

## 2020 PALS Updated Guidelines

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### Paediatric Cardiac Arrest Algorithm

- Emphasis on prioritizing on giving Epinephrine ASAP in non-shockable rhythms
- Every minute delay results in worse outcomes
- **Rationale:** Epi action acts on alpha receptors & improves coronary perfusion pressure, thereby delivering more oxygenated blood to myocardium & chance of getting ROSC is higher

### Ventilation Rate During CA

- Over last 10 years, in adults, a lot of resuscitation has gone to compression only or CAB CPR – works great in adults, but not in children
- Most arrests in children are hypoxic in nature (at least 70%), respiratory acidosis may impede heart's ability to be resuscitated, children need ventilation
- Models show the smaller the patient size, the higher the ventilation to compression ratio is required to optimize oxygen delivery
- **Advanced Airway:** No longer ventilating 1 breath q6 seconds (approx. 10 breaths/min)  
**NEW Recommendation:** 1 breath q2-3 seconds (approx. 20-30 breaths/min)
- **Hyperventilation:** Previous reason for 1 breath every 6 seconds was concern of hyperventilating child which can impede venous return to the heart. This is not the case in children, threshold for impeding venous return is much higher in children.

### High Quality CPR

- Re-emphasized importance of high-quality CPR, single most important intervention
- New defibrillators will have feedback which will improve CPR, has become standard of care

### Post-Arrest Care

- Preventing secondary brain injuries to give best possible outcomes
- **SpO<sub>2</sub> Targets:** Do not want to hyper-oxygenate (i.e.) SpO<sub>2</sub> of 100%, don't actually know what PaO<sub>2</sub> is and may be hyper-oxygenating child, oxygen free radicals can be detrimental
- **Targeted Temperature Management**
  - Fever is common after CA, aggressively avoid fever
  - **Hypothermia:** Studies show there are no benefits of cooling patients, though one benefit is they are less likely to become febrile
  - Most important to monitor temps in children who remain comatose post-arrest
  - When transporting child who is cool (i.e.) 35°C, you wouldn't rewarm them to 36-37.5°C prior to transport, less likely become febrile during transport
- Hypotension is <5<sup>th</sup> percentile for age, size & height of patient are important to look at ( $70 + 2(\text{age})$ )
- Some discussion aiming for 50<sup>th</sup> percentile may be better than having a fluctuating BP
- Studies on exact BP targets are elusive
- May need low-dose Epinephrine

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### Sepsis Updates

- Recognizing sepsis & signs of shock early is still key
- Fluid resuscitation is still key:
  - 2015 guidelines were a bit confusing as there was a caveat about amount of fluids given, based on 2011 study from low-income/resourced setting (Maitland, NEJM)
  - 2020 guidelines stress importance of reassessment between boluses
  - Give 10-20 mL/kg, then reassess looking for signs of fluid overload
  - Consider starting with 10 mL/kg with reassessment
- Consider inotropes earlier before getting to 60 mL/kg, can always be switched off
- If fluid is not getting desired effect or making child worse, start inotropes
- **Inotropes:** Dopamine deemphasized, no longer 1<sup>st</sup> or 2<sup>nd</sup> line (based on Critical Care Medicine's 2020 Surviving Sepsis Campaign International Guidelines & 2 RCTs)
- Epinephrine (usually starting inotrope of choice) & Norepinephrine (reserved more for warm shock)
- Kids have underlying myocardial dysfunction in septic shock, do not want to increase afterload on heart that may not be perfect
- Getting familiar with Epinephrine and start thinking about using it as first line is important
- How 'shocky' or hypotensive is your patient?
- PALS book says 0.1 to 1 mcg/kg/min (0.1 mcg is a fairly big dose) \*would not normally ever start a child at 1 mcg/kg/min
- **Examples:**
  1. Mentation isn't great, hasn't cleared lactate yet, just want to bump up BP, may want to start at 0.01-0.02 mcg/kg/min (considered quite low)
  2. Not making much headway, not responding to fluids, not imminently worried about arresting, but still in shock, may want to start at 0.05 mcg/kg/min
  3. Can't leave bedside, deteriorating, worried about arresting, may want to start at 0.1 mcg/kg/min
- Each increment you go up, you will get less bang for your buck, so many need to consider adding in another inotrope
- Lactate is a great marker for shock \*subject to measuring errors such as tourniquets, not sending on ice or not processed quickly

### Intubation

- Cuffed tubes desirable, control ventilation better as leak around tube is less
- **Age/4 + 3.5 (for cuffed tubes)**
- Very few situations where an uncuffed tube is needed (not speaking about preemies)
- **Good time for leadership to review intubation inventory for children in ED's to ensure enough cuffed tubes in a variety of paediatric sizes are available**
- Deemphasized cricoid pressure, studies show increase risk of first attempt intubation failure

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### High Performance Team

- Practicing as a team, knowing roles, performing Mock Codes, debriefing events
- **CPR Coach:** New Role in 2020 guidelines

### PALS Courses

- Future learners will have access to videos & exam prior to course, so may mean courses will be shorter as more learning is done in advance
- Feedback devices are excellent for improving CPR quality

### COVID-19 Considerations

- Healthcare worker safety is paramount
- Practicing mock codes are helpful
- Compressions themselves are not aerosol generating (AG), however, the moment you defibrillate, all chest compressions subsequent to it are AG
- Big difference is to intubate early if COVID status is not known **\*first pass success is key**
- At Children's, all Code Pinks are considered Protected Code Pinks, even if COVID status is known