

2.5 Resuscitation

Introduction

The aim of this chapter is to provide you with primary knowledge of the skills involved in basic life support and cardiopulmonary resuscitation (CPR) for adults, children, and infants. The main focus is dealing with the casualty as a healthcare provider both inside and outside the hospital environment. This is appropriate to you as a first-year student nurse, since the clinical skills involved in more advanced life support (ALS) are built on this solid foundation in the remaining years of your programme. The initial focus will be the adult patient, followed by the infant and child, and will be based on the resuscitation guidelines of the Resuscitation Council UK (Biarent *et al.* 2005; Handley *et al.* 2005; Nolan *et al.* 2005). Following on from the CPR sections, this chapter will also describe the steps to be taken for all age groups in the event of choking.

Learning outcomes

These outcomes relate to numbers 1, 3, 7, 9, 10, 13, 14, 17, and 22 of the NMC's Essential Skill Clusters and specifically to Care Domains 2 and 3 of the NMC's Standards of Proficiency for Pre-registration Nursing (outcomes to be achieved for entry to branch).

On reading the chapter and associated web pages and undertaking supervised activities, you will be able to:

- Define the term cardiac arrest
- Identify potential causes of cardiac arrest in adults and children
- Recognize signs of cardiac arrest
- Initially manage patients who require cardiopulmonary resuscitation

Prior knowledge

To use the skills in this chapter, it is important that you have a good understanding of the relevant anatomy and physiology. This can be found in a large range of textbooks.

Specifically you should be familiar with:

- The cardiovascular system
- The respiratory system
- The anatomical structures that comprise the chest and mediastinum

Background

Normal cardiac function

To maintain adequate performance of the vital organs, it is essential that we have:

- 1 An open **A**irway,
- 2 The capability to **B**reathe in oxygen and achieve adequate gas exchange in the lungs,
- 3 A functioning heart that will act as a pump to **C**irculate this oxygen to the organs of the body sustaining life.

Disruption to this 'ABC' process at any point will, within minutes, result in reduced oxygen delivery, organ failure,

and death. When the amount of circulating oxygen in the arterial blood is diminished, this is referred to as hypoxaemia and when the oxygen level in the tissues falls, we refer to this as **hypoxia**.

Cardiac arrest is the abrupt cessation of cardiac function and is the ultimate clinical emergency. Cardiopulmonary resuscitation is a dramatic emergency exercise that aims to restore effective circulation and breathing following cardiac arrest. In adults the most common cause of sudden cardiac arrest, out of hospital, is acute coronary syndrome (heart attack). However, in children and infants this is unlikely, unless there is a predisposing congenital cardiac condition. Cardiac arrest in children and infants tends to be the result of a primary respiratory problem. However, in all cases, other causes may exist, including:

- Drowning
- Choking
- Bleeding
- Drug overdose
- Hypoxia
- Trauma

(Resuscitation Council 2006)

2.5.1 Cardiopulmonary resuscitation for adults

Definition

Cardiopulmonary resuscitation is the act of artificially maintaining respiratory and cardiac function. It involves maintaining a clear airway, artificial breathing, and compressing the chest to circulate blood.

When to perform cardiopulmonary resuscitation

The skill should be performed in any casualty who has suddenly collapsed and is unresponsive with absence of signs of circulation. Basic life support measures, as shown in **Fig. 2.20**, may be commenced in any environment, however in hospital, where expertise is at hand, these will quickly be supplemented by more advanced

interventions. There may be situations where it has been agreed that an individual patient should not be resuscitated (e.g. terminal illness). As part of the health-care team you should be made aware of such decisions and it should be clearly recorded in the patient's notes. If you have not been made aware of this, and if there is no one around to guide you, then you should not hesitate in commencing resuscitation.

The diagnosis of cardiac arrest is confirmed by:

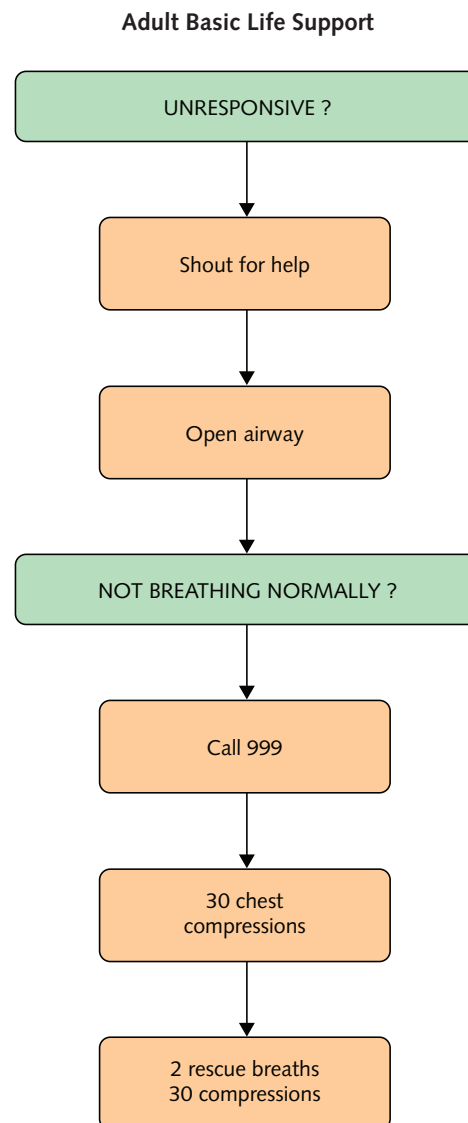


Figure 2.20 Basic life support for an adult. Courtesy of the Resuscitation Council UK.

