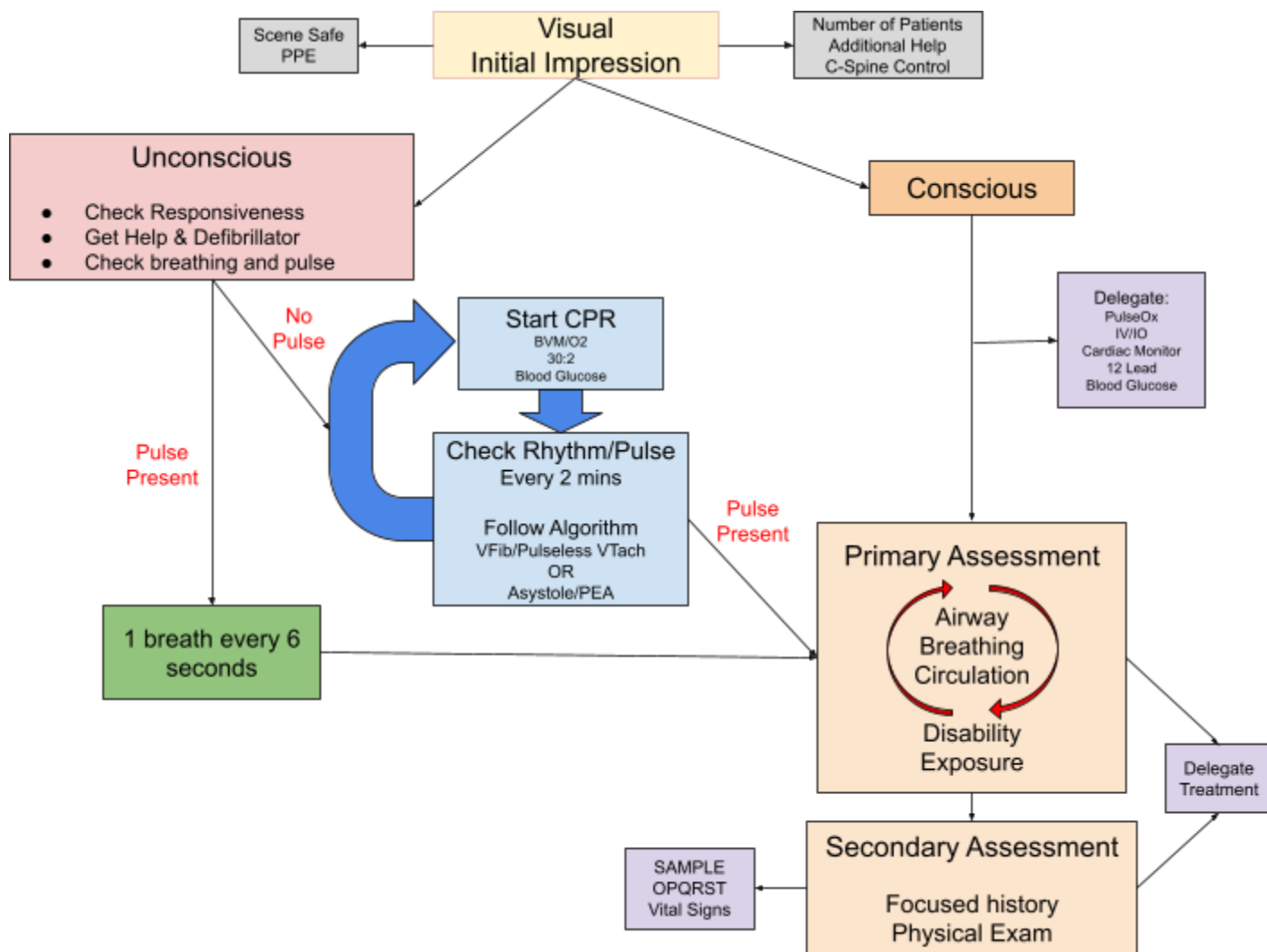
