

Paediatric resuscitation in general practice

Jane Lambert explains what knowledge is required to resuscitate a child or infant should an emergency occur in general practice



Figure 1. Assessing for breathing on an infant with head in a neutral position

Cardiac arrests among children continue to occur rarely. Children usually show signs of deterioration which means that prompt action can be taken to avoid this happening in many cases. It is thought that many children receive no resuscitation at all because rescuers fear causing harm as they have not been taught specific paediatric resuscitation.

Cardiac arrest in infancy and childhood is rarely a result of primary cardiac disease. Most cardiac arrests are secondary to hypoxia, underlying causes including birth asphyxia, epiglottitis, inhalation of foreign body, bronchiolitis, asthma and pneumothorax.

Respiratory arrest also occurs secondary to neurological dysfunction such as that caused by some poisons or during convulsions (Advanced Life Support Group, 1999).

Most other cardiac arrests are secondary to circulatory failure (shock). This will have resulted from fluid or blood loss, or from fluid maldistribution within the circulatory

system. Causes may include trauma, gastroenteritis, burns, sepsis, heart failure or anaphylaxis.

Although cardiac arrest occurs rarely in general practice, in the author's experience of training and working with GPs and practice nurses, such an emergency may occur in general practice when a parent runs a child to the surgery because it is closer than an accident and emergency department.

Another possible cause of a cardiac arrest in the surgery is as a result of babies receiving their vaccinations in general practice, in which case there is a small risk of seeing an anaphylactic reaction.

It is essential that all staff working in the practice should be taught both adult and paediatric resuscitation. They should also have the opportunity to practice on manikins of all ages to build their confidence.

The Resuscitation Council (UK) announced new resuscitation guidelines in November 2005. These affect both adult and paediatric

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basic life support. In paediatric basic life support, two sets of guidelines were introduced: one for health professionals with a duty to respond and one for laypeople (Resuscitation Council (UK), 2005). As a result, there has been some confusion about which guidelines should be used by GPs and practice nurses. Although GPs and practice nurses are health-professionals, they do not specialize in treating children, and retention of the skill is the most essential point of training. Therefore, it might be more appropriate to teach the lay people's guidelines to GPs and practice nurses.

At Resuscitation 2006, the Eighth Scientific Congress of the European Resuscitation Council held in Stavanger, Norway, 10–13 May, representatives from the Resuscitation Council (UK) suggested that the paediatric guidelines for health professionals were ideally designed for those professionals who specialize in paediatrics. The main focus should be on appropriate training for the group attending. If time allows, instructors teaching with ECG Ltd teach GPs and practice nurses the health professionals' guidelines for paediatrics, so long as there is sufficient time for an appropriate amount of supervised practice and assessment of those skills. They also cover the 'easier to remember' guidelines designed for lay people, and reassurance is given that either method is satisfactory in their case.

Paediatric basic life support for health professionals

The main changes in the new guidelines are the age definitions (Resuscitation Council (UK), 2005). These are now:

- An infant is a child under 1 year
- A child is between 1 year and puberty (not 8 years).

The following sequence should be followed:

- Ensure the safety of the rescuer and child
- Check the child's responsiveness (do not shake infants, or children with suspected cervical spine injuries).

If the child does not respond:

- Shout for help
- Open the child's airway by tilting the head and lifting the chin. Use a neutral position for an infant (*Figure 1*).

If you suspect that there may have been an injury to the neck, try to open the airway using chin lift or jaw thrust alone. If this is unsuccessful, add head tilt a small amount at a time until the airway is open.

Look, listen and feel for normal breathing for no more than 10 seconds (*Figure 1*). If the child is not breathing or is making agonal gasps (infrequent, irregular breaths), begin rescue breaths:

- Carefully remove any obvious obstruction in the airway
- Give five initial rescue breaths
- Blow steadily into the mouth over about 1–1.5 seconds, watching the chest rise and fall between breaths
- For a child, do a head tilt or chin lift and pinch the nose while getting a seal around the mouth
- For infants, do a head tilt or chin lift. It is then necessary to close a seal around both the nose and mouth together (*Figure 2*).

If there is difficulty in achieving an effective breath:

- Check the airway for any obvious obstruction
- Ensure the airway is open enough, but not over-extended
- Make up to five attempts to achieve effective breaths.