- A sudden loss of consciousness
- Absent or abnormal breathing (for example, slow, laboured breathing, gasping, or an absence of breathing)
- The absence of signs of circulation

Procedure: confirming cardiac arrest in adults

The sequence of steps used to confirm a diagnosis of cardiac arrest can be remembered using the mnemonic 'Dr's ABC'. These initials represent:

- **D**anger—check for obvious signs—your own safety is paramount!
- **R**esponse—of the casualty
- **S**hout—for assistance
- **A**irway—check and open
- **B**reathing—check for breathing
- **C**irculation—check for signs



Figure 2.21 Performing head tilt and chin lift (adult)



Figure 2.22 Performing look, listen, and feel (adult)



Figure 2.23 The recovery position

Key point: Agonal breathing (infrequent, occasional gasps) will be evident in 40% of victims; DO NOT confuse this with normal respiration (ILCOR 2005). The emergency medical services (EMS) must be alerted prior to commencing CPR in adults; therefore, if you are alone you should leave the casualty and call them. However, if you have a second rescuer one should call the emergency medical services while the other begins CPR.

Aftercare

Once expert help arrives, a safe handover should be given and the casualty removed from the scene and transferred to the nearest Accident and Emergency Department. You may be asked to continue with CPR by the ambulance personnel while they attend to more advanced life support measures. If you are too exhausted to continue, you should make this known.

Responding to cardiopulmonary resuscitation in adults

▶	Step	Rationale
Danger		
1	Remove any obvious danger to the rescuer.	To prevent causing harm to the rescuer and prevent harm to the victim and rescuer.
Response		
2	Check response of the casualty by shaking and asking, 'Are you alright?'	Confirm the conscious level of the casualty and assist in diagnosis.
3	If the casualty responds, leave in position in which found and alert help if you need it.	To check the casualty's condition, and allow an opportunity to reassess.
4	If the casualty does not respond, shout, 'HELP!'	To obtain assistance if you should need it.
Airway		
5	Check the airway for obvious signs of obstruction. If a solid obstruction is detected, remove this with a hooked finger and sweeping motion. Well-fitting dentures should remain in place, as this helps to create a good seal during assisted ventilation. Loose or broken dentures should be removed.	To clear airway and optimize the casualty's airway.
6	Open the airway, using the head tilt and chin lift manoeuvre (see Fig. 2.21).	To prevent the tongue blocking the airway and allow for accurate assessment.
Breathing		
7	While maintaining an open airway, position your ear over the mouth and nose and direct your eyes towards the chest. Look, listen, and feel (see Fig. 2.22) for expired air for no more than ten seconds.	To confirm or refute diagnosis.
8	If the casualty is breathing, place in the recovery position (see Fig. 2.23) and call for help, continually assessing condition.	To maintain a patent airway and identify signs of deteriorating condition.

continued

- 9** If after ten seconds, the breathing appears absent or abnormal (occasional, noisy, laboured gasps) and there are no obvious signs of circulation (movement, swallowing, etc.), alert the emergency medical services and begin CPR.
- To summon expert help and access essential advanced resuscitation equipment.
To minimize delay in resuscitation and act as holding mechanism to keep the vital organs alive.
- Circulation**
- 10** Place the casualty in a **supine** position on a firm flat surface.
- To permit easy access to the patient's chest and airway.
- 11** Place one hand on top of the other, on the centre of the chest, at the lower half of the sternum.
- To safely locate the correct landmarks.
- 12** The arms should be straight and the elbows locked, lean over the casualty with the shoulder positioned in line with the heel of the hand, keeping the fingers off the ribs.
- To use minimal exertion of the rescuer and prevent unnecessary harm to the casualty.
- 13** Press the chest by 4–5 cm, aiming for a rate of 100 compressions per min. Give 30 compressions, followed by two ventilations (see Fig. 2.24).
- To maintain a cardiac output.
- 14** To deliver mouth-to-mouth ventilation: place the palm of one hand on the hairline while using the thumb and forefinger to occlude the nose.
- To occlude the casualty's nose.
- 15** Allow the casualty's mouth to remain open, while placing the fingers of the opposite hand on the chin and lifting up.
- To open the airway.
- 16** Ventilation is then achieved by placing your lips around the casualty's open mouth and blowing steadily to raise the chest.
- To create a good seal.
- 17** Take about one second, allow the chest to fall fully between the first and second breath.
- To prevent **hyperinflation** of the casualty and early exhaustion of the rescuer.
- 18** After the second breath do not delay before returning to the chest for 30 compressions and continue this pattern.
- To deliver optimal resuscitation to the casualty.
- 19** This procedure should continue at a ratio of 30 compressions: 2 ventilations and should continue until expert help arrives, the casualty displays signs of life, or the rescuer becomes exhausted (Handley *et al.* 2005).



Figure 2.24 Performing chest compressions on an adult.

Alternative interventions

Compression-only CPR

Compression-only CPR can be used when attempts at mouth-to-mouth resuscitation have been unsuccessful or you are unable or unwilling to do this. Occasions where you may be unwilling to perform mouth-to-mouth may include situations which can compromise your personal safety (e.g. exposure to blood). This involves following the steps for life support as described previously without stopping to ventilate. Compressions should be delivered continuously at a rate of 100 compressions per minute (ILCOR 2005).

