

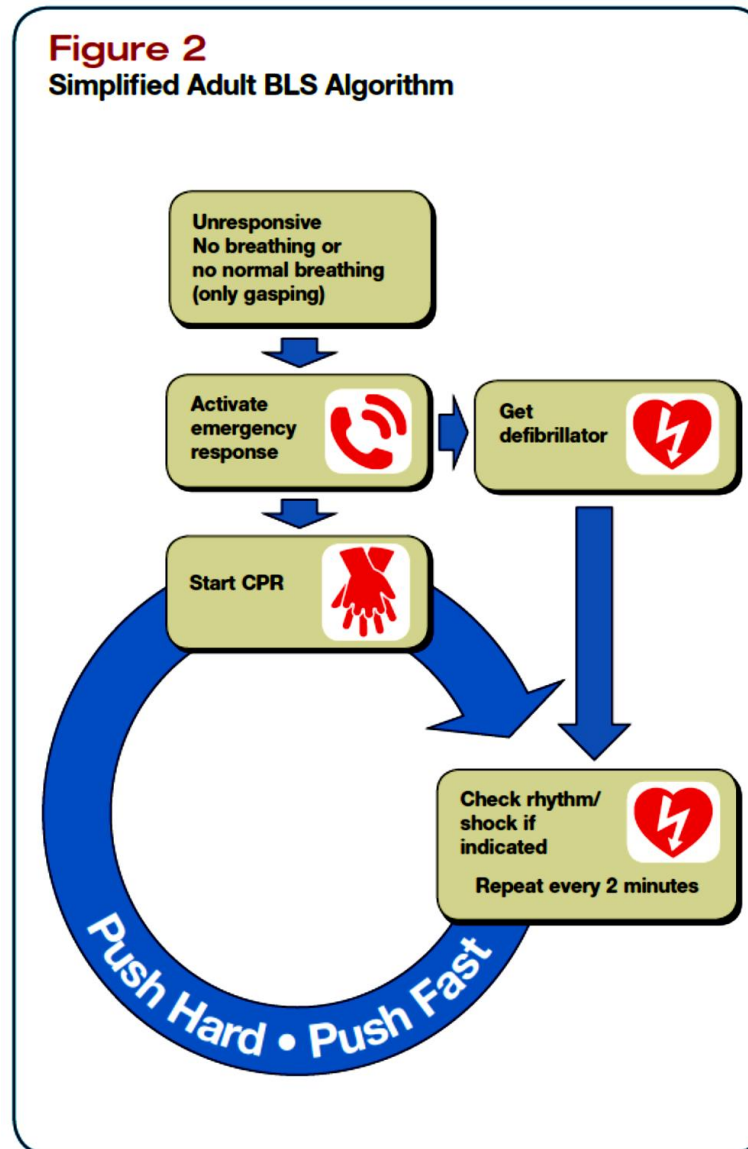


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# Bystander response

## *Check, call, compress, AED*

- No breathing
- 100 per minute
- 2 inches



# Dispatcher training

- Because cardiac arrest victims may present with a short period of seizure-like activity or agonal gasps that may confuse potential rescuers, dispatchers should be specifically trained to identify these presentations of cardiac arrest to improve cardiac arrest recognition.
- Dispatchers should instruct untrained lay rescuers to provide Hands-Only CPR for adults with sudden cardiac arrest.

