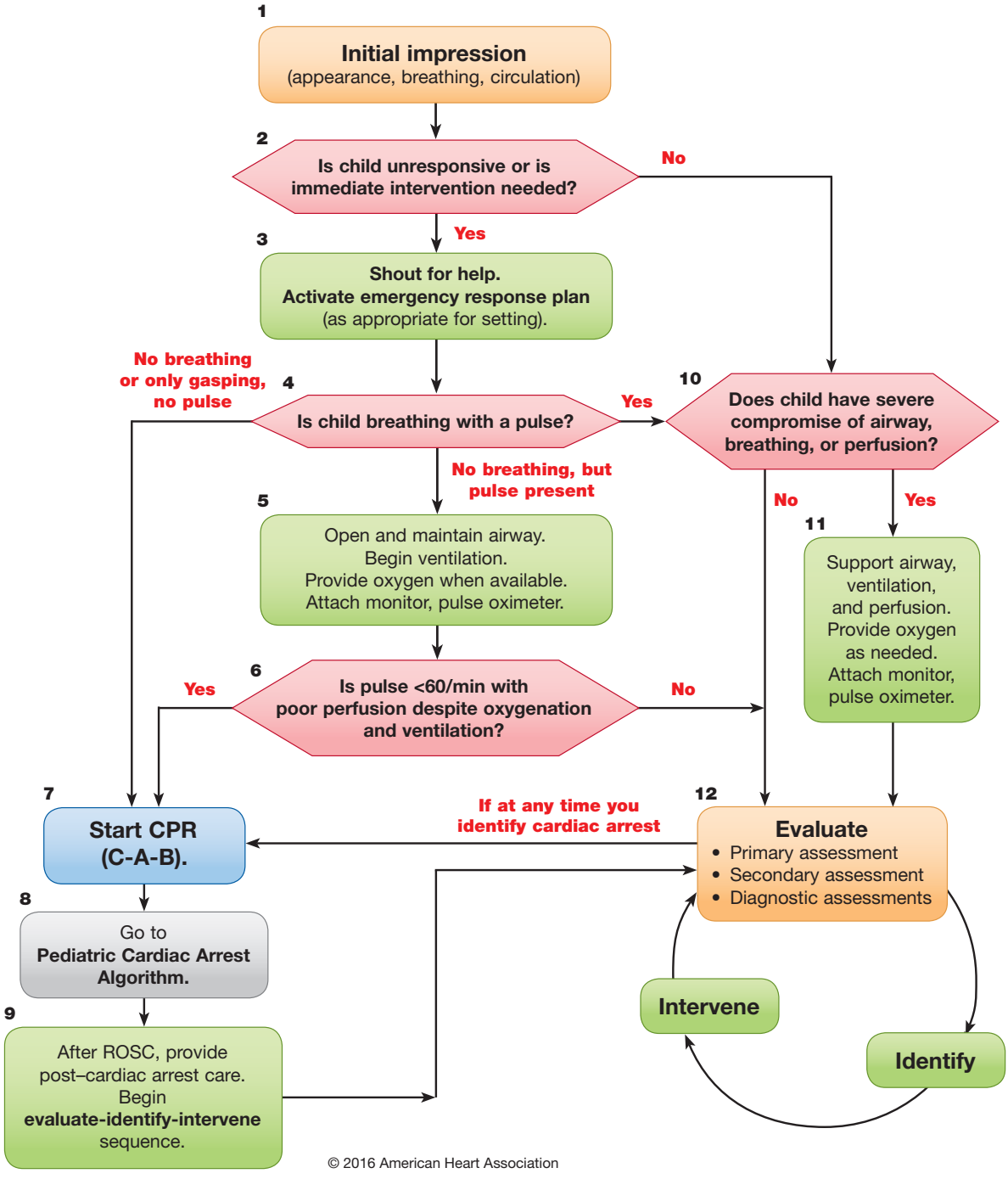
