

Ideal First 10 Minutes of a Pediatric Cardiac Arrest Simulation Video

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Background

Pediatric cardiac arrests extremely serious and unfortunate events. Every year, it is estimated that approximately 16,000 children in the United States will suffer from a cardiac arrest (Topjian et. al 2008). Unfortunately, only 5-10% of patients will survive out-of-hospital arrests and often with severe neurological sequelae (Meaney et. al 2006). Outcomes are dependent on many factors, one of which is the quality of treatment provided by the caregivers. The goal of every arrest is the same, namely, immediately reestablish effective cardiac output and deliver adequate oxygen to tissues with high-quality CPR.

Current American Heart Association (AHA) guidelines require CPR recertification training every two years. However, the AHA recommends more frequent refreshers. One such method of ensuring proper CPR techniques is through the use of simulations. Studies have shown that frequent simulation training sessions have helped to improve CPR performance (Sutton et. al 2011).

This simulation video is based on a randomized control study conducted at Johns Hopkins Hospital. Sullivan et. al (2015) randomized 3 groups that participated in 15 minute in-situ cardiac arrest simulations every two, three or six months. The study showed that short, repeated training simulations every 3 months greatly improved timely initiation of chest compressions and defibrillation.

Objectives

Plan, organize and produce an "ideal first ten minutes" cardiac arrest simulation video in the pediatric emergency department. This project is part of a larger QI project with the goal being to improve nurses' confidence and competence during pediatric cardiac arrests.

Methods

Develop a simulation script and video based off of the latest 2015 American Heart Association (AHA) Guidelines Update for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC).

Choreographed cardiac arrest response where team members were assigned specific roles including:

- Charge nurse
- Medication nurse
- Bedside nurse
- Quality CPR coach/nurse
- 2-3 compressors
- Tech
- 3 MDs (2 on airway, 1 team leader)

Sample from simulation script:

QCPR: "This is a 6 month old, non-intubated pt, in cardiac arrest. Our goal is a compression depth of 1.5 - 2 inches, rate of 100-120, compression to breath ratio of 15:2 since he's not intubated. Our end tidal goal is greater than 20 mmHg."

Team leader: "CPR coach is the end tidal ready on the Zoll? Med nurse please set the Epi timer and remind us to give epi Q4 min."

CPR Coach to 1st compressor: "This is where you look to see your depth and rate, I'll coach you to an appropriate depth and rate. When it's time to switch, second compressor should be on your left and you slide to the right."

QCPR: "Team leader, what rhythm are we in? (everyone looks at Zoll)"

Team Leader: "PEA, not shockable. Continue compressions and epi Q4."

QCPR: "Time for a compressor switch, on my count, step off the stool to the right and compressor 2 step up and resume compressions."

Future Directions

Upon completion of video editing, nurses in the pediatric emergency department at the Johns Hopkins Children's Center will watch the ideal first ten minutes cardiac arrest simulation video every 3 months followed by hands on practice utilizing a mannequin. Pre-and post intervention surveys will be collected to measure nurses perceived confidence with cardiac arrest management.

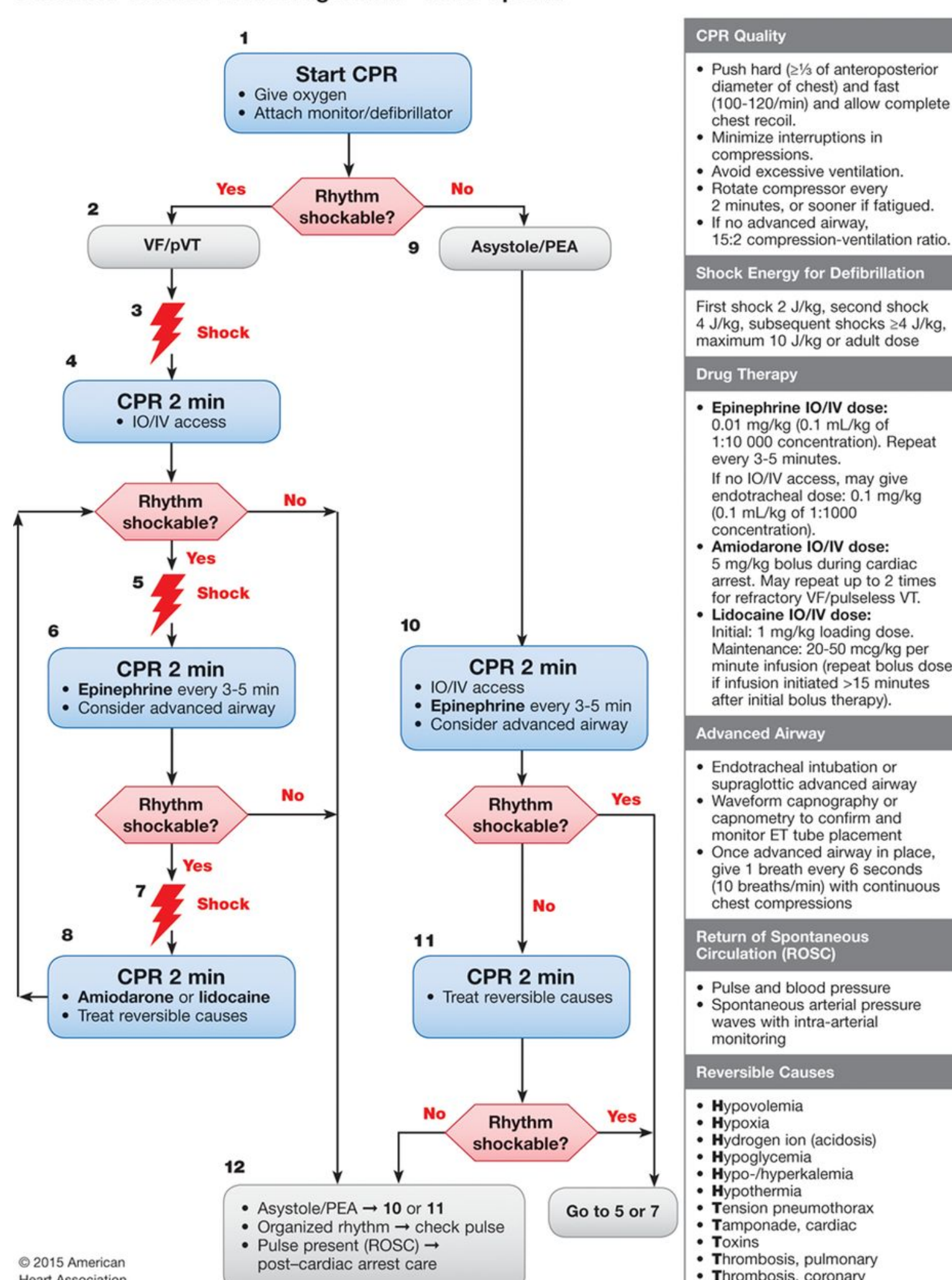
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Pediatric Cardiac Arrest Algorithm—2015 Update



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