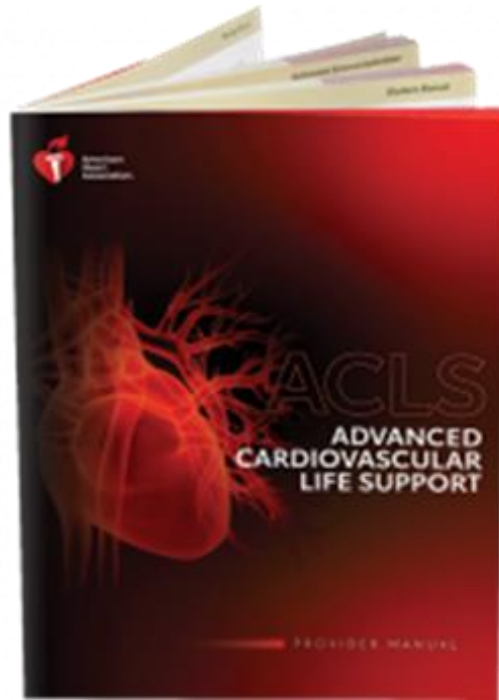


# ACLS Study Guide



Welcome to LearnACLS a multi-regional and international American Heart Association Training Center, the home of “Stress Free Learning”.

Before attending your class, it is mandatory that you complete the precourse online assessment. The links are:

**Precourse Assessment** <https://elearning.heart.org/course/423>

This self-evaluation is designed to prepare you for your upcoming certification class, as well as assist the instructors in guiding the class meet your educational needs.

If you register and pay 10 days prior to the class, you may choose to receive your course materials shipped to you for an additional \$9.00. Please take the opportunity to review the materials prior to attending your course. Enclosed you will find a quick reference study guide which we have prepared to assist you in preparing for your course. This guide is not meant to replace your AHA materials but to facilitate your learning.

Upon successful course completion, including demonstration of skills competency in all learning stations and passing the CPR and AED skills test, bag-mask ventilation skills test, a Megacode test and a written test, students receive an ACLS course completion card, valid for two years. Once again thank you for choosing LearnACLS for your American Heart Association training needs. We look forward to seeing you at your class.



High quality CPR and early defibrillator is the core of ACLS care in the cardiac arrest patient.

High quality CPR can be measured by, Partial End Tidal Carbon Dioxide (PETCO<sub>2</sub>). A reading greater than 10 and less than 23 indicates high quality CPR. The normal PETCO is 35-45 mm HG. Any reading less than 10 indicates ineffectiveness CPR during resuscitation.

A sudden rise of PETCO towards normal is the first sign of return spontaneous circulation (ROSC).

If an AED does not analyze it is defective, do not attempt to troubleshoot.

Integration of the Rapid Response Team (RRT) or Medical Emergency Team (MET) facilitates early identification of clinical deterioration of patients and visitors in hospital and improves overall outcome.

Atropine is not recommended for routine use in Asystole or PEA.

Pulseless Electrical activity is finding of a rhythm that would normally perfuse but is not.

All symptomatic bradycardiac patients should receive Atropine 1mg IVB every 3-5 minutes up to 3 mg. Those patients who do not respond may be treated with Dopamine or Epinephrine infusions or Transcutaneous pacing.

Any regular tachycardia is to be considered unstable and the treatment of choice should be synchronized cardioversion, with or without sedation.

In Return of Spontaneous Circulation (ROSC) algorithms the first priority is to maintain airway, the overall focus is maintenance of homeostasis. Percutaneous Coronary Intervention (PCI) and induction of therapeutic hypothermia can be safely combined.

Target values after ROSC,  $PAO_2 / FIO_2$  94-98,  $PETCO_2$  35-45, BP 90 mm HG systolic.

ROSC patients can receive 1-2L of 4-degree Celsius of Saline or Ringers.

In Bradycardia and Tachycardia always consider underlying causes as first line treatment.

The rate of chest compressions is 100 to 120 compressions. Adult a depth between 2 to 2.4 inches (5-6cm)

HCP will provide rescue breaths for the adult at a rate of 1 breath every 5-6 sec. (10-12/min); Once an advanced airway is in place continuous CPR with 1 ventilation every 6 sec. (10/min)

Post Cardiac Arrest Therapeutic Hypothermia-Targeted Temperature Management (TMM) is in the range of 32<sup>o</sup>-36<sup>o</sup>C for 24 hours.