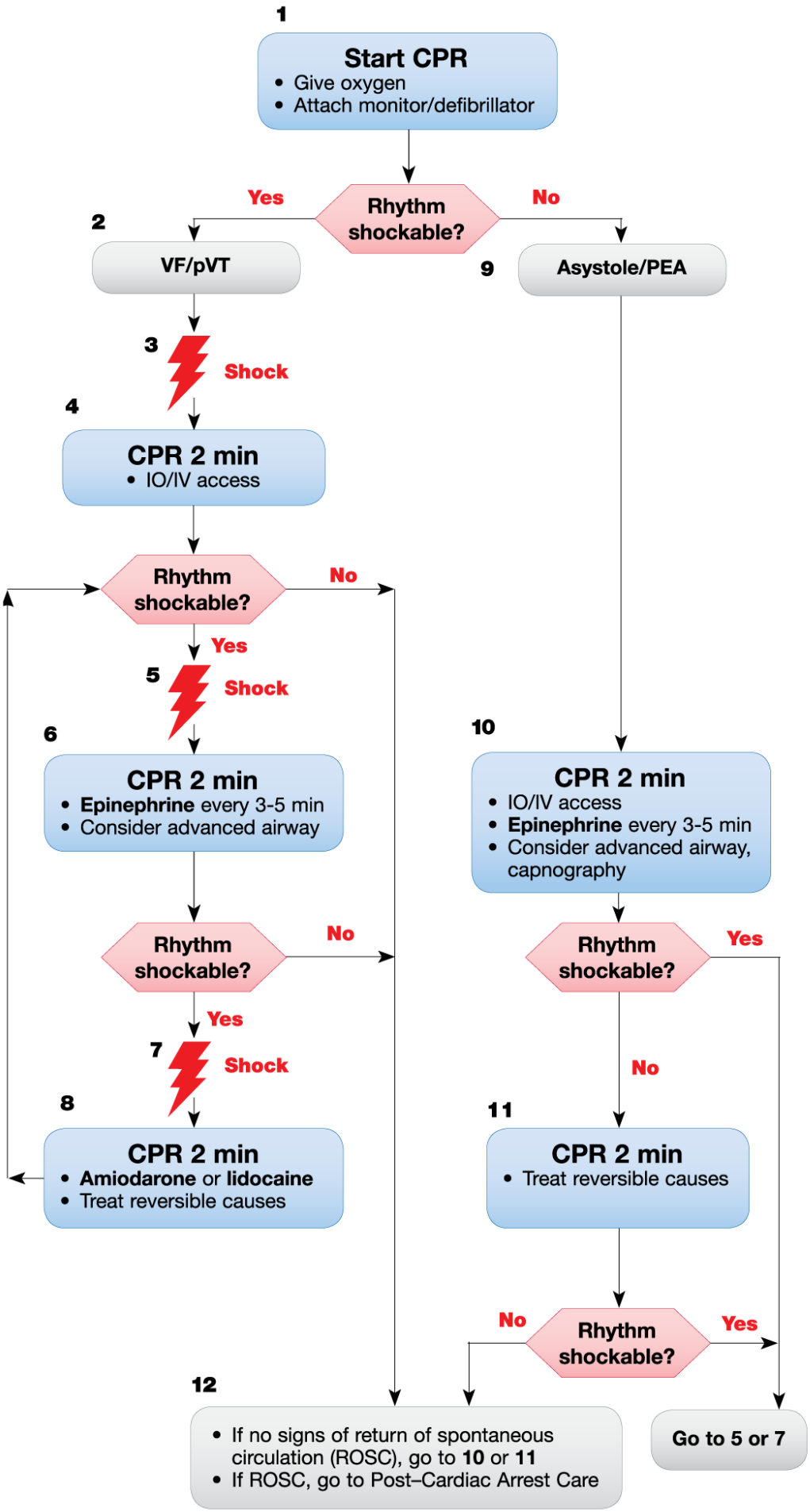
PALS Systematic Approach Algorithm



