Protocol
PC-01b

SECTION: PC-01b

PROTOCOL TITLE:
PEDIATRIC CARDIAC/RESPIRATORY ARREST –ALS Algorithm

REVISED: November 1, 2017

PED CARDIAC/RESPIRATORY ARREST - ALS

Box #1:
If adequate CPR is being performed upon arrival:

a) Confirm cardiopulmonary arrest and resume CPR.
b) Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor without cessation of CPR.
c) Apply length based resuscitation tape.
d) 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 (pediatric pads as per manufacturer's recommendation) and cardiac monitor.
b) Apply length based resuscitation tape.
c) Move on to, **"Box 4."**

Box #3:
If inadequate CPR or no CPR at all, is being performed upon arrival:

a) Confirm cardiopulmonary arrest
b) Initiate CPR
c) 5 cycles 15 compressions to 2 ventilations with two rescuers (approximately 1-2 minutes)
  1) 30:2 for single rescuer CPR (approx. 2 min)
d) During CPR:
  1) Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor.
  2) Apply length based resuscitation tape.
  3) Prepare for endotracheal intubation.
  4) Prepare IV/IO equipment.
  5) Move on to, **"Box 4."**

Box #4:
Rhythm Check

VF/Pulseless VT:

a) **Shock @ 2 J/kg or per manufacturers recommendations.**
  1) Continue CPR while defibrillator charges.
b) Immediately resume CPR without pause for rhythm check.
c) Perform 5 cycles 15:2 (2 rescuers)
d) Check rhythm every 5 cycles
e) Intubate without cessation of compressions if possible.

Asystole/PEA:

a) **No shock indicated**.
b) Immediately resume CPR.
c) Perform 5 cycles 15:2 (2 rescuers)
d) Check rhythm every 5 cycles
e) Intubate without cessation of compressions if possible.

Protocol

PC-01b

PED CARDIAC/RESPIRATORY ARREST - ALS

Box #5:
Rhythm Check

VF/Pulseless VT:

- **a) Shock @ 4 J/kg or per manufacturers recommendations.**
  - **1)** 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 compressions.
- **d)** Assess BGL.
- **e)** ***MEDICATION ADMINISTRATION DURING CPR:***
- **f) IV/IO 1:10,000 epinephrine:**
  - **1)** 0.01 mg/kg (0.1 ml/kg) with 10 ml NS flush.
  - **2)** Repeat every 3-5 minutes.
- **g)** CETT **1:1,000 epinephrine:**
  - **1)** If unable to obtain IV/IO access.
  - **2)** 0.1 mg/kg (0.1 ml/kg) diluted to 5 ml with NS.
  - **3)** Repeat every 3-5 minutes.

Asystole/PEA:

- **a) No shock indicated.**
- **b)** Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.
- **c)** Obtain IV/IO access without cessation of compressions.
- **d)** Assess BGL.
- **e)** ***MEDICATION ADMINISTRATION DURING CPR:***
- **f) IV/IO 1:10,000 epinephrine:**
  - **1)** 0.01 mg/kg (0.1 ml/kg) with 10 ml NS flush.
  - **2)** Repeat every 3-5 minutes.
- **g)** CETT**1:1,000 epinephrine:**
  - **1)** If unable to obtain IV/IO access.
  - **2)** 0.1 mg/kg (0.1 ml/kg) diluted to 5 ml with NS.
  - **3)** Repeat every 3-5 minutes.

Protocol
PC-01b

PED CARDIAC/RESPIRATORY ARREST - ALS

Box #6:
Rhythm Check

VF/Pulseless VT:

a) **Shock @ 4 J/kg or per manufacturers recommendations.**

b) Continue CPR while defibrillator charges.

c) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.

d) ***MEDICATION ADMINISTRATION DURING CPR:***

e) **IV/IO Amiodarone:**

- **1)** 5mg/kg. Repeat up to 15mg/kg (max dose 300mg).

f) **IV/IO 2% lidocaine:**

- **1)** 1 mg/kg with 10 ml NS flush.
- **2)** Repeat every 3-5 minutes as needed.
- **3)** Maximum of 3 mg/kg.

g) CETT **2% lidocaine:**

- **1)** If unable to obtain IV/IO access.
- **2)** 2 mg/kg diluted to 5 ml with NS.
- **3)** Repeat every 3-5 minutes.

h) **IV/IO magnesium sulfate:**

- **1)** First-line agent in the treatment of torsades de pointes.
- **2)** 25-50 mg/kg to a maximum of 2 g.

i) After 5 cycles of CPR go back to “Box #5”

During CPR

- **Push hard and fast (100/min)**
- **Ensure full chest recoil**
- **Minimize interruptions in chest compressions**
- One cycle of CPR: 15 compressions then 2 breaths; 5 cycles ≈ 1 to 2 minutes
- Avoid hyperventilation
- Secure airway and confirm placement
- Rotate compressions every 2 minutes with rhythm checks
- Search for and treat possible contributing factors:
  - **H**ypovolemia
  - **H**ypoxia
  - **H**ypo-/hyperkalemia
  - **H**ypoglycemia
  - **H**ypothermia
  - **T**oxins
  - **T**amponade, cardiac
  - **T**ension Pneumothorax
  - **T**hrombosis (coronary or pulmonary)
  - **T**rauma

* 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/minute. Check rhythm every 2 minutes.

Protocol

PC-01b

PED CARDIAC/RESPIRATORY ARREST - ALS

PHYSICIAN PEARLS:

Outside of the Comfort One/DNR situations (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 10 minutes of rhythm appropriate therapy should have been performed prior to considering termination of efforts.

The American Heart Association (AHA) current guidelines for CPR and Emergency Cardiac Care recommends:

- Good, sustained, and effective CPR. **"Push hard and fast".**
- **Sustained coronary perfusion is believed essential for the heart to respond to defibrillation, any interruption in compressions should be minimized or avoided.** Even brief interruptions of compressions (such as seen in the pause for ventilations or defibrillation) result in a rapid decrease of coronary perfusion.
- Change to a 1-shock protocol. Frequent or long interruptions in precordial chest compressions for rhythm analysis or rescue breathing were associated with post resuscitation myocardial dysfunction and **reduced survival rates**. The AHA notes that: *"…if 1 shock fails to eliminate VF, the incremental benefit of another shock is low, and* ***the resumption of CPR is likely to confer a greater value than another shock.****"* Therefore when a shockable rhythm is found, **only one shock, instead of three stacked shocks, is recommended.**

CETT vs. IO Access: The AHA notes that *"…administration of epinephrine by the IV route was associated with a higher rate of ROSC and survival to discharge than administration of the drugs by the endotracheal route".* **Therefore, while CETT administration of drugs in cardiac arrest is not prohibited, IO is encouraged when peripheral venous access is unsuccessful.**