Synchronized Cardioversion for Unstable Tachycardias-Initial energy for Narrow Regular (atrial flutter) or (SVT) 50-100 J

Initial energy dose for cardioversion for Narrow Irregular (atrial fibrillation) is 120-200 J; Initial energy for Wide Regular (monomorphic VT ) is 100 J

Pacing-Transcutaneous pacing (TCP) is considered for symptomatic bradycardia with a pulse if atropine is ineffective; NOT recommended for asystolic cardiac arrest. If TCP fails, transvenous pacing should be initiated by a trained provider.

Capnography--It is the most reliable method to confirm ET tube placement. Normal PETCO<sub>2</sub> values = 35-40mmHg. PETCO<sub>2</sub> values ≥10 mmHg during CPR suggest chest compressions are effective, if values are less than 10 mm HG, - improve chest compressions (depth, placement, rate) and vasopressor therapy.

Colormetric ETCO<sub>2</sub> devices should be used only when waveform capnography is not available.

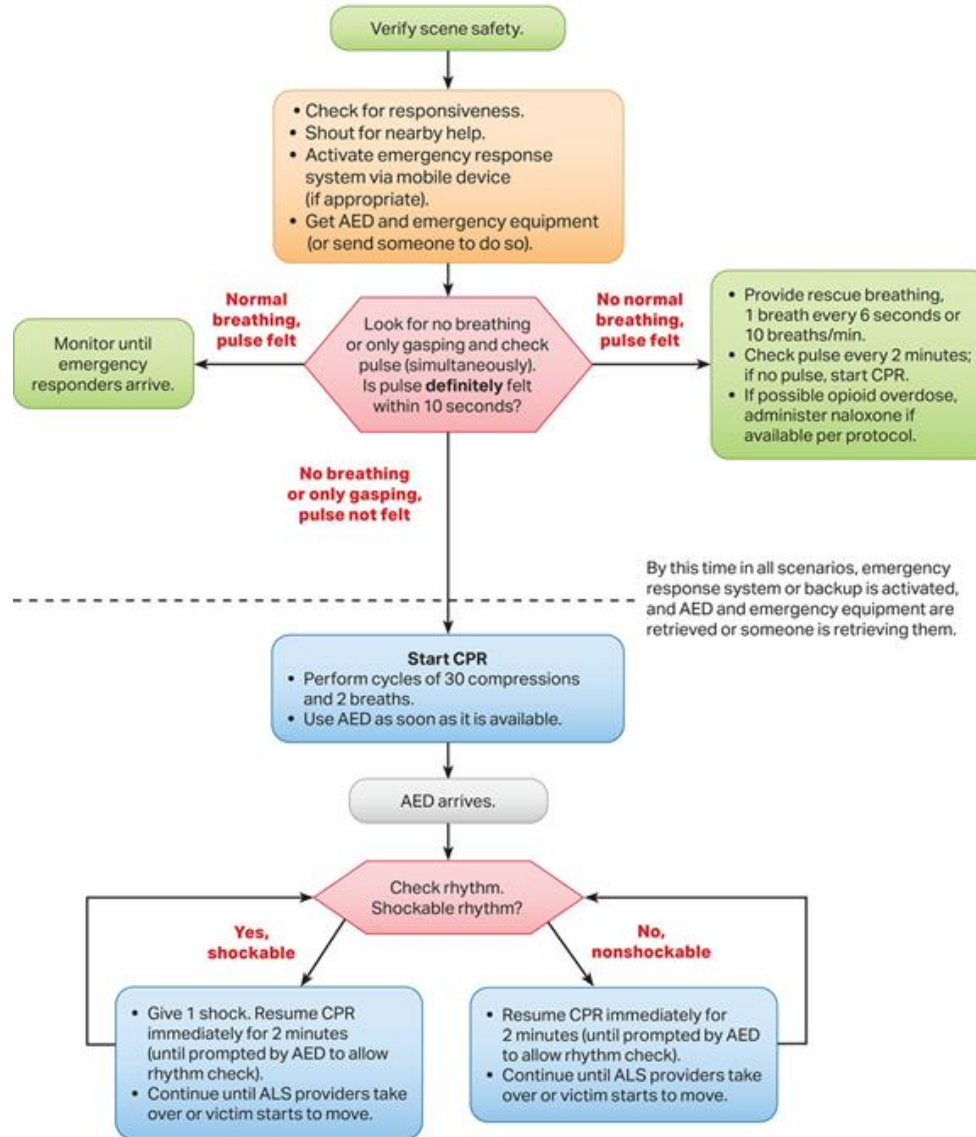


Key changes in advanced cardiovascular life support, reflecting the *2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care*

- Basic life support skills, including effective chest compressions monitored by a CPR Coach, use of a bag-mask device with a filter and use of an (AED)