Pediatric Cardiac Arrest Algorithm—2018 Update



CPR Quality

- Push hard (≥⅓ of anteroposterior diameter of chest) and 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, 15:2 compression-ventilation ratio.

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 IO/IV dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Repeat every 3-5 minutes. If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- **Amiodarone IO/IV dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.

-OR-

Lidocaine IO/IV dose: Initial: 1 mg/kg loading dose. Maintenance: 20-50 mcg/kg per minute infusion (repeat bolus dose if infusion initiated >15 minutes after initial bolus therapy).

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- 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

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypoglycemia
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

PALS Management of Shock After ROSC Algorithm

Optimize Ventilation and Oxygenation

- Titrate FIO_2 to maintain oxyhemoglobin saturation 94%-99% (or as appropriate to the patient's condition); if possible, wean FIO_2 if saturation is 100%.
- Consider advanced airway placement and waveform capnography.
- If possible, target a PCO_2 that is appropriate for the patient's condition and limit exposure to severe hypercapnia or hypocapnia.

Assess for and Treat Persistent Shock

- Identify and treat contributing factors.*
- Consider 20 mL/kg IV/IO boluses of isotonic crystalloid. Consider smaller boluses (eg, 10 mL/kg) if poor cardiac function suspected.
- Consider the need for inotropic and/or vasopressor support for fluid-refractory shock.

***Possible Contributing Factors**

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

Hypotensive Shock

- Epinephrine
- Dopamine
- Norepinephrine

Normotensive Shock

- Dobutamine
- Dopamine
- Epinephrine
- Milrinone

- Monitor for and treat agitation and seizures.
- Monitor for and treat hypoglycemia.
- Assess blood gas, serum electrolytes, and calcium.
- If patient remains comatose after resuscitation from cardiac arrest, maintain targeted temperature management, including aggressive treatment of fever.
- Consider consultation and patient transport to tertiary care center.

Estimation of Maintenance Fluid Requirements

- **Infants <10 kg:** 4 mL/kg per hour

  Example: For an 8-kg infant, estimated maintenance fluid rate
  = 4 mL/kg per hour × 8 kg
  = 32 mL per hour

- **Children 10-20 kg:** 40 mL per hour + 2 mL/kg per hour for each kg above 10 kg