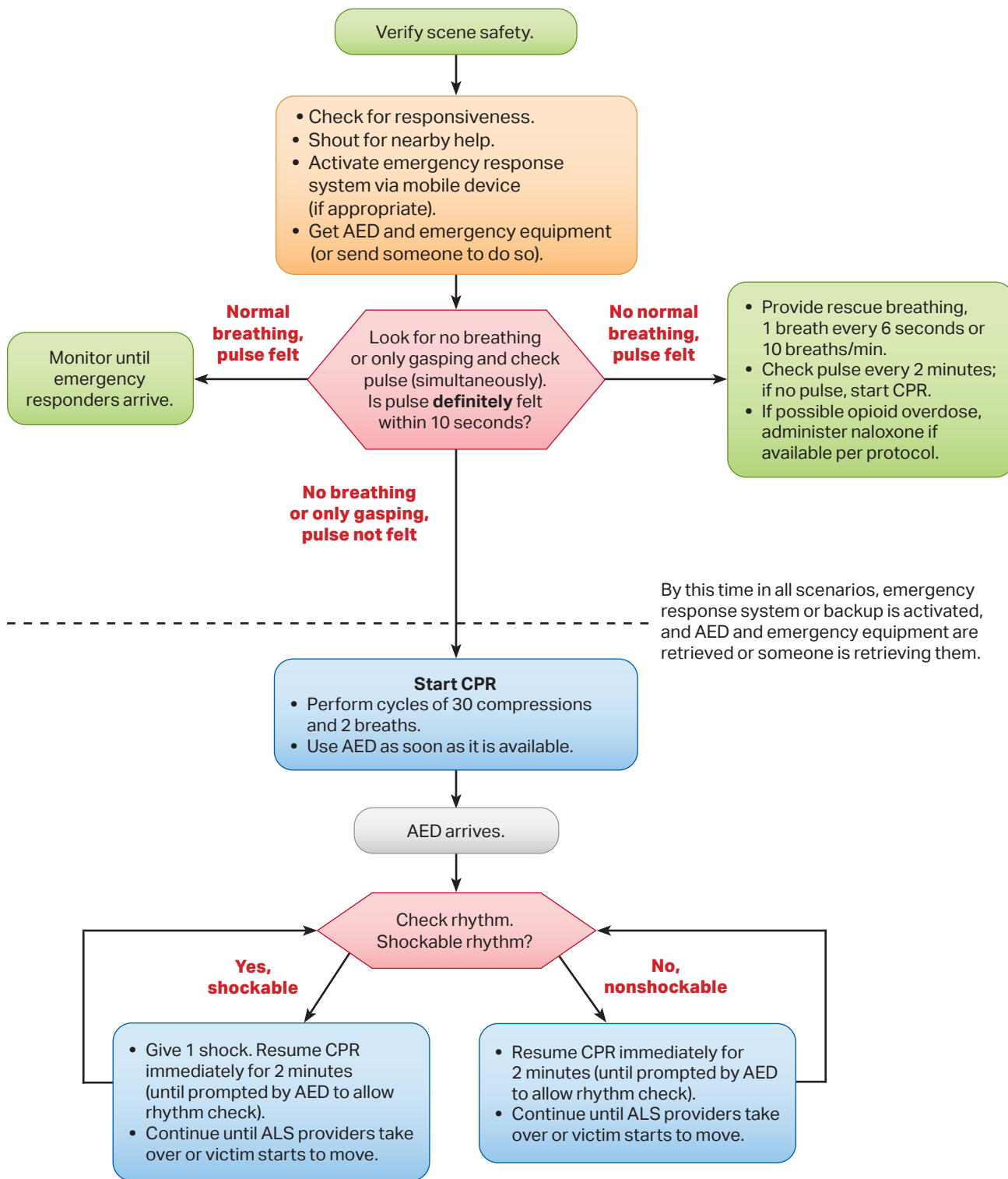


