	COUNTY OF SACRAMENTO EMERGENCY MEDICAL SERVICES AGENCY	Document #	8031.27
	PROGRAM DOCUMENT: **Non-Traumatic Cardiac Arrest**	Initial Date:	08/12/93
		Last Approval Date:	12/14/23
		Effective Date:	05/01/24
		Next Review Date:	03/01/26

_____   _____
            EMS Medical Director   EMS Administrator

Purpose:

    A. To establish the treatment standard for non-traumatic cardiac arrest patients.
        NOTE: For traumatic arrest, see PD# 8032 – Traumatic Cardiac Arrest
    B. To serve as the treatment standard for Non-Traumatic Asystole, Pulseless Electrical Activity (PEA), Ventricular Fibrillation (VF), and Pulseless Ventricular Tachycardia (VT).

Authority:

    A. California Health and Safety Code, Division 2.5
    B. California Code of Regulations, Title 22, Division 9

Protocol:

    A. High-quality Cardiopulmonary Resuscitation (CPR) is fundamental to the management of all cardiac arrest rhythms. Periodic pauses in CPR should be as brief as possible and only as necessary to assess rhythm, shock VF/VT, and perform a pulse check when an organized rhythm is detected.
    B. CPR must be performed with a "Chest Compressions, Airway, Breathing" sequence (C-A-B) to emphasize the importance of maintaining blood flow with good compressions.
    C. Performing CPR while a defibrillator is readied for use is strongly recommended for all patients in cardiac arrest.
    D. Advanced airway placement shall be confirmed with $ETCO_2$ detection device or waveform capnography.
    E. Vascular access, drug delivery, and advanced airway placement should not cause significant interruptions in chest compressions or delay defibrillation.
    F. Treatment on scene- The movement of a patient may interrupt CPR or prevent adequate depth and rate of compressions. Consider resuscitative efforts on scene to maximize chances of Return of Spontaneous Circulation (ROSC).
    G. Whenever feasible and safe to do so, transport the medical Durable Power of Attorney (DPOA) or immediate family member with the patient to the hospital. DPOA and immediate family members can provide medical insight and consent for special therapies or termination of resuscitation to hospital staff.
    H. Perform an early Pre-Alert notification to the receiving hospital.
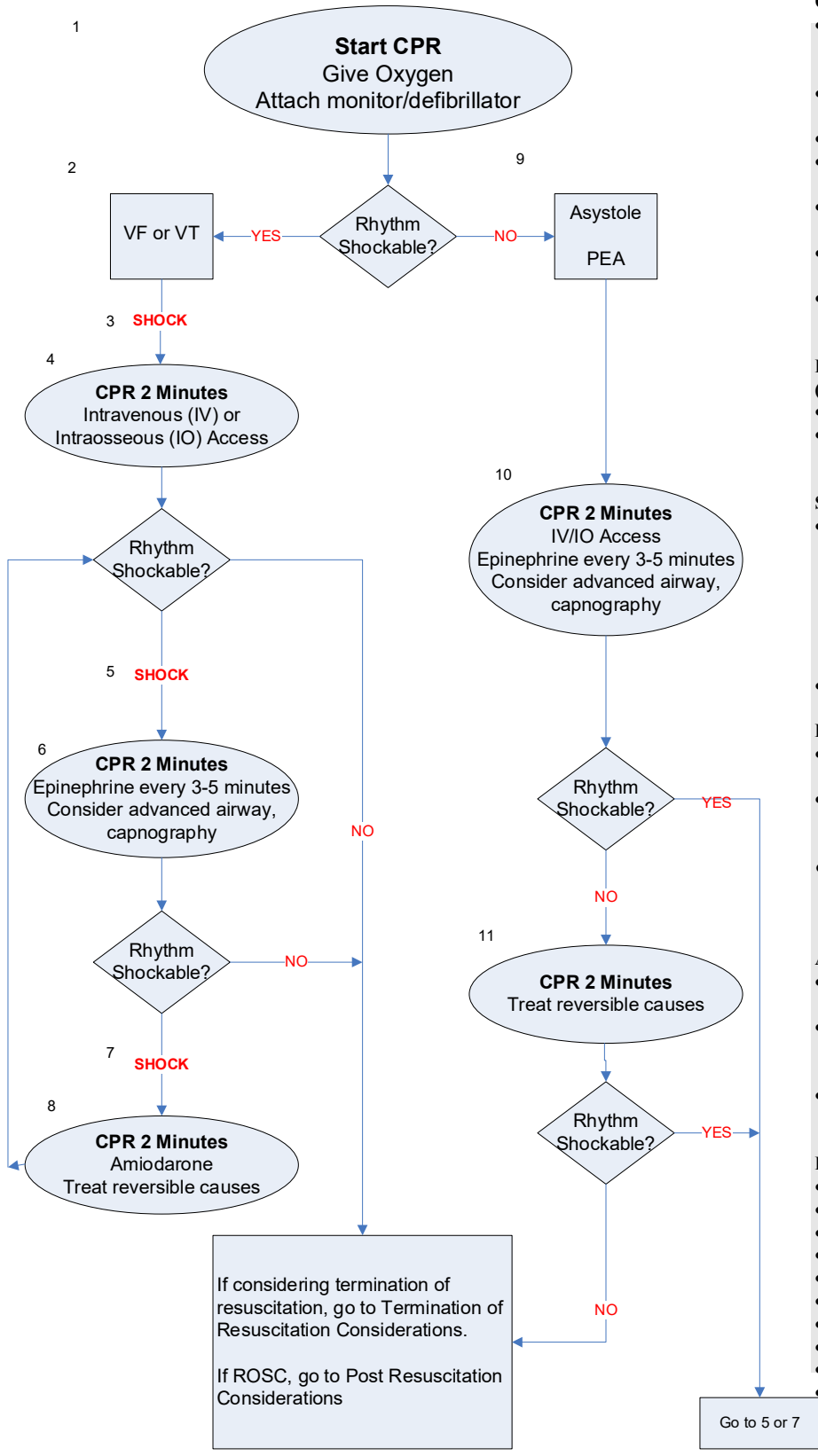
Post Resuscitation Considerations:

