Scope: EMR | EMT | AEMT | INT | PM

Continued from…
Protocol 2.1.1 – Cardiac Arrest (Adult)

CCR

Continue CHEST COMPRESSIONS ONLY

- Rate of 100-120/min.
- Compression depth at least 2 inches.
- Allow complete chest recoil after each compression.
- Minimize interruptions in chest compressions.
- Manage airway (see below)

Check rhythm
Shockable rhythm?

Shockable

Give 1 shock[1]
Resume chest compressions immediately for 2 minutes

Not Shockable

Resume chest compressions immediately for 2 minutes

Perform 3 cycles of chest compression only CCR (6 minutes total)

CCR Guidelines

- Analyze/check rhythm every 2 minutes – shock as indicated.
- Minimize interruptions in chest compressions (<5 seconds)
- Push hard (≥ 2 inches) and fast (100-120/min)
- Allow complete chest recoil

Establish and maintain an open airway and passively administer oxygen.

OPTION 1 (Preferred)

- Insert an I-GEL O2 SUPRAGLOTTIC AIRWAY, connect an oxygen tube to the oxygen port and set the oxygen flow rate to 4 lpm.
- Manually support the head in a sniffing position. **DO NOT** perform positive pressure ventilation.

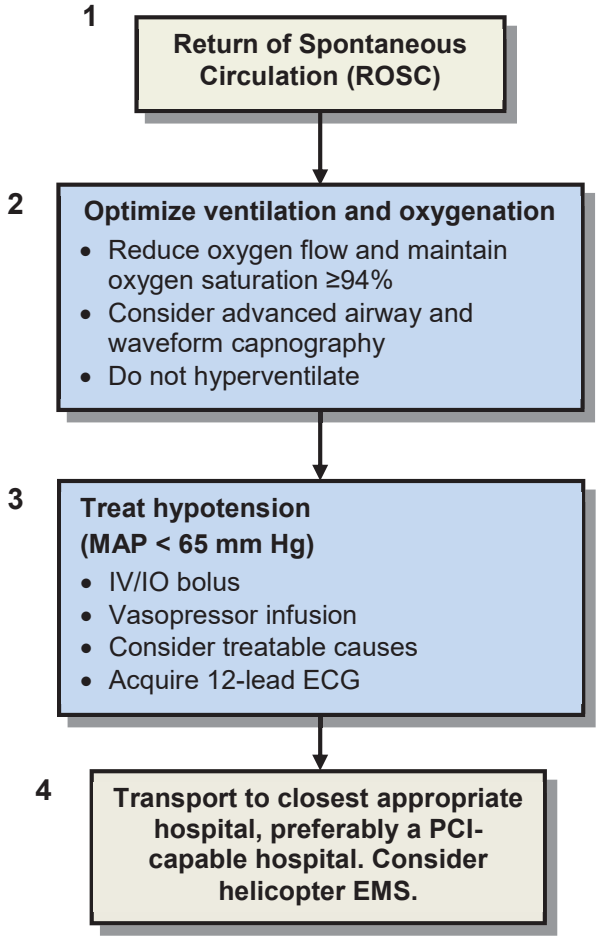
OPTION 2

- Insert an appropriately sized oropharyngeal airway
- Manually maintain an open airway (e.g. chin-lift; jaw thrust, etc.)
- Administer oxygen via non-rebreather AND nasal cannula. Set flow rates for both devices at maximum (≥15 lpm)
- **DO NOT** perform positive pressure ventilation

[INT,PM] **Give epinephrine 1:10,000 1 mg (as soon as possible) every 3-5 min. Do not interrupt chest compressions.**

After 3 cycles of CCR, switch to traditional CPR
Protocol 2.1.3 – Cardiopulmonary Resuscitation

[ALS] Establish IV or IO access only if procedure can be performed WITHOUT interrupting chest compressions.



Ventilation/Oxygenation

- Start at 10-12 breaths/min and titrate to target $ETCO_2$ of 35-40 mm Hg. Avoid excessive ventilation.
- Titrate oxygen to minimum necessary to achieve SpO_2 ≥94%.
  - Start with 100% oxygen during the CPR phase
  - After ROSC, rapidly reduce oxygen flow to the BVM until at room air or SpO_2 ≥94%.

IV Bolus for hypotension
20 mL/kg normal saline.