- Recognition and early management of respiratory and cardiac arrest
- Recognition and early management of peri-arrest conditions such as symptomatic bradycardia
- Airway management
- Related pharmacology
- Management of acute coronary syndromes (ACS) and stroke
- Effective communication as a member and leader of a resuscitation team
- Effective Resuscitation Team Dynamics



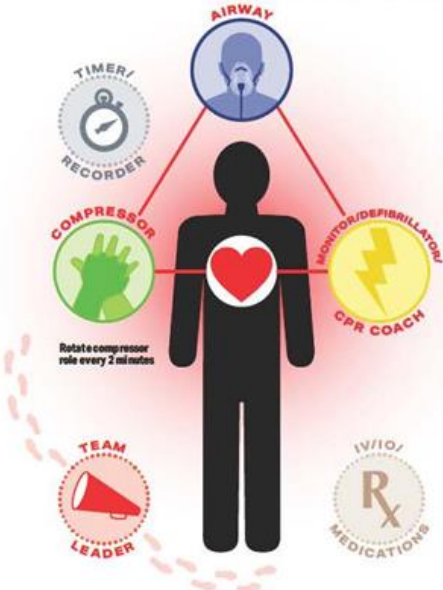
## Adult Basic Life Support Algorithm for Healthcare Providers



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- Resuscitation Triangle Roles**
- Compressor**
    - Assesses the patient
    - Performs compressions according to local protocols
    - Rotates every 2 minutes or earlier if fatigued
  - Monitor/Defibrillator/ CPR Coach**
    - Brings and operates the AED/monitor/defibrillator and acts as the CPR Coach if designated
    - If a monitor is present, places it in position where it can be seen by the Team Leader (and most of the team)
  - Airway**
    - Opens the airway
    - Provides bag-mask ventilation
    - Inserts airway adjuncts as appropriate
- The team owns the code. No team member leaves the triangle except to rotate compressors or to protect his or her safety.