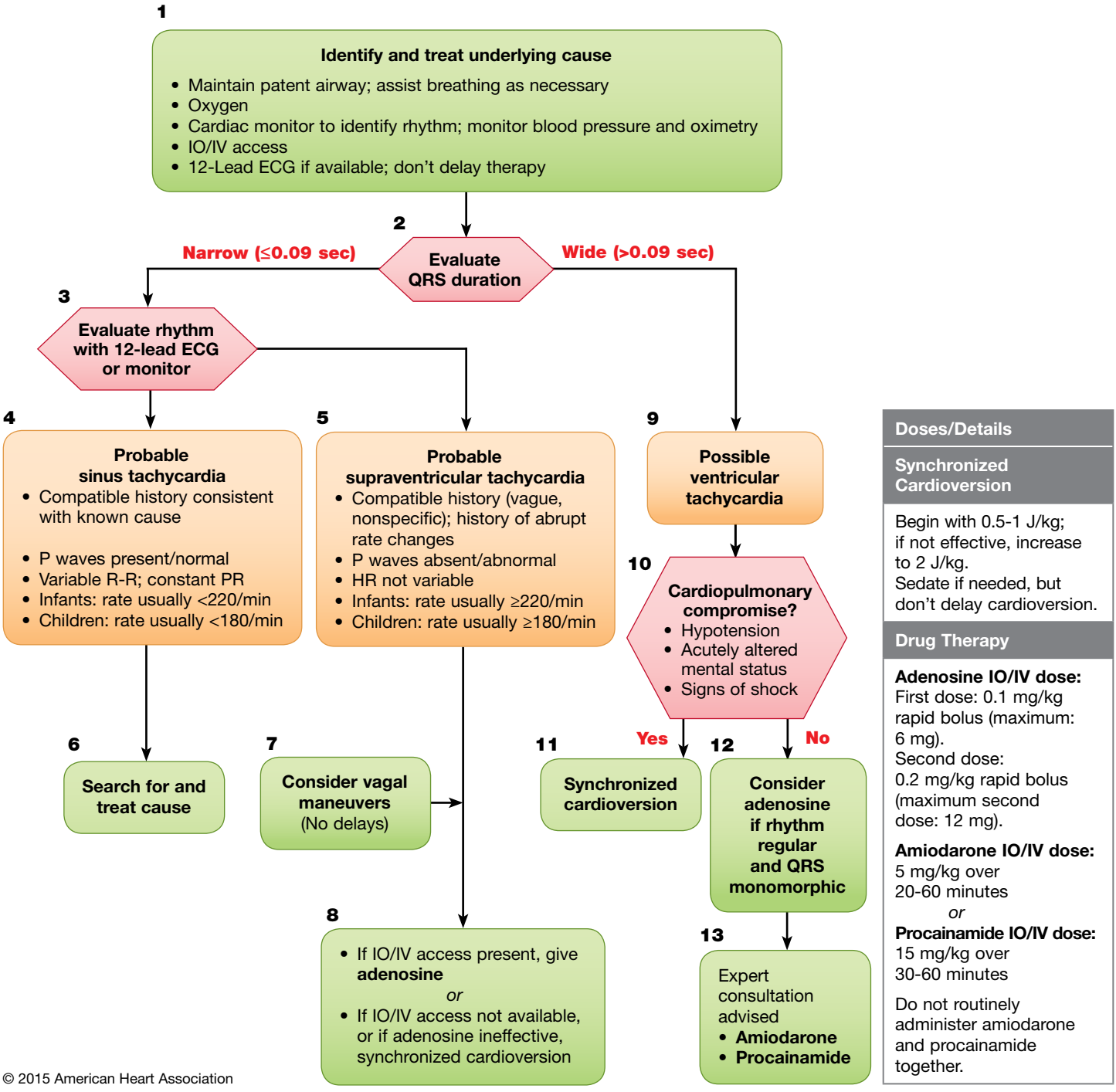
  Example: For a 15-kg child, estimated maintenance fluid rate
  40 mL per hour
  + (2 mL/kg per hour × 5 kg)
  = 50 mL per hour

- **Children >20 kg:** 60 mL per hour + 1 mL/kg per hour for each kg above 20 kg

  Example: For a 28-kg child, estimated maintenance fluid rate
  60 mL per hour
  + (1 mL/kg per hour × 8 kg)
  =68 mL per hour

After initial stabilization, adjust the rate and composition of intravenous fluids based on the patient's clinical condition and state of hydration. In general, provide a continuous infusion of a dextrose-containing solution for infants. Avoid hypotonic solutions in critically ill children; for most patients, use isotonic fluid such as normal saline (0.9% NaCl) or lactated Ringer's solution with or without dextrose, based on the child's clinical status.

Pediatric Tachycardia With a Pulse and Poor Perfusion Algorithm



Doses/Details
Synchronized Cardioversion
Begin with 0.5-1 J/kg; if not effective, increase to 2 J/kg. Sedate if needed, but don't delay cardioversion.
Drug Therapy
Adenosine IO/IV dose: First dose: 0.1 mg/kg rapid bolus (maximum: 6 mg). Second dose: 0.2 mg/kg rapid bolus (maximum second dose: 12 mg).
Amiodarone IO/IV dose: 5 mg/kg over 20-60 minutes *or* **Procainamide IO/IV dose:** 15 mg/kg over 30-60 minutes
Do not routinely administer amiodarone and procainamide together.

Pediatric Bradycardia With a Pulse and Poor Perfusion Algorithm