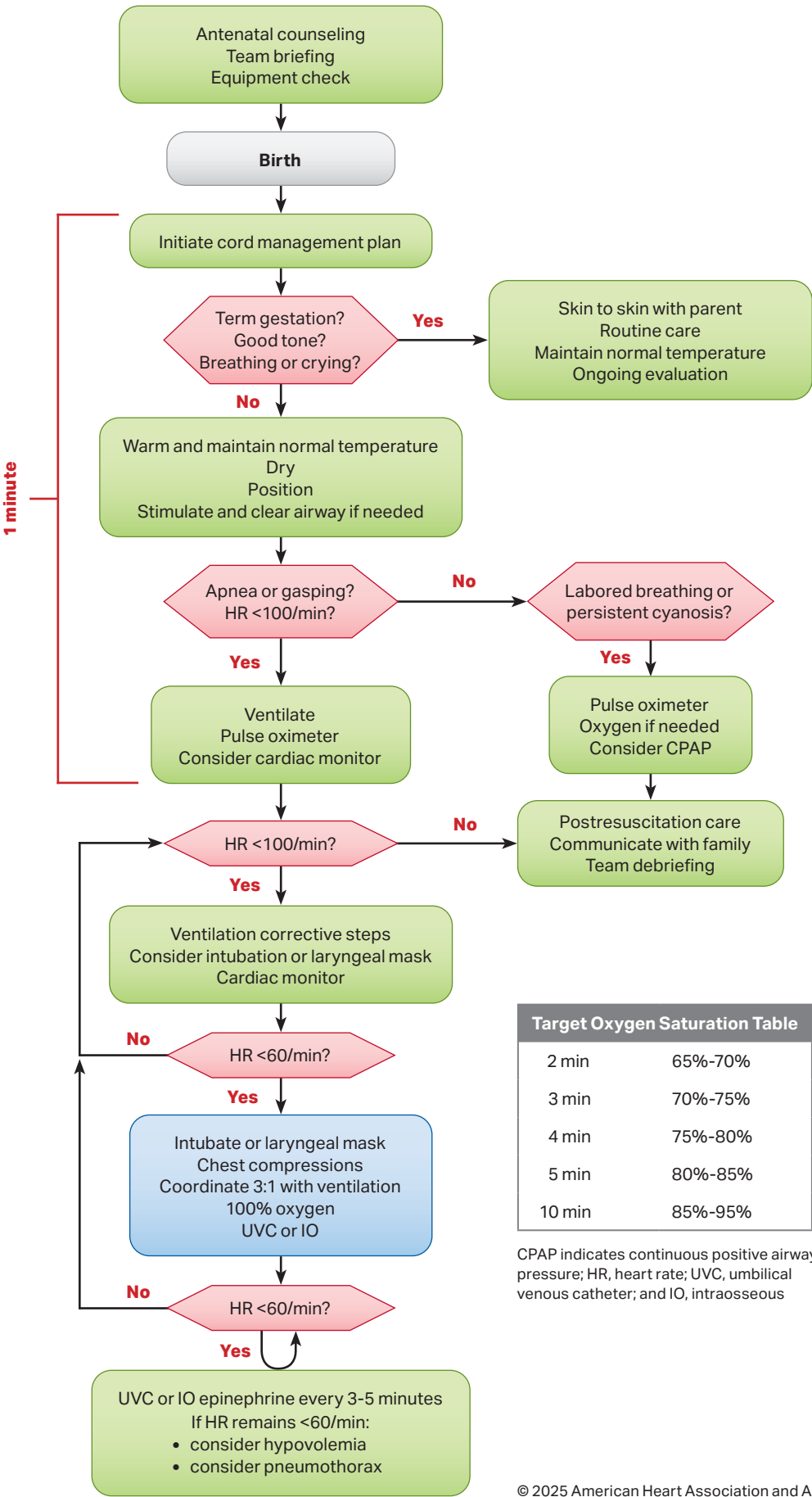
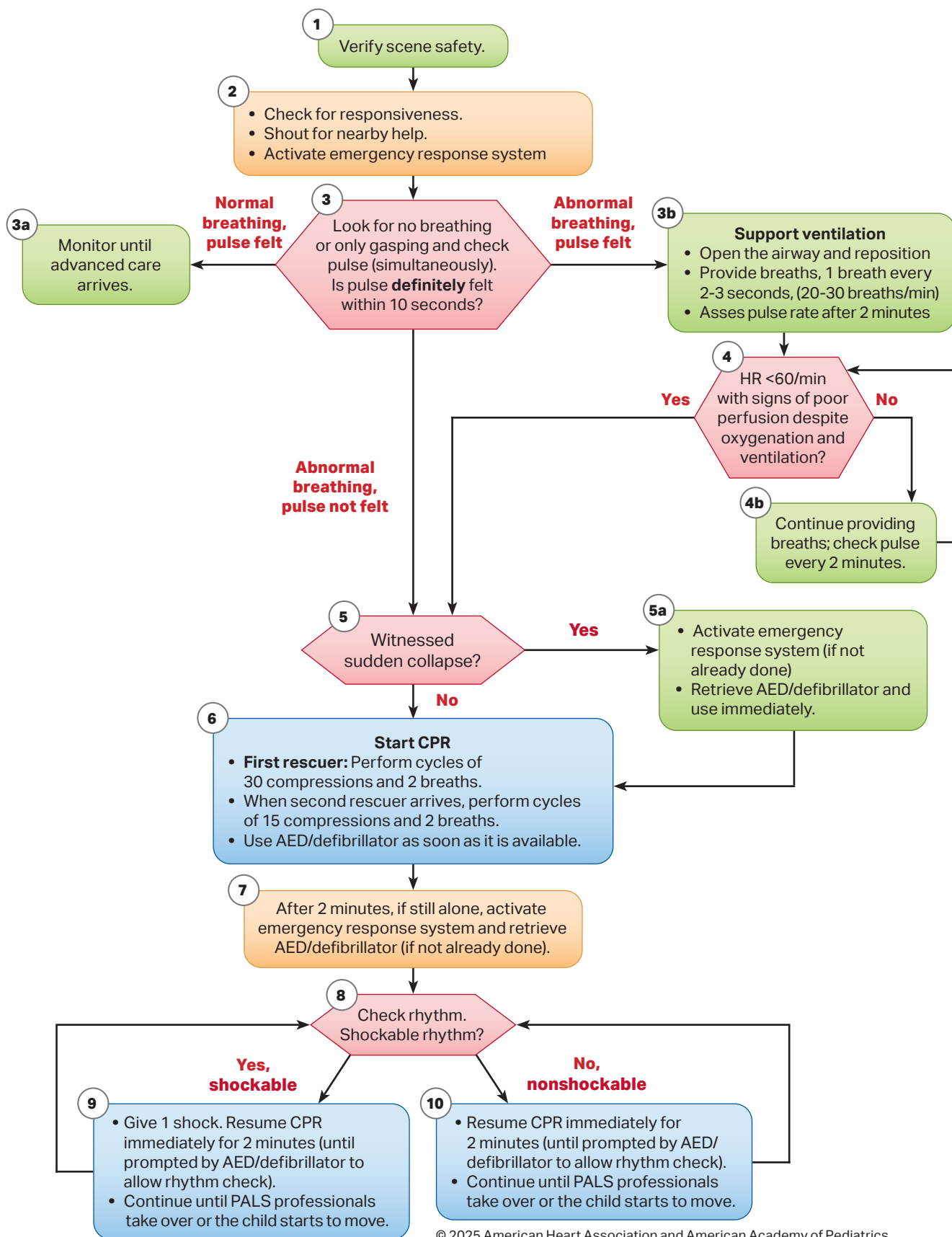


