Educational Objectives

The goals of this program are to improve the management of intraoperative cardiac arrest and to overcome barriers to the provision of palliative care. After hearing and assimilating this program, the clinician will be better able to:

1. Differentiate between Advanced Cardiac Life Support and Anesthesia Advanced Circulatory Life Support.
2. Optimize resuscitation for patients who experience cardiac arrest in the operating room.
3. Differentiate between palliative care and end-of-life care.
4. Appreciate the value of palliative care.

5. Choose treatment modalities that are most beneficial to patients receiving end-of-life care.

Faculty Disclosure

In adherence to ACCME Standards for Commercial Support, Audio Digest requires all faculty and members of the planning committee to disclose relevant financial relationships within the past 12 months that might create any personal conflicts of interest. Any identified conflicts were resolved to ensure that this educational activity promotes quality in health care and not a proprietary business or commercial interest. For this program, members of the faculty and planning committee reported nothing to disclose.
by decrease in cardiac output; optimal ratio of compressions to breaths likely 15:1 or 30:2 for medial professional and 25:1 or 50:2 for layperson; ratio of 30:2 yields 8 to 10 breaths; Rates of ventilation most beneficial to patients in distress are lower than those most beneficial to healthy patients; min or 1 breath every 6 to 8 sec

**Goals:** patients in OR monitored; ETCO₂ ≥20 mm Hg desirable; ETCO₂ ≥30 mm Hg indicates excellent chest compressions; maintain diastolic BP ≥30 mm Hg; maintain gradient between systolic BP and central venous pressure ≥15 mm Hg; intubate patient without interrupting chest compressions; consider echocardiography; begin CPR quickly after cardiac arrest; ventilation beyond necessary minimum likely decreases survival

**Defibrillation:** ACLS uses heart rhythm to triage patients into probability categories; anesthesiologist in OR must consider special scenarios; defibrillation as soon as possible indicated for ventricular fibrillation or ventricular tachycardia; biphasic more effective than with monophasic defibrillators

**Defibrillation first vs CPR first:** in OR, rhythm recognizable and defibrillation first appropriate; among all patients with cardiac arrest, outcomes (eg, survival to admission, survival to discharge, 1-yr survival) statistically similar regardless of whether CPR or defibrillation performed first; no difference observed with CPR vs defibrillation for patients recued quickly; patients in cardiac arrest for prolonged period before rescue benefit from CPR first, compared with defibrillation first; in OR, perform defibrillation as quickly as possible; perform CPR if defibrillation delayed

**Medications:** amiodarone most important drug for ventricular fibrillation and ventricular tachycardia (lidocaine secondary drug); procainamide rarely used in current practice; hyperkalemia more common in OR, compared with out-of-hospital arrest, and treatable; calcium chloride, sodium bicarbonate, and insulin with dextrose play role in treatment of suspected hyperkalemia; magnesium used to treat polymorphic ventricular tachycardia; amiodarone ideal for supraventricular and ventricular tachycardia

**Medications for asystole and pulseless electrical activity (PEA):** primary drugs epinephrine and vasopressin; vasopressin removed from ACLS to reduce confusion; heart and brain 2 most important organs to save during resuscitation, and both depend on diastolic BP for perfusion; vasopressin effective for raising diastolic BP in certain circumstances (eg, patients taking angiotensin blockers); speaker argues vasopressin potentially helpful for patients with PEA; consider epinephrine 1 mg every 3 to 5 min; consider vasopressin ≤40 IU; remember to flush line after administration of drugs

**“8 Hs and 8 Ts” for PEA and asystole:** consider hypoxia, hypovolemia, hypervagal reactivity, hydrogen ion, hyperkalemia, malignant hyperthermia, hypothermia, and hypoglycemia; consider trauma, tension pneumothorax, thrombosis of coronary artery, cardiac tamponade, thrombosis of pulmonary artery, long QT syndrome, toxins, and pulmonary hypertension

**Question and answer:** benefit of mounting algorithms on wall of OR — checklists useful as reminders; strict adherence to checklists can lead to useless interventions and lost time in crisis; person leading resuscitation should not read checklist; designate additional person to read checklist and suggest consideration of missed items