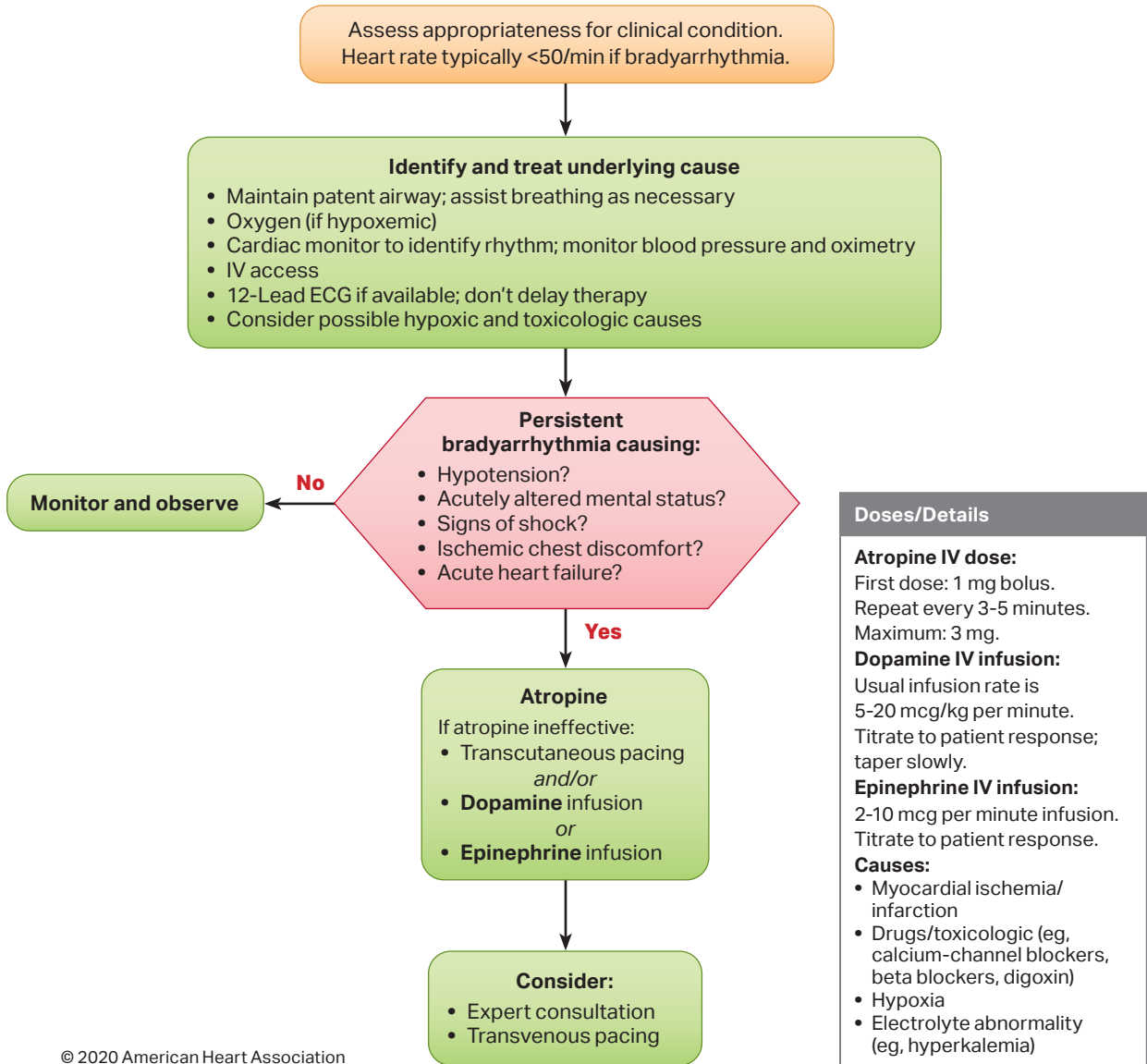
# Systematic Approach