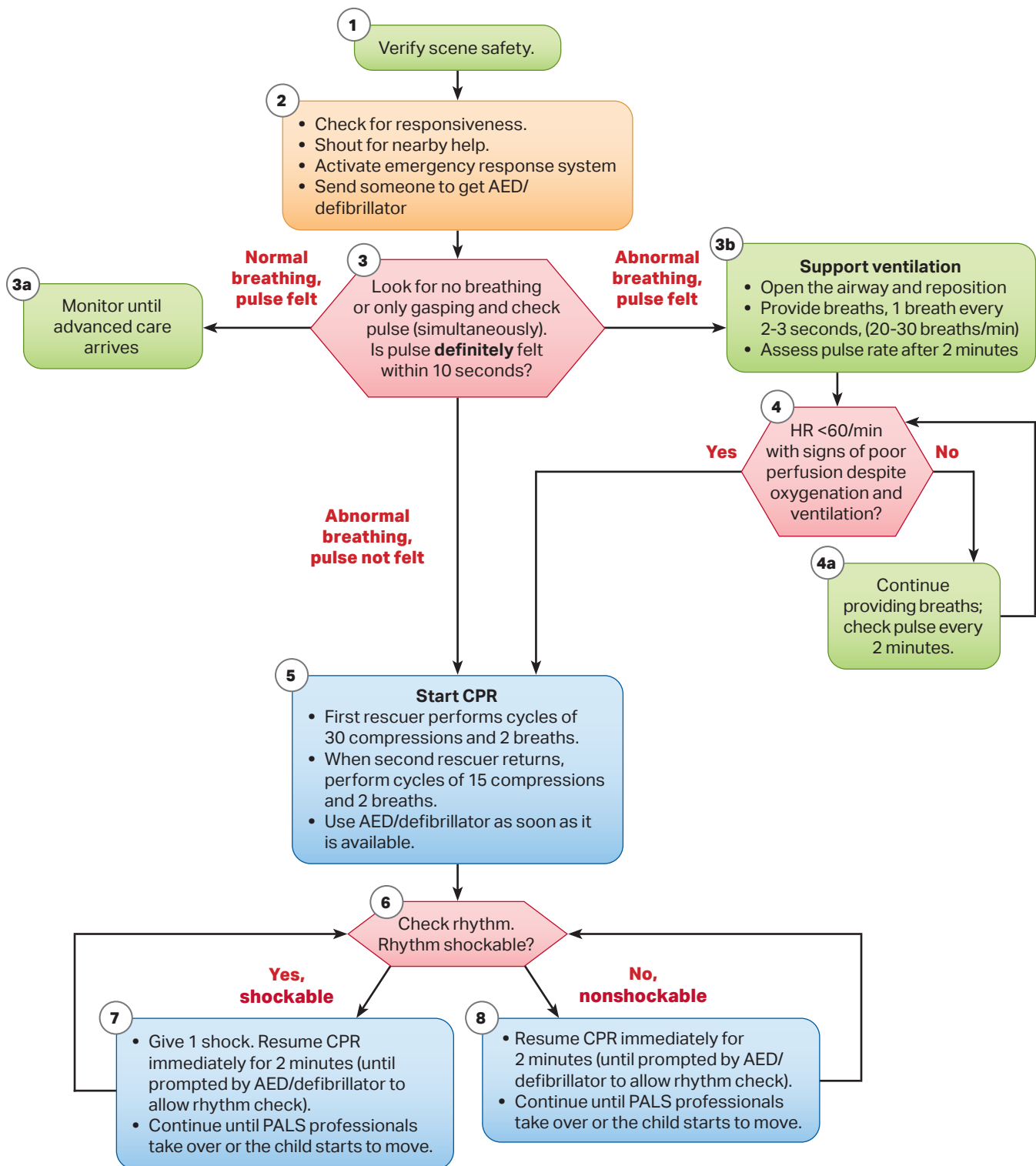
Neonatal Resuscitation Algorithm



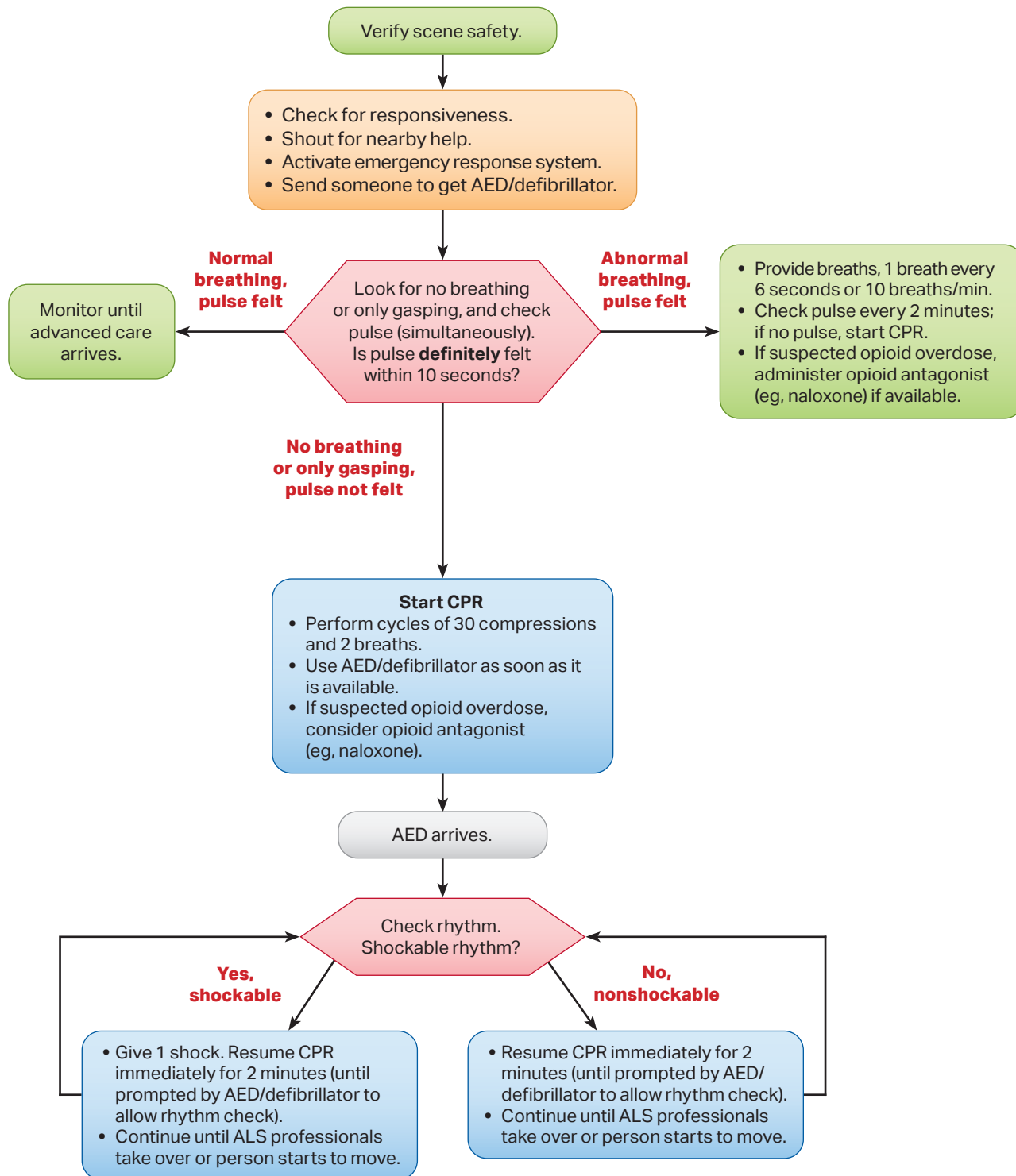
Pediatric Basic Life Support Algorithm (1 year of age to puberty) for Health Care Professionals—Single Rescuer



Pediatric Basic Life Support Algorithm (1 year of age to puberty) for Health Care Professionals—2 or More Rescuers



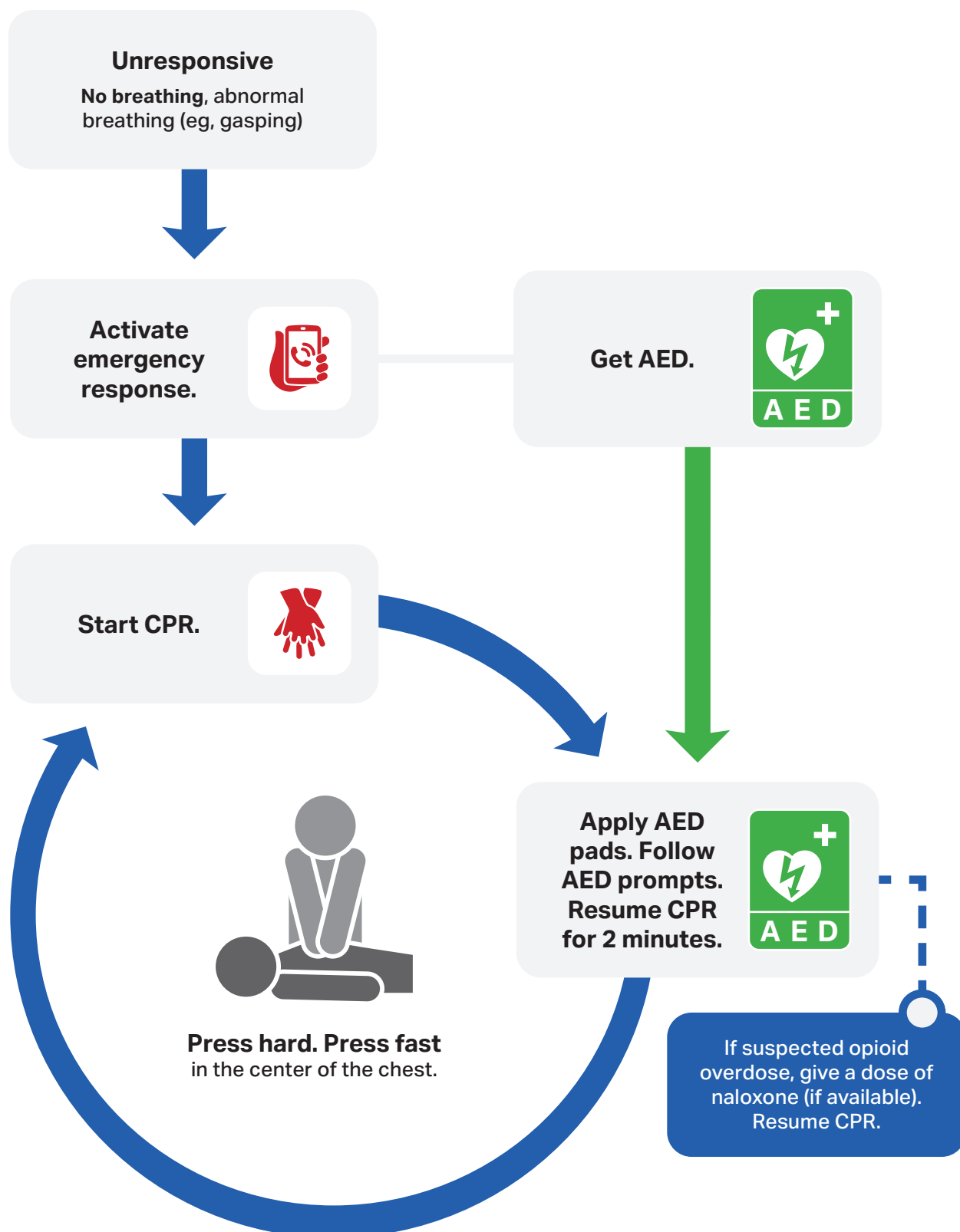
Adult* Basic Life Support Algorithm for Health Care Professionals



