Pediatric Advanced Life Support Science Update 2010

What’s New for 2010?

CPR
• Take no longer than ____________ seconds for pulse check
• Rate at least on ____________ per minute (instead of “around 100 per minute”)
• Depth change:
  • Adult depth is at least 2”
  • Child: ____________ depth of chest (“about 2”)
  • Infant 1/3 depth of chest (“about 1 ½”)
• “Hard and Fast”
• 3:1 Compression to ventilation remains for ____________

4 Steps of BLS Survey
• 1. Check for ______________________________________
• 2. Activate emergency response (call 911) and get AED
• 3. Check ______________________________________
  • No more than ____________ seconds while monitoring for breathing
  • Begin chest compressions if pulseless (30:2)
• 4. Defibrillation

CPR
• "______________________________________ Only” CPR
  • Widely taught for lay rescuers
  • 911 dispatchers should instruct callers
  • Dispatcher identification of agonal gasps
  • Concept of “Team Approach”
  • Greatest emphasis remains with high quality chest compressions with ____________ interruptions

Capnography
• Continuous capnography is beneficial during CPR to help guide therapy
• Protects proper placement of ____________ tube
• Monitors effectiveness of compressions
• May not be very __________________________ for infants in cardiac arrest for a prolonged time

Further Reinforcement of 2005 Recommendation of Capnography
• Confirmation of Tube placement requires __________________________
  assessment and exhaled carbon dioxide (CO2)
• ____________ detectors devices may be considered in children >20 kg who have a perfusing rhythm
• Correct tube placement must be verified upon insertion, during transport, and when the patient is ____________
Cardiac Arrest Algorithm
• PALS cardiac arrest algorithm was _______________________________ to emphasize organization of care around 2 minute periods of CPR
• Not yet available

Airway Management
• __________________________ Pressure not recommended
• __________________________ ET tubes are OK for all ages

Defibrillation Settings
• _________ J/Kg for initial setting
• At least ___________ J/kg for second and all subsequent settings.
• Doses higher than ___________ J/kg (not to exceed ___________ J/kg or the adult dose) may also be safe and effective, especially if delivered with a biphasic defibrillator

Resuscitation of Infants and Children with Congenital Heart Disease
• Specific resuscitation guidance has been added for management of cardiac arrest in infants and children with congenital __________________________
• Due to __________________________ challenges associated with these diseases
• Really not applicable to EMS

Management of Tachycardia
• Wide-complex tachycardia is present if QRS width is > ___________ seconds.
• Was classified as prolonged if it was > ___________ seconds for a child under 4yoa and ≥0.1 for a child between 4 and 16 yoa.
• This lead to confusion over 0.01 seconds

Medications During Arrest and Shock
• Routine __________________________ administration is NOT recommended for pediatrics during cardiac arrest without documentation hypocalcemia
• Routine administration of Calcium is not beneficial and may be harmful
• __________________________ is NOT recommended for routine use in pediatrics with evidence of septic shock
• Causes adrenal suppression

Induced Hypothermia
• Therapeutic hypothermia (___________ °C to ___________ °C) may be beneficial for adolescents who remain comatose after resuscitation from sudden witnessed out-of-hospital V-Fib cardiac arrest
• May also be considered for infants and __________________________ who remain comatose after resuscitation from cardiac arrest

Neonatal Resuscitation
• Infants born at 37-39 weeks via an elective C-section have a __________________________ need for intubation
• Really not applicable for EMS
Neonatal Assessment

- Once positive-pressure ventilation or supplemental oxygen administration is begun, assessment should consist of simultaneous evaluation of 3 clinical characteristics:
  - __________________________ Rate
  - __________________________ Rate
  - State of oxygenation (preferably by pulse __________________________ rather than by simple assessment of color.

Neonatal Supplemental Oxygen

- Pulse oximetry, attached to the __________________________ upper extremity, should be used to assess any need for supplemental oxygen
- For full term babies, it is best to begin resuscitation with __________________________ rather than 100% O2
- Oxygen should be “blended” in accordance with pulse ox reading
- This helps avoid potential of oxygen toxicity __________________________

Neonatal Suctioning

- Suctioning immediately after birth (including suctioning with a bulb syringe) should be reserved for babies that have an obvious __________________________ to spontaneous breathing or require assisted ventilations
- Does not apply if __________________________ is present in a non-vigorous neonate
- Reasoning is that there is no evidence that babies __________________________ from this suctioning
- NOTE: Curriculum and Protocols should be followed

CPR for Neonates

- Recommendation remains __________________________ for compression to ventilations of neonates
- If the arrest is known to be of cardiac etiology, a higher ration __________________________ should be considered

Induced Hypothermia for Neonates

- It is recommended that infants born at ≥___________ weeks gestation with evolving moderate to severe hypoxic-ischemic encephalopathy should be offered therapeutic hypothermia.