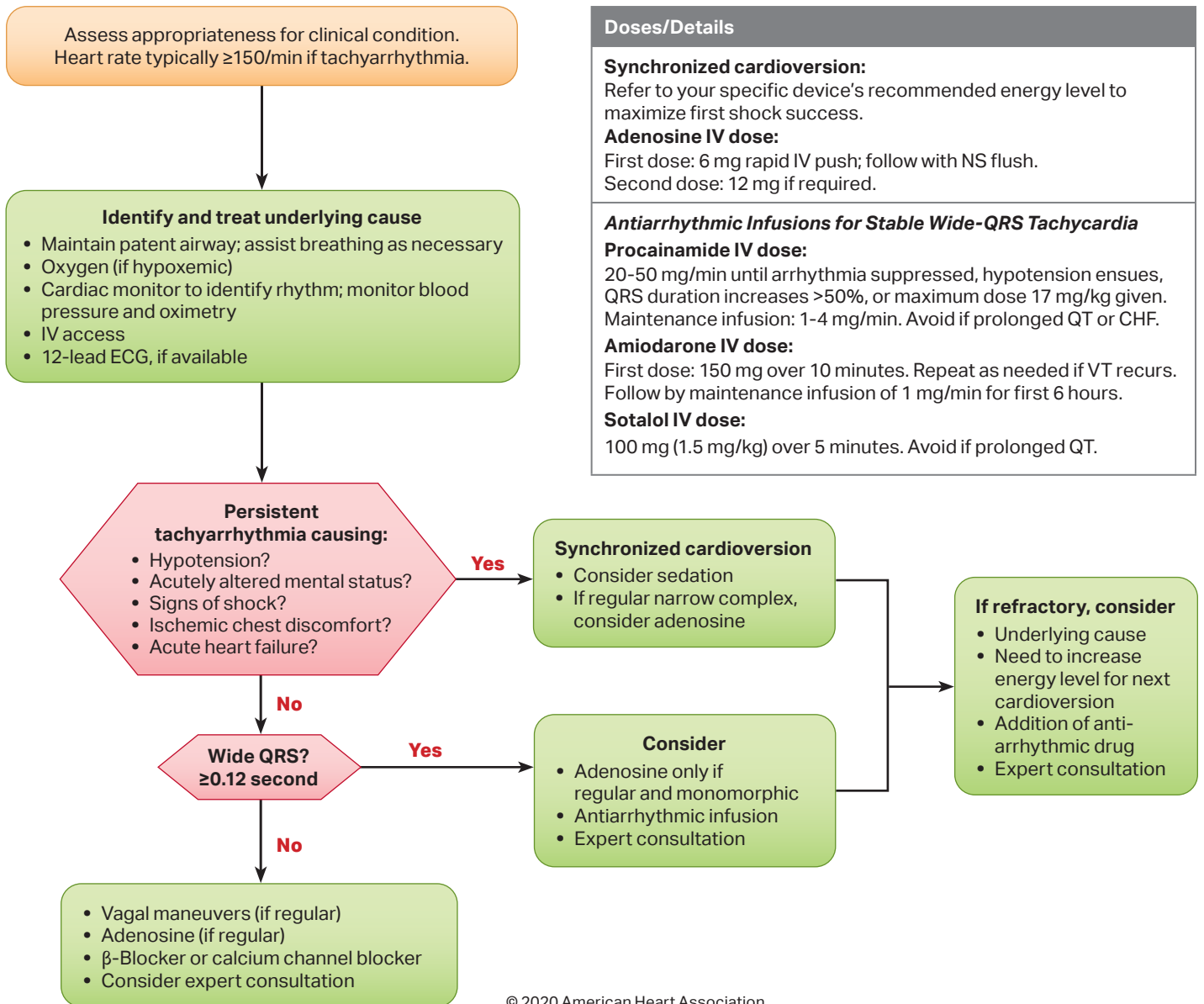
# Adult Basic Life Support Algorithm for Healthcare Providers