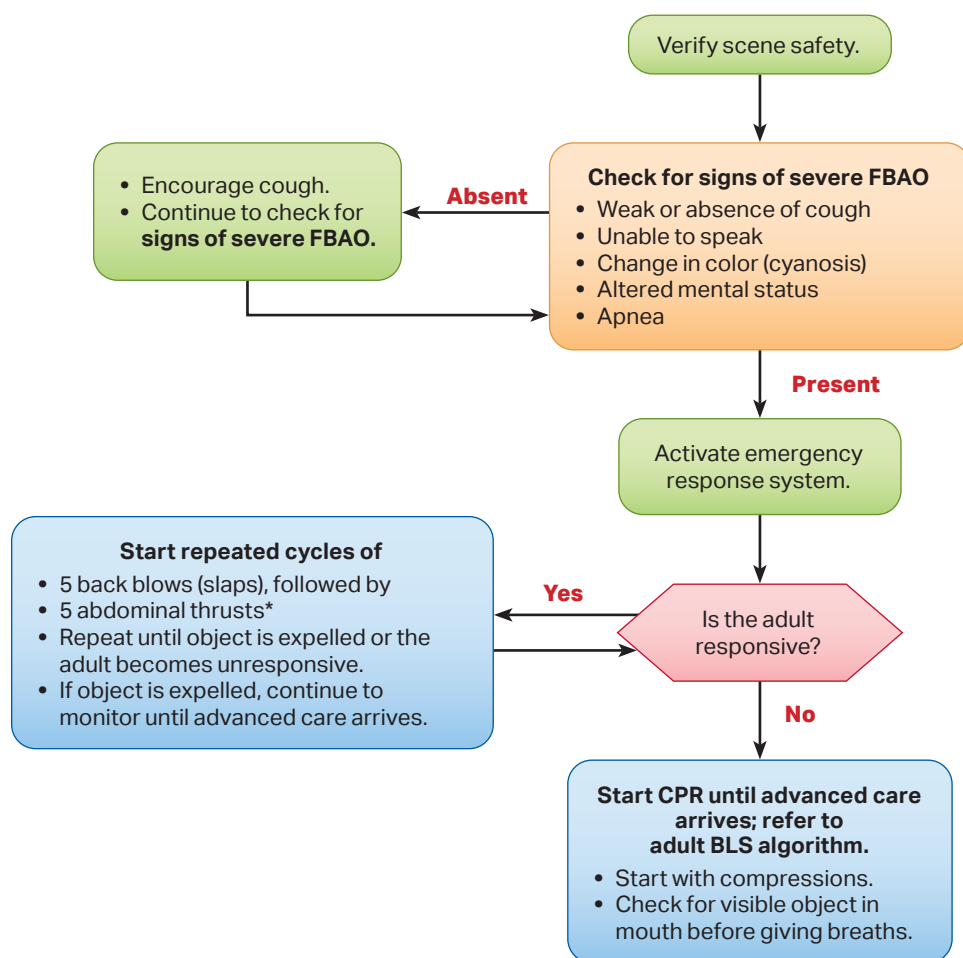
*If signs of puberty, treat as adult.

Act Now. Save a Life.

Follow these steps to take action.

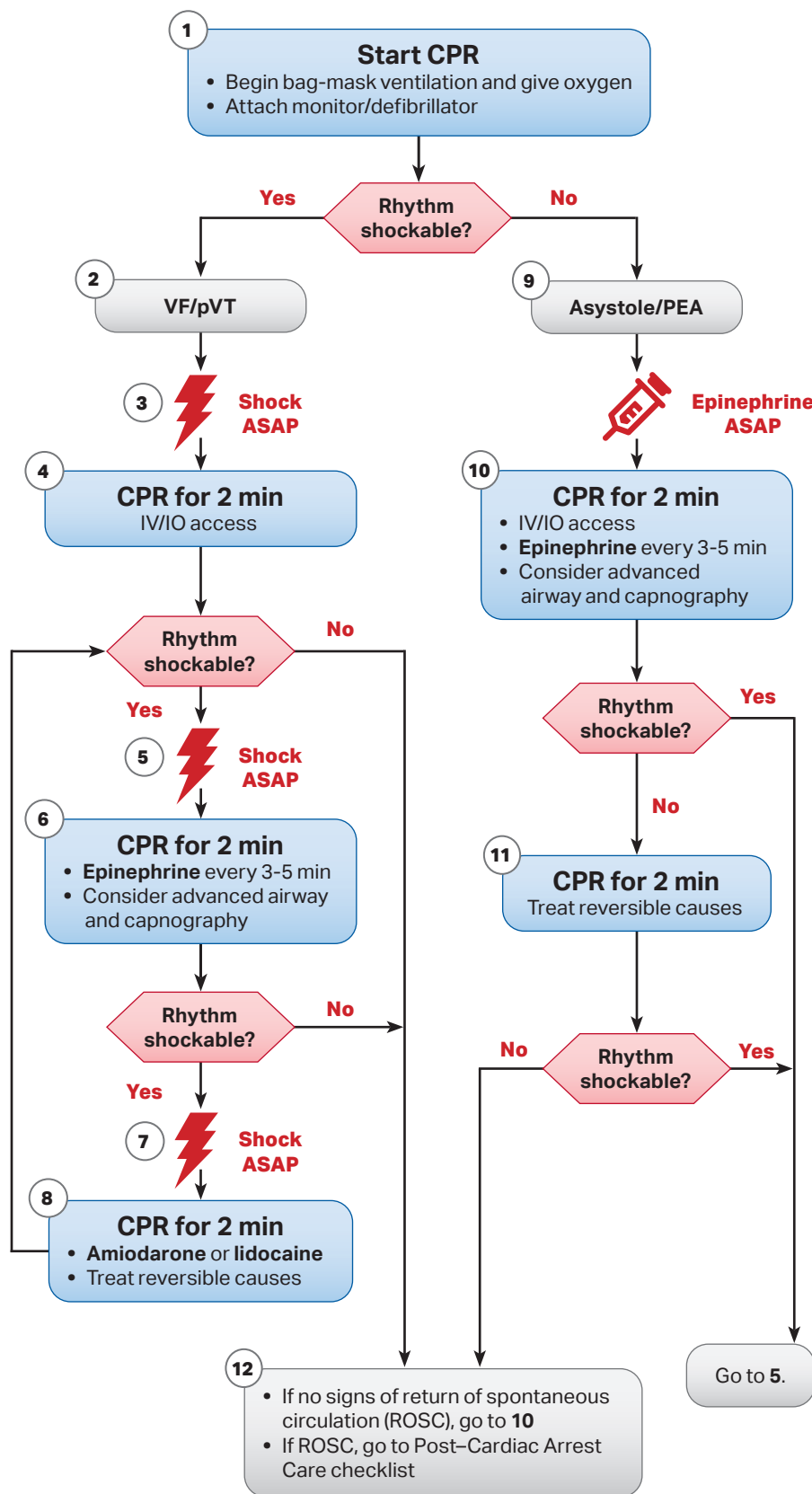


Adult Foreign-Body Airway Obstruction



*For patients in the late stages of pregnancy, or when the rescuer is unable to encircle the patient's abdomen, 5 chest thrusts should be used instead.