**Positions for 6-Person High-Performance Teams\***



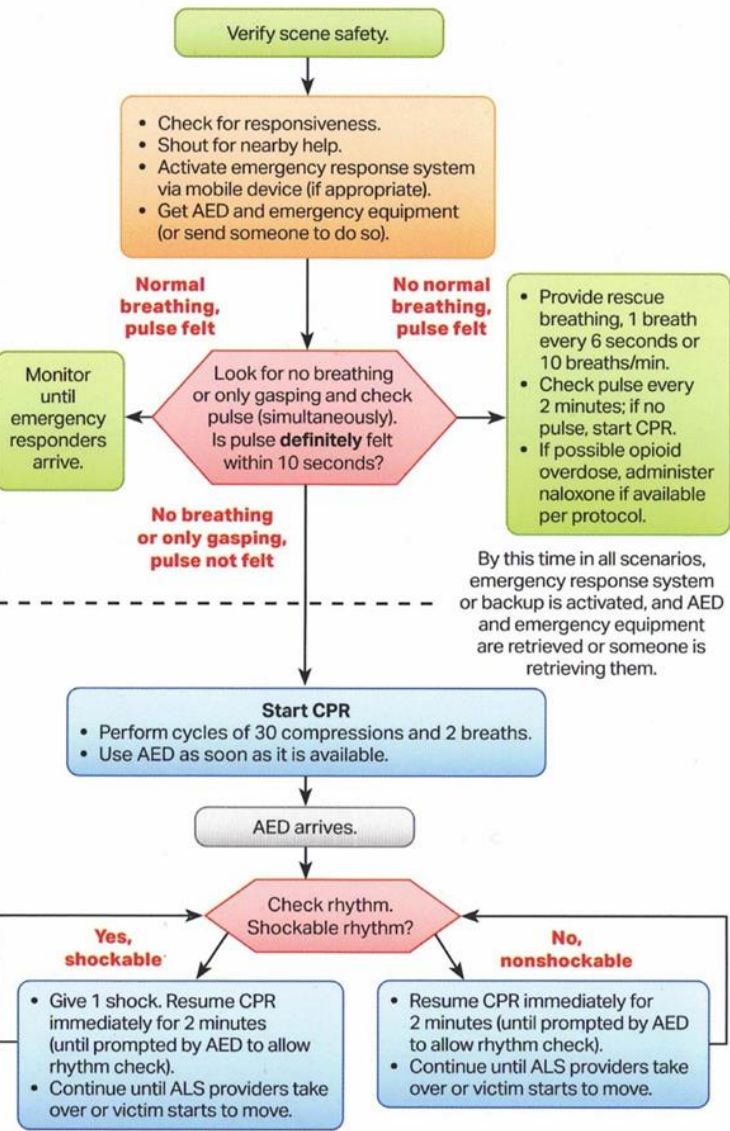
- Leadership Roles**
- Team Leader**
    - Every resuscitation team must have a defined leader
    - Assigns roles to team members
    - Makes treatment decisions
    - Provides feedback to the rest of the team as needed
    - Assumes responsibility for roles not defined
  - IV/IO Medications**
    - An ALS provider role
    - Initiates IV/IO access
    - Administer medications
  - Timer/Recorder**