In a hospital environment

As soon as the diagnosis of cardiac arrest is confirmed, ensure that appropriately experienced clinicians are alerted, and the emergency equipment is gathered; in hospital this will be the cardiac arrest team or equivalent. Begin chest compressions with minimal delay. This could be achieved

by sending a second person for help, to make best use of the elapsing time and gain support from skilled personnel.

You may see airway adjuncts being used to help maintain an open airway. These include **oral** and nasal airways, and should only be used by personnel experienced and trained in their use.

Mouth-to-mouth ventilation should be discouraged within the hospital environment, unless it is absolutely necessary and if there is no alternative available. This will be in extreme circumstances only. Therefore, within the hospital setting, devices such as a pocket mask or bag-valve-mask device, as shown in **Fig. 2.25** will be used with supplementary oxygen (if available).

A single rescuer may find it necessary to combine mouth-to-mask ventilation and over-the-head chest compressions to minimize the disruption to compressions (Handley and Handley 2004).

If more than one healthcare provider is available, a two-person technique for ventilation and compressions should be used. Swap every 2 minutes. When the nurse tires during chest compressions, roles may be changed. Again, this should be with minimal disruption to chest compressions (Resuscitation Council UK 2006).

Once an airway is secured with an endotracheal tube, chest compressions should continue uninterrupted at a rate of 100 per minute and the patient should be ventilated at a rate of 10 breaths per minute (Resuscitation Council UK 2006).

Out-of-hospital environment

The situation in a community setting is individual to that particular area (for example, a patient's or client's own



Figure 2.25 Multi-rescuer resuscitation demonstrating three roles: maintaining the airway, bag-breathing, and chest compression.

home; a GP practice; or supported accommodation). As a student nurse you should ensure that when on placement in community settings you are aware of the procedure specific to that clinical environment. In the absence of any clinical emergency team, calling for help will involve contacting the ambulance service on 999 or 112. Individuals should be aware of the information required when calling these services and that it can take a few moments to relay the necessary information. This may include: who you are; where you are; what you're dealing with; who the casualty is, and the age of the casualty.

Defibrillation

The use of automated external defibrillators (AEDs) is becoming more common in the community. These should only ever be used by personnel trained in their use. Once the defibrillator is switched on, the operator is guided by the voice prompt to the defibrillator and will attach the monitoring pads to the bare chest. This should be done with minimal disruption to chest compressions. The operator will instruct rescuers to stand clear while the defibrillator assesses the cardiac rhythm and to remain clear while the shock is delivered.

Developing your skills

You will be given the opportunity to learn this skill by using mannequins and simulated patients. However, you should recognize that the real situation will be very different and you may feel nervous or anxious when faced with this. There is no way of determining how you will react, and for this reason it is vital that you continue to take any opportunity to practice these skills in a controlled environment to prepare you for the real situation.

Other factors to consider

This clinical emergency is stressful for all involved and for those witnessing events as they unfold. For this reason, appropriate care of fellow patients and clients must be considered, since often these individuals require emotional support. This is of particular importance when dealing with potentially emotionally labile individuals (for example, those patients encountered in mental-health and learning-disabilities specialties).

Further consideration may be required of the relatives of patients who, if they are present at the time of the incident, may request to stay and observe. Relatives can find this useful. However, one staff member should be allocated to care for them during this time and explain procedures in language they will understand (Kidby 2003; Rattrie 2000). If the resuscitation attempt is unsuccessful, allowing the relatives to witness the event may help in the grieving process. However, this should not be forced on them, if it is not their desire. (Further information is available in Chapter 12.)

It is good practice to follow clinical emergencies with debriefing sessions, and often this will happen within the hospital environment. As a student nurse, you may wish to reflect on the experience and record those aspects that require clarification so you make the most of this learning opportunity. You can then discuss your queries with your mentor and academic staff (McGuinness 2008).

Do not attempt resuscitation

Recommendations for this sensitive topic have been compiled in a joint statement by the Resuscitation Council UK; British Medical Association, and Royal College of Nursing. Ultimately, this statement of best practice suggests that this very complex decision should only be made by an experienced, qualified practitioner and should be clearly documented. The information documented should include the date of the decision, the rationale for the decision, and a clear indication of the name and job title of the individual responsible for making it (Resuscitation Council UK 2007). Once this decision is made, it should be communicated to staff and respected.

Living will

It is the prerogative of an adult, with the appropriate intellectual capacity, to request that resuscitation is not attempted in the event of a cardiac arrest. In this situation, this should be clearly documented according to local policy and all members of the healthcare team should be made aware of the situation. The onus is on the patient to ensure that staff are made aware of the existence and content of any advance directive (Resuscitation Council UK 2007).

2.5.2 Paediatric healthcare provider basic life support

Definition

This section is aimed *only* at those student nurses who will have a professional responsibility or duty to care for children. It will describe the key points of basic life support for children and review some of the adaptations made in the in hospital environment. For the purpose of this chapter, the age definitions used by the Resuscitation Council UK (Biarent *et al.* 2005) will be used:

- Infant: child under 1 year
- Child: between 1 year and puberty.