Dopamine Infusion
5-20 mcg/kg per minute

Epinephrine Infusion
0.1 to 0.5 mcg/kg/min

Reversible Causes

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

CARDIAC ARREST – SPECIAL RESUSCITATION CIRCUMSTANCES	
ETIOLOGY	**INTERVENTION**
Anaphylaxis	**Cardiac Arrest (BLS):** Immediate use of an epinephrine auto-injector is recommended. **Cardiac Arrest (ALS):** Standard ALS approach. Administer epinephrine as soon as possible. *Adjuvant use of antihistamines, inhaled β-adrenergic agents, and IV corticosteroids has been successful in management of the patient with anaphylaxis and may be considered in cardiac arrest due to anaphylaxis. (Class IIb, LOE C)* **Post-Resuscitation:** *IV infusion of epinephrine is a reasonable alternative to IV boluses for treatment of anaphylaxis in post-arrest management. (Class IIb, LOE C).*
Asthma	**Cardiac Arrest:** Standard BLS and ALS algorithms with the following considerations. Administer epinephrine as soon as possible. 1) A ventilation strategy of low respiratory rate and tidal volume is reasonable. 2) During arrest, a brief disconnection from the bag-valve mask may be considered and compression of the chest wall to relieve air-trapping can be effective. 3) Consider 20 mL/kg normal saline bolus.
Benzodiazepines	**Cardiac Arrest:** Standard BLS and ALS algorithms (antidotes are not indicated).
Beta-Blockers	**Cardiac Arrest:** Standard BLS and ALS algorithms (antidotes are not indicated). **Post-Resuscitation:** For symptomatic presentation, follow the **BRADYCARDIA** protocol. Other therapeutic options include: **GLUCAGON** or **CALCIUM CHLORIDE**.
Calcium Channel Blockers	**Cardiac Arrest:** Standard BLS and ALS algorithms (antidotes are not indicated). **Post-Resuscitation:** For symptomatic presentation, follow the **CALCIUM CHANNEL BLOCKER OVERDOSE** protocol.
Cardiac Arrest Associated with Trauma	*Reserved for future consideration.*
Cocaine	**Cardiac Arrest:** Standard BLS and ALS algorithms (antidotes are not indicated). **Post-Resuscitation:** For symptomatic presentation, follow the **STIMULANT OVERDOSE** protocol.
Cyanide/Smoke Inhalation	**Cardiac Arrest:** Administration of **HYDROXOCOBALAMIN** and is recommended.
Cyclic Antidepressants	**Cardiac Arrest:** Administration of **SODIUM BICARBONATE** may be considered. **Post-Resuscitation:** For symptomatic presentation, follow the **TRICYCLIC ANTIDEPRESSANTS OVERDOSE** protocol.

CARDIAC ARREST – SPECIAL RESUSCITATION CIRCUMSTANCES	
ETIOLOGY	**INTERVENTION**
Digoxin (and related cardiac glycosides)	**Cardiac Arrest:** Standard BLS and ALS algorithms (antidotes are not indicated).
Drowning	**Cardiac Arrest:** CPR for drowning victims should use the traditional A-B-C approach in view of the hypoxic nature of the arrest and standard ALS algorithm. **DO NOT** use abdominal thrusts or the Heimlich maneuver for drowning victims. **Post-Resuscitation:** All victims of drowning who require any form of resuscitation (including rescue breathing alone) should be transported to the hospital for evaluation and monitoring, even if they appear to be alert and demonstrate effective cardiorespiratory function at the scene.
Hyperkalemia, Suspected	**Cardiac Arrest:** Standard BLS and ALS algorithms. Additionally, consider administration of **CALCIUM CHLORIDE** to stabilize myocardial cell membrane and **SODIUM BICARBONATE** to shift potassium into the cells.
Hypoglycemia	**Cardiac Arrest:** Standard BLS and ALS algorithms. **DEXTROSE** should only be administered in the following circumstances. 1) Neonatal resuscitation (see algorithm). 2) Pediatric cardiac arrest (see algorithm). Note: Assessment of venous or capillary blood glucose is unreliable during cardiac arrest. **Post-Resuscitation:** Consider titrating **DEXTROSE** to achieve the specific therapeutic goals of restoring normal blood sugar levels. Avoid hyperglycemia.
Opioids	**Cardiac Arrest:** Standard BLS and ALS algorithms (**naloxone** is not indicated). **Post-Resuscitation:** Consider **NALOXONE** to achieve the specific therapeutic goals of reversing the effects of long-acting opioids.
Pregnancy (Second half of term)	**Cardiac Arrest:** Perform high-quality CPR. If the fundus height is at or above the level of the umbilicus, manual lateral uterine displacement can be beneficial in relieving aortocaval compression during chest compressions. Contact **[Medical Control]** to consider transport to the hospital for perimortem cesarean delivery at four (4) minutes after onset of cardiac arrest or resuscitative efforts (for unwitnessed arrest) if there is no ROSC.

