood should not be discovered in middle of surgery); environment — failure of communication can be caused by presence of music, noise, and competing conversations; communication may also be inhibited if patient awake; clarity of content — failure can occur if message not sufficiently detailed (what may be implicitly understood by one clinician or specialty may not be understood by others); purpose of communication — should be transparent; should know why question being asked (eg, when surgeon asks, “how is patient doing,” may be uncertain whether making request must be made to appropriate target or audience — person must have authority to make decision or execute task as well as adequate expertise; explicitly identify target; timing — communication must occur early enough to be actionable (eg, inability to crossmatch blood should not be discovered in middle of surgery); environment — failure of communication can be caused by presence of music, noise, and competing conversations; communication may also be inhibited if patient awake; clarity of content — failure can occur if message not sufficiently detailed (what may be implicitly understood by one clinician or specialty may not be understood by others); purpose of communication — should be transparent; should know why question being asked (eg, when surgeon asks, “how is patient doing,” may be uncertain whether making small talk or concerned because inadvertently cut major vascular structure); poor communication can also be related to fears of retribution, embarrassment, embarrassing somebody else, or jeopardizing ongoing relationship

Educational Objectives

The goal of this program is to improve the management of emergencies and the implementation of enhanced recovery after surgery (ERAS) protocols. After hearing and assimilating this program, the clinician will be better able to:

1. Anticipate and manage emergencies in the operating room.
2. Explain the principles of appropriate communication during an emergency.
3. Identify the elements of ERAS.
4. Discuss effects of ERAS on length of hospital stay and rates of complications.
5. Evaluate the effect of the ERAS pathway on survival following surgery for colorectal cancer and outcomes in emergency abdominal surgery.

Anticipation and prevention: anticipate likely emergency; prepare for worst-case scenario; consider environment, contingency plans, and location of equipment; know what skills available in building and vulnerabilities of system; especially important when in unfamiliar facility

Using all available information: may be difficult because brain can process only limited amounts of data; information can be available but not perceived; surgeons and anesthesiologists have different filters and focuses; important information must be shared; information cascade — tendency to focus on initial information; however, important to continue to solicit input rather than focus on previous information that may be misleading

Calling for help: should be done early; need to know what to do with help when it arrives; commonly thought that too many people in room impede, but problem may really be inadequate delegation of work; assignment of tasks — “hands help” and “head help”; hands help involved in performing tasks; head help defined as providing assistance in diagnosis and treatment; role of person should be explicitly stated, and communication should be appropriate for that role; person assigned to insert arterial line does not need to know patient’s history; person acting as head help should be told role before being giving patient’s history, because will then be more attentive when listening

Mobilization of resources: sometimes need specific personnel (eg, to perform echocardiography or 12-lead electrocardiography); may need special equipment or medication not found in room; better to call otolaryngologist or open tracheostomy tray early and not need them than to call too late

Management of emergencies: determine leader — may not be clear when number of attending physicians present; leader needs to be explicitly announced; when anesthesiologist not primarily involved (eg, called to assist in emergency department (ED) or catheterization laboratory), must determine leader; when uncertain, anesthesiologist should ask whether other physicians want him/her to take control; if anesthesiologist feels role as leader inappropriate, should delegate to somebody else; once leader established, other roles should be designated; consider strengths of personnel; may take personnel out of usual roles (eg, surgeons can place intravenous lines; almost anyone can perform cardiopulmonary resuscitation); recruit person to document events; personnel should state if they do not feel comfortable with assigned role; distribution of workload — emergencies involve many tasks, each requiring delegation (eg, treatment of malignant hypertension requires gaining access; applying monitors;
taking cooling measures; charting; calling hotline; obtaining, mixing, and administering dantrolene; notifying intensive care unit [ICU]; for CPR, organize rotation of persons performing chest compression
Avoid task fixation: team leader should avoid involvement in tasks; if at all possible, all tasks should be delegated, because individual loses perspective of whole picture when actively involved in tasks