Alternative intervention

For those who do not normally have a professional duty to care for children and are not familiar with the different requirements that children have, the preceding procedure for adults may be used with the following adaptations in the event of a paediatric emergency, where the child is unresponsive and not breathing normally it is recommended that:

- Five initial breaths are given before starting chest compression
- If alone, carry out CPR for approximately 1 minute before going for help
- The chest should be depressed by around one-third of its depth:
 - Use two fingers if the casualty is an infant under 1 year,
 - Use one hand if the casualty is over 1 year and **prepubescent**.

When to perform paediatric cardiopulmonary resuscitation

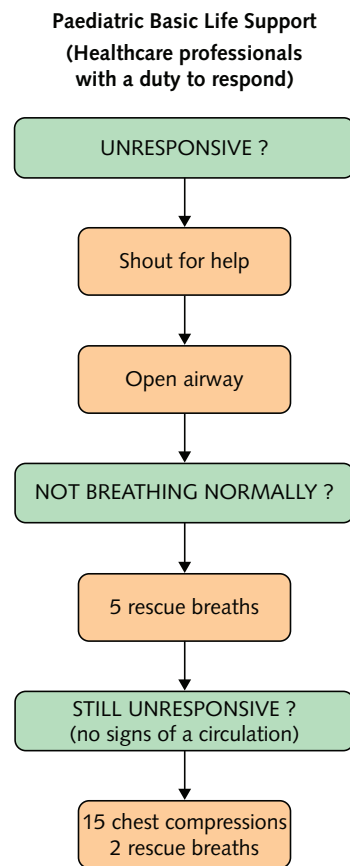
The most common primary cause of paediatric cardiorespiratory arrests tend to be the result of **hypoxia**, and it is unusual for children to have a sudden cardiac event. For this reason, swift oxygenation is the most pressing requirement. This can be achieved by delivering good basic life support (BLS), as shown in Fig. 2.26. For a lone rescuer, the priority is initiating BLS for approximately one minute

before summoning the emergency medical services (EMS). If more than one rescuer is available, one rescuer should initiate BLS while the other activates the EMS.

Procedure: Basic life support sequence for an infant

The sequence of steps used to confirm a diagnosis of cardiac arrest in adults can also be applied to children using the mnemonic ‘Dr’s ABC’. These initials represent:

- Danger—check for obvious signs - your own safety is paramount!
- Response—of the casualty,
- Shout—for assistance
- Airway—check and open
- Breathing—check for breathing
- Circulation—check for signs



After 1 minute call resuscitation team then continue CPR

Figure 2.26 Paediatric basic life support. Courtesy of the Resuscitation Council UK.

Paediatric basic life support sequence for an infant

Key point: This procedure should only be performed by student nurses who will have a professional responsibility or duty to care for children.

▶	Step	Rationale
Danger		
1	Remove any obvious danger to the rescuer.	To prevent causing harm to the rescuer and prevent harm to the infant.
Response		
2	Check the response of the infant by stimulating and asking loudly 'are you alright?'.	To confirm the conscious level of the infant and assist in diagnosis.
3	Avoid unnecessary vigorous shaking and take care not to exacerbate any potential injury sustained in the events leading to the collapse.	To prevent further injury.
4	If the infant does not respond, shout 'HELP!'	To obtain assistance if you should need it.
Airway		
5	Check the airway for obvious signs of obstruction. If a solid obstruction is detected, remove this with care by using a hooked little finger to gently sweep the obstruction.	To clear airway and optimize the casualty's airway.
6	DO NOT attempt blind finger sweeps.	To prevent unnecessary damage.
7	Open the airway using a head tilt and chin lift and position the head in the neutral position.	To clear airway and optimize the infant's airway.
8	Be careful not to press on the soft tissues of the neck.	To prevent damage. Pressing on the neck tissues may block the airway.
Breathing		
9	While maintaining an open airway, position your ear over the mouth and nose and direct your eyes towards the chest. Look, listen and feel for expired air for no more than 10 seconds.	To confirm or refute the presence of adequate breathing.

- | | | |
|--------------------|---|---|
| 10 | If the infant is breathing normally, place in the recovery position. | To maintain a patent airway and identify signs of deteriorating condition. |
| 11 | If the breathing is absent or inadequate (occasional noisy laboured gasps) proceed to deliver five initial rescue breaths. | To optimize oxygen uptake and potentially reverse any hypoxic event. |
| 12 | Place head in neutral position with chin lift applied. Take a breath and cover the mouth and nose with your mouth. | To create a good seal. |
| 13 | If it is too difficult to ventilate both the mouth and nose of the infant, attempt to ventilate through either the nose or mouth, while occluding the other. | |
| 14 | Inflate steadily for 1–1.5 seconds, watching for the chest rising, maintain head tilt and chin lift while you remove your mouth and watch the chest fall. | Prevent hyperinflation of the chest and allow for observation of any response from the infant. |
| 15 | Repeat until five attempts have been made. | |
| 16 | If there is no chest movement during the procedure; check the mouth for signs of obstruction and remove any obvious blockage carefully. | Ensure airway insufficiency is not the result of poor technique or foreign body airway obstruction. |
| 17 | If there is no obstruction; reposition the head each time until a rise and fall of the chest wall has been observed | |
| Circulation | | |
| 18 | Check the circulation by looking for obvious signs of life (movement, swallowing, and so on). If you are experienced in clinical assessment, you may wish to perform a brachial artery pulse check. | To confirm the diagnosis. |
| 19 | If you are certain you can detect signs of circulation within ten seconds, continue rescue breathing, continuously observing the response. | To maintain oxygenation and early detection of deterioration. |
| 20 | If you are uncertain of the signs of circulation and either there is no pulse or it is below 60 beats per minute, with poor perfusion – commence chest compressions. | To create a blood flow to the vital organs. |
| 21 | Place the casualty in a supine position on a firm flat surface. | To optimize delivery of chest compressions. |