    A. Any patient with an initial shockable rhythm (VT or VF or shocked by an AED) who has a ROSC during any part of the resuscitation and who is transported shall be transported to a STEMI center

1. Any other cardiac arrest patient who is transported, shall be transported to the time closest hospital.
B. Intravenous (IV) or Intraosseous (IO) fluids should be placed to keep open (TKO) unless hypotension is present.
C. Post-resuscitation bradycardia, hypotension, shock and pulmonary edema:
   1. Bradycardia, refer to PD# 8024 – Cardiac Dysrhythmias.
   2. Congestive Heart Failure/Pulmonary Edema refer to PD# 8026 – Respiratory Distress.
   3. Hypotension/Shock
      a. Normal Saline 1000 ml bolus, may repeat once to achieve Systolic Blood Pressure (SBP) > 90 mmHg. Reassess vital signs after each bolus
      b. Push Dose Epinephrine 0.01 mg/ml (10mcg/ml).
         • Dose: 0.5-2 ml every 2-5 minutes (5-20mcg). Titrate to SBP ≥ 90 mmHg.
           NOTE: Once ROSC is obtained, monitor SBP frequently while administering/titrating.

Termination of Resuscitation Considerations:

A. Consider termination of resuscitation efforts after twenty (20) minutes of Advanced Life Support (ALS) care if BOTH of the following are present:
   1. Pulseless, apneic, or agonal respirations with no signs of life (non-reactive pupils, no response to pain, no spontaneous movement).
   2. Asystole, or wide complex Pulseless Electrical Activity with HR < 40 bpm.

Cross Reference: PD# 8024 – Cardiac Dysrhythmias
PD# 8026 – Respiratory Distress

1

Start CPR
Give Oxygen
Attach monitor/defibrillator

Rhythm Shockable?

2 — YES → VF or VT

9 — NO → Asystole / PEA

3 **SHOCK**

4
CPR 2 Minutes
Intravenous (IV) or
Intraosseous (IO) Access

Rhythm Shockable?

5 **SHOCK**

6
CPR 2 Minutes
Epinephrine every 3-5 minutes
Consider advanced airway,
capnography

Rhythm Shockable? — NO →

7 **SHOCK**

8
CPR 2 Minutes
Amiodarone
Treat reversible causes

NO →

10
CPR 2 Minutes
IV/IO Access
Epinephrine every 3-5 minutes
Consider advanced airway,
capnography

Rhythm Shockable? — YES →

NO

11
CPR 2 Minutes
Treat reversible causes

Rhythm Shockable? — YES →

NO

If considering termination of
resuscitation, go to Termination of
Resuscitation Considerations.

If ROSC, go to Post Resuscitation
Considerations

Go to 5 or 7

CPR Quality
- Push hard (≥2 inches [5 cm]) and fast (≥100/min) and allow complete chest recoil
- Minimize interruption in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnogrpahy
- If PETCO2 <10 mmHg, attempt to improve CPR quality

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in PETCO2 (typically ≥40 mmHg)

Shock Energy
- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 Joules); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 Joules.

Drug Therapy
- **Epinephrine IV/IO Dose:**
  1 mg every 3-5 minutes
- **Amiodarone IV/IO Dose:**
  First dose: 300 mgs bolus.
  Second dose: 150 mg
- Sodium Bicarbonate IV/IO 50 mEq for renal failure or suspected hyperkalemia only

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

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