Paediatric Cardiac arrest in vaccination settings

Cardiorespiratory arrest in children is rare. Children attending a vaccination setting will usually be well, relative to their underlying condition, so their oxygen levels prior to vaccination should be at their normal baseline. The most likely cause of arrest in this setting, therefore, would be severe anaphylaxis – something which is very uncommon in young people (children and adolescents).

The first priority must be to treat anaphylaxis proactively according to the anaphylaxis guidelines (algorithm attached). In particular, intramuscular adrenaline should be a priority treatment and delivery of high-flow oxygen if available, along with a call to emergency services (999).

If cardiorespiratory arrest occurs the emergency services must be called, and immediate cardiopulmonary resuscitation (CPR) started.

Rescue breaths increase the risk of transmitting the COVID-19 virus, either to the rescuer or the child. However, this risk is small compared to the risk to the child of taking no action. Therefore give ventilations/rescue breaths wherever possible as per Paediatric Basic life Support guidelines (algorithm attached). Bag-valve-mask ventilation (ideally with an HME/viral filter) by those trained to do so, is preferable to using a face mask, which is in turn preferable to mouth-to-mouth or mouth-to-mouth-and-nose from a rescuer safety perspective.

With this in mind, a risk assessment is essential and should include the skills required, training to be provided and equipment made available, along with a documented response to emergencies.

The level of PPE provided will vary in vaccination settings (e.g. proximity to advanced resuscitation facilities, and vaccination of higher risk populations such as those with chronic health conditions) and the planned emergency response should reflect this. The individual rescuer may need to undertake a dynamic risk assessment and should be supported whenever possible in their actions.

CPR (including ventilation and chest compressions) is an aerosol generating procedure. Therefore, resuscitation should be carried out using the highest level of PPE available to the rescuer. The risk assessment will clarify the planned response and needs within the vaccination setting and identify what PPE will be provided and the training to use it. This must be communicated to everyone working in the setting.

Once the emergency medical response arrives, direction should be taken from the ambulance personnel. They may require rescuers to withdraw from the area whilst procedures are carried out and all directions should be followed.

There should be a debrief of the event and the drug reaction should be reported using the ‘yellow card system’. There should be governance structures in place to review and report events.

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Paediatric out-of-hospital basic life support

Unresponsive

Shout for help

Open airway

Breathing normally?

NO or any doubt

5 rescue breaths
Infant: mouth to nose/mouth
Child: mouth to mouth
If unable/unsafe to ventilate, perform continuous chest compressions
Add rescue breaths as soon as possible

If no signs of life observed during rescue breaths

30 chest compressions

2 rescue breaths

Clear signs of life?

YES

Observe and re-assess as necessary

Single rescuer

• Call EMS if phone available, using speaker function
• If no phone available continue with CPR for 1 minute before calling EMS

Second rescuer or single rescuer suspecting a primary cardiac arrest

• Call EMS on 999
• Collect and apply AED if feasible

Those trained only in ‘adult’ BLS (may include healthcare providers and lay rescuers) who have no specific knowledge of paediatric resuscitation, should use the adult sequence they are familiar with, including paediatric modifications.
Management of Anaphylaxis in the Vaccination Setting

**Anaphylaxis?**

A = Airway  B = Breathing  C = Circulation  D = Disability  E = Exposure

**Diagnosis**

Look for:
- Sudden onset of Airway and/or Breathing and/or Circulation problems
- And usually skin changes (e.g., itchy problems)

**Call for help**

- Ensure Ambulance or Resuscitation Team called
- Lie patient flat (with or without legs elevated)
  - A sitting position may optimise respiratory effort in respiratory distress
  - If pregnant, lie on left side

**Give intramuscular (IM) adrenaline**

If no improvement:
- Repeat IM adrenaline every 5 min
- IV fluid bolus

If ongoing treatment is required despite TWO doses of adrenaline:
- Ensure Ambulance or Resuscitation Team called
- Repeat IV fluid bolus
- Further IM adrenaline every 5 min
- Get expert help to start an IV adrenaline infusion

1. **Life-threatening problems**

   **Airway**
   - Swelling, hoarseness, stridor

   **Breathing**
   - Rapid breathing, wheeze, fatigue, cyanosis, SpO₂ <94%, confusion

   **Circulation**
   - Pale, clammy, low blood pressure, faintness, drowsy/coma

2. **IM adrenaline**

   IM doses of 1 mg in 1 mL (1:1000) adrenaline
   - Adult and child >12 years: 900 micrograms IM (0.5 mL)
   - Child 6–12 years: 300 micrograms IM (0.3 mL)
   - Child 6 months to 6 years: 150 micrograms IM (0.15 mL)
   - Child <6 months: 100–150 micrograms IM (0.1–0.15 mL)

   (Adrenaline IV to be given only by experienced specialists)

3. **IV fluid bolus**

   Use crystalloid
   - Adults: 500–1000 mL
   - Children: 10 mL/kg