Delayed Cord Clamping

- There is increasing evidence of benefit of cord clamping for at least 1 minute in term and preterm infants not requiring resuscitation.
- Note: Curriculum and protocols remain at immediate clamping of cord

Withholding or Discontinuing Resuscitative Efforts

- 2010 guidelines reaffirms the 2005 recommendation…..
- In a newborn with no detectable heart rate, which remains undetectable for ____________ minutes, it is appropriate to consider stopping efforts
Reinforcement of Previous Recommendations

• Further caution about the use of ________________________________ tubes
• LMA’s are acceptable when used by experienced providers.
• (IV/IO) is preferred to ________________________________ drug administration

Review

Synchronized Cardioversion

• Initial is ____________ J/kg to ____________ J/kg
• Additional are up to ____________ J/kg maximum

IV Fluids

• Fluid resuscitation is normally with an isotonic crystalloid (LR or NS)
• Neonates: ____________ cc/kg
• Pediatrics: ____________ cc/kg
• ________________________________ as needed to achieve effect

Head Injuries

• Effort should be to ________________________________ respirations, pulse, and BP
• After stabilized, a ____________ of the head and neck should be performed (in hospital)

Wheezing

• In pediatrics, with prolonged expiratory time, the obstruction is normally in the ________________________________ airways
• The ________________________________ the expiratory time, the higher the obstruction

Chest Compressions with a Pulse

• Neonates should have compressions performed if heart rate is below ____________ bpm and other efforts have failed
• Infants should have compressions performed if heart rate is below ____________ bpm and other efforts have failed

Pediatric Resuscitation

• Most cardiac arrests are NOT due to cardiac conditions but are normally ________________________________ in nature or due to shock
• Many times, the key is to obtain ________________________________ from family or caregivers

Drug Therapy for Cardiac Arrest

• ________________________________ : the drug of choice
  —IV/IO dose: ____________ mg/kg (tracheal: 0.1 mg/kg)
  —Repeated every 3 to 5 minutes
  —Routine use of high doses of epinephrine is not recommended
• Vasopressin: No clinical trials on Pedis
• Amiodarone: ____________ mg/kg IV/IO
• Lidocaine: ____________ mg/kg IV/IO
• Magnesium ____________ gm to ____________ gm for torsades de pointes

33 Vagal Maneuvers for Supraventricular Tachycardia
• Evidence supports use of vagal maneuvers to try to terminate supraventricular tachycardia, particularly in the ______________________________ patient
• Maneuvers:
  — Apply ______________________________ water to the face of infants and young children (Note: Do not occlude airway.)
  — Older children may blow into occluded ______________________________
• Can be performed while preparing for drug administration or cardioversion

34 Potentially Reversible Causes of Arrest: 6 H’s
• ____________
  • Hypovolemia
  • Hypothermia
  • Hydrogen ion (acidosis)
  • ____________
  • Hypo/Hyperkalemia

35 Potentially Reversible Causes of Arrest: 5 T’s
• ____________
  • Tension pneumothorax
  • ____________
  • Thrombosis (coronary or pulmonary)
  • ____________

36 Priorities
Treatment priorities are the same as for an adult
• ____________
  • Rhythm
  • ____________

37 Treating Rate
• Most heart rates should be treated with airway management, oxygenation, and ____________ first
  • 10-20cc/kg of isotonic crystalloid
  • ____________ should be given for increased vagal tone or primary AV block
  — 0.02mg/kg up to 1mg total dose
  — Minimum dose ____________mg

38 Treating Rhythm
• Remember most arrhythmias can be treated with airway management and fluids
• Aystole and PEA
• Treated with ______________________________
• NO Atropine and NO ________________________________
• V-Fib and Pulseless V-Tach

Treating BP

• ________________________________ should be first choice
  • 10-20cc/kg of NS or LR
  • Epinephrine Drip 0.1 to 1mcg/kg/min
  • ________________________________ Drip 10-20mcg/kg/min
  • ________________________________ Drip 0.1 to 1mcg/kg/min

For the Test

• Remember that the questions on the PALS exam are intended for
  ________________________________ as well. Some treatments are correct even
  though these treatments are NOT commonly used in EMS.
  -Oxygen via cannula
  -No administration of oxygen due to good pulse ox reading
• The strips are NOT 6 second strips
• ________________________________ each question carefully