Protocol 4.24

SEPTIC SHOCK

	EMR	EMT	AEMT	INT	PM
1. Perform general patient management (SECTION 1).	•	•	•	•	•
2. Support life-threatening problems associated with airway, breathing, and circulation.	•	•	•	•	•
3. Administer oxygen via non-rebreather mask at 10-15 L/min. as necessary. Consider supporting respirations with a BVM.	•	•	•	•	•
4. Transport the patient in semifowler's or other appropriate position.		•	•	•	•
5. Monitor vital signs.		•	•	•	•
6. Obtain 12-lead ECG and transmit to receiving facility if capable.	•	•	•	•	•
7. Monitor capnography.			•	•	•
8. Notify Emergency Department of "SEPSIS ALERT."	•	•	•	•	•
9. Start an IV of normal saline.			•	•	•
10. For hypotension with a MAP <65 mmHg, infuse 20 mL/kg. If MAP is < 65 mmHg after one bolus, contact **[Medical Control]** for direction on additional fluid boluses.			•	•	•
11. Perform reassessment as indicated.	•	•	•	•	•

Key Points: MEDICAL – SEPTIC SHOCK

- Septic shock is tissue hypoperfusion caused by proliferation of bacteria and other infectious particles in the blood. The immune response to the infection induces vasodilation, increased capillary permeability, and intravascular coagulation, which result in hypotension, metabolic acidosis (increased serum lactate > 2.0 mmol/L), and multi-organ dysfunction.
- Suspect septic shock in any patient with suspected infection and any of the following:
  - Altered mental status
  - Tachypnea (Respiratory rate >20 breaths/min)
  - Heart rate >90 beats/min or age specific tachycardia
  - Hypotension with MAP < 65
  - $ETCO_2$ <25 mmHg
  - Fever >100.4°F (38.0°C) or hypothermia <96.8°F (36.0°C)
- If **SEPTIC SHOCK** is suspect, immediately notify receiving facility of "SEPSIS ALERT."
- Sepsis may lead to acute respiratory distress syndrome (ARDS), which is inflammation and permeability of the alveolar capillary membrane. ARDS is a cause of pulmonary edema and respiratory failure. Positive End Expiratory Pressure (PEEP) can be used FOR ARDS patients to improve ventilation and oxygenation. PEEP is administered via **Protocol 5.2 - CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)** and properly equipped BVMs. PEEP is contraindicated if systolic BP is <100 mmHg.
- Early and aggressive isotonic crystalloid fluid resuscitation is critical in septic shock management. Maintain MAP ≥ 65 mmHg (A / I / P).

Cincinnati Prehospital Stroke Scale / FAST exam	
F-(face)	**FACIAL DROOP: Have patient smile or show teeth. (Look for asymmetry)** **Normal**: Both sides of the face move equally or not at all. **Abnormal**: One side of the patient's face droops.
A-(arm)	***MOTOR WEAKNESS: Arm drift (close eyes, extend arms, palms up)** **Normal**: Remain extended equally, drifts equally, or does not move at all. **Abnormal**: One arm drifts down when compared with the other.
S-(speech)	**"You can't teach an old dog new tricks." (repeat phrase)** **Normal**: Phrase is repeated clearly and correctly. **Abnormal**: Words are slurred (dysarthria) or abnormal (aphasia) or none.
T-Time	Time **last seen normal**: _____ Time of **Symptom onset**: _____
* ***If any Cincinnati criteria are positive, perform VAN assessment***	

VAN Assessment

****** Perform if any Cincinnati Criteria are positive ******

VISION

Provider holds up 2 fingers to the right and 1 finger to left while patient stares at provider's nose. *(Left and Right Visual Fields)*

Can patient correctly identify number of fingers on both sides? ☐ **YES** ☐ **NO**

Ask the patient to look to the left and right one or more times. *(Double Vision- equal eye movement)*

Do both eyes move at the same speed and same direction? ☐ **YES** ☐ **NO**

APHASIA

Show patient 2 common objects (i.e. pen, clothing) and ask patient to verbally identify objects. *(Produce Language)*

Can patient verbally and correctly identify both objects? *Ignore slurred speech ☐ **YES** ☐ **NO**

Ask the patient to follow 2 simple commands (i.e. blink and make a fist). *(Comprehend Language)*

Can patient follow both commands? ☐ **YES** ☐ **NO**

NEGLECT

Ask patient to follow your finger with only their eyes from far left to far right. *(Forced Gaze / Inability to Track to One Side)*

Can patient track your finger? ☐ **YES** ☐ **NO**

Ask the patient to close their eyes with arms by their side. Begin brushing patient's forearms simultaneously down towards their hands with your fingers and ask, "Which arm am I touching?" *(Equal Arm Sensation)*

Can patient feel both arms at same time? ☐ **YES** ☐ **NO**

Observe if the patient gazes or turns to only one side or does not react to stimuli on one side (i.e. does not turn to face someone or does not seem to hear from one side). *(Ignoring One Side)*

Can patient freely look, move, and react to stimuli on both sides? ☐ **YES** ☐ **NO**

If "NO" to <u>any one</u> of the above:

Notify receiving facility of "stroke alert with positive VAN test."

