

SECTION: C-02a

TITLE: Adult Cardiopulmonary Arrest –ALS algorithms

REVISED: November 1, 2017

**Box #1:**

**If adequate CPR is being performed upon arrival :**

1. Confirm cardiopulmonary arrest.
2. Transition to high performance Cardiopulmonary Resuscitation
3. (AKA “Pit Crew”, see appendix 30) while applying Defib pads
4. Move on to, “**Box #4.**”

**Box #2:**

**Sudden, witnessed arrest in the presence of EMS:**

1. Perform high performance Cardiopulmonary Resuscitation
2. (AKA “Pit Crew”, see appendix 30) only long enough to apply Defib pads.
3. Move on to, “**Box #4.**”

**Box #3:**

**If inadequate CPR, or no CPR at all, is being performed upon arrival:**

1. Initiate/Perform high performance Cardiopulmonary Resuscitation
2. (AKA “Pit Crew”, see appendix 30)
3. During CPR:
  - a. Apply Defib pads
  - b. Prepare/establish Airway Management and/or vascular access
  - c. Medications/Interventions without interruption of high performance CPR
4. Move on to, “**Box #4,**” after approximately 2 minutes/200 Compressions completed

**Box #4:**

**Rhythm Check**

1. Place patient on firm surface with good workable space as soon as possible/feasible-
2. **\*\*Pre-charge Monitor to manufacturer’s recommendation prior to pause**
3. **Assess blood glucose**

**VF/Pulseless VT:**

- a) **Shock @ manufacturer’s recommendation.**
- b) Immediately resume HP-CPR without pause for rhythm check.
- c) Advanced airway management as appropriate
- d) Vascular Access as appropriate

**Asystole/PEA:**

- a) No shock indicated.
- b) Immediately resume HP-CPR.
- c) Advanced airway management as appropriate
- d) Vascular Access as appropriate

**ROSC:**

- a) Provide hemodynamic support
- b) Evaluate for POST-arrest/TTM protocol
- c) Advanced airway management as appropriate
- d) Vascular Access as appropriate
- e) Monitor closely for re-arrest

# Protocol C-02b

## Adult Cardiopulmonary Arrest – ALS

### Box #5:

#### Rhythm Check

1. **\*\*Pre-charge Monitor to manufacturer's recommendation prior to pause**

#### VF/Pulseless VT:

- a) **Shock @ manufacturer's recommendation.**
- b) Immediately resume HP-CPR without pause for rhythm check.
- c) Advanced airway management as appropriate

*Medication Administration During CPR*

- d) Epinephrine
- e) Antiarrhythmic
- f) **Additional pharmacologic therapies as indicated**

#### Asystole/PEA:

- a) No shock indicated.
- b) Immediately resume HP-CPR.
- c) Advanced airway management as appropriate

*Medications Administration During CPR*

- d) Epinephrine
- e) **Additional pharmacologic therapies as indicated**

#### ROSC:

- a) Provide hemodynamic support
- b) Evaluate for POST-arrest/TTM care
- c) Advanced airway management as appropriate
- d) Vascular Access as appropriate
- e) Monitor closely for re-arrest

### Box #6:

#### Treat possible Causes

Search for & treat possible contribution factors:

- a) **Hypovolemia**
- b) **Hypoxia**
- c) **Hydrogen ion (acidosis)**
- d) **Hypo-/hyperkalemia**
- e) **Hypothermia**
- f) **Toxins**
- g) **Tamponade, cardiac**
- h) **Tension Pneumothorax**
- i) **Thrombosis (coronary or pulmonary)**

**Return to Box #5**

\* **HP-CPR refers to “High Performance CPR” (AKA Pit Crew CPR) as described in Appendix 30.**

Continue this sequence until:

- Transport/transfer of care is complete.
- Resuscitative efforts are terminated. (See Appendix 26 “IN-FIELD DEATH/POST/DNR”
- A rhythm/condition change occurs.

If a rhythm/condition change occurs, treat according to its respective algorithm/protocol.

#### **MEDICATION ADMINISTRATION DURING CPR:**

*Vasopressors (for all cardiac arrest rhythms unless contraindicated)*

- Epinephrine
  - IV/IO: 1 mg 1:10,000 IVP every 3-5 minutes,
  - or**

Consider as appropriate:

*Anti-arrhythmic therapy:*

- Lidocaine (Xylocaine)
  - IV/IO: 1.0 to 1.5 mg/kg IV bolus, can repeat in 3-5 minutes **not to exceed 3 mg/kg or 300 mg in 30 minutes (not including infusion)**
  - **Maintenance Infusion:** 2-4 mg/minute titrated for effect, to be initiated if V-fib/V-Tach resolves. (Start @ 2 mg/min & add 1 mg/min for each additional 1 mg/kg IV bolus)
    - 1 mg/kg bolus = 2 mg/min.
    - 1.5-2 mg/kg total bolus = 3 mg/min.
    - 2.5-3 mg/kg total bolus = 4 mg/min.
  - Always give full initial dose, but reduce all subsequent doses by ½ for elderly (>70) or with impaired hepatic function.
- Amiodarone
  - IV/IO 300 mg initial dose.
  - Consider repeat x1 150 mg 3-5 min.
- Magnesium Sulfate
  - IV: 2 g every 5 minutes,
  - 1<sup>st</sup> line for Torsades or refractory V-Fib/Pulseless V-Tach.
  - Administer in conjunction with lidocaine if hypomagnesemia suspected.
  - Consider for refractory VF/pulseless VT.

*Sedation for CPR induced consciousness (Confirm continued pulseless-ness):*

- IV/IO Ketamine: 1-2 mg/kg for CPR induced consciousness. May repeat if needed in 5-10 minutes.

*Other specific therapy:*

- Sodium bicarbonate for known hyperkalemia, suspected acidosis, TCA toxicity, and prolonged resuscitation.
  - IV: 1 mEq/kg repeated in 10 minutes (if still in arrest) at 0.5 mEq/kg. Minimum initial dose is 50 mEq.
  - Follow TCA recommendations if TCA overdose is suspected
  - Consider dilution of Bicarb if given IO
- Calcium chloride for suspected hyperkalemia, calcium channel blocker OD, or suspected hypocalcemia
  - IV, IO: 500-1000 mg IVP
  - Administer sodium bicarbonate at 1 mEq/kg afterward for suspected hyperkalemia. **Flush line thoroughly between medications**
- Narcan (naloxone) for suspected narcotic overdose with cardiac arrest
  - IV,IO: 2 mg repeated PRN
- Dextrose 50% for hypoglycemia
  - IV/IO: 12.5-50 g

(Consider dilution of Dextrose if given IO or through small veins)

# Protocol C-02b

## Adult Cardiopulmonary Arrest – ALS

**Physician Pearls:** Outside of the Comfort One/DNR situations (see *Appendix 26*), once ALS intervention is initiated; Medical Control should be called prior to ceasing efforts.

In addition, BLS interventions, an advanced airway, and *at least* 20 minutes of rhythm-appropriate therapy should have been performed prior to considering termination of efforts.

Use waveform ETCO<sub>2</sub> as a gauge for effectiveness of resuscitation as well as monitoring CETT placement.