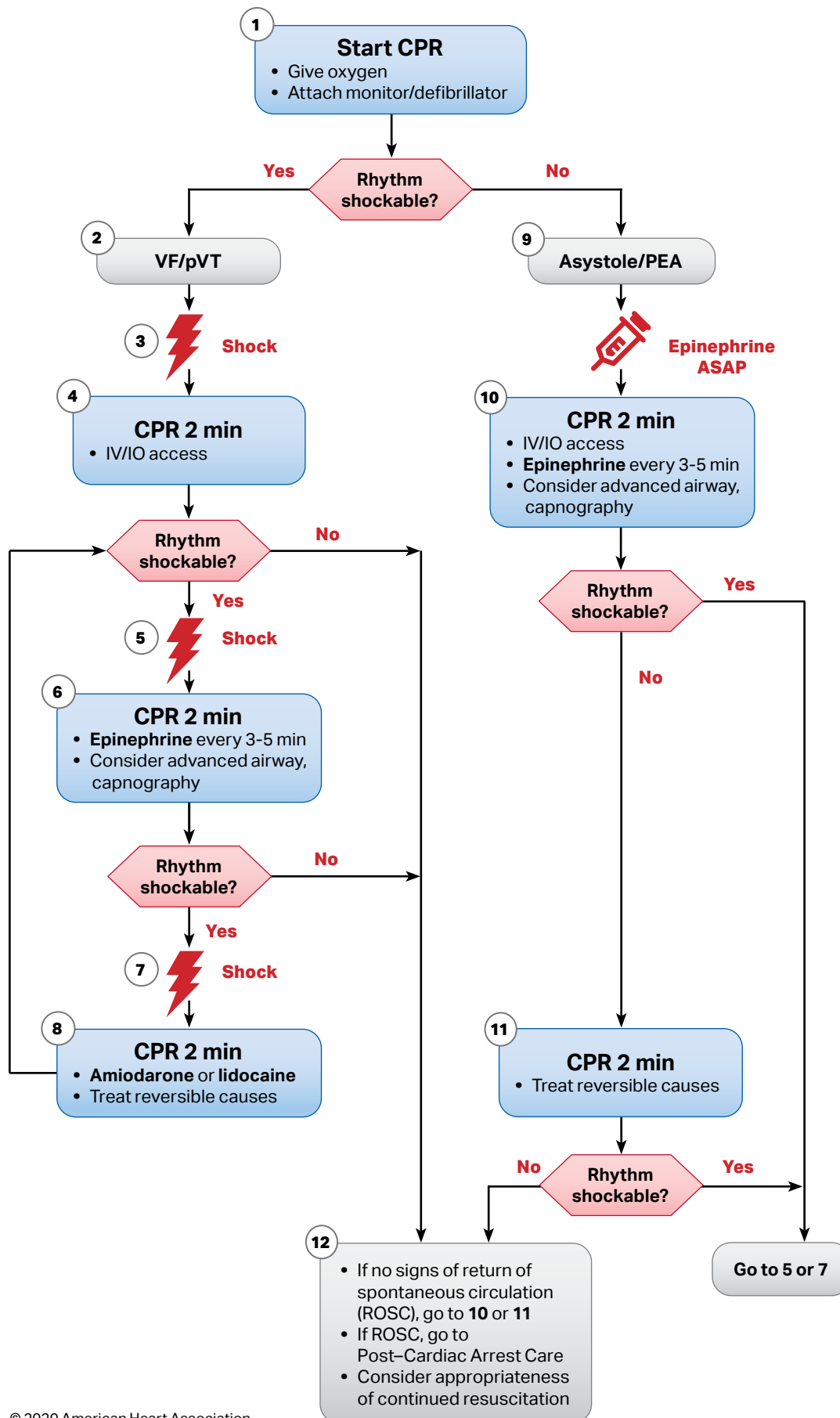
# Adult Bradycardia Algorithm



## Adult Tachycardia With a Pulse Algorithm

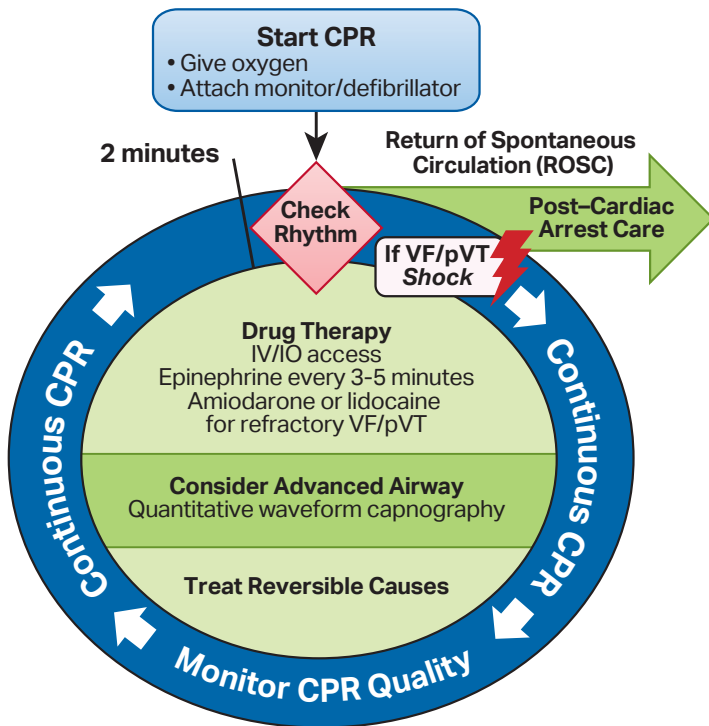


# Adult Cardiac Arrest Algorithm



CPR Quality
<ul style="list-style-type: none"> <li>• Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.</li> <li>• Minimize interruptions in compressions.</li> <li>• Avoid excessive ventilation.</li> <li>• Change compressor every 2 minutes, or sooner if fatigued.</li> <li>• If no advanced airway, 30:2 compression-ventilation ratio</li> <li>• Quantitative waveform capnography               <ul style="list-style-type: none"> <li>– If PETCO<sub>2</sub> is low or decreasing, reassess CPR quality.</li> </ul> </li> </ul>
Shock Energy for Defibrillation
<ul style="list-style-type: none"> <li>• <b>Biphasic:</b> 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.</li> <li>• <b>Monophasic:</b> 360 J</li> </ul>
Drug Therapy
<ul style="list-style-type: none"> <li>• <b>Epinephrine IV/IO dose:</b> 1 mg every 3-5 minutes</li> <li>• <b>Amiodarone IV/IO dose:</b> First dose: 300 mg bolus. Second dose: 150 mg.</li> <li>• <i>or</i></li> <li>• <b>Lidocaine IV/IO dose:</b> First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.</li> </ul>
Advanced Airway
<ul style="list-style-type: none"> <li>• Endotracheal intubation or supraglottic advanced airway</li> <li>• Waveform capnography or capnometry to confirm and monitor ET tube placement</li> <li>• Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions</li> </ul>
Return of Spontaneous Circulation (ROSC)