continued

Chapter 2 Mandatory skills

- 22** Place two fingers on the lower half of the sternum, one finger's breadth up from the xiphisternum (see Fig. 2.27).
To avoid damage to abdominal organs.
- 23** Press the chest by approximately one third of its depth, aiming for a rate of 100 compressions per min. Deliver a series of 15 compressions combined with 2 ventilations and continue with a ratio of 15:2.
To achieve optimal perfusion.
- 24** If there are two rescuers available, the encircling method may be used to deliver compressions and ventilation, see Fig. 2.29.
Make best use of space and a more effective method of achieving adequate compressions.
- 25** After 1 minute, briefly stop to reassess ABC and ensure that the emergency medical services have been called.
To confirm the diagnosis.
- 26** This procedure should continue at a ratio of 15 compressions: 2 ventilations until expert help arrives.

Key point: Exert caution when opening the airway, particularly in an infant. Be careful not to press on the soft tissues of the neck, as this can cause damage and may occlude the airway.



Figure 2.27 Placing fingers for chest compression.



Figure 2.28 Single rescuer performing chest compressions on an infant while maintaining the airway.



Figure 2.29 Alternative method for chest compression using thumbs and both hands. Requires second rescuer to maintain airway.

Paediatric basic life support sequence for a child

Key point: This procedure should only be performed by student nurses who will have a professional responsibility or duty to care for children.

Step Rationale

Danger

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|----------|--|---|
| 1 | Remove any obvious danger to the rescuer. | To prevent causing harm to the rescuer and prevent harm to the child. |
|----------|--|---|

Response

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|----------|--|---|
| 2 | Check response of the child by stimulating them and loudly asking 'are you alright?' | To confirm the conscious level of the infant and assist in diagnosis. |
| 3 | Take care not to exacerbate any potential injury sustained in the events leading to the collapse. | To prevent further injury. |
| 4 | If the child does not respond, shout 'HELP!' | To obtain assistance if you should need it. |

Airway

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| 5 | Check the airway for obvious signs of obstruction. If a solid obstruction is detected, remove this with care. | To clear airway and optimize the casualty's airway. |
| 6 | DO NOT attempt blind finger sweeps. | To prevent unnecessary damage. |
| 7 | Open the airway using a head tilt – chin lift. | To clear airway and optimize the child's airway. |
| 8 | Be careful not to press on the soft tissues of the neck. | To prevent damage and blocking of the airway. |

Breathing

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| 9 | While maintaining an open airway, position your ear over the mouth and nose and direct your eyes towards the chest. Look, listen and feel for expired air for no more than 10 seconds. | To confirm or refute the presence of adequate breathing. |
| 10 | If the child is breathing normally, place in the recovery position. | To maintain a patent airway and identify signs of deteriorating condition. |

continued

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|--------------------|---|---|
| 11 | If the breathing is inadequate (absent, or occasional, noisy, laboured gasps) proceed to delivering five initial rescue breaths. | To optimize oxygen uptake and potentially reverse any hypoxic event. |
| 12 | Position the child: head tilt, chin lift. | To allow delivery of mouth to mouth ventilation. |
| 13 | Pinch the soft part of the nose the between the thumb and forefinger of the hand which is positioned on the forehead. | To prevent air escaping from the nose. |
| 14 | Allow the child's mouth to remain open, while placing the fingers of the opposite hand on the chin and lifting it up. Ventilation is then achieved by placing your lips around the child's open mouth and blowing steadily to raise the chest. | To create a good seal. |
| 15 | While delivering the rescue breaths, observe the child for signs of gag or swallowing reflex. | This may indicate the presence of a circulation. |
| 16 | Inflate steadily for 1–1.5 seconds, watching for the chest rising, maintain head tilt and chin lift while you remove your mouth and watch the chest fall. | |
| 17 | Repeat until five attempts have been made. | Prevent hyperinflation of the chest and allow for observation of any response from the infant. |
| 18 | If there is no chest movement during the procedure; check the mouth for signs of obstruction and remove any obvious blockage carefully. | Ensure airway insufficiency is not the result of poor technique or foreign body airway obstruction. |
| 19 | If there is no obstruction; reposition the head each time until a rise and fall of the chest wall has been observed. | |
| Circulation | | |
| 20 | Check the circulation by looking for obvious signs of life (e.g. movement, swallowing, and so on) and if you are experienced in clinical assessment, you may wish to perform a carotid artery pulse check, see Fig. 2.30. | To confirm the diagnosis. |
| 21 | If you are certain that you can detect signs of circulation within ten seconds, continue rescue breathing, continuously observing the response. | To maintain oxygenation and early detection of deterioration. |

