

# SYSTEM F.I.R.S.T.

A publication by and for the Associates of Ephraim McDowell Health

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## OUR MISSION

Ephraim McDowell Health is a system committed to creating a healing environment, built on a legacy of best people, practices and performance, as seen through the eyes of our patients, healthcare providers and communities.

## OUR VALUES

F Friendliness  
I Innovation  
R Respect  
S Service  
T Trust

# SPECIAL EDITION

## ACLS changes will alter code blue procedures

Major changes are being implemented with regards to ACLS, BLS and PALS, all of which are driven by changes in the delivery of CPR and ventilations. These will change the code blue procedures, standing orders and code cart supplies/medications. Our clinical staff is being educated to be prepared for these changes; our intent with a special edition of this newsletter is to let the medical staff know about these changes.

### CPR/BLS Changes:

1. Compressions delivered for 2 minutes with 30 compressions and 2 breaths delivered in 5 cycles.
2. Breaths are given over 1 second each.
3. Complete chest wall recoil is assessed.
4. Recommend compressor rotates each 2 minute cycle – compressor fatigue may become an issue in poor delivery.
5. CPR should not be interrupted for AED placement or charging (machines will need to be re-programmed by manufacturer).

### ACLS Changes:

1. In first 4 minutes of V-Fib/Pulseless V-Tach, one immediate defibrillation at 360 joules monophasic or 150J-200J for biphasic truncated exponential waveform; 120J for biphasic rectilinear. If V-Fib unknown time, 2 minutes of CPR prior to defibrillation.
2. No rhythm or pulse check until 2 minutes of CPR completed.
3. No interruption of CPR for intubation or medications. These procedures should be done simultaneous with CPR. Medications should be started as soon as feasible. IV/IO routes

recommended over ET.

4. There should be no interruptions for charging or clearing the defibrillator prior to defibrillation – CPR should continue until the shock is ready to be delivered.
5. CPR should be resumed immediately after the shock instead of waiting for rhythm analysis. There is frequently a short period of PEA/Asystole after the defibrillation and CPR may improve ROSC at this time. When the monitor has returned to a waveform, then the rhythm can be analyzed.
6. Advanced Airway placement is deferred until patient fails to respond to initial CPR and defibrillation or demonstrates return of spontaneous circulation. BVM or adjuncts such as the LMA are highly recommended.
7. After an advanced airway is placed compressions will be delivered continuously without pause for ventilation. Ventilation rates are 8-10 per minute for adults.
8. Amiodarone recommended for V-Fib, V-Tach. Lidocaine may be used if Amiodarone unavailable.
9. Vasopressin is an alternative to Epinephrine in all Pulseless rhythms.
10. Atropine dose in Bradycardia is now 0.5 mg (not 0.5-1mg).
11. Acute Coronary Syndromes: Recommends EMS dispatchers be trained to instruct patients with ACS to chew an aspirin; Cardiac markers are emphasized in the identification/classification of high-risk patients with UA/NSTEMI; contraindications to thrombolytics have been refined to match criteria published by ACC/AHA.

12. Deliberate hypothermia after ROSC may be beneficial for victims of out-of-hospital V-Fib who have been resuscitated but are not conscious. Appropriate levels and methods are being investigated.

### **PALS Changes:**

1. Compression:ventilation ratio for all rescuers is 30:2. Compression ratio for 2 healthcare providers is 15:2 for infants and children.
2. In first 4 minutes of V-Fib, one immediate defibrillation at 2 joules per kg monophasic or biphasic is recommended. Subsequent defibrillations are at 4J per kg.
3. Sequences for defibrillation in V-Fib and CPR are same as adult.
4. AED is acceptable in all age children (1 year and above). If pediatric paddles/pads not available adult may be used, utilizing an anterior/posterior placement if pads overlap on the chest wall.
5. Advanced airway placement de-emphasized.
6. Cuffed endotracheal tubes acceptable in the hospital setting if cuff pressures are maintained a <20 cm H<sub>2</sub>O pressure. Cuffed ET tubes should be considered in children with large glottic air leaks or increased airway pressures.
7. Tube size formula now  $\frac{16 + \text{Age}}{3}$ .
8. Amiodarone 5mg/kg recommended for V-Fib or V-Tach. Lidocaine may be considered if Amiodarone not available.
9. Meconium aspiration no longer recommended in vigorous newborns with meconium staining.
10. No high dose epinephrine for any situation – may cause paradoxical stimulation of beta receptors in children.

### **Major Findings to Support Changes:**

- Cardiac output during current CPR is 15.7% +/- 6.0%. This provides 10-20% of the normal blood flow to the heart and 20-30% of the normal blood flow to the brain.
- Using a Three-Phase model, if the initial defibrillation is most successful for return of spontaneous circulation (ROSC) if delivered during the electrical phase (0-4 minutes). Multiple shocks increase the likelihood of PEA/Asystole by pushing the heart into the circulatory phase. If a shock is delivered during the Circulatory Phase (4-10 minutes) it may be detrimental, causing PEA/Asystole, as

the heart does not have adequate metabolic resources to respond appropriately and may be pushed into the metabolic phase (10-20 minutes). Optimal treatment during the metabolic phase has not been determined beyond current algorithm recommendations.

- Defibrillation within 2-3 minutes is optimal. Otherwise CPR is recommended for 2 minutes prior to attempting defibrillation. A single shock with a biphasic defibrillator delivered within 2-3 minutes has as much as 90% success rate of ROSC.
- Better coronary perfusion pressure increases ROSC.
- Current CPR techniques: 1) do not reach adequate coronary perfusion pressures until the 4<sup>th</sup>-5<sup>th</sup> compression and they are stopped for ventilations, dropping the pressure to 0; 2) a continuous rate sustains coronary perfusion pressures above the minimal 50%.
- Complete compression and recoil is necessary for proper intrathoracic pressures and circulation to and filling of the heart and coronary arteries.
- Studies showed that 1) chest compressions not delivered at least ½ of the time created a no-flow ratio of 48%; 2) compressions were not deep enough nor was there complete release, reaching target 27% of the time; 3) compression rates were consistently below 60 (100 recommended). *Wik et al (2005) JAMA*.
- Barriers to adequate CPR: 1) pausing for procedures such as airway and IV placement; 2) pausing for rhythm and pulse analysis; 3) pausing after defibrillation to await post-shock rhythm; 4) pausing to clear, charge and shock; 5) pausing for moving the patient; 6) pausing due to transport issues pre-hospital; 7) lack of CPR providers in the community.
- Ventilation rates have been recorded as high as 47 breaths/minute. Hyperventilation increases intrathoracic pressure decreasing coronary circulation and causing a decrease in cerebral perfusion pressure. The greatest # of persons survived with rates of 12 or less.
- Victims receiving bystander CPR had 4 times better survival.
- The heart needs to be “primed” first – a threshold must be crossed and sustained for up to 3 minutes. There is a rapid loss of priming when CPR is stopped for any reason.