<ul style="list-style-type: none"> <li>• Pulse and blood pressure</li> <li>• Abrupt sustained increase in PETCO<sub>2</sub> (typically ≥40 mm Hg)</li> <li>• Spontaneous arterial pressure waves with intra-arterial monitoring</li> </ul>
Reversible Causes
<ul style="list-style-type: none"> <li>• Hypovolemia</li> <li>• Hypoxia</li> <li>• Hydrogen ion (acidosis)</li> <li>• Hypo-/hyperkalemia</li> <li>• Hypothermia</li> <li>• Tension pneumothorax</li> <li>• Tamponade, cardiac</li> <li>• Toxins</li> <li>• Thrombosis, pulmonary</li> <li>• Thrombosis, coronary</li> </ul>

# Adult Cardiac Arrest Circular Algorithm



## 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<sub>2</sub> 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

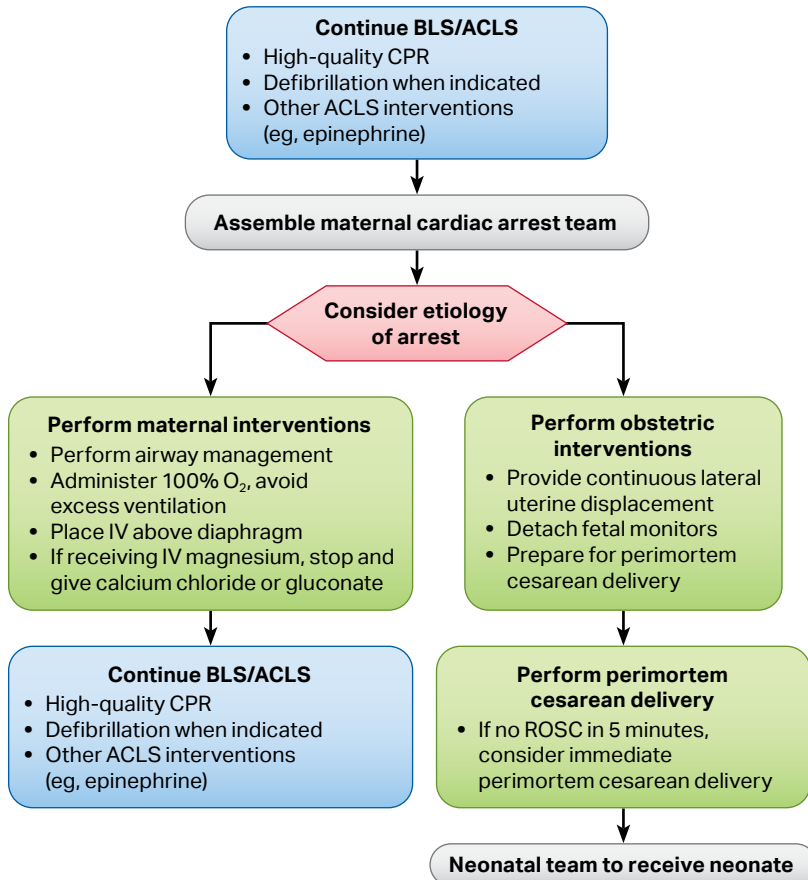
## Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO<sub>2</sub> (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

## Reversible Causes

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

## Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm



### Maternal Cardiac Arrest

- Team planning should be done in collaboration with the obstetric, neonatal, emergency, anesthesiology, intensive care, and cardiac arrest services.
- Priorities for pregnant women in cardiac arrest should include provision of high-quality CPR and relief of aortocaval compression with lateral uterine displacement.
- The goal of perimortem cesarean delivery is to improve maternal and fetal outcomes.
- Ideally, perform perimortem cesarean delivery in 5 minutes, depending on provider resources and skill sets.