**Suggested Readings**


**Perioperative End-of-Life and Hospice Considerations**

**Mary S. Hua, MD,** Assistant Professor of Anesthesiology (in Epidemiology) and Staff, Division of General Anesthesiology and Critical Care Anesthesia, Columbia University, College of Physicians and Surgeons, and Columbia University Medical Center; New York, NY

**Palliative care:** consists of specialized medical care for patients with serious illness, with focus on provision of relief from symptoms and stress; goal to improve quality of life for patient and family; appropriate at any age and any stage of serious illness; can be provided simultaneously with curative treatment; end-of-life care considered subset of (not equivalent to) palliative care; although palliative care provided in conjunction with care for prolonging life, its importance increases over time; end-of-life care continues until patient dies; palliative care continues after patient’s death to provide services to family for bereavement

**Benefits of palliative care:** decreases in admission to intensive care unit (ICU), length of stay, use of unequal beneficial therapies to sustain life, and hospital readmissions; increases in formulation of advance directives, rates of dying outside of ICU, and referrals to hospice; improvements in quality of life and survival

**Temel et al (2010):** performed randomized trial in patients with metastatic nonsmall-cell cancer of lung, and found early palliative care associated with improvement in quality of life and survival

**Statistics:** ≈14% of all patients in ICU meet published criteria that outline indications for palliative care consultation, but actual rates of consultation likely only 2% to 10%; palliative care often initiated late in course of disease, at which point potential for benefits diminished

**Barriers to use of palliative care:** include lack of familiarity, discomfort with prognostication, and culture of denial of death within medical community; lack of familiarity — benefits of palliative care largely unknown to health care providers and public; role of palliative care often uncertain

**Palliative care physicians:** specialists in management of complex pain and symptoms; assume responsibility for making decisions, address goals of care, provide emotional and spiritual support, aid in resolution of conflict, and facilitate referral to hospice

**Indications for palliative care:** study at speaker’s institution found palliative care physicians most commonly consulted to address goals of care and provide support to patients and family, and also called on for management of refractory symptoms; over course of consultation, majority of patients had additional needs addressed by consultant; recommendations for management of pain or symptoms offered in 60% of cases

**Patient perceptions:** patients and families prefer personalized and prompt attention to symptoms, participation in decisions, and holistic support; patients and families felt palliative care facilitated preparation for future

**Overcoming lack of familiarity:** will require education, dissemination of information, and focus on benefits

**Discomfort with prognostication:** Sinuff et al (2006) — performed meta-analysis that compared physicians’ prognostications vs scoring systems designed to estimate mortality; found physicians more sensitive and specific for prognostication, compared with scoring systems; study focused on prognostication at level of population and may not apply at level of individual; Rubin et al (2016) — asked patients with advanced illness to rate various conditions as “worse,” “equivalent,” or
“better” than death; found substantial number of conditions rated worse or equal to death by majority of patients; speaker suggests that discussion of prognosis should optimally focus on individual patient’s view of undesirable outcomes; initiation of palliative care need not be tied to prognosis; palliative care and care for prolonging life not mutually exclusive; certainty of prognosis not required

Culture of denial of death: death of patient can create feeling of failure in clinicians; Granek et al (2012) interviewed oncologists and found majority expressed feelings of failure when patients died; desire to avoid death can create disconnect between perceived and actual benefits of therapy; surveys demonstrate physicians often believe therapies more effective than data indicate

Poor prognosis: patients tend to choose less aggressive care in setting of poor prognosis; higher intensity of treatment, particularly at end-of-life, not associated with improved perception of quality of care; high intensity of care can cause suffering; ≥90% of critically ill patients report uncontrolled symptoms; quality of life poorer for patients with cancer who die in ICU, compared with patients who die at home

Postintensive-care syndrome: patients who survive critical illness often experience psychiatric problems, diminished health-related quality of life, functional disability, long-term cognitive impairment, and increased risk for death

Three Wishes Project: intervention carried out for dying patients in ICU, with goal of bringing peace and easing process of dying; project implements wishes generated by patients, families, and clinicians caring for them; cost averages between $0 and $200 per patient; interventions personalized death for patients and families, and facilitated change in clinicians’ approach to dying patients