Pediatric Cardiac Arrest Algorithm



High Quality CPR

- Push hard ($\geq 1/3$ chest depth)
- Push fast: 100-120/min
- Allow full chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 min, sooner if fatigued
- If no advanced airway, compression-ventilation ratio
 - 15:2 - 2 rescuers (pre-puberty)
 - 30:2 - 2 rescuers (post-puberty onset)
 - 30:2 - 1 rescuer (any age)
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds
- Monitor ETCO₂ and, when available, invasive diastolic BP

Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks ≥ 4 J/kg, maximum 10 J/kg or adult dose

Drug Therapy

- Epinephrine IV/IO dose:** 0.01 mg/kg (0.1 mg/mL concentration). Max dose 1 mg.
- Amiodarone IV/IO dose:** 5 mg/kg bolus (max 300 mg). May repeat up to 3 doses (max 150 mg subsequent doses).
- or
- Lidocaine IV/IO dose:** 1 mg/kg

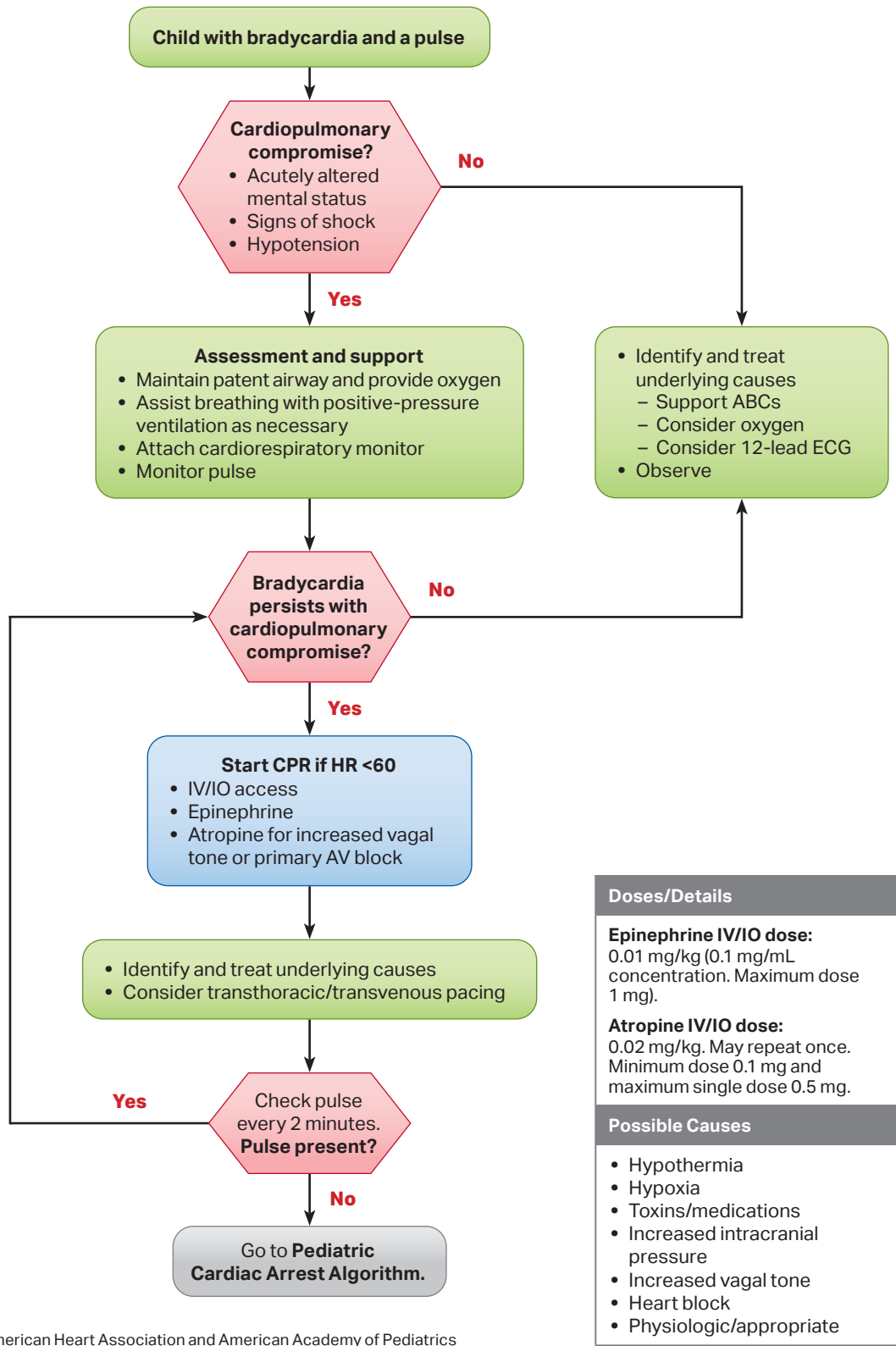
Advanced Airway

- Endotracheal intubation or supraglottic airway
- ETCO₂ to confirm and monitor ET tube placement

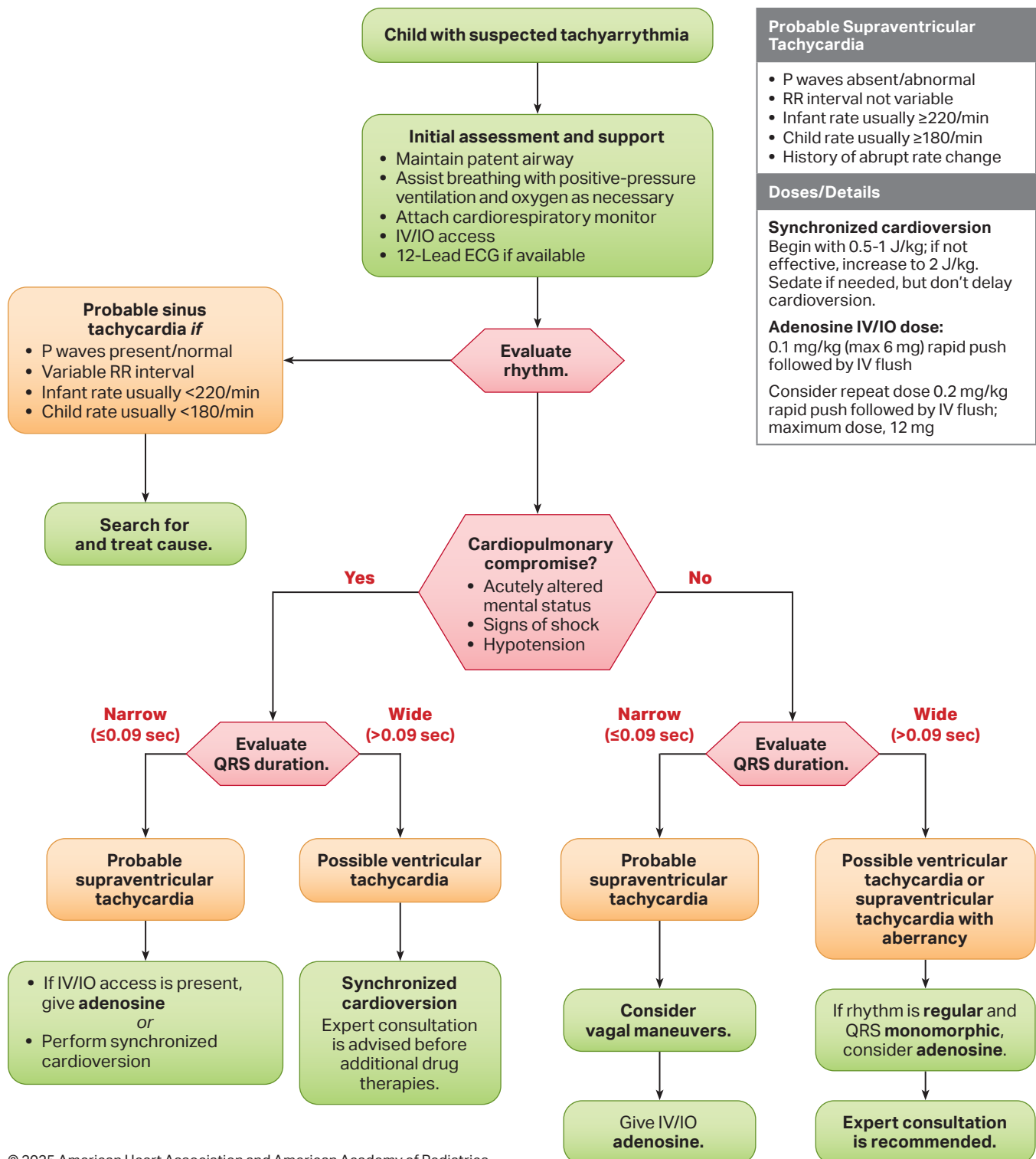
Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

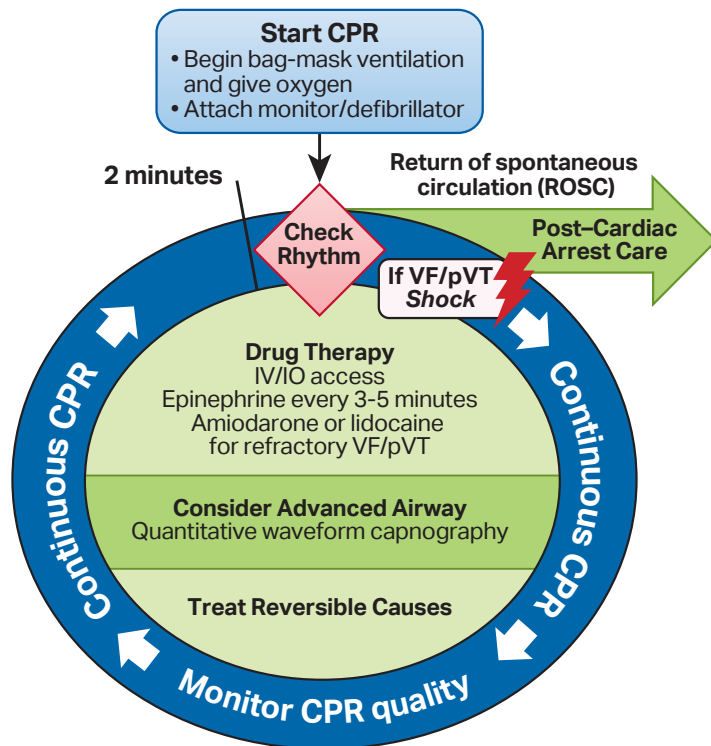
Pediatric Bradycardia With a Pulse Algorithm