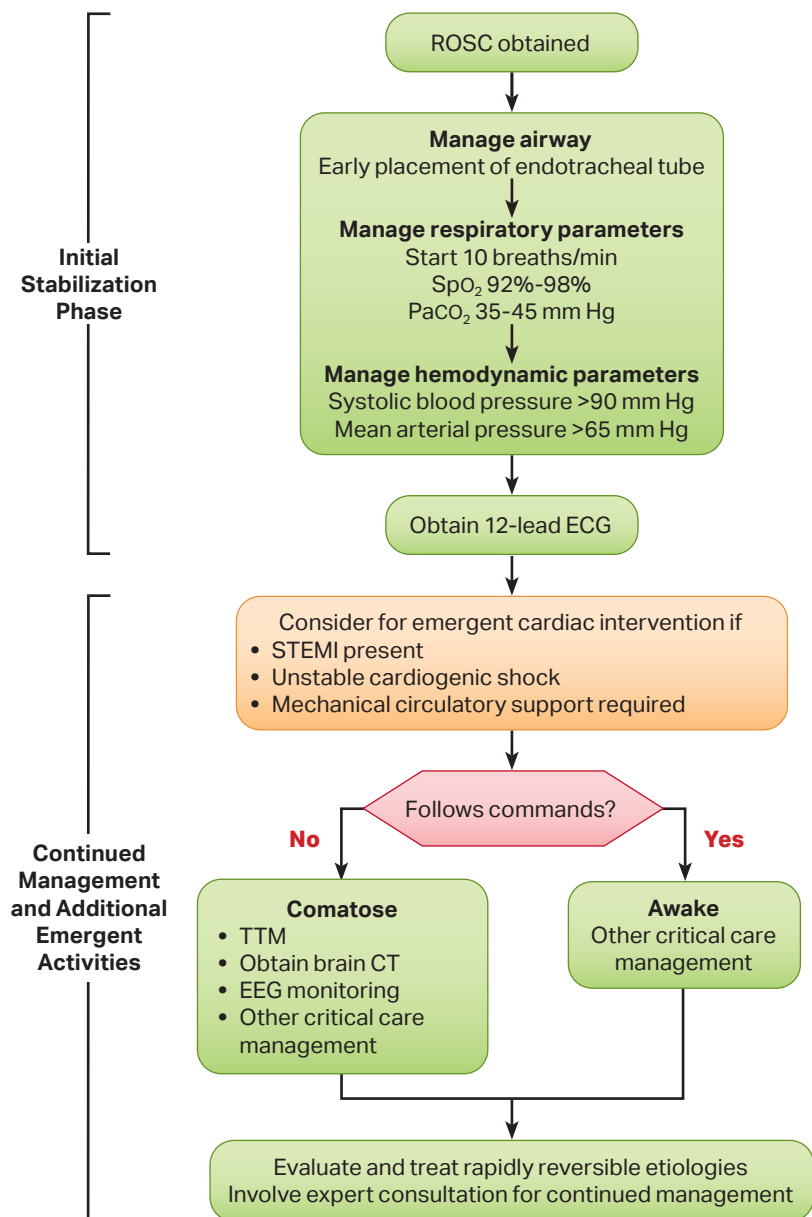
### Advanced Airway

- In pregnancy, a difficult airway is common. Use the most experienced provider.
- Provide endotracheal intubation or supraglottic advanced airway.
- Perform waveform capnography or capnometry to confirm and monitor ET tube placement.
- Once advanced airway is in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions.