    - Records the time of interventions and medications (and announces when these are next due)
    - Records the frequency and duration of interruptions in compressions
    - Communicates these to the Team Leader (and the rest of the team)

**Monitor;  
CPR Coach**

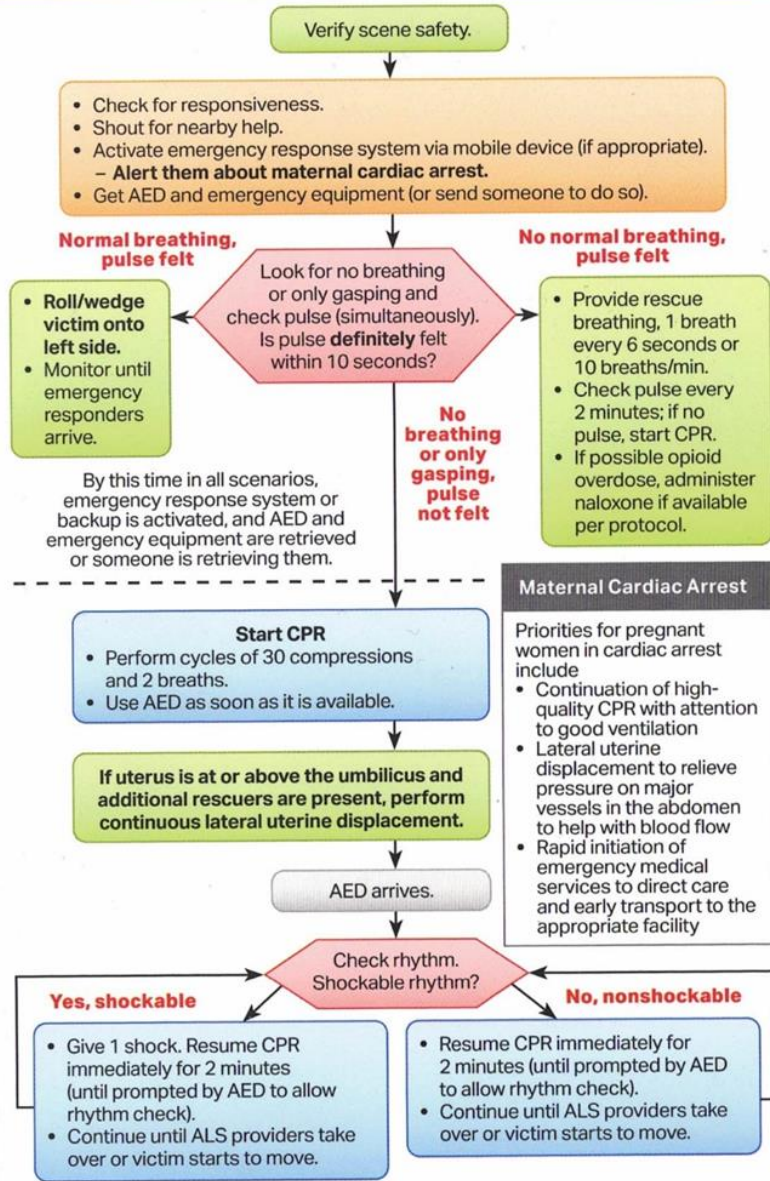
\*This is a suggested team formation. Roles may be adapted to local protocol. †Roles and tasks are performed by advanced providers. © 2020 American Heart Association