If these attempts are also unsuccessful, move on to chest compressions. These should be carried out as follows:

- Check for signs of a circulation (signs of life)—take no more than 10 seconds



Figure 2. Mouth to mouth on an infant, covering the nose and mouth at the same time.



Figure 3. Child: chest compressions (one or two hands can be used).

- Look for any movement, coughing or normal breathing
- Check for pulse (if trained): the carotid pulse for a child, or the brachial pulse for an infant.

If you are confident that there are signs of life:

- Continue rescue breathing, if required, until the child starts breathing effectively on his/her own (about 20 breaths per minute).

If there are no signs of a circulation, no pulse, or a slow pulse (less than 60 beats per minute) or you are not sure, chest compressions should be begun, as follows:

- Compress the lower third of the sternum
- Compress the chest to about one third of its depth (*Figure 3*)
- Repeat at a rate of about 100 compressions per minute
- After 15 compressions, give two rescue breaths.

For infants, use the tips of two fingers to perform chest compressions (*Figure 4*).

Resuscitation should be continued until:

- The child shows signs of life
- Further qualified help arrives
- You become exhausted.

When to call for help

In a general practice there should be more than one rescuer, so that one person would call an ambulance while the other starts resuscitation. If, for any reason, only one rescuer is present, resuscitation should be performed for about 1 minute before going



Figure 4. Infant resuscitation: chest compressions (using the tips of two fingers)

for assistance. It may be possible to carry an infant or a small child to the phone while summoning help.

Paediatric basic life support for lay people

As previously mentioned, it is acceptable for GPs and practice nurses to use the adult basic life support guidelines for ease of teaching and retention. In this instance, the following modifications to the adult sequence should be made:

- Give five initial rescue breaths before starting chest compressions
- If you are alone, perform 1 minute of cardiopulmonary resuscitation (CPR) before going for help
- Compress the chest for approximately one third of its depth—i.e. use two fingers for an infant under 1 year; use one or two hands for a child over 1 year—as needed to achieve an adequate depth of compression
- Otherwise continue with 30 compressions to 2 ventilations as in adult basic life support.

Resuscitation equipment for paediatrics

As the cause of many cardiac arrests in children are grounded in a respiratory problem, the ability to administer high-flow oxygen is important. The child may present in respiratory arrest, which means that good airway management may be needed to correct this before the arrival of the ambulance. Therefore, it is essential that all general practices are equipped to deal with both adult and paediatric patients who have breathing difficulties or respiratory or cardiac arrest.

The minimum equipment should include a

portable oxygen cylinder and a face mask (Figure 5). If training is provided in the use of a bag-valve mask (ambubag), these should be stocked for all ages to deliver more effective oxygenation of these patients.

An automated external defibrillator should also be available. Most companies that sell automated external defibrillators have paediatric pads available for the machine. These pads ensure that a lower number of joules are delivered during defibrillation (Lambert, 2006).

Conclusions

Outcomes from out-of-hospital paediatric cardiac arrest are generally poor. Witnessed arrest status remains associated with improved survival (Donoghue et al, 2005).

It is essential that practice nurses and GPs are updated annually on basic life support skills. They should have plenty of opportunity to practise these skills on appropriately sized manikins.

In addition, instructors providing this training should review all resuscitation equipment in the surgery and advise on paediatric equipment. It is only worth having equipment that staff can be trained to use, so this must be incorporated into any training courses.

With the introduction of the new guidelines, it is to be emphasized that any intervention and delivery of basic life support is better than none. It is acceptable to use the adult sequence on children if that is what is remem-



Picture 5. Pocket mask with supplemental oxygen.

bered at the time. It would be useful if the few modifications could be applied if it is a child.

For further information on guidelines, equipment or training contact Jane Lambert on 01908 331791 or jane@ecgtraining.co.uk or visit the Resuscitation Council (UK) website on www.resus.org.uk

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KEY POINTS

- Cardiac arrest in infancy and childhood is rarely caused by primary cardiac disease. Most cardiac arrests are secondary to hypoxia
- Parents may run a child to the surgery if it happens to be closer than an accident and emergency department
- Many cardiac arrests in children are the result of a respiratory problem. The ability to administer high-flow oxygen is therefore important, and the airway needs to be managed before the ambulance arrives
- All staff working in the practice should be taught both adult and paediatric resuscitation

Conflict of interest:

None