Pediatric Tachyarrhythmia With a Pulse Algorithm



Adult Cardiac Arrest Circular Algorithm



High-Quality CPR

- Push hard (at least 2 inches [5 cm]).
- Push fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- If advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions.
- Continuous waveform capnography
 - If ETCO_2 is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
- or
- **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

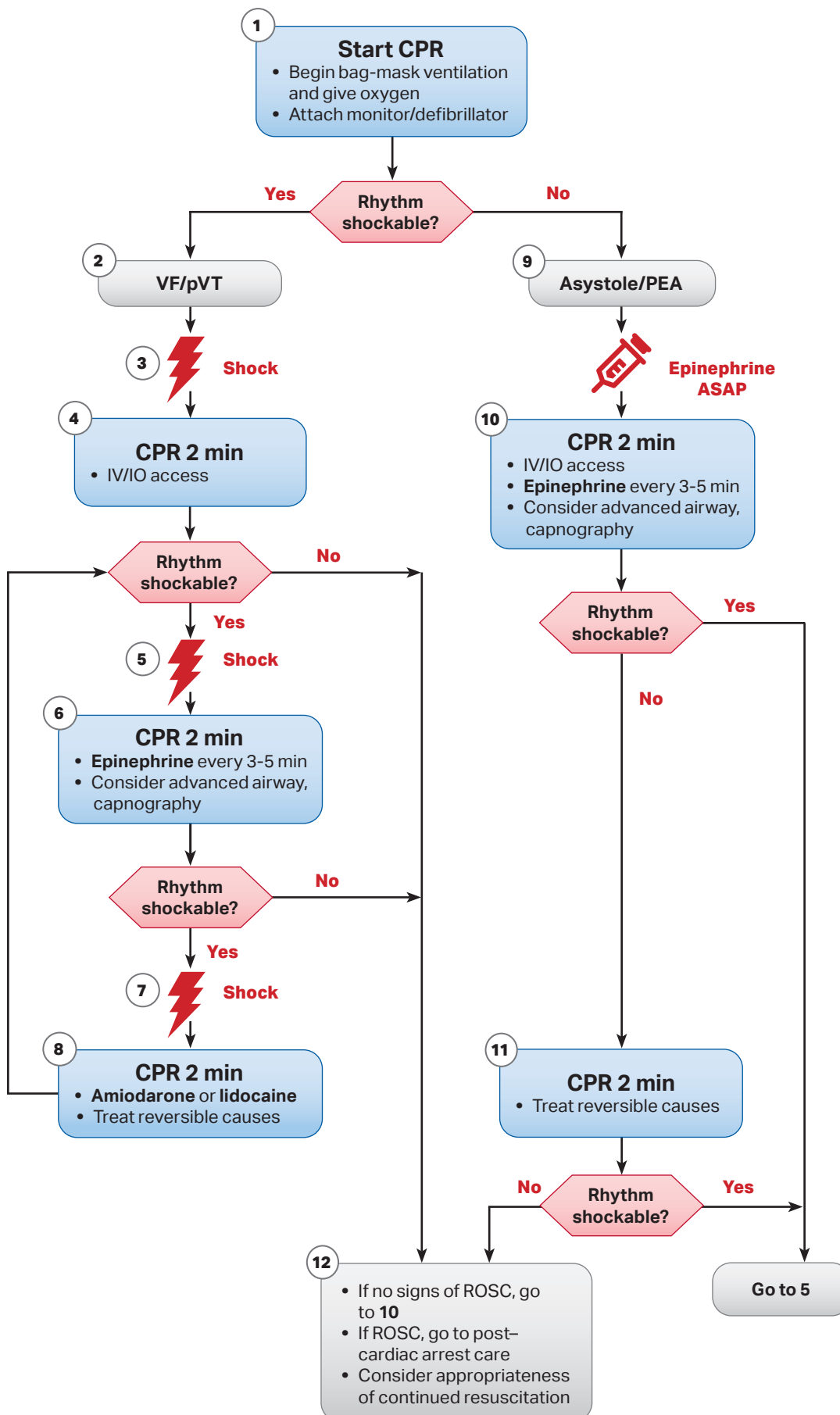
Advanced Airway

- ET intubation or supraglottic advanced airway
- Continuous waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Reversible Causes

- | | |
|---------------------------|-------------------------|
| • Hypovolemia | • Tension pneumothorax |
| • Hypoxia | • Tamponade, cardiac |
| • Hydrogen ion (acidosis) | • Toxins |
| • Hypo-/hyperkalemia | • Thrombosis, pulmonary |
| • Hypothermia | • Thrombosis, coronary |

Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)



High-Quality CPR

- Push hard (at least 2 inches [5 cm]).
- Push fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, use 30:2 compression-ventilation ratio.
- If advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions.
- Continuous waveform capnography
 - If ETCO_2 is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic:** 360 J

Drug Therapy

- Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- Amiodarone IV/IO dose:** First dose: 300 mg bolus
Second dose: 150 mg
or
Lidocaine IV/IO dose: First dose: 1-1.5 mg/kg
Second dose: 0.5-0.75 mg/kg

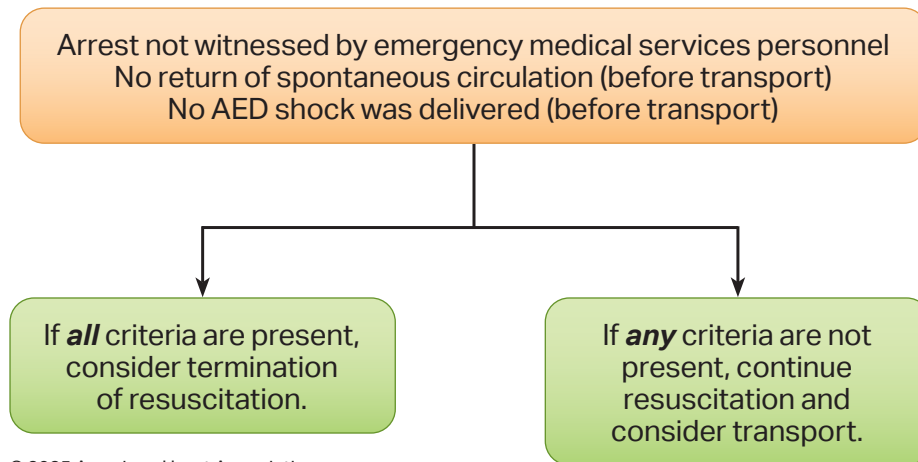
Advanced Airway

- ET intubation or supraglottic advanced airway
- Continuous waveform capnography or capnometry to confirm and monitor ET tube placement

Reversible Causes

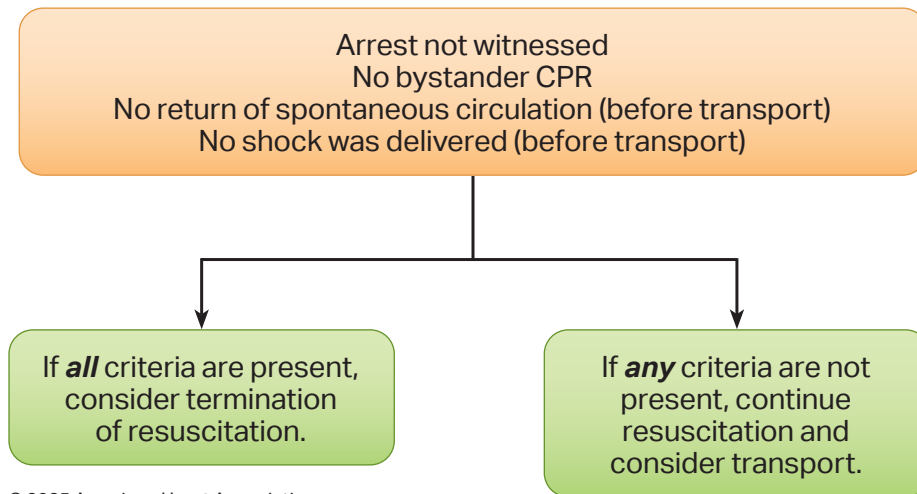
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