Anesthesiologists as palliative care physicians: anesthesiologists highly trained to manage pain and symptoms, facile at interdisciplinary care, and accustomed to focusing on individualized care

Question and answer: role of nurses in screening for and initiating palliative care — operationalization of model and practice presents great challenge; palliative care physicians scarce resource; optimally, consultations should be targeted toward patients most likely to benefit; quality of generalist palliative care provided by primary team must improve; role for triage in palliative care possible; some models place palliative care physician in ICU for screening, but this approach resource intensive; many nurses already implicitly participating in process

Suggested Readings


Acknowledgments

Dr. Nunnally and Dr. Hua were recorded at the 70th PostGraduate Assembly in Anesthesiology, held December 9-13, 2016, in New York, NY, and presented by The New York State Society of Anesthesiologists. For information about upcoming CME opportunities from The New York State Society of Anesthesiologists, please visit nyssa-pga.org. The Audio Digest Foundation thanks the speakers and The New York State Society of Anesthesiologists for their cooperation in the production of this program.

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AANA requires CRNAs to earn a score of 80% to receive credit, and they may not retest since the testing mechanism for this activity does not include utilization of randomly assigned computer-generated test items where at least half of the test items used on the second and third attempts are different than the initial test items used on the first attempt, etc.

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Estimated time to complete the educational process:

- Review Educational Objectives on page 1: 5 minutes
- Take pretest: 10 minutes
- Listen to audio program: 60 minutes
- Review written summary and suggested readings: 35 minutes
- Take posttest: 10 minutes
1. Which of the following values is the maximum percentage of normal cardiac output that can be achieved with optimal performance of cardiopulmonary resuscitation?
   (A) \( \approx 20\% \)  
   (B) \( \approx 35\% \)  
   (C) \( \approx 50\% \)  
   (D) \( \approx 65\% \)

2. Rates of ventilation most beneficial to patients in distress are _______ those most beneficial to healthier patients.
   (A) Higher than  
   (B) Lower than  
   (C) Equal to

3. Which of the following ratios of compressions to breaths is optimal during resuscitation performed by a medical professional?
   (A) 10:2  
   (B) 30:2  
   (C) 50:2  
   (D) 100:2

4. Initiating cardiopulmonary resuscitation before defibrillation:
   (A) Benefits all patients in cardiac arrest  
   (B) Benefits only patients in cardiac arrest for a prolonged period before rescue  
   (C) Benefits only patients in cardiac arrest who were rescued quickly  
   (D) Does not provide a statistically significant benefit for any category of patients in cardiac arrest

5. Which of the following is the most important medication for the treatment of ventricular tachycardia?
   (A) Lidocaine  
   (B) Procainamide  
   (C) Calcium chloride  
   (D) Amiodarone

6. All the following statements about palliative care are accurate, EXCEPT:
   (A) Can be provided simultaneously with curative treatment  
   (B) Continues after the patient’s death  
   (C) Is synonymous with end-of-life care  
   (D) Is appropriate for patients of any age

7. Statistics on the use of palliative care suggest which of the following?
   (A) It is beneficial only late in the course of disease  
   (B) <10\% of patients in intensive care meet criteria for referral for a palliative care consultation  
   (C) Health care providers are highly familiar with its benefits  
   (D) It can prolong survival when provided early to patients with nonsmall-cell lung cancer

8. In a study by Sinuff et al (2006), physicians were found to be _______ sensitive and _______ specific for prognostication than scoring systems designed to estimate risk for death.
   (A) More; more  
   (B) More; less  
   (C) Less; more  
   (D) Less; less

9. When discussing prognosis with a critically ill patient, it is best to focus on _______. The initiation of palliative care _______ be tied to prognosis.
   (A) The most optimistic statistics about the patient’s condition; should  
   (B) The most optimistic statistics about the patient’s condition; should not  
   (C) The patient’s view of undesirable outcomes; should  
   (D) The patient’s view of undesirable outcomes; should not

10. Which of the following statements about patients with a poor prognosis is most accurate?
    (A) Usually choose the most aggressive available care  
    (B) Perceive high-intensity treatment at end-of-life as high-quality care  
    (C) Often experience suffering when receiving high-intensity care  
    (D) Experience no difference in quality of life when end-of-life care is delivered in the intensive care unit vs at home