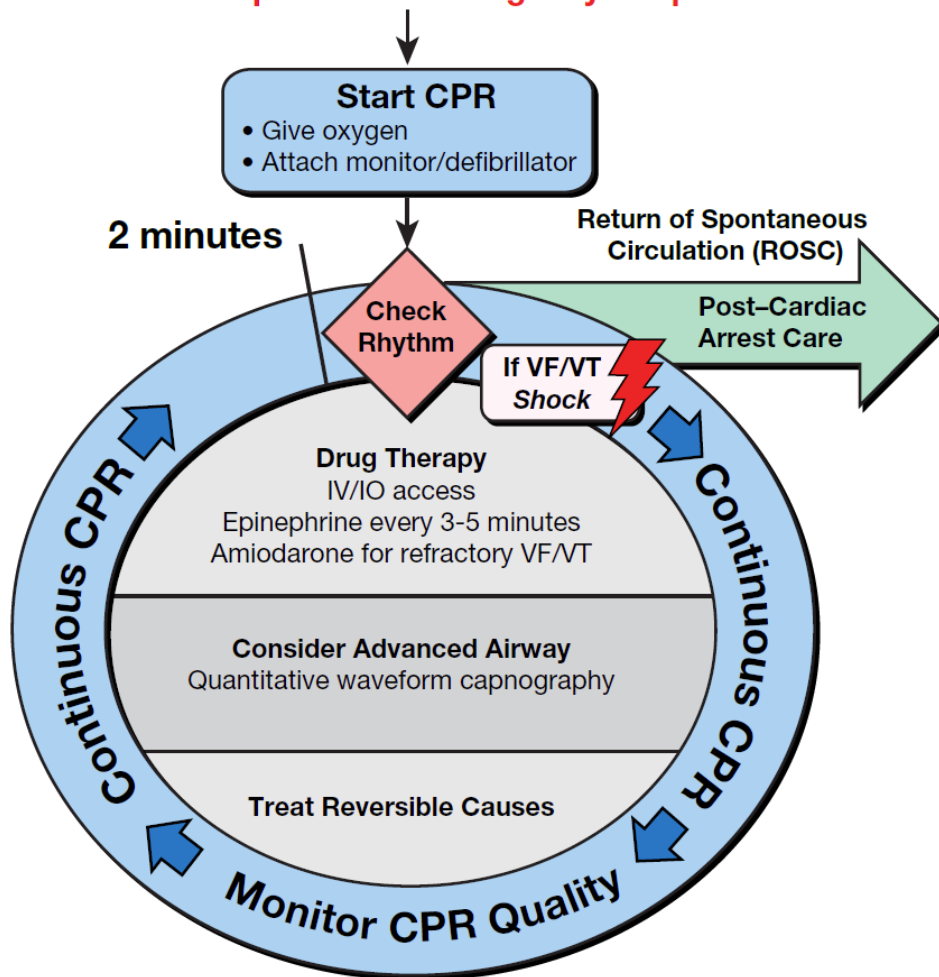
# Advanced Cardiac Life Support

- High quality CPR
- Quantitative waveform capnography
  - confirmation of endotracheal tube placement
  - CPR quality
- Atropine is no longer recommended for PEA)/asystole.

**Figure 4**  
Circular ACLS Algorithm

## Adult Cardiac Arrest

**Shout for Help/Activate Emergency Response**



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### CPR Quality

- Push hard ( $\geq 2$  inches [5 cm]) and fast ( $\geq 100$ /min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
  - If  $PETCO_2 < 10$  mm Hg, attempt to improve CPR quality
- Intra-arterial pressure
  - If relaxation phase (diastolic) pressure  $< 20$  mm Hg, attempt to improve CPR quality

### Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in  $PETCO_2$  (typically  $\geq 40$  mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

### Shock Energy

- **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
- **Vasopressin IV/IO Dose:** 40 units can replace first or second dose of epinephrine
- **Amiodarone IV/IO Dose:** First dose: 300 mg bolus. Second dose: 150 mg.

### Advanced Airway

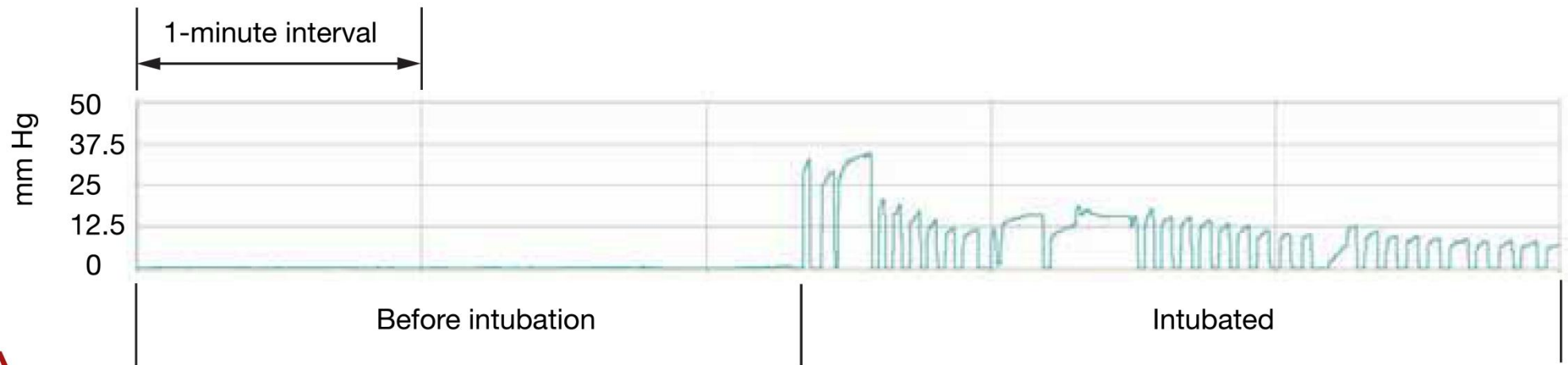
- Supraglottic advanced airway or endotracheal intubation
- Waveform capnography to confirm and monitor ET tube placement
- 8-10 breaths per minute with continuous chest compressions

