

SECTION: C-2b

TITLE: Adult Cardiopulmonary Arrest – ALS Algorithms

REVISED: October 15, 2014

Box #1:

If adequate CPR is being performed upon arrival:

- a) Confirm cardiopulmonary arrest and, if necessary, continue CPR.
- b) Apply defibrillation pads and cardiac monitor without cessation of CPR.
- c) Move on to, “**Box 4.**”

Box #2:

Sudden, witnessed arrest in the presence of EMS:

- a) Perform CPR only long enough to apply defibrillation pads and cardiac monitor.
- b) Move patient to Long Backboard as soon as possible/feasible
- c) Move on to, “**Box 4.**”

Box #3:

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

- a) Initiate CPR
- b) 5 cycles 30 compressions to 2 ventilations (approximately 2 minutes)
- c) During CPR:
 - 1) Apply defibrillation pads and cardiac monitor.
 - 2) Prepare for endotracheal intubation.
 - 3) Prepare IV/IO equipment.
 - 4) Move on to, “**Box 4.**”

Box #4:

Rhythm Check and assess blood glucose

VF/Pulseless VT:

- a) Continue CPR while defibrillator charges.
- b) **Shock @ manufacturer’s recommendation.**
- c) Immediately resume CPR without pause for rhythm check.
- d) Perform 5 cycles 30:2 (approx. 2 min)
- e) Intubate **without cessation of compressions** or place SGA

Asystole/PEA:

- a) No shock indicated.
- b) Immediately resume CPR.
- c) 5 cycles 30:2 (approx. 2 min)
- d) Intubate **without cessation of compression** or place SGA

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Box #5:
Rhythm Check

VF/Pulseless VT:

- a) **Shock @ manufacturer's recommendation.**
 - Continue CPR while defibrillator charges.
- b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.
- c) Obtain IV/IO access without cessation of compression

MEDICATION ADMINISTRATION DURING CPR:

- d) **IV/IO 1:10,000 epinephrine:**
 - 1) 1 mg with saline flush
 - 2) Repeat every 3-5 minutes as needed

OR:

- e) **ETT 1:1,000 epinephrine:**
 - 1) If unable to obtain IV/IO access.
 - 2) 2-2.5 mg diluted to 10 ml with NS.
 - 3) Repeat every 3-5 minutes as needed.

Asystole/PEA:

- a) **No shock indicated.**
- b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.
- c) Obtain IV/IO access.

MEDICATION ADMINISTRATION DURING CPR:

- d) **IV/IO 1:10,000 epinephrine:**
 - 1) 1 mg with saline flush
 - 2) Repeat every 3-5 minutes as needed.

OR:

- **ETT 1:1,000 epinephrine:**
 - 3) If unable to obtain IV/IO access.
 - 4) 2-2.5 mg diluted to 10 ml with NS.
 - 5) Repeat every 3-5 minutes as needed.

**Box #6:
Rhythm Check**

VF/Pulseless VT:

- a) **Shock @ manufacturer's recommendation.**
 - Continue CPR while defibrillator charges.
- b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.
- c) **MEDICATION ADMINISTRATION DURING CPR:**
- d) **IV/IO Amiodarone:**
 - 1) 300 mg initial dose. Consider repeat 150 mg 3-5 min after.
- e) **IV/IO 2% lidocaine:**
 - 1) 1-1.5 mg/kg with 20 ml NS flush.
 - 2) Repeat every 3-5 minutes as needed. Max dose 3 mg/kg

OR:

- **ETT 2% lidocaine:**
 - 3) If unable to obtain IV/IO access.
 - 4) 2-3 mg/kg.
 - 5) Repeat every 3-5 minutes as needed. Max dose 3 mg/kg
- f) **IV/IO magnesium sulfate:**
 - 1) 1-2 g bolus (may repeat every 5 min. prn.)
 - 2) First-line in torsades.
 - 3) Administer in conjunction with lidocaine if hypomagnesemia suspected.
 - 4) Consider for refractory VF/pulseless VT.

During CPR

- **Push hard & fast (100/min)**
- **Ensure full chest recoil**
- **Minimize interruptions in chest compressions**
- One cycle of CPR: 30 compressions to 2 breaths; 5 cycles ≈ 2 min
- Avoid hyperventilation
- Secure airway & confirm placement
- Rotate compressions every 2 minutes with rhythm checks
- Search for & treat possible contribution factors:
 - **Hypovolemia**
 - **Hypoxia**
 - **Hydrogen ion (acidosis)**
 - **Hypo-/hyperkalemia**
 - **Hypothermia**
 - **Toxins**
 - **Tamponade, cardiac**
 - **Tension Pneumothorax**
 - **Thrombosis (coronary or pulmonary)**

* After an advanced airway is placed, rescuers no longer deliver "cycles" of CPR. Give continuous chest compressions without pauses for breaths. Give 8 to 10 breaths/minutes. Check rhythm every 2 minutes.

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Continue the following:

CPR → RHYTHM CHECK → CPR (if necessary while defibrillator charges) → SHOCK (if indicated) → CPR AND MEDICATION ADMINISTRATION

Continue this sequence until:

- a) If ROSC after anti-arrhythmic, continue its use:

Lidocaine maintenance infusion:***

Using 4 mg/ml solution:

- 1 mg/kg bolus total=2 mg/min.
- 2 mg/kg bolus total=3 mg/min.
- 3 mg/kg bolus total=4 mg/min.

Amiodarone

1mg/min IV drip

- b) Transport/transfer of care is complete.
- c) Resuscitative efforts are terminated.
- d) A rhythm change occurs.

If a rhythm change occurs, treat according to its respective algorithm, starting at the top of that algorithm.

Additional pharmacologic therapies:

- a) **IV/IO Sodium bicarbonate:** 1 mEq/kg for known hyperkalemia, acidosis (DKA, TCA), prolonged resuscitation after ROSC. Flush line thoroughly before and after administration. Repeat @ ½ the dose in 10 minutes.
 - 1) If cyclic antidepressant OD suspected, rebolus in 5-10 minutes at 0.5 mEq/kg.
- b) **IV/IO Calcium chloride:** 500-1000 mg for suspected hyperkalemia or calcium channel blocker overdose. Flush line thoroughly before and after administration.
- c) **Albuterol:** For suspected hyperkalemia. ETT: 10 mg (4 unit doses) directly instilled into the ETT followed by brief hyperventilation.
- d) **IV/IM/IO/IN Narcan (naloxone):** 2 mg for suspected opiate overdose.
- e) **IV/IO Dextrose:** 12.5- 25 g if coexisting hypoglycemia present.