BLS/Universal Termination of Resuscitation Rules



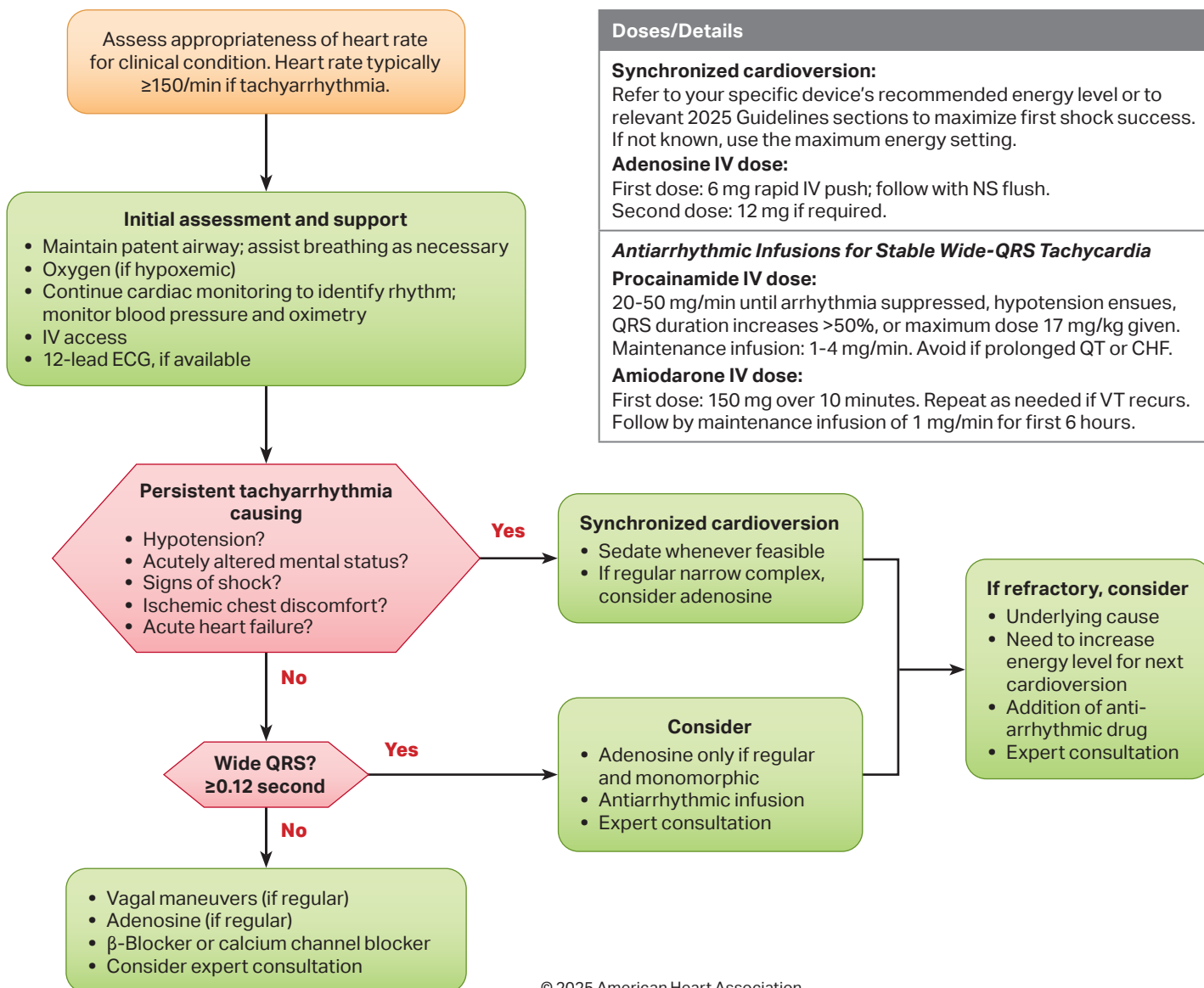
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ALS Termination of Resuscitation

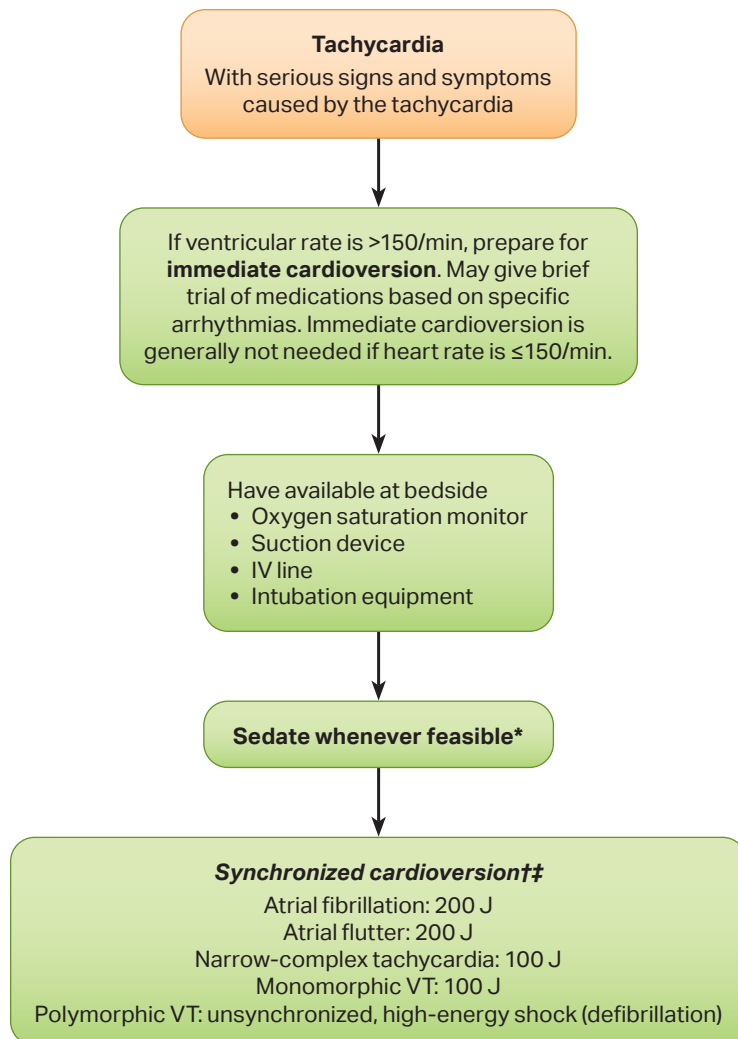


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Adult Tachyarrhythmia With a Pulse Algorithm



Electrical Cardioversion Algorithm



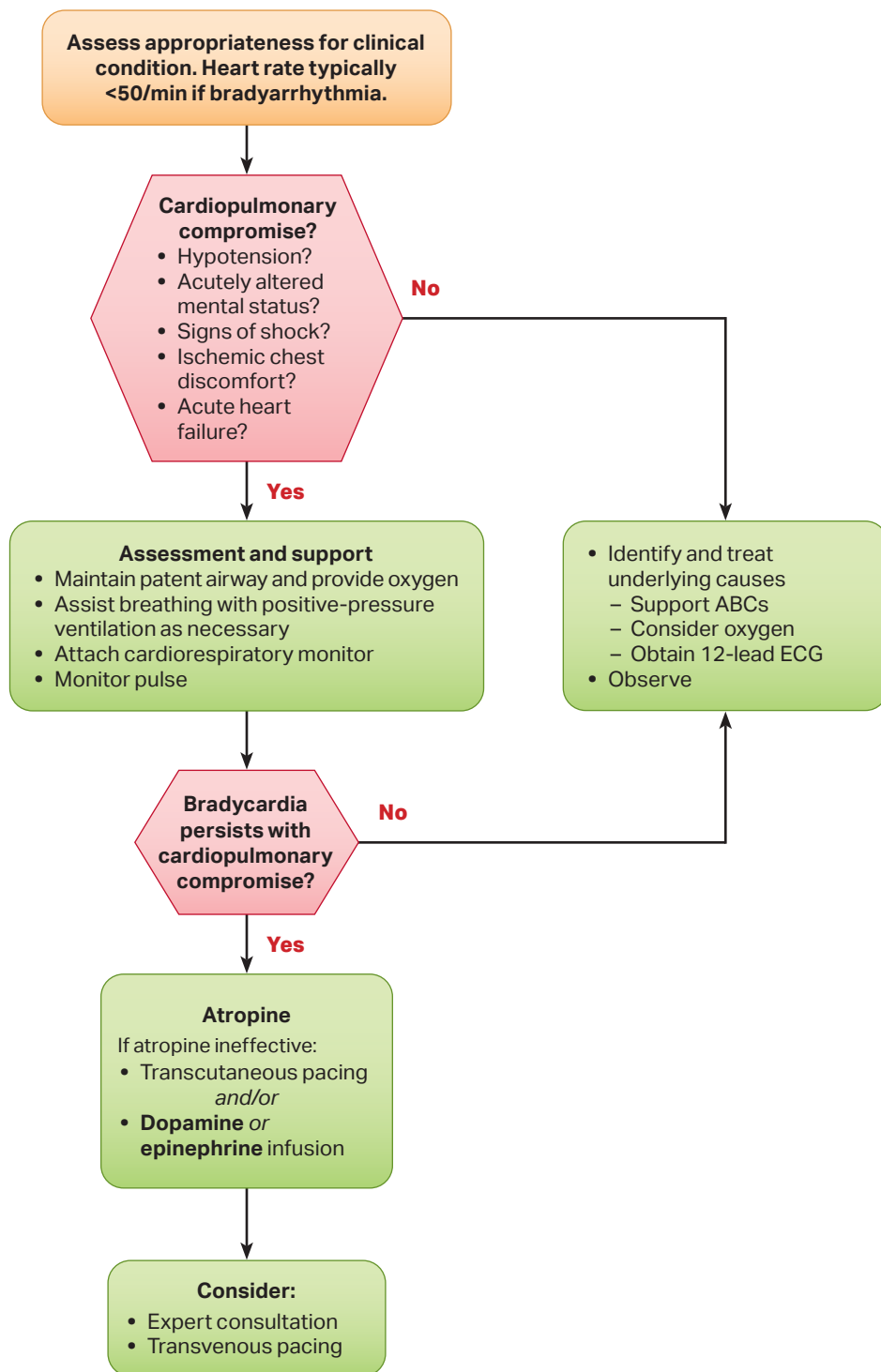
Notes

*Effective regimens have included a sedative (**eg, diazepam**) with or without an analgesic agent (**eg, fentanyl**). Many experts recommend anesthesia if service is readily available.