### Reversible Causes

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

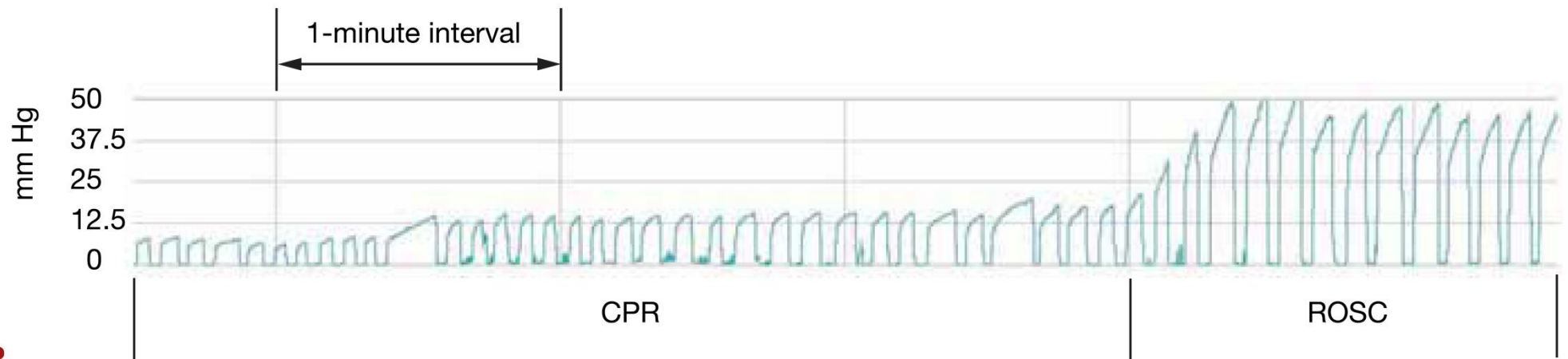
### Figure 3

#### Capnography Waveforms



**A.**

**Capnography to confirm endotracheal tube placement.** This capnography tracing displays the partial pressure of exhaled carbon dioxide (PETCO<sub>2</sub>) in mm Hg on the vertical axis over time when intubation is performed. Once the patient is intubated, exhaled carbon dioxide is detected, confirming tracheal tube placement. The PETCO<sub>2</sub> varies during the respiratory cycle, with highest values at end-expiration.



**B.**

**Capnography to monitor effectiveness of resuscitation efforts.** This second capnography tracing displays the PETCO<sub>2</sub> in mm Hg on the vertical axis over time. This patient is intubated and receiving CPR. Note that the ventilation rate is approximately 8 to 10 breaths per minute.



# Organized Post-Cardiac Arrest Care

**2010 (New):** Post-Cardiac Arrest Care is a new section in the 2010 AHA Guidelines for CPR and ECC. To improve survival for victims of cardiac arrest who are admitted to a hospital after ROSC, a comprehensive, structured, integrated, multidisciplinary system of post-cardiac arrest care should be implemented in a consistent manner (Box 3). Treatment should include cardiopulmonary and neurologic support. Therapeutic hypothermia and percutaneous coronary interventions (PCIs) should be provided when indicated (see also Acute Coronary Syndromes section). Because seizures are common after cardiac arrest, an electroencephalogram for the diagnosis of seizures should be performed with prompt interpretation as soon as possible and should be monitored frequently or continuously in comatose patients.