# Adult BLS Algorithm for Healthcare Providers

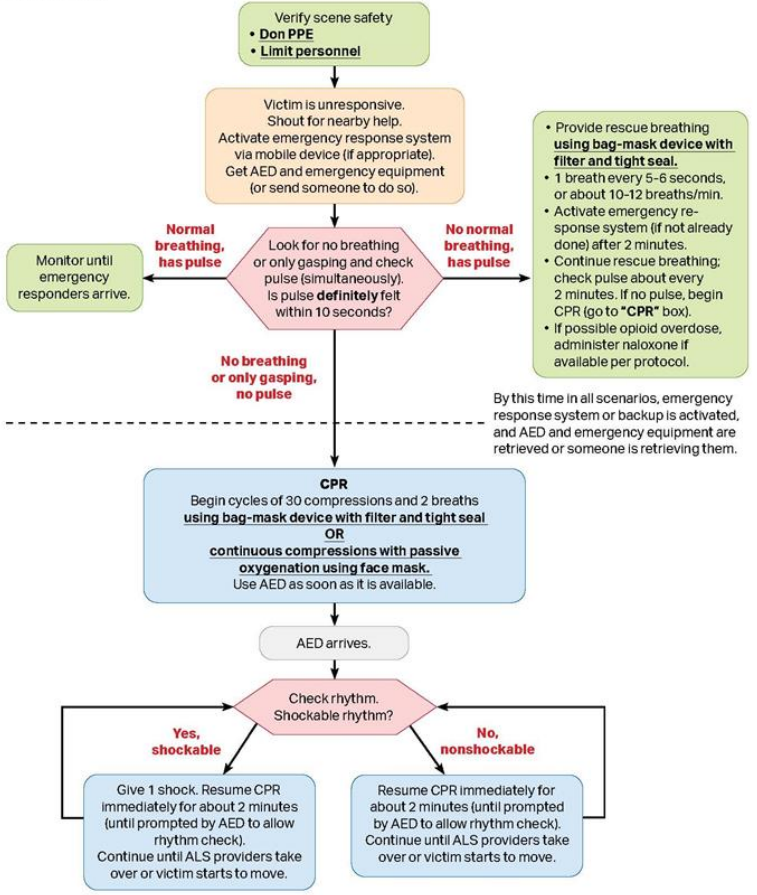


# Adult BLS in Pregnancy Algorithm for Healthcare Providers



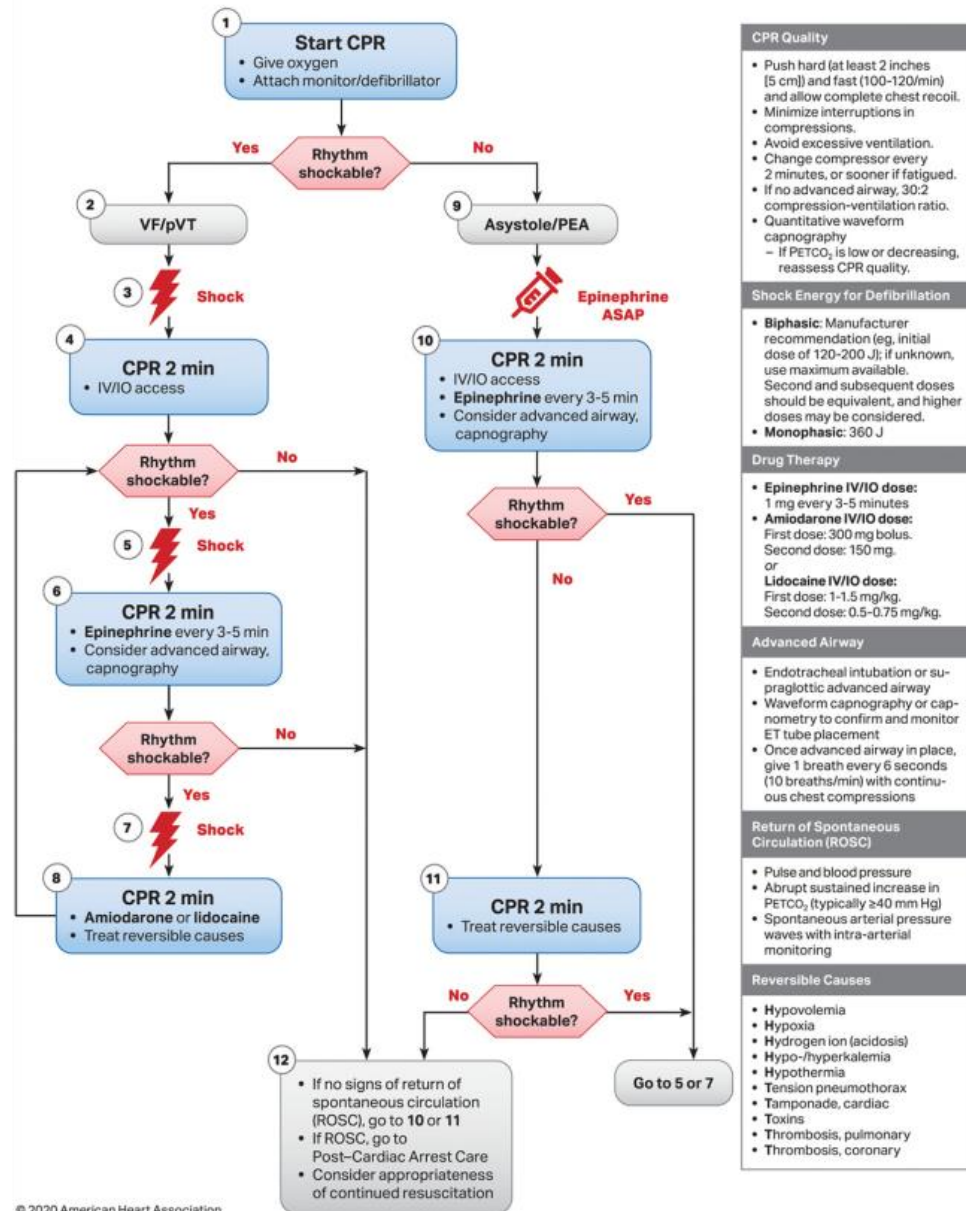
# BLS Healthcare Provider Adult Cardiac Arrest Algorithm for Suspected or Confirmed COVID-19 Patients