†Note possible need to resynchronize after each cardioversion.

‡If delays in synchronization occur and clinical condition is critical, go immediately to unsynchronized shocks.

Adult Bradycardia With a Pulse Algorithm



Doses/Details

Atropine IV dose:

First dose: 1 mg bolus.
Repeat every 3-5 minutes.
Maximum total dose: 3 mg.

Dopamine IV infusion:

Usual infusion rate is 5-20 mcg/kg per minute.
Titrate to patient response; taper slowly.

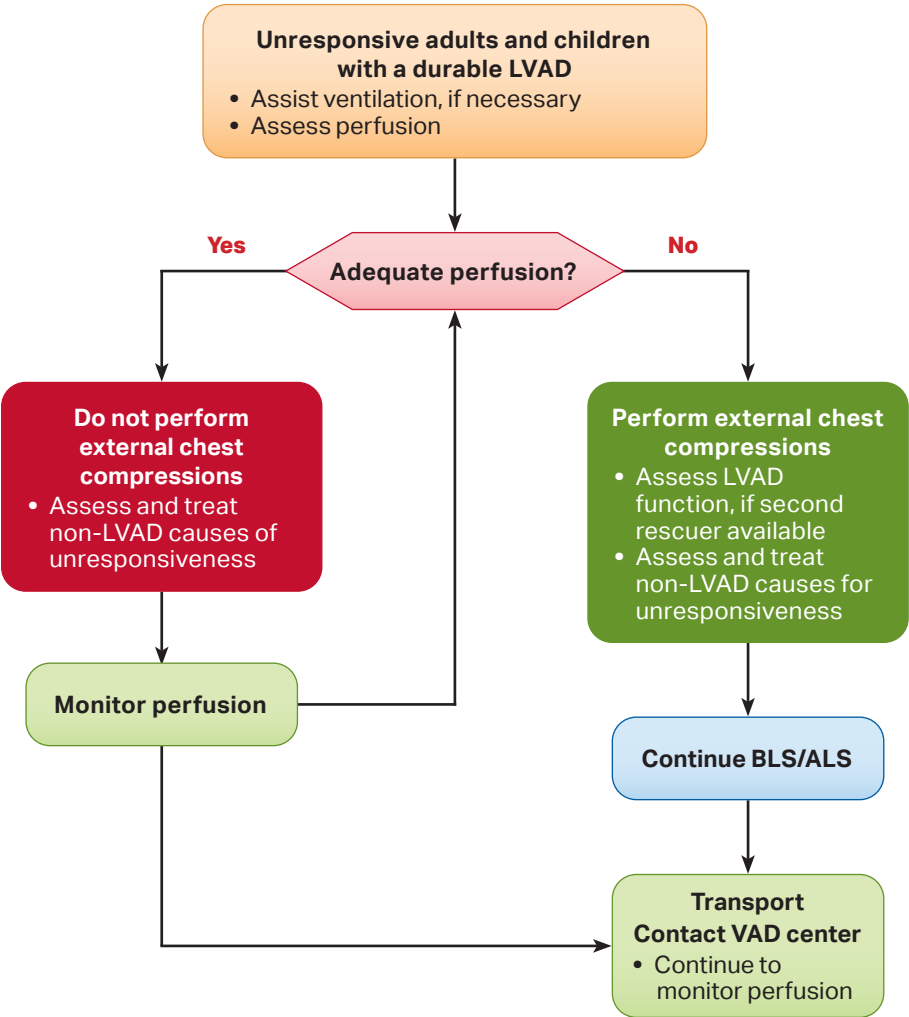
Epinephrine IV infusion:

2-10 mcg per minute infusion.
Titrate to patient response.

Possible Causes

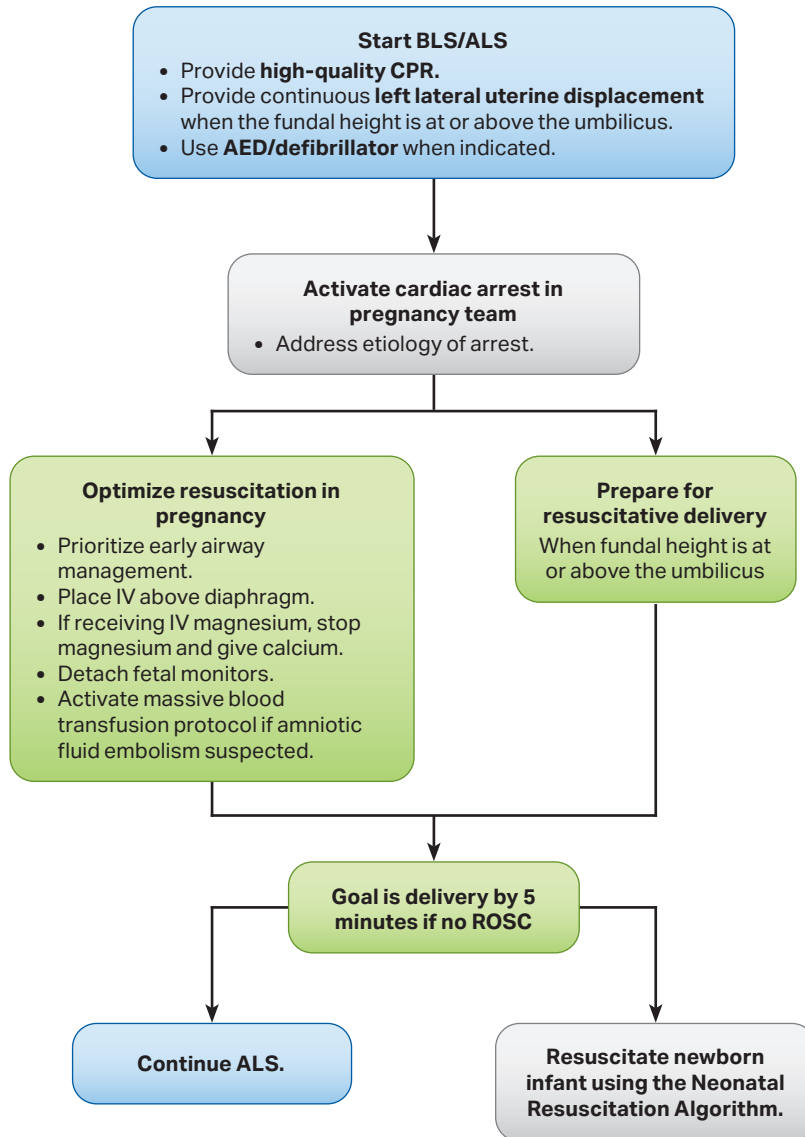
- Myocardial ischemia/infarction
- Drugs/toxicologic (eg, calcium-channel blockers, β -blockers, digoxin)
- Hypoxia
- Electrolyte abnormality (eg, hyperkalemia)

Adult and Pediatric Durable Left Ventricular Assist Device Algorithm



Assessing Perfusion
Adequate perfusion* if any of the following present: • Normal skin color and temperature • Normal capillary refill • MAP >50 mm Hg (if noninvasive BP cuff nonfunctional, use doppler or arterial line, if available) • PETCO₂ >20 mm Hg (if available and should be used only when an ET tube or tracheostomy is used to ventilate the patient; use of a supraglottic [eg, King] airway results in a falsely elevated PETCO₂ value) <i>*Patients may not have palpable pulse</i>
Non-LVAD Causes of Unresponsiveness
• Dysrhythmia • Hemorrhage/hypovolemia • Hypoglycemia • Hypoxia • Overdose • Right ventricular failure • Sepsis • Stroke
Assess and Attempt to Restart LVAD Function
• Look/listen for alarms • Listen for LVAD hum • Driveline connected? • Power source connected? • Need to replace system controller?

