AORN

eGUIDELINES+

Emergencies at a Glance: Cardiopulmonary Resuscitation

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Identifying a Cardiac Arrest and Getting Help

A resuscitation starts with recognition. Follow Basic Life Support (BLS) and Advanced Cardiovascular Life Support (ACLS) guidelines to assess C-A-B (circulation, airway, breathing). Immediately alert designated personnel in the perioperative area according to facility guidelines if a patient is in extremis and request emergency equipment (defibrillator, code cart) be brought to the bedside. Policies and procedures for calling for help (examples may include overhead paging, code

blue call bell buttons, or calling 911 if working at a freestanding facility).

Roles in a Resuscitation

The American Heart Association (AHA) recommends six unique roles for team members to fill during a resuscitation. These roles include team leader, compressor, automatic external defibrillator (AED)/monitor/defibrillator manager, airway manager, medication manager, and timer/recorder (see the AHA guidelines for details on each role). The specific title of the person who will be filling each of these roles may vary based on the facility's policies and procedures, but someone should be identified as responsible for the role and its tasks.

In the perioperative space, there are other unique considerations for the surgical team members.

- The anesthesia professional is likely to be the team lead initially; however, this role may be delegated to another appropriate team member to allow the anesthesia professional to focus on the airway and medication administration.
- The surgeon may be asked to continue the surgery (in the instance of hemorrhage for example). They may be asked to place central lines or other invasive lines or to performs compressions.

- The RN circulator will be involved in calling for help and notifying additional personnel of cardiac arrest. They are instrumental in ensuring a patient is positioned correctly for CPR, managing the traffic in the room, and fulfilling any of the AHA roles for which they are qualified and have received appropriate training (ie, certification).
  - Patients that are in a nonsupine position for surgery will need to rapidly be mobilized into a supine position to maximize CPR. Perioperative nurses should be familiar with the facility's plan for a smooth change of position to maximize the resuscitation efforts. Examples include having a transportation bed easily accessible in the hallway outside the OR for patients in a prone position.
- The scrub person's focus is on maintaining the sterile field and keeping track and an awareness of the surgical instruments and supplies still on the field or on and in the patient. Typically, the scrub person remains sterile during resuscitation to be able to assist the surgical team in closing or packing a wound. In situations in which there is limited personnel to manage the resuscitation, they may be asked to assist with CPR.
- Additional personnel can control and manage traffic in and out of the OR, obtain equipment and supplies needed during the resuscitation, or

assist with any of the defined AHA roles as appropriate.

Potential Causes and Associated Interventions

The perioperative team should review the Hs and Ts per the appropriate resuscitation algorithm during resuscitation and consider these potential complications:

- QT prolongation can be caused by several medication classes that are administered during surgery, including antihistamines, antiarrhythmics, antiemetics, and psychotropics. It can also be seen in patients with hypokalemia or hypomagnesemia.
  - Interventions include:
  - The immediate cessation of QT prolonging medications
  - Electrical therapy (such as cardioversion or defibrillation)
  - Administration of IV magnesium
- Electrolyte imbalances such as hypokalemia, hyperkalemia, and hypomagnesemia can cause cardiac arrest due to the deranged electrolyte levels from prolonged surgery, poor positioning, or prolonged hospitalization.
  - Interventions include correcting the underlying electrolyte abnormality

- LAST (Local Anesthetic Systemic Toxicity) is the systemic absorption of local anesthetics. This leads to an overwhelming amount of sodium channels to be blocked, causing neurologic and cardiovascular complications.
  - Interventions include:
  - Immediate cessation of local anesthetic use
  - Avoidance of further use of sodium channel blockers
  - Administration of intralipids 20% per the American Society of Regional Anesthesia and Pain Medicine (ASRA) guidelines and facility policy
- Hypoxia associated with the inability to ventilate can be caused by anatomical challenges leading to difficult views during laryngoscopy, from laryngospasm, trauma to the airway, or uncleared obstructions/foreign bodies.
  - Interventions include surgical airway insertion by surgeon or anesthesia provider
- Gas embolism can occur if CO_2 gas is systemically absorbed during laparoscopic surgery.
  - Interventions include:
  - Decreasing pneumoperitoneum pressure
  - Applying positive end-expiratory pressure (PEEP)
  - Ventilating with 100% FiO_2 (fraction of inspired oxygen)

▪ Placing the patient in left-lateral Trendelenburg (if possible)

- Tension pneumothorax may occur as a result of surgical manipulation of areas near the pleura, during central line placement, or from increased intra-abdominal/intrathoracic pressures from laparoscopic surgery.
  ◦ Interventions include:
  ▪ Needle decompression on affected side to immediately relieve the obstruction
  ▪ Chest tube placement on affected side to continue to relieve the obstruction
- Malignant hyperthermia (MH) is caused by the administration of volatile anesthetics or the depolarizing muscle relaxant succinylcholine to patients with a genetic mutation of the Ryanodine receptor (RYR1).
  ◦ Interventions include:
  ▪ Discontinuing the MH-triggering agent (ie, volatile anesthetics, succinylcholine)
  ▪ Hyperventilating the patient with 100% FiO_2
  ▪ Administration of Dantrolene
  ▪ Cooling to a goal of normothermia (< 38 C)

Resuscitation Medications

Facilities differ in the number and type of medications that are stocked in the resuscitation carts. Most facilities routinely stock the four common resuscitation medications listed below.

For each medication, follow the AHA guidelines for dosing.

- Amiodarone
  - Indications: ventricular dysrhythmias (with or without a pulse)
  - Medication class: antiarrhythmic agent, class III
  - Nursing considerations:
    - Can cause bradycardia, hypotension, atrioventricular blocks, and sinoatrial arrest.
- Atropine sulfate injection
  - Indication for use: symptomatic bradycardia
  - Medication class: anticholinergic agent
  - Nursing considerations:
    - Can cause pupillary dilation if medication is mishandled and medication contacts the eye
    - Slow administration can cause paradoxical bradycardia
    - Maximum cumulative dose is 3 mg
- Epinephrine injection
  - Indication for use: sudden cardiac arrest associated with asystole, pulseless electrical activity (PEA), ventricular fibrillation, or pulseless ventricular tachycardia
  - Medication class: alpha and beta agonist
  - Nursing considerations:
    - Can be administered via an endotracheal tube (ETT) if vascular access cannot be obtained in a timely manner
- Lidocaine hydrochloride injection

◦ Indication for use: treatment of sudden cardiac arrest associated with ventricular fibrillation or pulseless ventricular tachycardia that is unresponsive to CPR, defibrillation and epinephrine administration

◦ Medication class: antiarrhythmic agent, Class 1b (sodium channel blocker)

◦ Nursing considerations:

▪ Not to be used in patients with known Wolff-Parkinson-White syndrome or severe degrees of sinoatrial, atrioventricular, or intraventricular heart blocks (except for those individuals with a functional pacemaker)

▪ Avoid in patients with LAST

▪ Maximum cumulative dose of 3 mg/kg

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