Updated April 2020



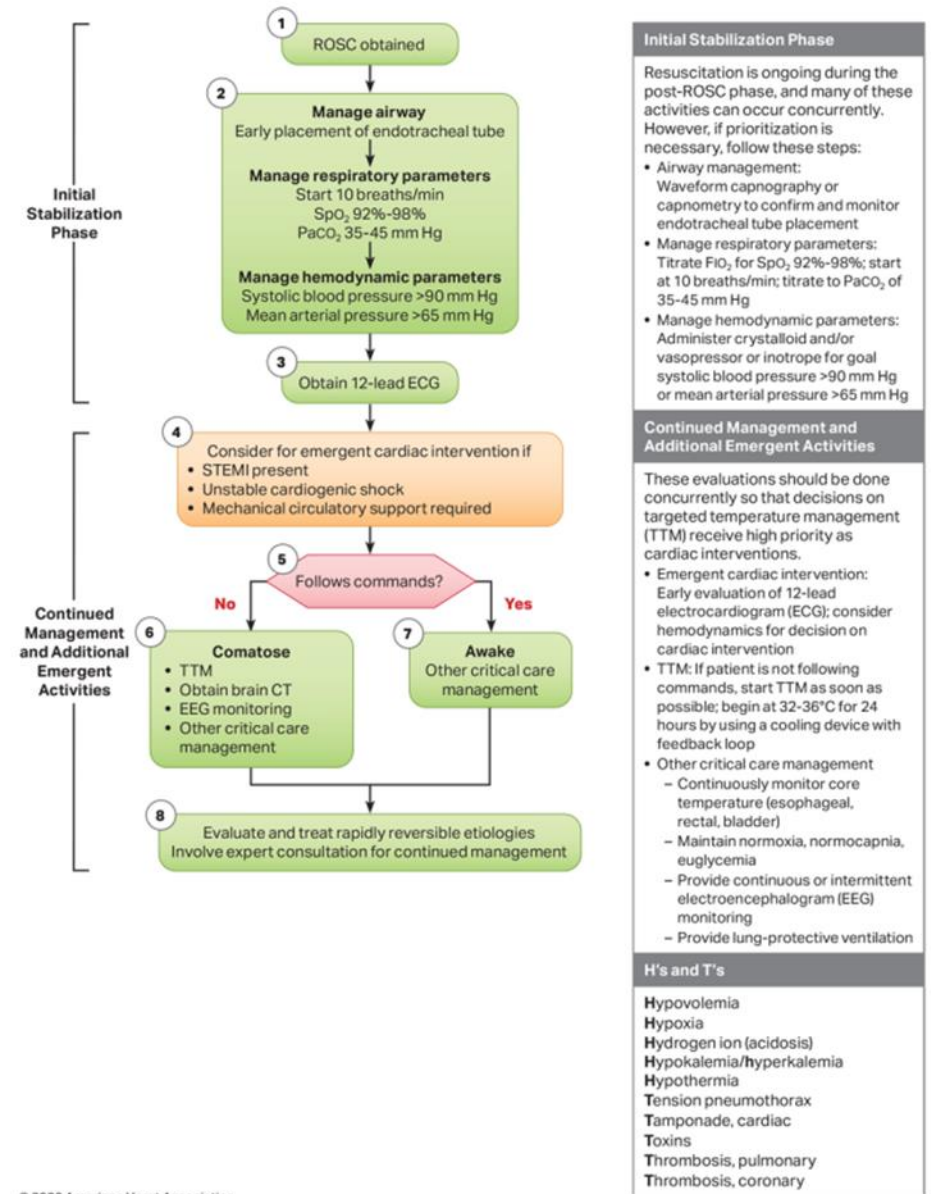
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## Adult Cardiac Arrest Algorithm



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## Adult Post-Cardiac Arrest Care Algorithm



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## Adult Bradycardia Algorithm

Assess appropriateness for clinical condition.  
Heart rate typically <50/min if bradyarrhythmia.

### Identify and treat underlying cause

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-Lead ECG if available; don't delay therapy
- Consider possible hypoxic and toxicologic causes

### Persistent bradyarrhythmia causing:

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

No

Yes

Monitor and observe

### Atropine

- If atropine ineffective:
- Transcutaneous pacing and/or
  - Dopamine infusion or
  - Epinephrine infusion

### Consider:

- Expert consultation
- Transvenous pacing

### 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)

## Adult Tachycardia With a Pulse Algorithm

1

Assess appropriateness for clinical condition.  
Heart rate typically  $\geq 150$ /min if tachyarrhythmia.

2

### Identify and treat underlying cause

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-lead ECG, if available

3

### Persistent tachyarrhythmia causing:

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

Yes

No

6

### Wide QRS? $\geq 0.12$ second

Yes

No

8

- Vagal maneuvers (if regular)
- Adenosine (if regular)
- $\beta$ -Blocker or calcium channel blocker
- Consider expert consultation

4

### Synchronized cardioversion

- Consider sedation
- If regular narrow complex, consider adenosine

7

### Consider

- Adenosine only if regular and monomorphic
- Antiarrhythmic infusion
- Expert consultation

5

### If refractory, consider

- Underlying cause
- Need to increase energy level for next cardioversion
- Addition of antiarrhythmic drug
- Expert consultation

### Doses/Details

#### Synchronized cardioversion:

Refer to your specific device's recommended energy level to maximize first shock success.