Cardiac Arrest in Pregnancy Algorithm



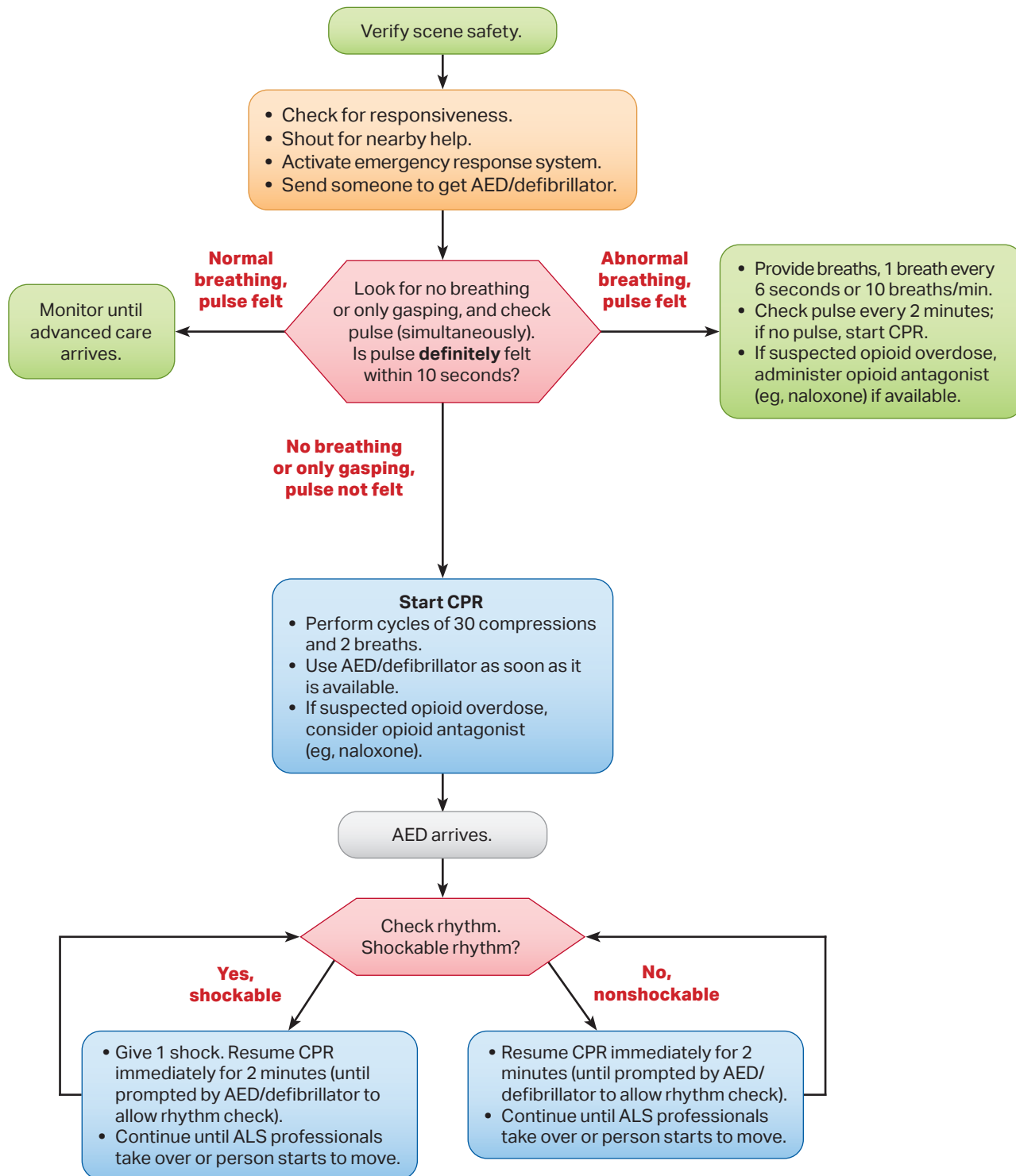
Explanation of Cardiac Arrest Interventions

- Cardiac arrest in pregnancy team will vary according to local resources but may include
 - Team Leader
 - Anesthesiologist
 - Obstetrician
 - Neonatologist
 - Nurses
 - Pharmacists
 - Other professionals
- The goal of left lateral uterine displacement is to relieve aortocaval compression and to facilitate effective chest compressions.
- The goal of resuscitative delivery is to improve the pregnant patient's outcome, and when feasible, the newborn infant's outcome.
- Ideally, perform resuscitative delivery by 5 minutes, depending on local resources.
- In pregnancy, difficult airway is common and is managed (eg, endotracheal intubation or supraglottic airway) by the most experienced professional.

Etiologies of Cardiac Arrest

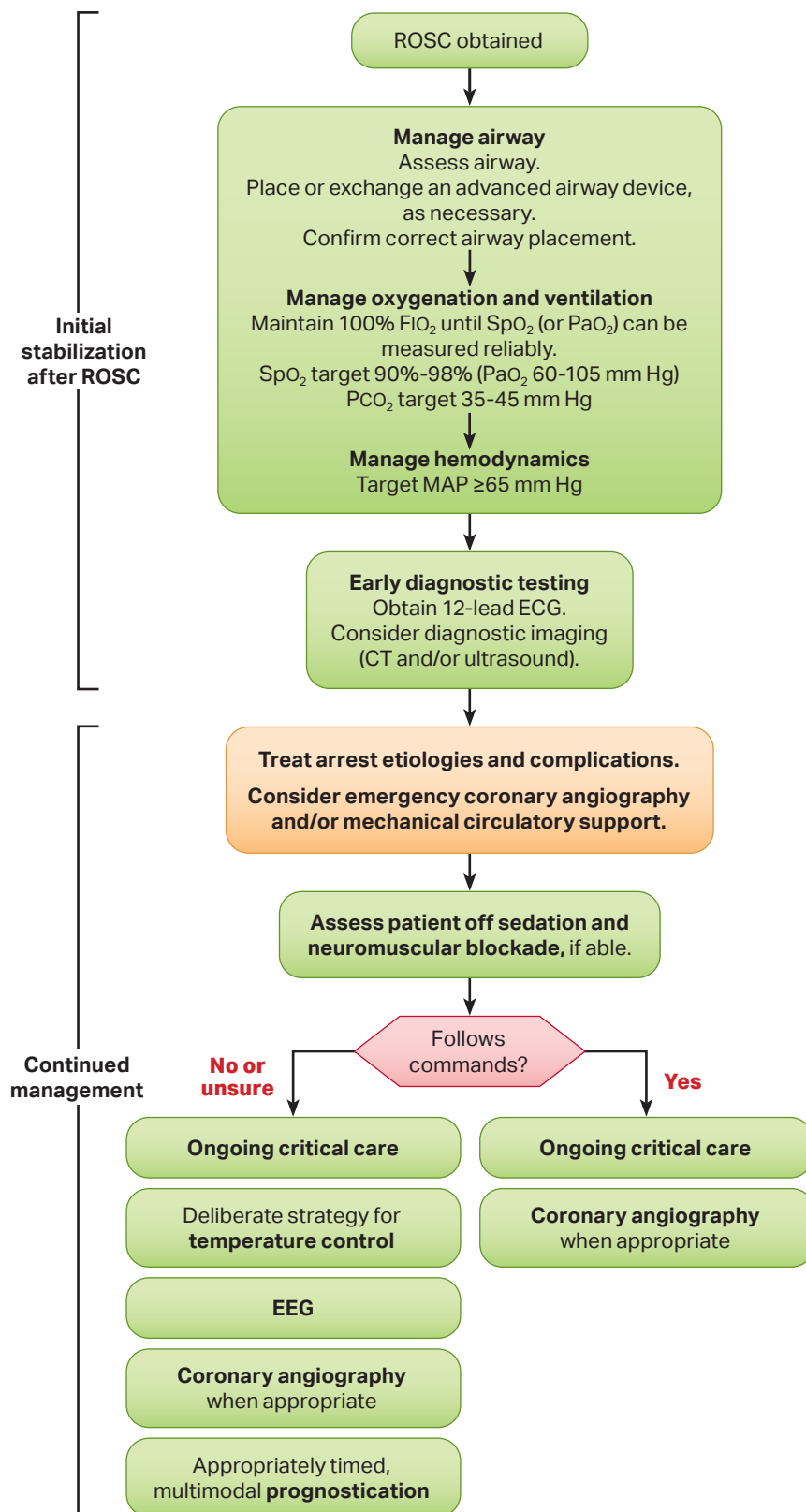
- A** Anesthetic complications
- B** Bleeding
- C** Cardiovascular
- D** Drugs
- E** Embolic (amniotic fluid or pulmonary embolism)
- F** Fever
- G** General causes (H's and T's)
- H** Hypertension (eg, preeclampsia)

Adult* Basic Life Support Algorithm for Health Care Professionals



*If signs of puberty, treat as adult.

Adult Post–Cardiac Arrest Care Algorithm



Initial Stabilization After ROSC

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently.

Manage airway: Assess and consider placement or exchange of an advanced airway device (usually endotracheal tube or supraglottic device). Confirm correct placement of an advanced airway. This generally includes the use of waveform capnography or capnometry.

Manage oxygenation and ventilation: Titrate FIO₂ for SpO₂ 90%-98% (or PaO₂ 60-105 mm Hg). Adjust minute ventilation to target PCO₂ 35-45 mm Hg in the absence of severe acidemia.

Manage hemodynamics: Initiate or adjust vasopressors and/or fluid resuscitation as necessary for goal MAP ≥65 mm Hg.

Early diagnostic testing: Obtain 12-lead ECG to assess for ischemia or arrhythmia. Consider CT head, chest, abdomen, and/or pelvis to determine cause of arrest or assess for injuries sustained during resuscitation. Point-of-care ultrasound or echocardiography may be reasonable to identify clinically significant diagnoses requiring intervention.

Continued Management

Treat arrest etiologies and complications.

Consider emergency cardiac intervention:

- Persistent ST-segment elevation present
- Cardiogenic shock
- Recurrent or refractory ventricular arrhythmias
- Severe myocardial ischemia

Temperature control: If patient is not following commands off sedation and neuromuscular blockade or is unable to assess, initiate a deliberate strategy of temperature control with goal 32 °C-37.5 °C as soon as possible.

Evaluate for seizure: Evaluate for clinical seizure and obtain EEG to evaluate for seizure in patients not following commands.

Prognostication: Multimodal approach with delayed impressions (≥72 hours from ROSC or achieving normothermia).

Ongoing critical care includes the following:

- Target PaO₂ 60-105 mm Hg, PCO₂ 35-45 mm Hg (unless severe acidemia); avoid hypoglycemia (glucose <70 mg/dL) and hyperglycemia (glucose >180 mg/dL); target MAP ≥65 mm Hg.
- Consider antibiotics.