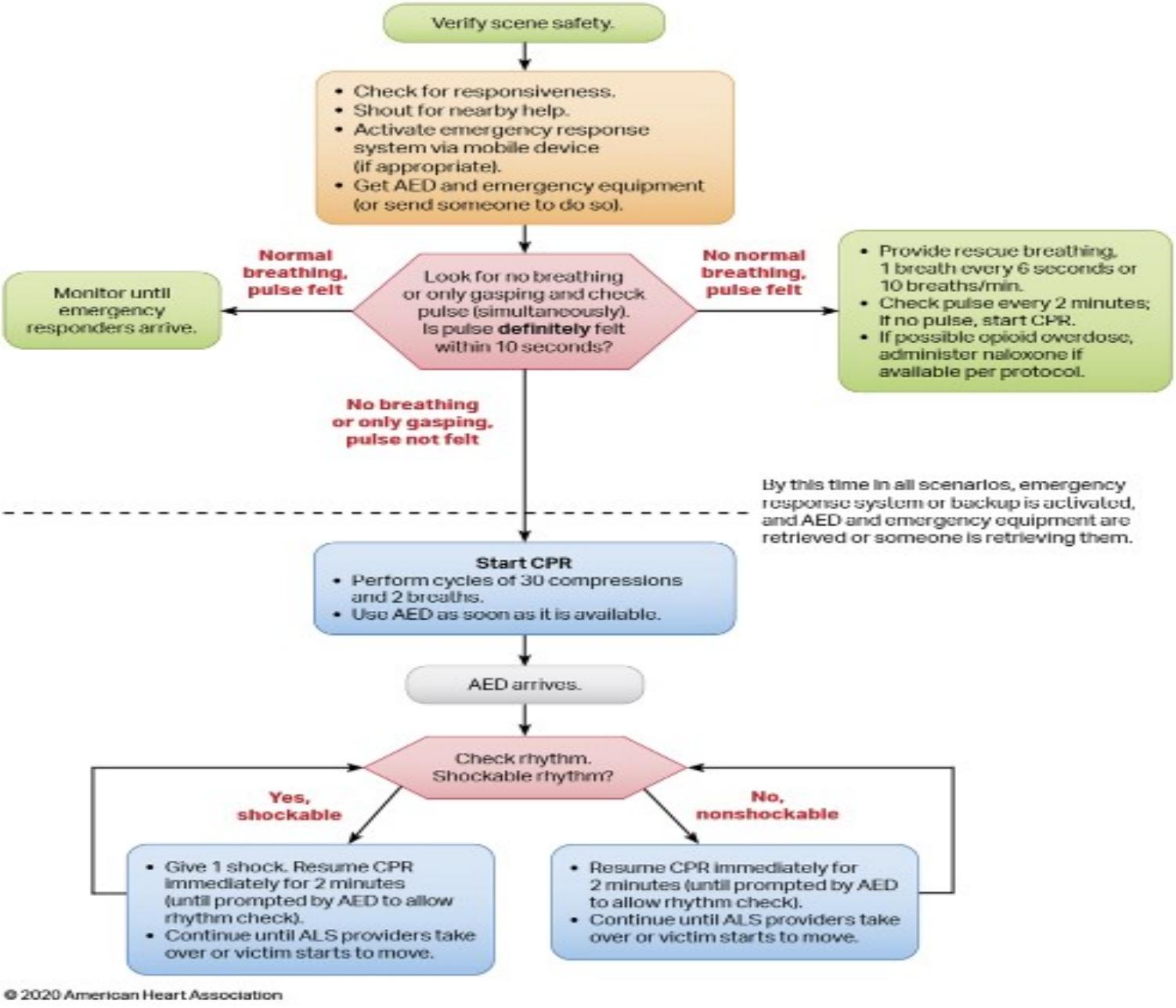
Adult Basic Life Support

2020 AHA



High-quality CPR improves a victim's chances of survival. The critical characteristics of high-quality CPR include the following:

- **Start compressions within 10 seconds** after recognizing cardiac arrest.
- **Push hard and push fast:** Compress at a rate of 100 to 120/min with a depth of
  - At least 2 inches (5 cm) for adults
  - At least one third the depth of the chest, approximately 2 inches (5 cm), for children
  - At least one third the depth of the chest, approximately 1½ inches (4 cm), for infants
- **Allow complete chest recoil** after each compression.
- **Minimize interruptions** in compressions (try to limit interruptions to less than 10 seconds).
- **Give effective breaths** that make the chest rise.
- **Avoid excessive ventilation.**