- | | | |
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| 22 | If you are uncertain of the signs of circulation and either there is no pulse or it is below 60 beats per minute, with poor perfusion, prepare to commence chest compressions. | To create a blood flow to the vital organs. |
| 23 | Place the casualty in a supine position on a firm flat surface. | To optimize delivery of chest compressions. |
| 24 | Place the heel of one hand on the lower half of the sternum, one finger's breadth up from the xiphisternum. | To avoid damage to abdominal organs. |
| 25 | Press the chest by approximately one third of its depth, aiming for a rate of 100 compressions per min. Deliver a series of 15 compressions combined with 2 ventilations and continue with a ratio of 15:2. | To achieve optimal perfusion. |
| 26 | If it is difficult to achieve a compression depth of one third of the chest, two hands and a compression ratio of 30:2 should be used. | |
| 27 | If there are two rescuers available, one should take control of the airway while the other performs compressions, see Fig. 2.31. | Makes best use of resources and is an effective method. |
| 28 | After 1 minute, briefly stop to reassess ABC and ensure that the emergency medical services have been called. | To confirm the diagnosis |
| 29 | This procedure should continue at a ratio of 15 compressions: 2 ventilations until expert help arrives. | |



Figure 2.30 Maintaining the airway while finding the carotid pulse on a child



Figure 2.31 Two-rescuer method, showing chest compression

Key points Only attempt to remove airway obstruction if it is clearly visible and easily reached with the little finger.

Aftercare

Once expert help arrives, a safe handover should be given and the casualty removed from the scene and transferred

to the nearest Accident and Emergency Department with paediatric specialty.

Developing your skills

Within most universities you will be given the opportunity to learn this skill. However, you should be advised that this sequence might only be taught to those students who will have a responsibility to care for paediatric patients. The opportunity to develop this skill will be achieved by using manikins and simulated patients. As with adult resuscitation, however, you should recognize that the real situation will be very different and you may be anxious when faced with this situation. There is no way of determining how you will react, and for this reason it is vital that you continue to take any opportunity to practice these skills in a controlled environment to prepare for the real situation.

Alternative interventions

In-hospital environment

As soon as a critical problem with a child or infant has been identified, local policy and procedure should be followed. The clinical emergency team (or equivalent) should be alerted and emergency equipment must be gathered.

Mouth-to-mouth ventilation should be discouraged within the hospital environment unless it is absolutely necessary and there is no alternative available; this will be in extreme circumstances. Therefore, within the hospital setting, devices such as a pocket mask or bag-valve-mask device (see Figs 2.29 and 2.31) will be used with supplementary oxygen (if available). If more than one healthcare provider is available, the two-person technique for ventilation and compressions should be adopted.

Once an airway is secured with an endotracheal tube, chest compressions should continue uninterrupted at a rate of 100 compressions per minute and the patient should be ventilated at a rate of 10 breaths per minute (Biarent *et al.* 2005).

Defibrillation

The use of automated external defibrillators (AEDs) is becoming more common in the community. These should only ever be used by personnel trained in their use. Once the defibrillator is switched on, the operator is guided by the voice prompt of the defibrillator and will attach the monitoring pads to the bare chest. This should be done with minimal disruption to chest compressions. The operator will instruct rescuers to stand clear while the defibrillator assesses the cardiac rhythm and remain clear while the shock is delivered.

Defibrillation is not frequently required in paediatrics; however, if a child does require defibrillation, this should be done with minimum delay. A standard automated external defibrillator can be used in children over eight years old. However, children younger than eight require either a manual defibrillator or an automatic external defibrillator that has purpose-made paediatric pads and a device that alters the current delivered to suit the size of the child. If no such system is available, an adult defibrillator may be used, since the evidence to support or oppose this is insufficient at present (Biarent *et al.* 2005).

Alternative mnemonics

You may encounter alternative mnemonics to Dr's ABC. Two other mnemonics used in paediatrics are SSSABC(R) and the SAFE approach to resuscitation. Respectively, these translate as:

Safety; **S**hout; **S**timulate; **A**irway; **B**reathing;
Circulation; **R**eassess, and

Shout help; **A**pproach with care; **F**ree from danger;
Evaluate ABC.

Other factors to consider

This clinical emergency is stressful in all cases, and could be considered even more so in the case of children and infants. The emotional needs of staff, relatives, and other patients or clients must be considered, identified, and supported. With this age group, additional support will be required for the parents or carers of the child, particularly if they have witnessed the event. Often they will

request to stay and observe, indeed this opportunity should be made available to parents, but under no circumstances should this be forced on them if it is not their desire.

Facilitating this will involve ensuring that a suitably qualified staff member is available to remain with the parents or carers and to explain all procedures to them, and appropriately answer any questions which may arise. Ultimately, this may ease the grieving process should the resuscitation be unsuccessful (Kidby 2003; Rattrie 2000). (Further information is available in Chapter 12).

It is good practice to follow clinical emergencies with debriefing sessions, and often this will happen within the hospital environment. As a student nurse, you may wish to reflect on the experience and record those aspects that require clarification so that you can make the most of this learning opportunity. You can then discuss your queries with your mentor and academic staff (McGuinness 2008).

2.5.3 The choking casualty

Definition

Early detection of a choking casualty, regardless of age, is paramount for the rescue attempt to be successful. Choking is sometimes referred to as a foreign body airway obstruction (FBAO) and can cause a mild or severe blockage in the casualty's airway.

Background

Signs of choking include sudden onset of an attack while eating or grasping the neck. The recognition and removal of any airway obstruction should be performed swiftly and safely, as soon as the diagnosis has been confirmed. Onset is usually sudden in the absence of other illness.