Checklists, manuals, and cognitive aids: shortcomings of checklists — using multiple checklists can cause fatigue and lack of enthusiasm; checklist not helpful if providers not committed to implementation; effective only when all elements actually performed; allocation of attention — eliminate distractions; personnel should refrain from unnecessary talking; people should leave if not being utilized; disruptive individuals need to be redirected; prospective memory — remembering that task needs to be done later (eg, after blood drawn, need to remember to obtain results); best approach to delegate responsibility to person originally assigned to task (eg, person who sent blood to laboratory should check results and report back to leader); cognitive aids — useful only if location known; most useful if familiar with content and format; emergency situation should not be first time provider has looked at aid; designated algorithm — may be anyone who can read; role to access algorithm and notify leader if anything overlooked and to help determine whether appropriate clinical responses occurring; has been shown in simulation studies to be of benefit
Practicing: principles need to be put into practice every day; communicate appropriately with colleagues; consider how to mobilize resources and how to direct helpers; if maneuvers practiced routinely, will be remembered when emergency occurs

Suggested Reading


Enhanced Recovery for the Surgical Patient

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Principles of enhanced recovery after surgery (ERAS): approach began with Kehlet (2003), who identified 3 causes of delayed discharge in patients undergoing colorectal surgery, 1) poor analgesia, 2) poor mobility, and 3) poor gut function; consensus article (Fearon et al, 2005) enumerated 17 evidence-based elements that individually have small impact but together improve outcomes after surgery; they include preadmission counseling, avoidance of bowel preparation, implementation of carbohydrate loading, avoidance of prolonged fasting and long-acting sedatives, insertion of midhilaric epidural, use of short-acting anesthetic agents, avoidance of sodium and fluid overload, use of short incisions, maintenance of body heat during surgery by use of warm air, early mobilization, multimodal analgesia with prevention of postoperative nausea and vomiting, stimulation of gut motility, early removal of catheters, and administration of nutritional supplements
Developments since 2005: ERAS protocols being adopted internationally and expanding into subspecialties (eg, surgery of esophagus, breast, and pancreas, as well as emergency surgery); guidelines reflect both evidence-based practice and “practice-based evidence”; updated every 3 yr by multinational experts; 17 original elements being evaluated for subspecialties, with elements added for specific procedures

ERAS in United Kingdom (UK): National Health Service identified ERAS as desirable; has been implemented across all specialties; key to success — enrolled champion in each specialty in each hospital, with engagement of anesthesiologist; appointment of enhanced recovery nurse specialist; important to consider ERAS multidisciplinary commitment that includes nurses, dietitians, and physical therapists; once patient on pathway, role of surgeon to identify patients not staying on pathway, which suggests complication; charts for administration of drugs printed for each specialty
Results: during 5-yr period, length of stay (LOS) decreased across all specialties; program has saved 118,000 bed days (ie, capacity of 1 to 2 hospitals); no increase in readmissions; reduced variance in results; as of 2014, ERAS standard of care in UK

Clinical elements: preoperative phase includes assessment, optimization, and counseling; standards of care implemented (eg, thromboprophylaxis); avoiding gut dysfunction; auditing of compliance and outcomes; emphasis on informed decision making (has resulted in decrease in decision to operate by 5%); giving patients targets to promote motivation; optimizing prehabilitation; reducing pathophysiologic insult — refraining from insertion of unnecessary nasogastric tubes (which might increase risk for chest infections and delay gastric emptying); use of minimally invasive surgery (MIS) key element, as is reducing tissue injury and blood loss (even in open surgery); avoiding drains whenever feasible; using regional anesthetic techniques to help reduce stress response; early discontinuation of intravenous fluids; start feeding <24 hr after surgery (even for open liver and pancreatic surgery); maintain euvelemia; avoid administration of excess salt and water; reduce or avoid opioids (because of risk of ileus); implement early enteral feedings, mobilization, chewing gum, and bowel stimulants (evidence based in colorectal surgery); improving metabolic response to surgery — surgeon has major impact on reducing injury and blood loss; role of anesthesiologist includes using appropriate anesthesia and management of fluids