**Figure 1**

AHA ECC Adult Chain of Survival

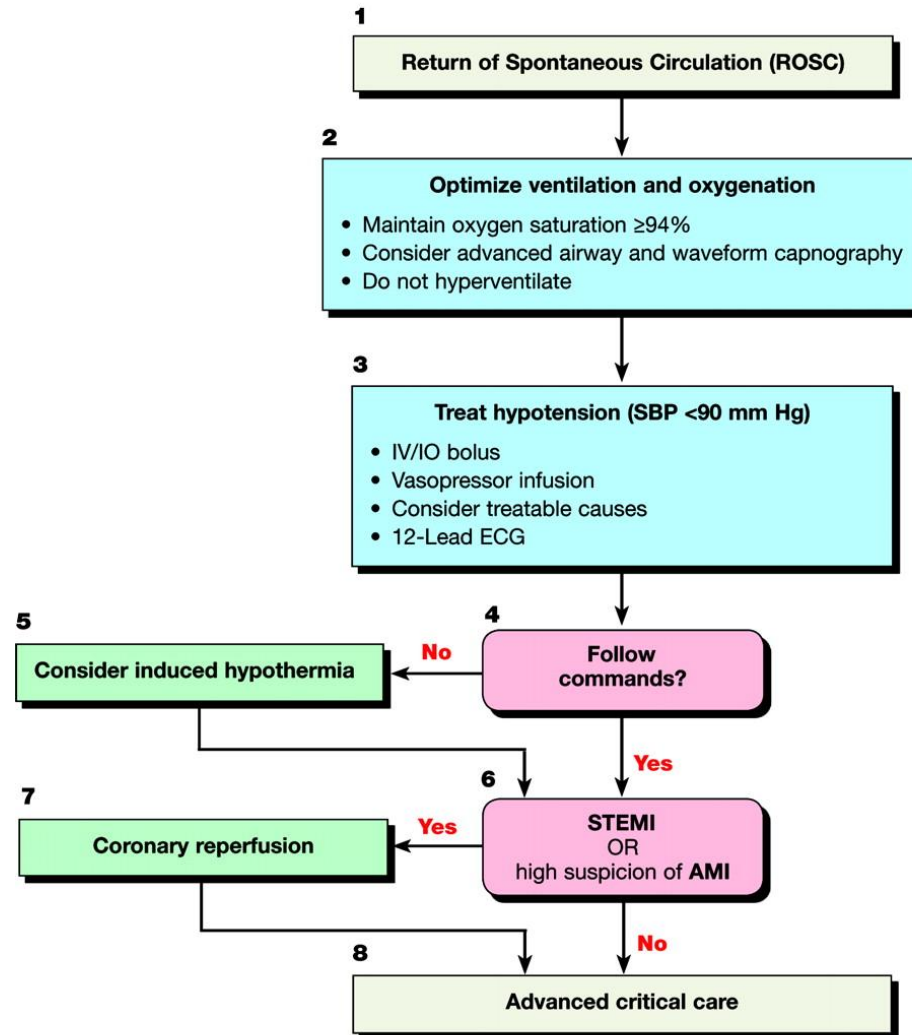
The links in the new AHA ECC Adult Chain of Survival are as follows:

1. Immediate **recognition** of cardiac arrest and **activation** of the emergency response system
2. Early **CPR** with an emphasis on chest compressions
3. Rapid **defibrillation**
4. Effective **advanced life support**
5. Integrated **post-cardiac arrest care**



# Post-cardiac arrest care algorithm

## Adult Immediate Post-Cardiac Arrest Care



### Doses/Details

#### Ventilation/Oxygenation

Avoid excessive ventilation. Start at 10-12 breaths/min and titrate to target PETCO<sub>2</sub> of 35-40 mm Hg. When feasible, titrate FIO<sub>2</sub> to minimum necessary to achieve SpO<sub>2</sub>  $\geq 94\%$ .

#### IV Bolus

1-2 L normal saline or lactated Ringer's. If inducing hypothermia, may use 4°C fluid.

#### Epinephrine IV Infusion:

0.1-0.5 mcg/kg per minute (in 70-kg adult: 7-35 mcg per minute)

#### Dopamine IV Infusion:

5-10 mcg/kg per minute

#### Norepinephrine

#### IV Infusion:

0.1-0.5 mcg/kg per minute (in 70-kg adult: 7-35 mcg per minute)

#### Reversible Causes

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

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