There may be signs to which the rescuer should be sensitive (for example, the casualty has been eating; children may have been playing with small toys) prior to the symptoms. Without exception, you must always consider your own safety first before attempting to respond to the needs of any casualty. Flow diagrams to illustrate the procedures for adults and children are given in Figs. 2.32 and 2.33, respectively.

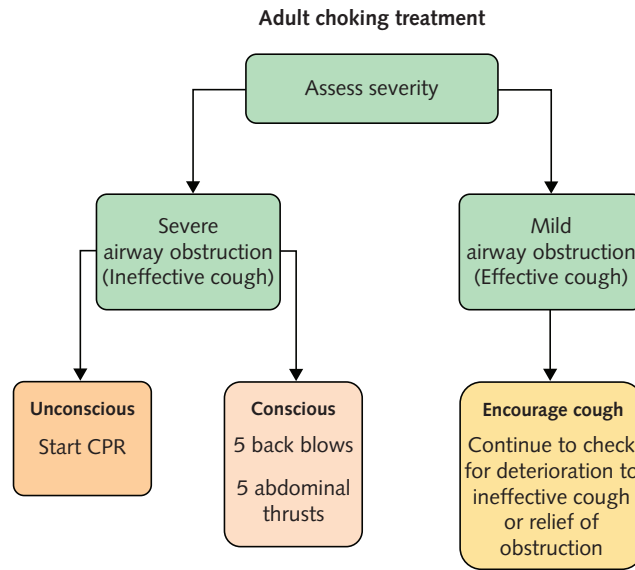


Figure 2.32 Adult choking treatment. Courtesy of the Resuscitation Council UK

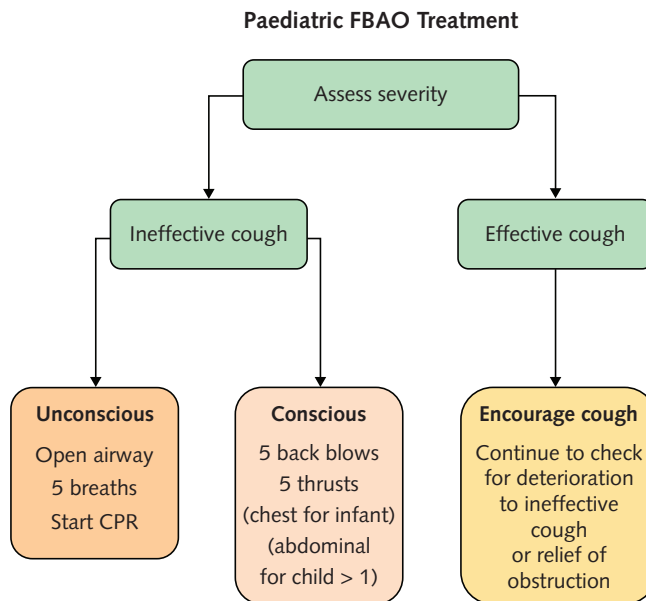


Figure 2.33 Paediatric choking treatment. Courtesy of the Resuscitation Council UK

The choking adult

Key point: It is essential that the student nurse acknowledges his or her own clinical limitations and acts always in the best interests of the casualty (NMC 2008).

Step	Rationale
<p>1 Confirm the severity of the attack: is it mild or severe? Ask the casualty, 'Are you choking?'</p>	<p>To avoid asking open questions that the casualty will be unable to answer and to establish the immediate action required.</p>
<p>2 If the casualty replies and is coughing, encourage the coughing.</p>	<p>To reduce stress and prevent inflicting unnecessary procedures on the casualty.</p>
<p>3 If the casualty is unable to speak, has a silent cough, noisy breathing, or can only reply by nodding, there may be a severe obstruction.</p>	<p>If the airway is partially obstructed, attempts at breathing will be noisy. If the obstruction is complete, attempts at breathing will be silent.</p>
<p>4 Deliver up to five back blows. Stand at the side, lean the casualty forwards, support the chest, and deliver five firm blows between the shoulder blades, checking after each blow for signs of dislodgement.</p>	<p>To attempt to dislodge the obstruction.</p>
<p>5 If after five back blows the obstruction is not cleared, progress to abdominal thrusts. Stand behind the casualty, leaning the casualty forwards. Position your fist between the navel and breastbone, grab this with the opposite hand and with apply a sharp upwards and inwards motion.</p>	<p>To try an alternative method and create changes in abdominal pressure.</p>
<p>6 If after five attempts, the obstruction is not dislodged, alternate between back blows and abdominal thrusts until the obstruction is dislodged or the casualty becomes unconscious.</p>	<p>To try an alternative method and create changes in abdominal pressure.</p>
<p>7 If the casualty becomes unconscious, call the EMS and begin CPR.</p>	<p>This is now a hypoxic event and advanced life support measures are required.</p>