#### Adenosine IV dose:

First dose: 6 mg rapid IV push; follow with NS flush.  
Second dose: 12 mg if required.

#### Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

##### Procainamide IV dose:

20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.

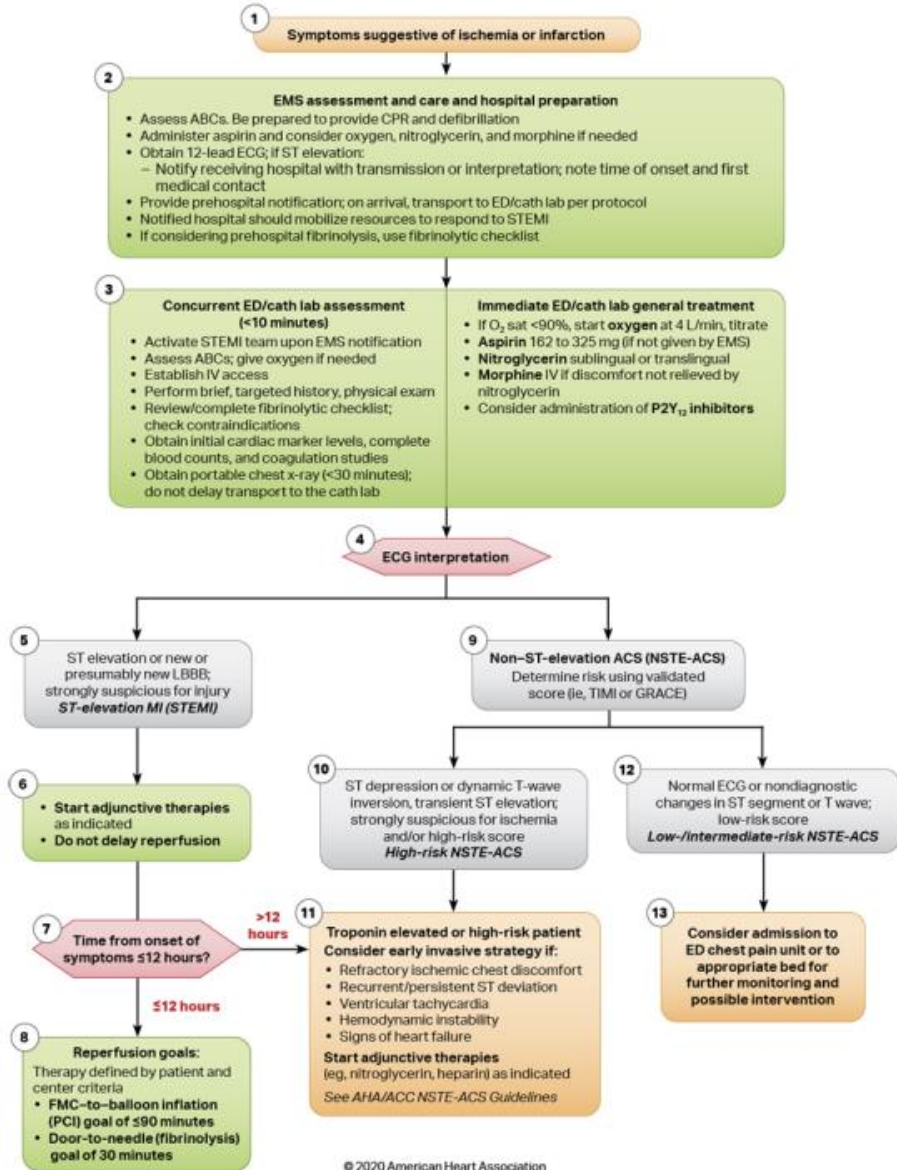
##### Amiodarone IV dose:

First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.

##### Sotalol IV dose:

100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

## Acute Coronary Syndromes Algorithm



## Adult Suspected Stroke Algorithm