### Potential Etiology of Maternal Cardiac Arrest

- A** Anesthetic complications
- B** Bleeding
- C** Cardiovascular
- D** Drugs
- E** Embolic
- F** Fever
- G** General nonobstetric causes of cardiac arrest (H's and T's)
- H** Hypertension

# ACLS Healthcare Provider Post-Cardiac Arrest Care Algorithm



## 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/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary



**ACLS**

**ALIVE** = IV/IO, CARDIAC MONITOR, 12 LEAD, SPO2, BLOOD GLUCOSE LEVEL, DRAW LAB WORK, GET A SAMPLE HISTORY

**DEAD** = CPR, BVM O2, IV/IO, CO2, CARDIAC MONITOR, BLOOD GLUCOSE LEVEL, DRAW LAB WORK, GET A SAMPLE HISTORY IF POSSIBLE

**BRADYCARDIA <50 bpm**

STABLE = MONITOR AND OBSERVE

UNSTABLE = ATROPINE 1 mg q 3-5 mins (MAX 0.04 mg/kg UP TO 3 mg)  
IF ATROPINE INNEFFECTIVE:

- TCP set HR 60/min, capture + 2 mA
- OR DOPAMINE 5-20 mcg/kg/min
- OR EPINEPHRINE 2-10 mcg/min

NOTE: SEDATE FOR TCP IF NOT HYPOTENSIVE AND TIME ALLOWS

**TACHYCARDIA ≥ 150 bpm**

UNSTABLE = SYNCHRONIZE CARディオVERSION

START at 100J

NOTE: SEDATE IF NOT HYPOTENSIVE AND TIME ALLOWS  
IF NARROW: CONSIDER ADENOSINE 6 mg & 12 mg

STABLE = MEDICATIONS

NARROW (SVT)= VAGAL MANEUVERS = ADENOSINE 6 & 12 mg

WIDE (VTACH)= AMIODARONE 150 mg OVER 10 mins

IF WIDE (VTACH) is REGULAR/MONOMORPHIC can consider ADENOSINE 6 & 12 mg

**VENTRICULAR FIBRILLATION OR PULSELESS VENTRICULAR TACHYCARDIA**

ANALYZE (NO PULSE) = SHOCK 200J (OR MANUFACTURER RECOMMENDATION)

2 min CPR

ANALYZE (NO PULSE) = SHOCK 300 J

ZOLL is 120-150-200 J

2 min CPR + EPI 1 mg

ANALYZE (NO PULSE) = SHOCK 360J

2 min CPR + AMIODARONE 300 mg OR LIDOCAINE 1-1.5 mg/kg

ANALYZE (NO PULSE) = SHOCK 360J

REPEAT

NOTE: 2<sup>ND</sup> dose of Amiodarone 150 mg and Lidocaine 0.5-0.75 mg/kg

**ASYSTOLE AND PEA**

ANALYZE (NO PULSE) ←

2 min CPR + EPI 1 mg

ANALYZE (NO PULSE)

2 min CPR + SKIP A DRUG

REPEAT

NOTE: IF YOU FOLLOW THE CYCLES, MEDS WILL BE ADMINISTERED EVERY 4 MINUTES. THIS IS WITHIN THE 3-5 MINUTE RECOMMENDATION

**POST-RESUSCITATION:**

VENTILATION TO ACHIEVE PaCO2 OF 35-45 and SpO2 92-98%

(At 1 breath every 6 Seconds or 10 breaths per minute)

SYSTOLIC BP GOAL OF > 90 mmHg (Consider Fluids and Vasopressors)

DIAGNOSTICS: 12 LEAD, BGL

CONSIDER 24 HRS of THERAPEUTIC HYPOTHERMIA (32-36°C)

**NOTES:**

MAGNESIUM SULFATE = 1-2 G in 10 mL IV/IO FOR POLYMORPHIC VTACH

HYPOTENSION Post-Resuscitation: 1-2 LITERS OF FLUID

DOPAMINE = 5-10 mcg/min, or

EPINEPHRINE 2-10 mcg/min

LATE PREGNANCY = MANUALLY DISPLACE FETUS TO LEFT

FIND THE PROBLEMS – **H'S AND T'S**(These are just a few of the H's and T's)

HYPOXIA → VENTILATE

HYPOTHERMIA → WARM THEM

HYPOVOLEMIA → GIVE A FLUID BOLUS (350-500 cc)

HYPERKALEMIA → CALCIUM CHLORIDE/SODIUM BICARB

HYPOKALEMIA → MAGNESIUM

TENSION PNEUMOTHORAX → DECOMPRESS THE CHEST

CARDIAC TAMPONADE → PERICARDIOCENTESIS

TOXINS → GET LABS + HISTORY + EXPERT CONSULT

→ BETA-BLOCKER OD = GLUCAGON

→ CALCIUM CHANNEL BLOCKER OD = CaCl

→ OPIOID OD = NALOXONE