The choking infant or child

Step	Rationale
<p>1 Confirm the severity of the attack, is it mild or severe? Are attempts at coughing effective or ineffective?</p>	To establish the immediate action required.
<p>2 If the coughing is effective, crying or verbal response can be given; the casualty can manage a loud cough, with a breath before each and is fully responsive. Encourage coughing and observe for signs of improvement or deterioration.</p>	To help the casualty to dislodge the obstruction without further help.
<p>3 If the coughing is ineffective: the patient is quiet or silent; unable to vocalize; has a silent cough, noisy breathing or is unable to breathe; if there is cyanosis, or a decreasing conscious level, there may be a severe obstruction.</p>	If the airway is partially obstructed, attempts at breathing will be noisy, if the obstruction is complete, attempts at breathing will be silent.
<p>4 Deliver up to five back blows.</p> <p>For an infant: Support the infant in a head down, prone position supporting the infant safely. Place the thumb at the angle of the jaw and the forefinger at the opposite side; gently apply a chin lift, avoiding the soft tissues, while supporting the head. Check after each blow for signs of dislodgement.</p> <p>For a child: Ideally the child will be positioned head down with support similar to the infant position. However, if this is not possible, lean the child forwards, supporting the chest and deliver the blows from the side. Check after each blow for signs of dislodgement.</p>	This allows gravity to help and maintains the safety of the infant.
<p>5 Deliver up to five sharp back blows with the heel of the opposite hand.</p>	To create an artificial cough and attempt to dislodge the obstruction.
<p>6 If after five blows, the obstruction is not cleared, progress to the next step.</p>	To try an alternative method and create changes in abdominal pressure.

Infant: Carefully turn the infant over into the head down, supine position. Place your free arm down the infants back and hold the occiput as you rotate the infant round. Identify the landmarks for chest compressions, and deliver five slow deliberate sharp chest thrusts.

To reduce harm and protect the organs of the abdominal cavity.

Child: Deliver abdominal thrusts. Stand behind the child, leaning the child forwards. Position your fist between the navel and breastbone, grab this with the opposite hand and apply a sharp upwards and inwards motion.

To create an artificial cough.

7 If after five attempts, the obstruction is not dislodged, alternate between back blows and abdominal thrusts until the obstruction is dislodged or the casualty becomes unconscious.

To try an alternative method and create changes in abdominal pressure.

8 If the casualty becomes unconscious, call the EMS and begin CPR.

This is now a hypoxic event and advanced life support measures are required.

Aftercare

Depending on the severity of the obstruction, it may be necessary for the casualty to attend the local accident and emergency department for review by experienced medical personnel.

Developing your skills

Take the opportunity to use the relevant manikins to practice positioning and the technique required when dealing with a choking victim. This technique can be difficult to master, and because of the nature of the clinical situation, opportunities to practice will be nonexistent.

Patient scenarios

Consider what you should do in the following situations, then turn to the end of the section to check your answers.

Further scenarios are available at www.oxfordtextbooks.co.uk/orc/docherty/



Scenario 1

You are standing in the checkout queue in the supermarket when a middle-aged lady collapses in front of you. What action do you take?



Scenario 2

You are in a restaurant having lunch, when you hear a baby sitting in a high chair at the next table, begin to cough noisily. The loud coughing rapidly deteriorates to a quieter cough and the baby is turning blue. The mother and father are obviously distressed and are not coping with the situation. Consider your immediate response and action to address the situation.

Website

www.oxfordtextbooks.co.uk/orc/docherty/

You may find it helpful to work through our short online quiz and interactive scenarios intended to help you to develop and apply the skills in this chapter.

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- Resuscitation Council UK (2007). *Decisions relating to Cardiopulmonary Resuscitation – A Joint Statement from the British Medical Association, the Resuscitation Council UK, and the Royal College of Nursing*. Resuscitation Council UK, London.

Useful further reading and websites

www.resus.org.uk/pages/bls.pdf
Basic life support for adults.

www.resus.org.uk/pages/pbls.pdf

Basic life support for paediatrics.

www.resus.org.uk/pages/dnar.pdf

Information on ‘do not attempt resuscitation’ decisions.

www.resus.org.uk/pages/pals.pdf

Paediatric advanced life support skills.

Check  www.oxfordtextbooks.co.uk/orc/docherty/ for changes and new developments. Updated research, guidelines, or equipment will be added every four months.

Answers to scenarios

Scenario 1

- Assess for signs of danger.
- Shake and shout and ask the casualty if she is alright.
- Shout for help.
- Check and open the airway.
- Assess for signs of breathing and circulation for no more than ten seconds.
- Confirm cardiac arrest.
- Instruct help to summon the emergency medical services and to come back.
- Placing interlocked hands one on top of the other on the lower half of the sternum, begin chest compressions:
 - Rate 100 compressions per min,
 - Depth 4–5 cm.
- Give 30 compressions.
- Then give two ventilations:
 - Pinch nose,
 - Tilt head,
 - Lift chin,
 - Cover mouth with your lips,
 - Inflate for about one second,
 - Allow to deflate and repeat.
- Continue at ratio of 30 compressions to two ventilations until expert help arrives, you become exhausted, or the casualty responds.

Scenario 2

- Ensure personal safety.
- Diagnose severe foreign body airway obstruction with ineffective coughing.

- Summon help.
- Determine whether conscious level is deteriorating.
- Hold infant's jaw with the thumb at the angle of the jaw on one side and the forefinger at the other, taking care with the soft tissues, and lift chin.
- Hold infant in head down prone position and deliver up to five firm back blows, checking the effectiveness of each blow.
- After five unsuccessful back blows, cup occiput with hand, lie arm down the infant's back and rotate infant into the supine head down position – deliver five chest thrusts locating landmarks for chest compressions, deliver slow, deliberate, sharp thrusts up to a maximum of five thrusts.
- Repeat until obstruction clears or becomes unconscious, and then follow infant basic life support.