Summary of High-Quality CPR Components for BLS Providers

Component	Adults and Adolescents	Children (Age 1 Year to Puberty)	Infants (Age Less Than 1 Year)
Scene safety	Make sure the environment is safe for rescuers and victim		
Recognition of cardiac arrest	Check for responsiveness		
	No breathing or only gasping (ie, no normal breathing)		
	No definite pulse felt within 10 seconds		
	(Breathing and pulse check can be performed simultaneously in less than 10 seconds)		
Activation of emergency response system	If you are alone with no mobile phone, leave the victim to activate the emergency response system and get the AED before beginning CPR	**Witnessed collapse** Follow steps for adults and adolescents on the left	
	OR	**Unwitnessed collapse** Give 2 minutes of CPR Leave the victim, activate the emergency response system, get the AED (if available), return to the child or infant and resume CPR; use the AED if needed	
	Send someone and begin CPR immediately; use the AED as soon as it's available		
Compression-ventilation ratio	**1 or 2 rescuers**	**1 rescuer**	**2 or more rescuers**
	30 to 2	30 to 2	15 to 2
Compression rate	100-120/min		
Compression-ventilation ratio with advanced airway	Continuous compressions at a rate of 100-120/min		
	Give 1 breath every 6 seconds (10 breaths/min); Effective breaths produce adequate chest rise		
Compression depth	At least 2 inches (5 cm)*	At least one-third AP diameter of chest	At least one-third AP diameter of chest
	***no more than 2.4 inches (6 cm)**	About 2 inches (5 cm)	About 1.5 inches (4 cm)
Hand placement	2 hands on the lower half of the breastbone (sternum)	2 hands or 1 hand (optional for a very small child) on the lower half of the breastbone (sternum)	**1 rescuer** 2 fingers in the center of the chest, just below the nipple line **2 or more rescuers** 2 thumbs encircling hands in the center of the chest, just below the nipple line
Chest recoil	Allow full recoil of chest after each compression to allow the heart to adequately refill between compressions		
Minimizing interruptions	Limit interruptions in chest compressions to less than 10 seconds		
AED	Turn it on 1st; Follow AED prompts; Actions required for submerged victim and hairy chested victim		
Rapid defibrillation	Eliminates abnormal heart rhythm; Restores a regular cardiac rhythm		
Team dynamics	Knowing one's limitations; Clear role & responsibilities; Constructive feedback		
Foreign Body Airway Obstruction	Conscious - Heimlich maneuver Unconscious - CPR *modified* to look for obstructed object when you open the airway		Conscious - 5 Back slaps & 5 chest thrusts Unconscious - CPR *modified*

Abbreviations: AED - automated external defibrillator; AP - anteroposterior; CPR - cardiopulmonary resuscitation

Adult Cardiac Arrest

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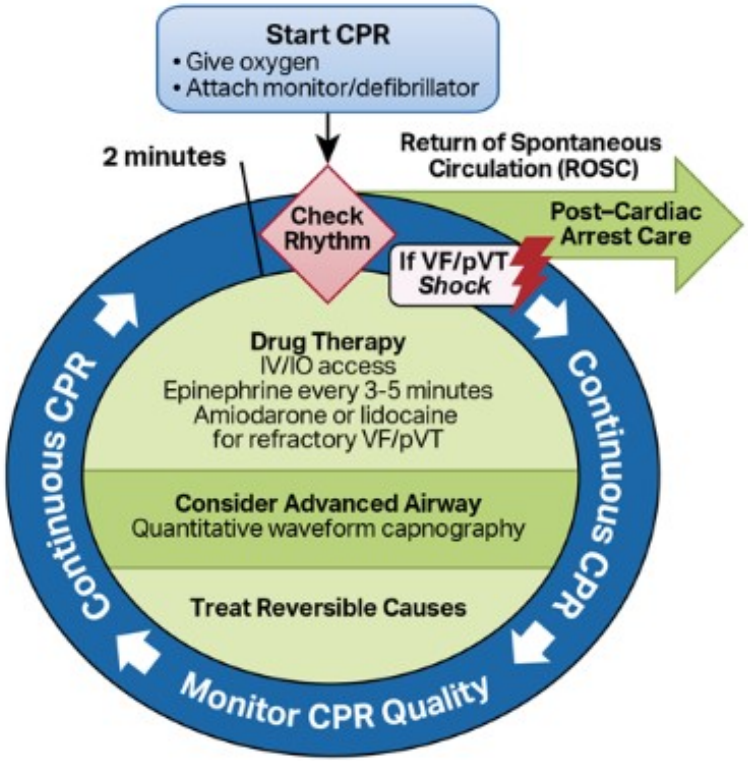