Scope	EMR	EMT	AEMT	INT	PM

INDICATIONS

1. Cardiac or respiratory arrest.
2. Unresponsive medical or trauma patients who lack a gag reflex.

CONTRAINDICATIONS

1. Child less than 8 years of age [PM].
2. Gag reflex present.
3. Epiglottitis.

PRECAUTIONS

1. Placement of the endotracheal tube must continually be assessed; accidental displacement is a common occurrence.
2. Dextrose or naloxone to be used.

PROCEDURE *(MAXIMUM OF 2 ATTEMPTS, REGARDLESS OF TECHNIQUE)*†

NOTE: Use of an **ENDOTRACHEAL TUBE INTRODUCER** is required for all intubation attempts using standard laryngoscopy.

1. Use standard isolation precautions including eye protection. Use a face mask and gown when splashing is likely.
2. Open the airway and preoxygenate the patient the patient with a bag-valve-mask supplied with 100% oxygen for at least 30 seconds.
3. Auscultate for breath sounds to establish a baseline.
4. Assemble and check the equipment including:
    a. The distal cuff for leaks.
    b. Lubricating the distal end of the endotracheal tube with a water soluble lubricant.
    c. Inserting a stylet, if desired, in the endotracheal tube, ensuring the stylet is recessing 2 cm from the distal end of the tube.
    d. The laryngoscope bulb to ensure it is bright white and tightly secured in place.
    e. Prepare endotracheal tube introducer.
    f. Prepare waveform capnography.
5. Turn on the suction unit and attached the appropriate tip.
6. Place the head and neck into a “sniffing position” to align the three axes of the mouth, pharynx and trachea.

    NOTE: When there is a potential for cervical spine injury, ensure the head is firmly held in a neutral position during intubation.
7. Holding the handle in the left hand, insert the laryngoscope blade into the right side of the patient’s mouth. Using a sweeping motion, displace the tongue to the left.
8. Move the blade slightly toward the midline and advance it until the distal end is positioned at the base of the tongue.

CONTINUED ON NEXT PAGE

Scope	EMR	EMT	AEMT	INT	PM

INDICATIONS

1. Monitor in patients presenting with hypotension associated with shock.
2. Monitor in patients presenting with severe hypertension with an etiology of suspected increased intracranial pressure.
3. Monitor in post-resuscitation patients.
4. MAP is a decision criteria for treatments and/or pre-hospital alerts in the OVERDOSE – STIMULANT and MEDICAL – SEPTIC SHOCK protocols.

PRECAUTIONS

1. MAP can only be calculated with a known systolic and diastolic blood pressure. MAP cannot be determined for a patient if only the palpated blood pressure is known.
2. Be familiar with cardiac monitor display settings. Some monitors automatically determine and display MAP based on automated blood pressure measurements. An automated MAP may be useful, however, the provider must ensure that the monitor display settings are showing the MAP reading and that another value is not errantly used by the provider.

PROCEDURE

1. Obtain the patient's auscultated blood pressure.
2. Determine the patient's pulse pressure by subtracting the diastolic from the systolic.
3. Calculate one-third (⅓) of the pulse pressure and add that value to the diastolic pressure to yield the patient's MAP.
4. Obtain the patient's MAP at the same frequency as other vital signs and observe for trending.

Key Points: MEAN ARTERIAL PRESSURE (MAP)

- Conceptually, MAP is one-third (⅓) the range between the diastolic systolic pressure.
- A MAP < 65 mmHg is associated with severe shock and may present with altered mental status or decreased level of consciousness.
- Use the following formula to calculate the MAP:

$$\text{MAP} = \text{Diastolic} + \frac{1}{3}\,\text{Pulse Pressure}$$

- Become familiar with the location that MAP is displayed on the specific cardiac monitor that your agency uses. Images of the way that MAP is displayed are provided below for the following devices:
  - Philips - HeartStart MRx
  - Physio Control - LIFEPAK 15
  - Zoll - R Series