Outcomes: Paton et al (2014) reviewed results of ERAS in colorectal surgery and concluded that it reduced LOS and reduced costs; Gustaffson et al (2011) demonstrated that with compliance to ERAS of >95%, LOS as well as rates of readmissions and complications reduced; Khuri et al (2005) — identified determinants of long-term survival after wide spectrum of major surgery; demonstrated that patients with complications <30 days of surgery followed different trajectory of life expectancy compared with patients without complications; hypothesized that perioperative complications promote cellular apoptosis and effectively accelerated aging; 4 factors identified with shorter life expectancy myocardial infarction, deep wound infection, chest infection, and pulmonary embolism; measures to reduce complications — MIS and ERAS reduce deep wound infections; patients mobilized early less likely to develop chest infections; use of adequate thromboprophylaxis reduces risk for pulmonary embolism; Moonesinghe et al (2014) — reviewed operations (10-yr follow-up); with no complications, 22% died by 10 yr; with complication on postoperative day 3 to 5, life expectancy reduced; complication on postoperative day 8 resulted in halving of long-term life expectancy; with complications on postoperative day 15, no survivors >10 yr; ERAS for hip and knee replacements — Malviya et al (2011) studied 4500 patients and demonstrated that all-cause morbidity and mortality reduced; randomized controlled trial of ERAS in open liver resection — pathway included oral preloading, insertion of thoracic epidural catheter, early mobilization, and goal-directed fluid therapy with rapid infusion for 6 hr in critical care area to restore volume; with ERAS, LOS
Experience of Royal Surrey County Hospital, Guildford: over 10 yr, average LOS for colorectal resection (excluding construction of ileostomy) ≥2 days; compared with other centers in UK, Guildford has higher rate of 5-yr survival for patients with colorectal cancer; retrospective study of ≥800 patients demonstrated that type of analgesia (eg, spinal, epidural, opioids) did not affect outcomes; improved outcomes associated with reducing primary surgical injury by utilizing MIS, clear tumor margins, and reducing secondary injuries and complications (ie, ERAS); rapid recovery permits early administration of chemotherapy

Emergency abdominal surgery: overall outcomes in UK poor; Symonds et al (2013) reviewed ≥367,000 emergency admissions for general surgery; mortality >15%, with range from 9% to 18%; predictors of reduced mortality included access to computed tomography (CT) and ultrasonography for rapid diagnosis, use of ICU beds, and optimization of patients; UK Emergency Laparotomy Network — 14.9% of patients die after emergency laparotomy; in patients ≥80 yr of age, 30-day mortality 24.4% and mortality at 1 yr >50%; pilot study at Guildford — combined ERAS with implementation of Surviving Sepsis bundle; key points included early assessment and resuscitation in ED, early administration of antibiotics in patients showing signs of sepsis, prompt diagnosis (priority for obtaining CT), prompt surgery (priority in securing operating room), goal-directed fluid therapy to enhance oxygen delivery, and all patients admitted to ICU; resulted in 42% reduction in mortality across all 4 sites of study; improvements correlated with compliance with elements of pathways