CPR Quality

- Push hard (at least 2 inches [5 cm]) 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, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If $PETCO_2$ 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

- 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
- Abrupt sustained increase in $PETCO_2$ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

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

Bradycardia

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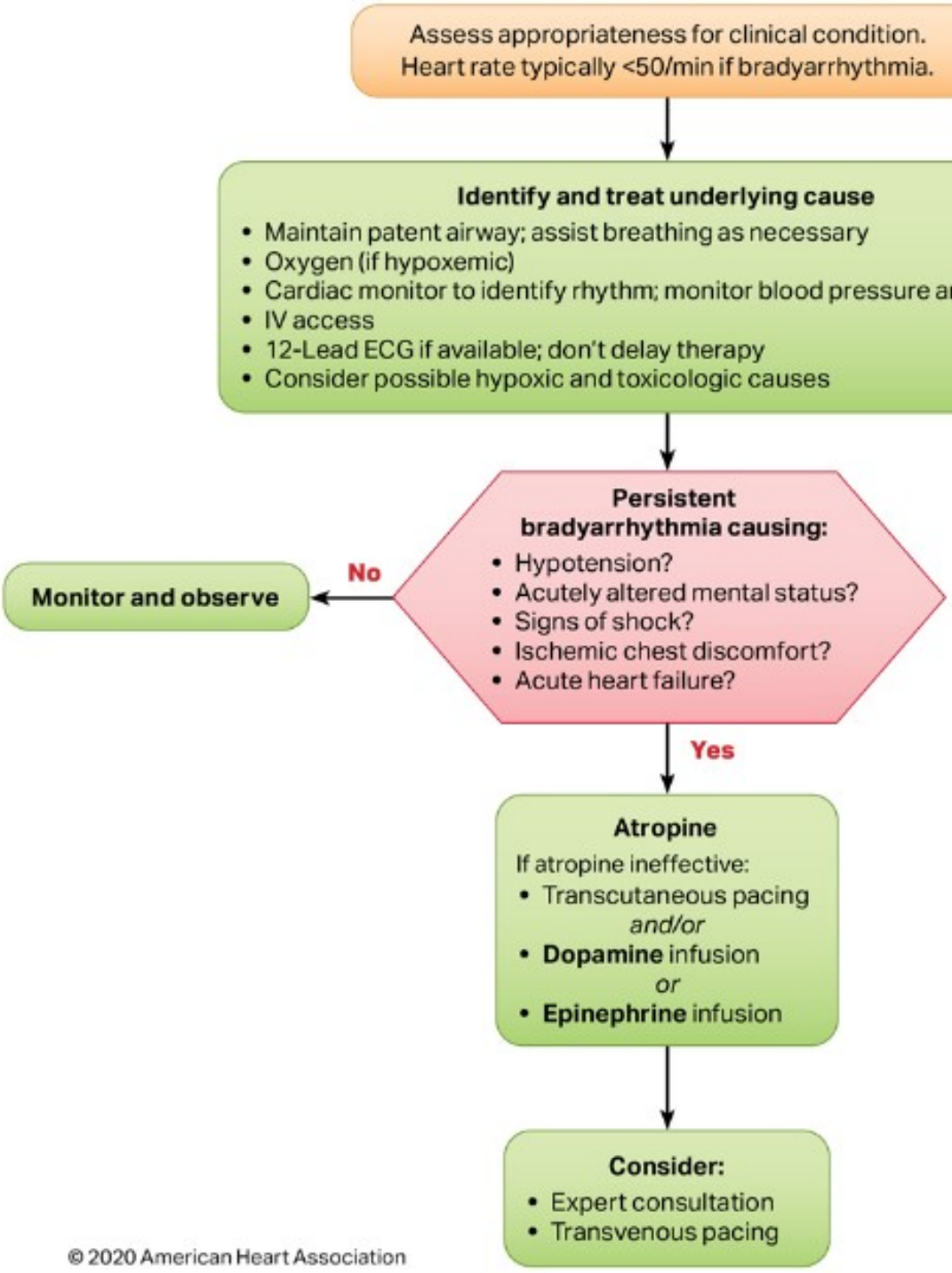

