

SECTION: C-02b

TITLE: Adult Cardiopulmonary Arrest –ALS algorithms

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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/200-220 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)**
- Amiodarone
 - IV/IO 300 mg initial dose.
 - Consider repeat x1 150 mg 3-5 min.
- Magnesium Sulfate
 - IV: 2 g every 5 minutes,
 - 1st 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)

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.

Protocol
C-02b

ADULT CARDIOPULMONARY ARREST – ALS

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 ETCO₂ as a gauge for effectiveness of resuscitation as well as monitoring CETT placement.