Acknowledgments

Dr. Stiegler spoke at the 28th Annual Carolina Refresher Course: Update in Anesthesiology, Pain, and Critical Care Medicine, presented by the University of North Carolina at Chapel Hill School of Medicine and the Mountain Area Health Education Center and held June 24-27, 2015, in Kiawah Island, SC. For information on upcoming CME meetings from the University of North Carolina at Chapel Hill School of Medicine, please visit med.uc.edu, and for information on CME courses from the Mountain Area Health Education Center, please visit mahec.net. Dr. Scott spoke at the 10th Annual Perioperative Medicine Summit, presented by Rush University Medical Center, the Cleveland Clinic, Cleveland, and the Society for Perioperative Assessment and Quality Improvement, held February 26-28, 2015, in Scottsdale, AZ. For information on upcoming CME meetings from Rush University Medical Center, please go to rush.edu/cme; for the Cleveland Clinic, please go to clevelandclinicmeded.com; for the Society for Perioperative Assessment and Quality Improvement, please go to spoqi.org or visit our website, Audiodigest.org, and click on “Upcoming Meetings.” The Audio Digest Foundation thanks the speakers and the sponsors for their cooperation in the production of this program.

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Suggested Reading

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To test online, go to www.audiodigest.org and sign in to online services.
To submit a test form by mail or fax, complete Pretest section before listening and Posttest section after listening.

1. According to data from the Joint Commission, failure in which of the following areas is the most common root cause of sentinel events?
   (A) Operative care  
   (B) Medications  
   (C) Care planning  
   (D) Communication **

2. Which of the following is true about effectively managing an emergency during a surgical procedure?
   (A) A clinician who is asked to assist with diagnosis and treatment should be informed of patient’s history before being told his or her specific role  
   (B) Otolaryngologist should not be called until tracheostomy definitively needed  
   (C) Patient history should not be given to person requested to insert an arterial line **  
   (D) Anesthesiologist should always be designated team leader when called to emergency department or catheterization laboratory

3. In an emergency situation, who should be responsible for obtaining the results of laboratory blood tests?
   (A) Circulating nurse  
   (B) Laboratory personnel  
   (C) Person delegated originally to send blood to laboratory **  
   (D) Leader

4. It is necessary to practice the principles of management of emergencies (eg, appropriate communication, mobilizing resources, and directing helpers) regularly. Ideally this should be done:
   (A) Daily **  
   (B) Weekly  
   (C) Monthly  
   (D) Every 3 mo

5. Which of following is NOT among the 17 elements of the enhanced recovery after surgery (ERAS) protocols described in a 2005 consensus article?
   (A) Preadmission counseling  
   (B) Bowel preparation **  
   (C) Use of short-acting analgesic agents  
   (D) Stimulation of gut motility

6. Based on a study by Gustafsson et al (2011), which of the following is(are) associated with ERAS?
   (A) Reduced length of stay  
   (B) Reduced complications  
   (C) Reduced rates of readmission  
   (D) All the above **

7. In a study by Khuri et al (2005) of patients undergoing major surgery, which of the following were associated with decreased long-term survival?
   (A) Postoperative ileus  
   (B) Deep venous thrombosis  
   (C) Deep wound infection  
   (D) Delayed discharge from hospital

8. In a randomized controlled trial of ERAS protocols in patients undergoing open liver resection, ERAS was associated with ______ reduction in complications.
   (A) ≈15%  
   (B) ≈30%  
   (C) ≈50% **  
   (D) No

9. Which of the following statements accurately reflects the experience of the Royal Surrey County Hospital, Guildford, United Kingdom, in applying ERAS to patients undergoing surgery for colorectal cancer?
   (A) Improved 5-yr mortality after surgery  
   (B) Improved results were linked to the type of analgesia used  
   (C) Improved results were linked to the use of minimally invasive surgery  
   (D) A and C **

10. In a pilot study from the Royal Surrey County Hospital of patients undergoing emergency laparotomy, the use of ERAS plus Surviving Sepsis bundle was associated with ______ reduction in mortality.
    (A) ≈10%  
    (B) ≈20%  
    (C) ≈30%  
    (D) ≈40% **

Answers to Audio Digest Anesthesiology Volume 57, Issue 39: 1-C, 2-B, 3-C, 4-D, 5-B, 6-C, 7-D, 8-D, 9-A, 10-A

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