Doses/Details

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

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

Tachycardia

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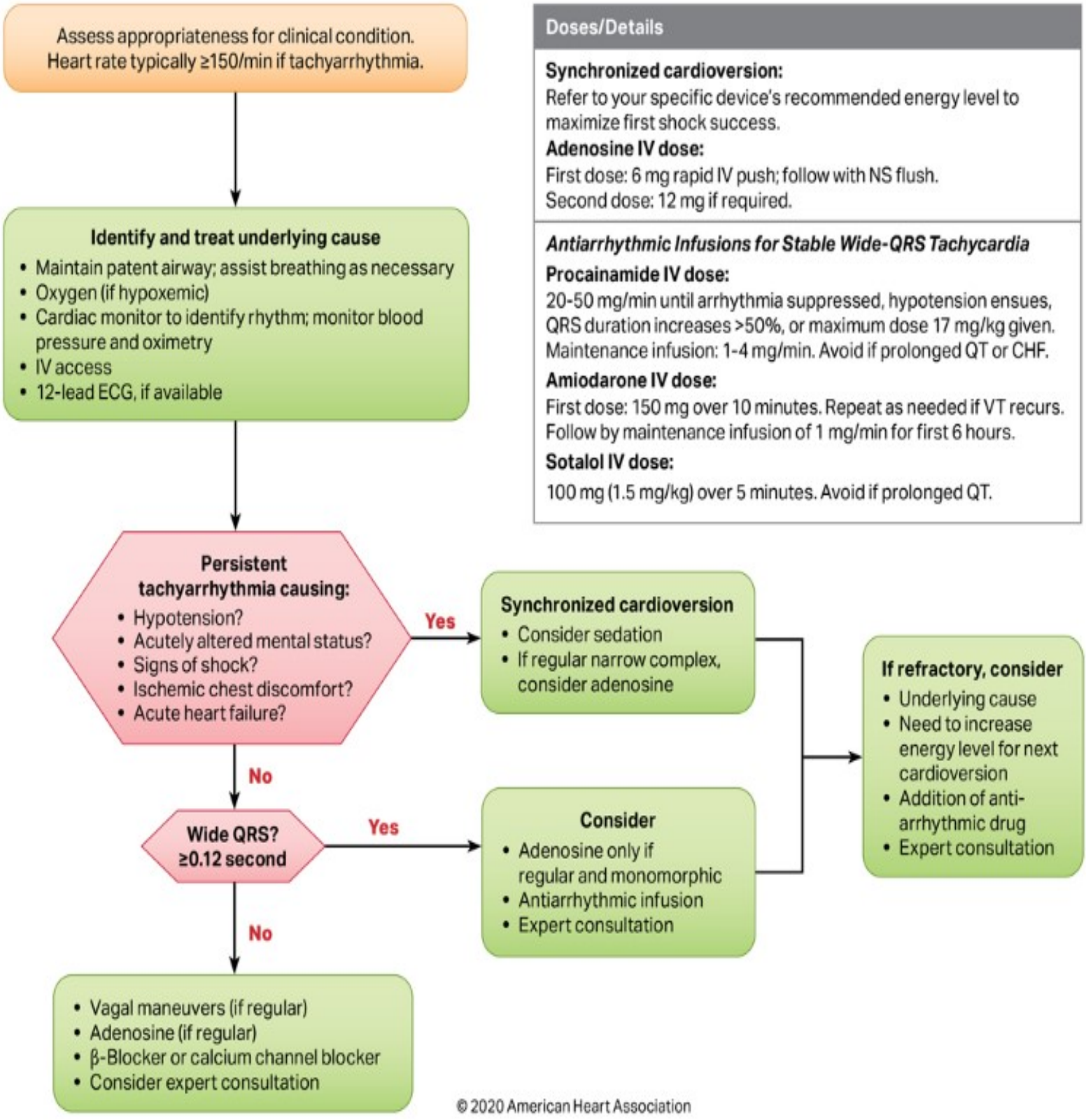

Acute Coronary Syndromes

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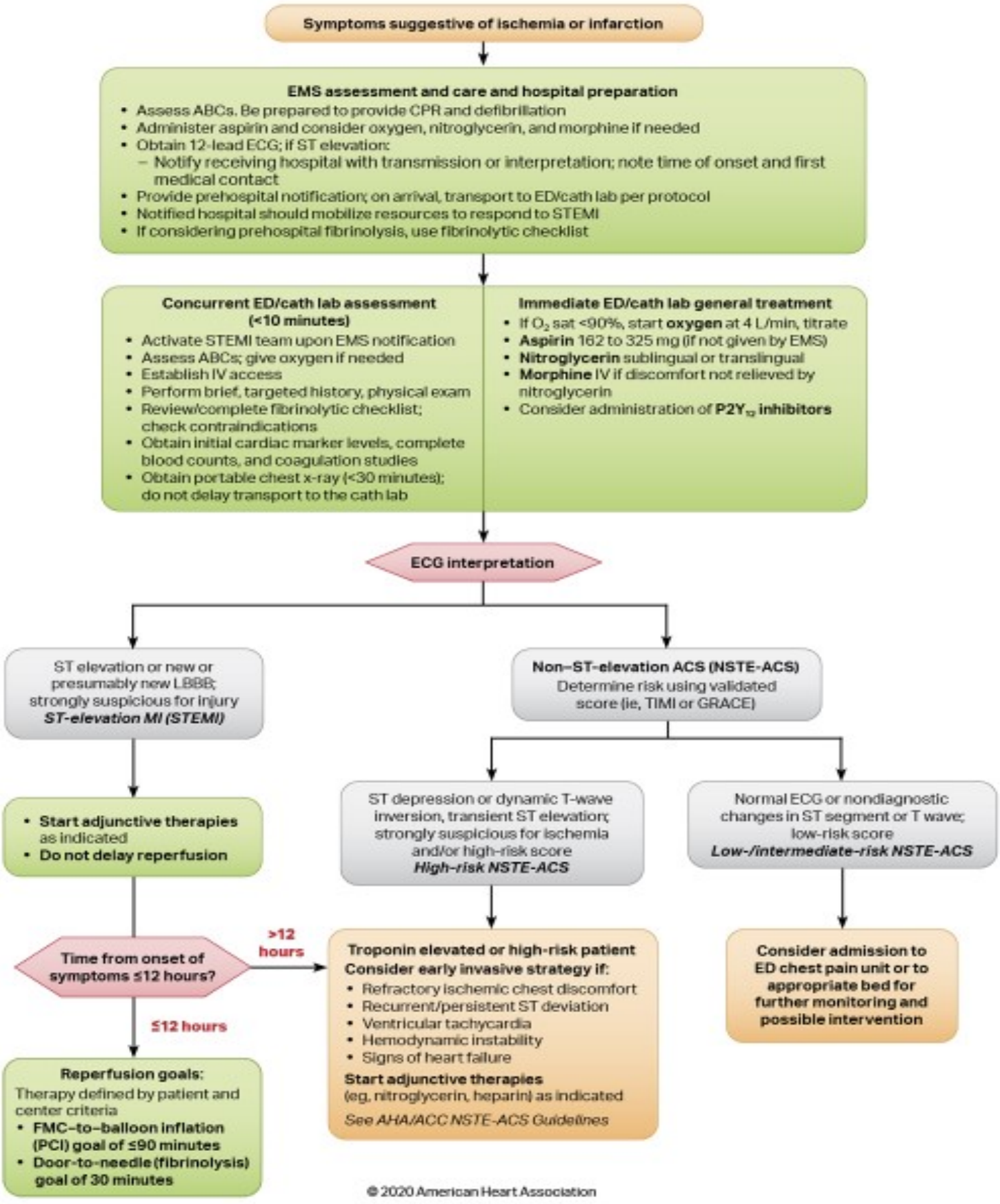
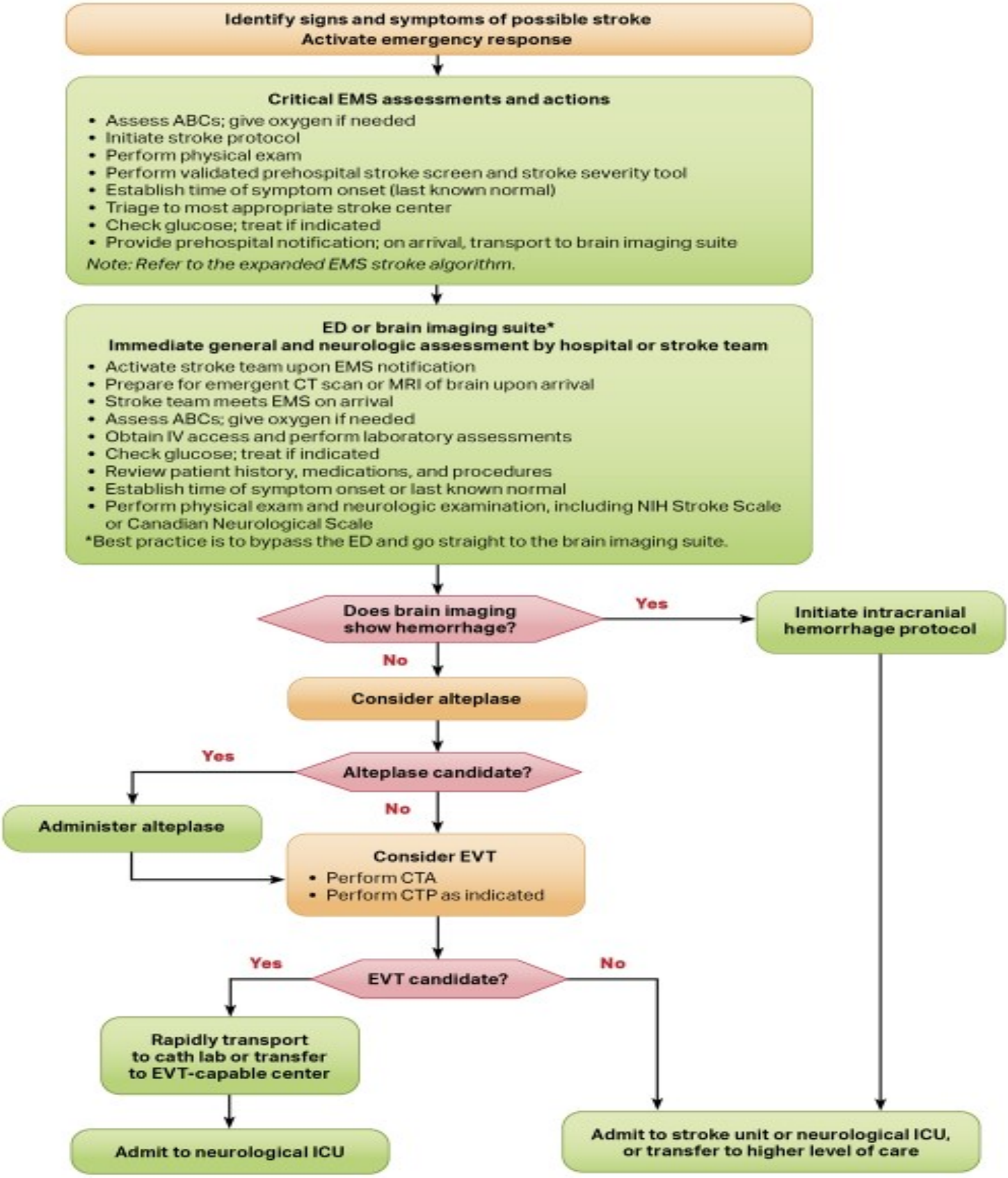


Suspected Stroke

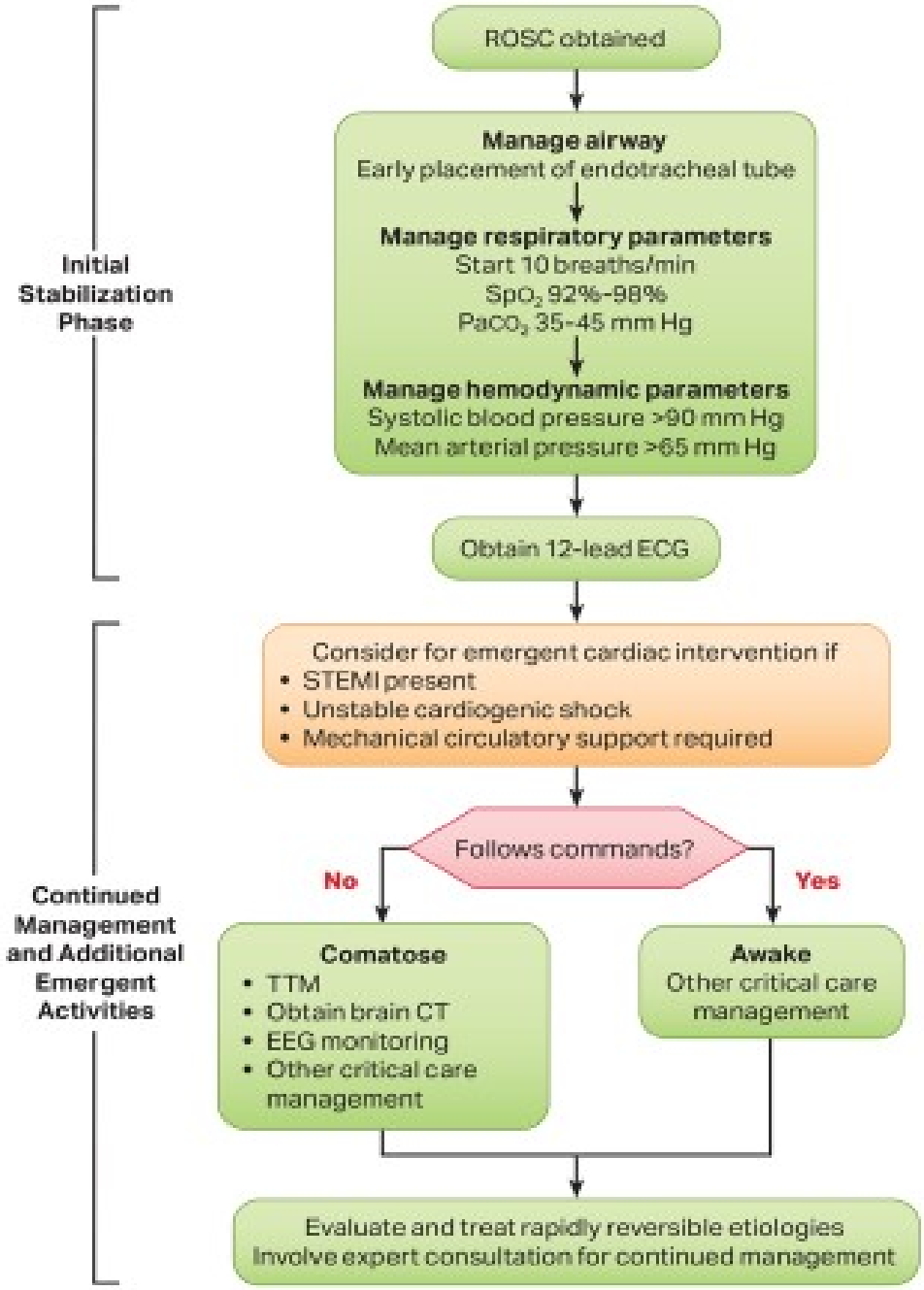
2020 AHA



Adult Suspected Stroke Algorithm

Adult Post Cardiac Arrest Care (ROSC)

2020 AHA



Initial Stabilization Phase

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management: Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters: Titrate FiO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to $PaCO_2$ of 35-45 mm Hg
- Manage hemodynamic parameters: Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

- Emergent cardiac intervention: Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
  - Continuously monitor core temperature (esophageal, rectal, bladder)
  - Maintain normoxia, normocapnia, euglycemia
  - Provide continuous or intermittent electroencephalogram (EEG) monitoring
  - Provide lung-protective ventilation

H's and T's

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypokalemia/**h**yperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary