



ANZCOR Basic Life Support Guideline Changes April 2021

Guideline Number	Guideline Title	2021 Significant Changes
All Guidelines 2-8		<ul style="list-style-type: none">• The basic principles of BLS remain the same with the same ratios of compressions to ventilations (30:2), depth of compression (>5cm in adults, approximately 5cm in children and 4 cm in infants), and compression rate of 100 to 120/minute.• The value of ventilation is reaffirmed, and ventilation should be performed whenever the rescuer is willing and able.• The wording around considering danger to the rescuer has been changed
Guideline 5	Breathing	<ul style="list-style-type: none">• bag valve mask ventilation has been added to the breathing guideline for advanced rescuers who have been trained in their use.

ANZCOR Guideline 2 – Managing an Emergency

Summary

Who does this guideline apply to?

This guideline applies to all who are in need of immediate care ('person' or 'person in need').

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) recommends that in all emergencies, the rescuer should:

1. Quickly assess the situation.
2. Ensure safety for the rescuer, person in need and bystanders (this may mean moving the person in need).
3. Send for help (call an ambulance).

Individuals who are unresponsive and breathing normally should be positioned into a lateral, side-lying recovery (lateral recumbent) position.

If the person in need is unresponsive and not breathing normally, follow the ANZCOR Basic Life Support Flowchart (Guideline 8).

Where more than one person requires attention, the care of an unconscious person has priority.

Guideline

1 Priorities in an Emergency

Early recognition is a key step in initiating early management of an emergency situation.¹⁻³

In all emergencies, the rescuer should:

- quickly assess the situation
 - Check for danger (assess and manage risks to the rescuer and others. This may mean moving the person in need)
- send for help (call an ambulance).

If the person is unresponsive and not breathing normally, follow the ANZCOR Basic Life Support Flowchart (Guideline 8).

Where more than one person requires attention, **THE CARE OF AN UNCONSCIOUS PERSON HAS PRIORITY.**

2 General principles of management

After ensuring safety for the person in need, rescuer and bystanders and sending for help, the management of the collapsed or injured person involves:

- prevention of further harm or injury
- checking response to verbal and tactile stimuli (“talk and touch”)
- care of airway, and breathing
- control of bleeding (Guideline 9.1.1)
- checking for physical (eg. alert jewellery) or electronic alert devices (eg. smartphone application) that may be relevant to assessment or management
- protection from the weather
- other first aid measures depending on the circumstances
- gentle handling
- reassurance
- continued observation.

2.1 Moving a person in need

The condition of a collapsed or injured person may be made worse by movement: increasing pain, injury, blood loss and shock. However, a person lying in a hazardous area, for example on a road or railway, may need to be moved to ensure safety.

A rescuer should move a person when needed to:

- ensure the safety of both rescuer and the person in need
- protect from extreme weather conditions
- enable evacuation from difficult terrain
- enable the care of airway and breathing (e.g. turning the unconscious breathing person onto the side or turning a collapsed person onto their back to perform cardiopulmonary resuscitation)
- enable the control of severe bleeding.

ANZCOR suggests that an unresponsive person who is breathing normally is positioned into a lateral, side-lying recovery (lateral recumbent) position as opposed to leaving them supine.^{1,4,5} [2015/2020 CoSTRs, weak recommendation, very-low-certainty evidence]

It is reasonable to roll a face-down unresponsive person onto their back to assess airway and breathing and initiate resuscitation. [Good Practice Statement] Concern for protecting the neck should not hinder the evaluation process or life saving procedures.⁶

Ideally, the most experienced rescuer should take charge and stay with the person in need while another rescuer is sent to seek help. If movement is necessary and help is available, the rescuer in charge should explain clearly and simply the method of movement to the assistants, and to the person in need if they are conscious.

When ready to move the person in need:

- avoid bending or twisting the person's neck and back: a spinal injury (Guideline 9.1.6) can be aggravated by rough handling
- try to have three or more people to assist in the support of the head and neck, the chest, the pelvis and limbs while moving the person. A spine board may be used if available
- a single rescuer may need to drag the person. Either an ankle drag or arm-shoulder drag is acceptable
- make prompt arrangements for transport by ambulance to hospital.

2.2 Specific management of a person in need at a Road Accident

- Approach with caution and make the accident scene as safe as possible.
- Do not touch a vehicle, or attempt to rescue a person from within ten metres⁷ of a fallen power line unless an appropriate electrical authority has declared the area safe.
- Use hazard lights, road triangles, or torches to warn oncoming traffic of the accident scene. Bystanders may also be used where it is safe to do so.
- Turn off the ignition of a crashed vehicle and activate the park brake. If unable to activate the park brake, place a chock under a wheel. Be cautious that airbags that have not deployed may activate following a crash.
- Remove a motorbike helmet from a person if it is necessary to manage the airway, assist breathing or control bleeding.
- If an unconscious breathing person can be managed within the vehicle, do not remove them from the vehicle unless there is a threat to life. Clear the airway of foreign material; maintain head tilt and jaw support and continuously reassess the airway and breathing.
- If the person in the vehicle is unconscious and not breathing normally despite opening the airway, remove the person from the vehicle if possible and commence CPR immediately following the ANZCOR Basic Life Support Flowchart (Guideline 8).

2.3 Specific Management of Electric Shock

- When power lines are in contact with a vehicle or a person, do not approach until the situation is declared safe by authorities. The rescuer should ensure that all bystanders remain at least ten metres clear of any electrified material; examples being a car body, cable, pool of water.⁷ Metal and water conduct electricity and may be extremely hazardous.
- In a **domestic** or similar situation it is essential to promptly separate the person in need from the electricity supply. Turn off the supply of electricity and, if possible, unplug the appliance from the power outlet. Until the power is off, avoid direct skin contact with the person or any conducting material.

- If the person is unresponsive and not breathing normally, follow the ANZCOR Basic Life Support Flowchart (Guideline 8).
- Other injuries may require treatment. Burns are common and should be managed following ANZCOR Guideline 9.1.3.
- Promptly refer all who have suffered an electric shock for medical assessment.
- Assess the person who has been struck by lightning: if unresponsive and not breathing normally, follow the ANZCOR Basic Life Support Flowchart (Guideline 8).

References

1. Singletary EM, Zideman DA, Bendall JC, et al. 2020 International Consensus on First Aid Science With Treatment Recommendations. *Resuscitation* 2020;156:A240-A82.
2. Olasveengen TM, Mancini ME, Perkins GD, et al. Adult Basic Life Support: 2020 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation* 2020;142:S41-S91.
3. Olasveengen TM, Mancini ME, Perkins GD, et al. Adult Basic Life Support: International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation* 2020;156:A35-A79.
4. Zideman DA, Singletary EM, De Buck EDJ, et al. Part 9: First aid 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation* 2015;95:e225-e61.
5. Singletary EM, Zideman DA, Bendall JC, et al. 2020 International Consensus on First Aid Science With Treatment Recommendations. *Circulation* 2020;142:S284-S334.
6. Hood N, Considine J. Spinal immobilisation in pre-hospital and emergency care: a systematic review of the literature. *Australasian Emergency Nursing Journal* 2015;18:118-37.
7. Electrical Safety: Look up and Live. Energy Safe Victoria. Accessed 12 November 2020 from <https://esv.vic.gov.au/campaigns/look-up-and-live/> 2020.

Further Reading

ANZCOR Guideline 3 Recognition and First Aid Management of the Unconscious Person
 ANZCOR Guideline 4 Airway
 ANZCOR Guideline 5 Breathing
 ANZCOR Guideline 8 Cardiopulmonary Resuscitation
 ANZCOR Guideline 9.1.3 Burns
 ANZCOR Guideline 9.1.6 Management of suspected spinal injury
 ANZCOR Guideline 9.2.3 Shock

About this Guideline

Search date/s	ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents: CPR Prior to Call for Help (BLS): Systematic Review https://costr.ilcor.org/document/cpr-prior-to-call-for-help-task-force-systematic-review-costr
Questions/PICOs:	Are described in the CoSTR documents (https://costr.ilcor.org)
Method:	Mixed methods including ARC NHMRC methodology before 2017 and ILCOR GRADE methodology described in ILCOR publications since 2017.
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ANZCOR Guideline 3 – Recognition and First Aid Management of the Unconscious Person

Summary

Who does this guideline apply to?

This guideline applies to all persons who are unconscious. **Unconsciousness** is a state of unrousable, unresponsiveness, where the person is unaware of their surroundings and no purposeful response can be obtained.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) recommends that in all emergencies, the rescuer should manage the unconscious person who is breathing normally as follows:

1. Check for danger (assess and manage risks to the rescuer and others).
2. Assist the unconscious person to the ground and position on their side. Ensure the airway is open (Guideline 4). Do not leave the person sitting in a chair nor put their head between their knees.
3. **Call an ambulance.**
4. Promptly stop any bleeding (Guideline 9.1.1).
5. Constantly re-check the person's condition for any change.

If the person is unresponsive and not breathing normally, follow ANZCOR Basic Life Support Flowchart (Guideline 8).

Guideline

1 Causes of Unconsciousness

The causes of unconsciousness can be classified into four broad groups:

- low brain oxygen levels
- heart and circulation problems (e.g. fainting, abnormal heart rhythms)
- metabolic problems (e.g. overdose, intoxication, low blood sugar)
- brain problems (e.g. head injury, stroke, tumour, epilepsy).

Combinations of different causes may be present in an unconscious person e.g. a head injury due to the influence of alcohol.

2 Recognition

Before loss of consciousness, the person may experience yawning, dizziness, sweating, change from normal skin colour, blurred or changed vision, or nausea.

Assess the collapsed person's response to verbal and tactile stimuli ('talk and touch'), ensuring that this does not cause or aggravate any injury. This may include giving a simple command such as, "open your eyes; squeeze my hand; let it go". Then grasp and squeeze the shoulders firmly to elicit a response.

A person who fails to respond or shows only a minor response, such as groaning without eye opening, should be managed as if unconscious. [Good practice statement]

3 Management

If the person is unresponsive and not breathing normally, follow ANZCOR Basic Life Support Flowchart (Guideline 8).

With an unconscious breathing person, care of the airway takes precedence over any injury, including the possibility of a spinal injury (Guideline 9.1.6). An unconscious person must be handled gently and every effort made to avoid any twisting or forward movement of the head and spine.¹

ANZCOR suggests that an unresponsive person who is breathing normally be positioned into a lateral, side-lying recovery (lateral recumbent) position as opposed to leaving them supine. ²

⁴ [2015/2020 CoSTR, weak recommendation, very-low-certainty evidence]

1. Ensure the safety of both the person and rescuer.
2. Assist the unconscious person to the ground and position them on the side. Ensure their airway is open (Guideline 4). Do not leave the person sitting in a chair nor put their head between their knees.
3. **Call an ambulance.**
4. Promptly stop any bleeding (Guideline 9.1.1).
5. Constantly re-check the person's condition for any change.
6. Ideally, the most experienced rescuer should stay with the person.

References

1. Hood N, Considine J. Spinal immobilisation in pre-hospital and emergency care: a systematic review of the literature. *Australasian Emergency Nursing Journal* 2015;18:118-37.
2. Zideman DA, Singletary EM, De Buck EDJ, et al. Part 9: First aid 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation* 2015;95:e225-e61.
3. Singletary EM, Zideman DA, Bendall JC, et al. 2020 International Consensus on First Aid Science With Treatment Recommendations. *Circulation* 2020;142:S284-S334.
4. Singletary EM, Zideman DA, Bendall JC, et al. 2020 International Consensus on First Aid Science With Treatment Recommendations. *Resuscitation* 2020;156:A240-A82.

Further Reading

ANZCOR Guideline 4 Airway

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.1.1 Principles of Control of Bleeding for First Aiders

ANZCOR Guideline 9.1.6 Management of Suspected Spinal Injury

About this Guideline

Search date/s	ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents: CPR Prior to Call for Help (BLS): Systematic Review https://costr.ilcor.org/document/cpr-prior-to-call-for-help-task-force-systematic-review-costr
Questions/PICOs:	Are described in the CoSTR documents (https://costr.ilcor.org)
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ANZCOR Guideline 4 – Airway

Summary

Who does this guideline apply to?

This guideline applies to all persons who need airway management. Airway management is required to provide an open airway when a person is unconscious, has an obstructed airway, or needs rescue breathing.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. Check for danger (assess and manage risks to the rescuer and others)
2. In an unconscious person, care of the airway takes precedence over any injury, including the possibility of spinal injury.
3. To assess breathing and airway, leave the person in the position in which they have been found, unless fluid or matter obstructs the airway.
4. To clear the airway the mouth should be opened and the head turned slightly downwards to allow any obvious foreign material (e.g. food, vomit, blood and secretions) to drain.
5. If the airway becomes compromised during resuscitation, promptly roll the person onto their side to clear the airway. Once the airway is clear, reassess for responsiveness and normal breathing. If the person is unresponsive and not breathing normally, follow ANZCOR Basic Life Support Flowchart (Guideline 8).
6. For an unresponsive adult or child, open the airway using the head tilt-chin lift. For an infant, open the airway by placing the head in the neutral position and support the jaw from falling back.
7. Manage Foreign Body Airway Obstructions using the Choking Algorithm (Figure 4).

Guideline

1 General Principles

When someone is unconscious, all muscles are relaxed. If they are left lying on their back, the tongue, which is attached to the back of the jaw, falls against the back wall of the throat and blocks air from entering the lungs. Other soft tissues of the airway may worsen this obstruction. The mouth falls open but this tends to block, rather than open, the airway.

The unconscious person is further at risk because of being unable to swallow or cough out foreign material in the airway. This may cause airway obstruction, or laryngeal irritation and foreign material may enter the lungs. For this reason the rescuer should not give an unconscious person anything by mouth, and should not attempt to induce vomiting.

If foreign material irritates the vocal cords, a protective reflex muscular spasm (laryngeal spasm) prevents the entry of material into the lungs. This may result in partial or complete airway blockage of the entrance to the trachea (windpipe) with the person often making an abnormal noise (stridor) during attempts to breathe. Airway closure due to laryngeal spasm can be complete; in this case there is no noise (stridor) because there is no airflow. That can persist until the person becomes blue or unconscious from lack of oxygen. When consciousness is lost, the spasm usually relaxes.

In an unconscious person, care of the airway takes precedence over any injury, including the possibility of spinal injury (Refer to Guideline 9.1.6). All who are unconscious should be handled gently with no twisting or bending of the spinal column and especially the neck.¹ If it is necessary, move the head gently to obtain a clear airway. Where possible, an assistant should support the head when an injured person is being moved, but no time should be wasted in detailed positioning.

The person should not be routinely rolled onto the side to assess airway and breathing—leave them in the position in which they have been found. This has the advantages of simplified teaching, taking less time to perform and avoids movement. The exceptions to this would be where the airway is obstructed with fluid (water or blood) or matter (sand, debris, vomit). Here, the person should be promptly rolled onto their side to clear the airway.

The mouth should be opened and the head turned slightly downwards to allow any obvious foreign material (e.g. food, vomit, blood and secretions) to drain. Loose dentures should be removed, but well-fitting ones can be left in place. Visible material can be removed by using the rescuer's fingers. Case series reported the finger sweep as effective for relieving foreign body airway obstruction (FBAO) in unconscious adults and children aged >1yr. However, five case reports documented harm to the person's mouth or biting of the rescuer's finger².

If the airway becomes compromised during resuscitation, promptly roll the person onto their side to clear the airway. Once the airway is clear, reassess for responsiveness and normal breathing, then begin resuscitation as appropriate following the ANZCOR Basic Life Support Flowchart (Guideline 8).

Regurgitation is the passive flow of stomach contents into the mouth and nose. Although this can occur in any person, regurgitation and inhalation of stomach contents is a major threat to an unconscious person. It is often unrecognised because it is silent and there is no obvious muscle activity. **Vomiting** is an active process during which muscular action causes the stomach to eject its contents.

In resuscitation, regurgitation and vomiting are managed in the same way: by prompt positioning the person on their side and manual clearance of the airway prior to continuing rescue breathing.

If the person begins to breathe normally, they can be left on their side with appropriate head tilt. If not breathing normally, the person must be rolled on their back and resuscitation commenced.

2 Airway Management

Airway management is required to provide an open airway when the person:

- is unconscious
- has an obstructed airway
- needs rescue breathing.

For unresponsive adults and children, it is reasonable to open the airway using the head tilt-chin lift manoeuvre.² [Good practice statement] For lay rescuers performing compression-only CPR, there is insufficient evidence to recommend the use of any specific passive airway manoeuvre.² However, the value of maintaining an unobstructed airway is recognised. [Good practice statement]

2.1 Head Tilt/Chin Lift

One hand is placed on the forehead or the top of the head. The other hand is used to provide Chin Lift. The head (NOT the neck) is tilted backwards (see Figure 1). It is important to avoid excessive force, especially where neck injury is suspected. When the person is on their side, the head will usually remain in this position when the rescuer's hands are withdrawn.

Figure 1: Head tilt/chin lift manoeuvre



Chin lift is commonly used in conjunction with Backward Head Tilt. The chin is held up by the rescuer's thumb and fingers in order to open the mouth and pull the tongue and soft tissues away from the back of the throat.

A suggested technique is to place the thumb over the chin below the lip and supporting the tip of the jaw with the middle finger and the index finger lying along the jaw line. Be careful that the ring finger does not squash the soft tissues of the neck. The jaw is held open slightly and pulled away from the chest.

2.2 Children and Infants

An **infant** is defined as younger than one year, a **child** as one to eighteen years of age (or up to onset of puberty if the age is unknown). In both cases the principle is to maintain an open airway.

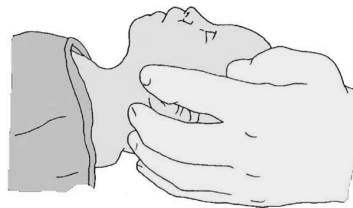
Children

Children should be managed as for adults.

Infants

In an infant, the upper airway is easily obstructed because of the narrow nasal passages, the entrance to the windpipe (vocal cords) and the trachea (windpipe). The trachea is soft and pliable and may be distorted by excessive backward head tilt or jaw thrust. Therefore, in an infant the head should be kept neutral and maximum head tilt should not be used (Figure 2). The lower jaw should be supported at the point of the chin while keeping the mouth open. There must be no pressure on the soft tissues of the neck. If these manoeuvres do not provide a clear airway, the head may be tilted backwards very slightly with a gentle movement. [Good practice statement]

Figure 2: Infant in neutral position



Infant in Neutral Position

(Reproduced Courtesy of European Resuscitation Council)

3 Recognition of Upper Airway Obstruction

Airway obstruction may be partial or complete, and present in the conscious or the unconscious person. Typical causes of airway obstruction may include, but are not limited to:

- relaxation of the airway muscles due to unconsciousness
- inhaled foreign body
- trauma to the airway
- anaphylactic reaction.

The symptoms and signs of obstruction will depend on the cause and severity of the condition. Airway obstruction may occur gradually or suddenly, and may lead to complete obstruction within a few seconds. As such the person should be observed continually.

In the conscious person who has inhaled a foreign body, there may be extreme anxiety, agitation, gasping sounds, coughing or loss of voice. This may progress to the universal choking sign, namely clutching the neck with the thumb and fingers (as shown in Figure 3).

Figure 3: Universal choking sign



Airway obstruction will cause the diaphragm muscle to work harder to achieve adequate ventilations. The abdomen will continue to move out but there will be loss of the natural rise of the chest (paradoxical movement), and in-drawing of the spaces between the ribs and above the collar bones during inspiration.

Partial obstruction can be recognised where:

- breathing is labored
- breathing may be noisy
- some escape of air can be felt from the mouth.

Complete obstruction can be recognised where:

- there may be efforts at breathing
- there is no sound of breathing
- there is no escape of air from nose and/or mouth.

Airway obstruction may not be apparent in the non-breathing unconscious person until rescue breathing is attempted.

4 Management of Foreign Body Airway Obstruction (Choking)

A Foreign Body Airway Obstruction (FBAO) is a life-threatening emergency. Chest thrusts or back blows are effective for relieving FBAO in conscious adults and children with low risk of harm (only 4 observational studies report harm from back blows and 5 observational studies report harm from chest thrusts).³⁻⁵ Life-threatening complications associated with use of abdominal thrusts (including the Heimlich Manoeuvre) have been reported in 52 observational studies.³⁻⁵ Therefore, the use of abdominal thrusts in the management of FBAO is not recommended and, instead back blows and chest thrusts should be used. [Good practice statement] These techniques should be applied in rapid sequence until the obstruction is relieved. More than one technique may be needed: there is insufficient evidence to determine which should be used first.



4.1 Assess Severity

The simplest way to assess severity of a FBAO is to assess for effective cough.

4.2 Effective Cough (Mild Airway Obstruction)

The person with an effective cough should be given reassurance and encouragement to keep coughing to expel the foreign material. If the obstruction is not relieved the rescuer should call an ambulance.

4.3 Ineffective Cough (Severe Airway Obstruction)

Conscious person

If the person is conscious send for an ambulance and perform up to five sharp, back blows with the hand in the middle of the back between the shoulder blades. Check to see if each back blow has relieved the airway obstruction. The aim is to relieve the obstruction with each blow rather than to give all five blows. An infant may be placed in a head downwards position prior to delivering back blows, i.e. across the rescuer's lap.^{1,2} [Good practice statement]



If back blows are unsuccessful the rescuer should perform up to five chest thrusts. To perform chest thrusts, identify the same compression point as for CPR and give up to five chest thrusts. These are similar to chest compressions but sharper and delivered at a slower rate. The infant should be placed in a head downwards and on their back across the rescuer's thigh, while children and adults may be treated in the sitting or standing position.^{1,2} [Good practice statement]

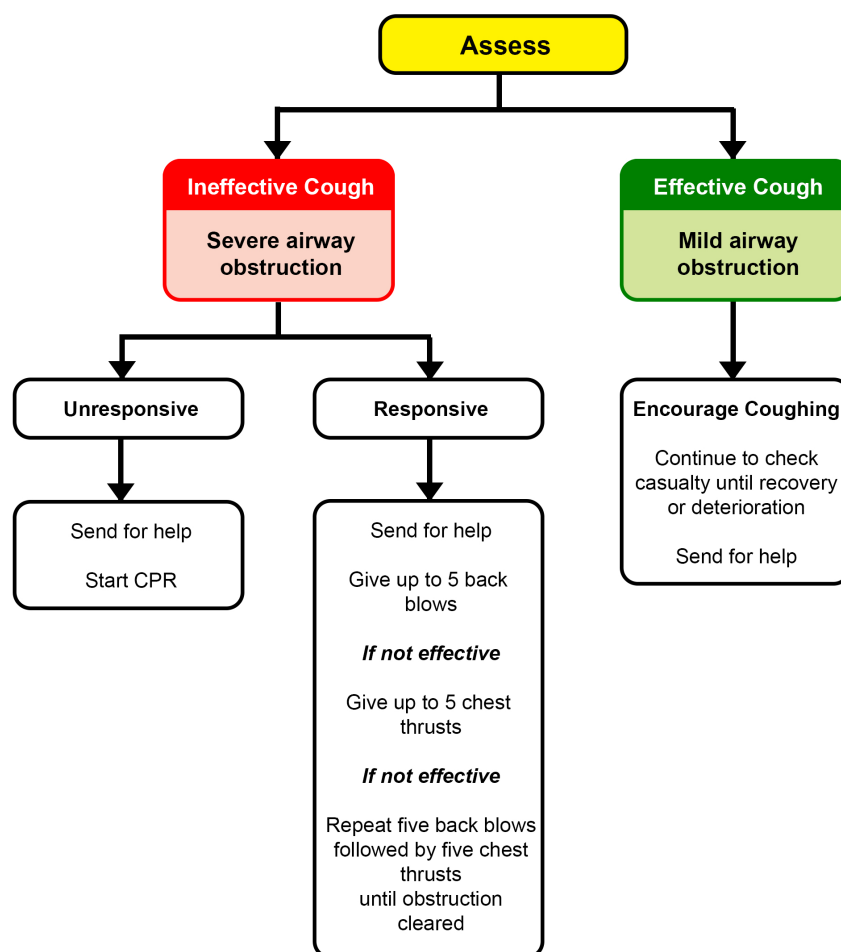
With each chest thrust, check to see whether the airway obstruction has been relieved. The aim is to relieve the obstruction rather than deliver all five chest thrusts. If the obstruction is still not relieved and the person remains responsive, continue alternating five back blows with five chest thrusts.



Unconscious person

ANZCOR suggests against the use of blind finger sweeps.^{3,4} [2020 CoSTR, weak recommendation, very-low-certainty evidence] ANZCOR suggests that rescuers consider the manual extraction of visible items in the mouth.^{3,4} [2020 CoSTR, weak recommendation, very-low-certainty evidence] If the person is unresponsive and not breathing normally, follow ANZCOR Basic Life Support Flowchart (Guideline 8).

Figure 4: Management of Foreign Body Airway Obstruction (Choking) Algorithm



References

1. Hood N, Considine J. Spinal immobilisation in pre-hospital and emergency care: a systematic review of the literature. *Australasian Emergency Nursing Journal* 2015;18:118-37.
2. Koster RW, Sayre MR, Botha M, et al. Part 5: Adult basic life support: 2010 International consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Resuscitation* 2010;81:e48-e70.
3. Olasveengen TM, Mancini ME, Perkins GD, et al. Adult Basic Life Support: 2020 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation* 2020;142:S41-S91.
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5. Couper K, Abu Hassan A, Ohri V, et al. Removal of foreign body airway obstruction: A systematic review of interventions. *Resuscitation* 2020;156:174-81.

Further Reading

ANZCOR Guideline 9.1.6 Management of Suspected Spinal Injury

About this Guideline

Search date/s	ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents: Airway Management in Drowning (BLS 856): Scoping Review https://costr.ilcor.org/document/bls-856-airway-management-in-drowning-tf-scoping-review Removal of Foreign Body Airway Obstruction (BLS 368): Systematic Review https://costr.ilcor.org/document/removal-of-foreign-body-airway-obstruction-tfsr-costr
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ANZCOR Guideline 5 – Breathing

Summary

Who does this guideline apply to?

This guideline applies to all persons in need of resuscitation.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals.

Recommendations.

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. Persons who are gasping or breathing abnormally and are unresponsive require resuscitation.
2. When assessing breathing, rescuers should look, listen and feel: **LOOK** for movement of the upper abdomen or lower chest; **LISTEN** for the escape of air from nose and mouth; and **FEEL** for movement of air at the mouth and nose.
3. The ratio of compressions to rescue breaths is 30:2.
4. Mouth to mouth, mouth to nose, mouth to mask and bag valve mask are all viable methods of rescue breathing. Mouth to stoma should be used where a person has had a laryngectomy.
5. Risk of disease transmission is very low and rescuers need not be deterred from providing rescue breaths without a barrier device. However, rescuers should consider using a barrier device if this is available.
6. Those who are trained and willing to give rescue breaths do so for all persons who are unresponsive and not breathing normally.

Guideline

Normal breathing is essential to maintaining life. A person who is gasping or breathing abnormally and is unresponsive requires resuscitation.^{1,2}

1 Causes of Ineffective Breathing of Acute Onset

Breathing may be absent or ineffective as a result of:

- direct depression of, or damage to, the breathing control centre of the brain
- upper airway obstruction
- paralysis or impairment of the nerves and/or muscles of breathing
- problems affecting the lungs
- drowning
- suffocation.

2 Assessment of Breathing

There is a high incidence of abnormal gasping (agonal gasps) after cardiac arrest.^{1,4} All rescuers should use a combination of unresponsiveness and absent or abnormal breathing to identify the need for resuscitation.^{1,2} [Good practice statement]

The rescuer should maintain an airway and assess for normal breathing:

- **LOOK** for movement of the upper abdomen or lower chest
- **LISTEN** for the escape of air from nose and mouth
- **FEEL** for movement of air at the mouth and nose.

Movement of the lower chest and upper abdomen does not necessarily mean the person has a clear airway. Impairment or complete absence of breathing may develop before the person loses consciousness.

3 Rescue Breathing

If the unconscious person is unresponsive and not breathing normally after the airway has been opened and cleared, the rescuer must immediately begin chest compressions and then rescue breathing. Give 30 compressions and then two breaths, allowing about one second for each ventilation following the ANZCOR Basic Life Support Flowchart (Guideline 8).^{1,2} [2015/2020 CoSTR, weak recommendation, very-low-certainty evidence]

ANZCOR suggests that those who are trained and willing to give breaths do so for all persons who are unresponsive and not breathing normally.^{1,4} [2015/2020 CoSTR weak recommendation, very-low-certainty evidence]

3.1 Mouth to mouth

Kneel beside the victim's head. Maintain an open airway (refer to ANZCOR Guideline 4).

Take a breath, open your mouth as widely as possible and place it over the person's slightly open mouth. While maintaining an open airway, pinch the nostrils (or seal nostrils with rescuer's cheek) and blow to inflate the person's lungs. Because the hand supporting the head comes forward some head tilt may be lost and the airway may be obstructed. Pulling upwards with the hand on the chin helps to reduce this problem.

For mouth to mouth ventilation, it is reasonable to give each breath in a short time (one second) with a volume to achieve chest rise regardless of the cause of cardiac arrest.⁵ [Good practice statement] Care should be taken not to over-inflate the chest. [Good practice statement]

Look for rise of the chest during each inflation. If the chest does not rise, possible causes are:

- obstruction in the airway (tongue or foreign material, or inadequate head tilt, chin lift)
- insufficient air being blown into the lungs
- inadequate air seal around mouth and or nose.

If the chest does not rise, ensure correct head tilt, adequate air seal and ventilation. After inflating the lungs, lift your mouth from the person's mouth, turn your head towards their chest and listen and feel for air being exhaled from the mouth and nose.

3.2 Mouth to nose

The mouth to nose method may be used:

- where the rescuer chooses to do so
- where the person's jaws are tightly clenched
- when resuscitating infants and small children.

The technique for mouth to nose is the same as for mouth to mouth except for sealing the airway. Close the mouth with the hand supporting the jaw and push the lips together with the thumb. Take a breath and place your widely opened mouth over the person's nose (or mouth and nose in infants) and blow to inflate the lungs. Lift your mouth from the person's nose. Look for the fall of the chest, and listen and feel for the escape of air from the nose and mouth.

If the chest does not move, there is an obstruction, an ineffective seal, or insufficient air being blown into the lungs. In mouth-to-nose resuscitation a leak may occur if the rescuer's mouth is not open sufficiently, or if the person's mouth is not sealed adequately. If this problem persists, use mouth-to-mouth resuscitation. If blockage of the nose prevents adequate inflation, the rescuer should use mouth-to-mouth resuscitation.^{5,6} [Good practice statement]

3.3 Mouth to mask

Mouth to mask resuscitation is a method of rescue breathing which avoids mouth-to-mouth contact by using a resuscitation mask. Rescuers should take appropriate safety precautions when feasible and when resources are available to do so, especially if a person is known to have a serious infection (e.g. HIV, tuberculosis, Hepatitis B virus or SARS).⁷ [Good practice statement]

Position yourself at the person's head and use both hands to maintain an open airway and to hold the mask in place to maximise the seal. Maintain head tilt and chin lift. Place the narrow end of the mask on the bridge of the nose and apply the mask firmly to the face. (Figure 1)

Inflate the lungs by blowing through the mouthpiece of the mask with sufficient volume and force to achieve chest movement. Remove your mouth from the mask to allow exhalation.

Turn your head to listen and feel for the escape of air. If the chest does not rise, recheck head tilt, chin lift and mask seal.

Failure to maintain head tilt and chin lift is the most common cause of obstruction during resuscitation.

Figure 1: Mouth to Mask method



Mouth to mask method

(Reproduced Courtesy of European Resuscitation Council)

3.4 Bag valve mask

For rescuers trained in its use, bag valve mask ventilation is an alternative method option of providing rescue breathing. A bag valve mask device is a self-inflating bag attached to a non-rebreathing valve and face mask. There is an option to connect the bag to a reservoir and oxygen supply. There are different size devices for infants, children and adults: it is important to select the size appropriate to the person. Successful bag valve mask ventilation requires a patent airway (Guideline 4), adequate mask seal, and adequate ventilation technique. Prolonged bag valve mask ventilation or poor technique may introduce air into the stomach increasing the risk of regurgitation of gastric contents.

It is recommended that when bag valve mask ventilation is used, two trained rescuers provide ventilation for a non-breathing person: one to manage the airway, mask and seal, and the second to operate the bag.⁸ ANZCOR considers bag valve mask ventilation an extension to Basic Life Support thus it is not mandated in Basic Life Support training programs. [Good practice statement]

3.5 Mouth to neck stoma

A person with a laryngectomy has had the larynx (voice box) removed and breathes through a hole in the front of their neck (stoma). A stoma will be more obvious when the person is on their back for Rescue Breathing and the head is put into backward tilt. If a tube is seen in the stoma, always leave it in place to keep the hole open for breathing and resuscitation.

The rescuer should place their mouth over the stoma and perform rescue breathing as described above. If the chest fails to rise, this may be due to a poor seal over the stoma, or the person having a tracheostomy rather than laryngectomy thus allowing air to escape from the mouth and nose or a blocked stoma or tube. If stoma or tube is blocked use back blows and chest thrusts in an attempt to dislodge the obstruction (Refer to Guideline 4). [Good practice statement]

4 Risks

No human studies have addressed the safety, effectiveness, or feasibility of using barrier devices to prevent person-to-rescuer contact during rescuer breathing.⁷³ Nine clinical reports advocate the use of barrier devices to protect the rescuer from transmitted disease: three studies showed that barrier devices can decrease transmission of bacteria in controlled laboratory settings.⁷

The risk of disease transmission is very low and need not deter rescue breathing without a barrier device. If available, rescuers should consider using a barrier device.⁷ [Good practice statement]

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Further Reading

ANZCOR Guideline 4 Airway

ANZCOR Guideline 9.3.2 Resuscitation of the Drowning Victim

ANZCOR Guideline 10.1 Basic Life Support Training

About this Guideline

Search date/s	ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents: Harm to Rescuers from CPR (BLS): Scoping Review https://costr.ilcor.org/document/harm-to-rescuers-from-cpr-scoping-review Starting CPR (ABC vs CAB) (BLS): Scoping Review https://costr.ilcor.org/document/starting-cpr-abc-vs-cab-tfstr-costr
Questions/PICOs:	Are described in the CoSTR documents (https://costr.ilcor.org)
Method:	Mixed methods including ARC NHMRC methodology before 2017 and ILCOR GRADE methodology described in ILCOR publications since 2017.
Principal reviewers:	Julie Considine, Hugh Grantham
Approved:	April 2021
Guideline superseded:	January 2016

ANZCOR Guideline 6 – Compressions

Summary

Who does this guideline apply to?

This guideline applies to all persons who are unresponsive and not breathing normally.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. All rescuers should perform chest compressions for all persons who are unresponsive and not breathing normally.
2. Interruptions to chest compressions should be minimised.
3. Those who are trained and willing to give rescue breaths do so for all persons who are unresponsive and not breathing normally.

Guideline

All rescuers should perform chest compressions for all persons who are unresponsive and not breathing normally.^{1,2} [Strong recommendation, moderate certainty of evidence] ANZCOR suggests that those who are trained and willing to give rescue breaths do so for all who are in cardiac arrest.^{1,2} [Weak recommendation, very-low-certainty evidence]

1 Recognition of the need for Chest Compressions

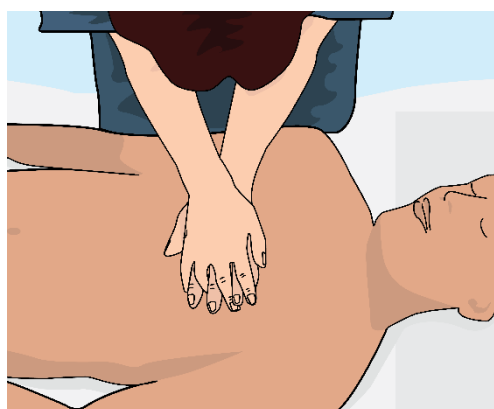
All rescuers, including health care professionals, should use unresponsiveness and absence of normal breathing to identify the need for resuscitation.¹⁻⁴ [Good practice statement] Palpation of a pulse is unreliable and should not be performed to confirm the need for resuscitation.⁵⁻⁸ [Good practice statement]

2 Locating the site for Chest Compressions

ANZCOR suggests performing chest compressions on the lower half of the sternum.^{1,2,4,9} [CoSTR 2015/2020, weak recommendation, very-low-certainty evidence] In making this recommendation, we place a high value on consistency with current treatment recommendations in the absence of compelling data suggesting the need to change the recommended approach.^{1,2,4,9} Place the heel of their hand in the centre of the chest with the other hand on top (Figure 1). [Good practice statement]

Avoid compression beyond the lower limit of the sternum. Compression applied too high is ineffective and if applied too low may cause regurgitation and/or damage to internal organs. [Good practice statement]

Figure 1: Location of chest compressions

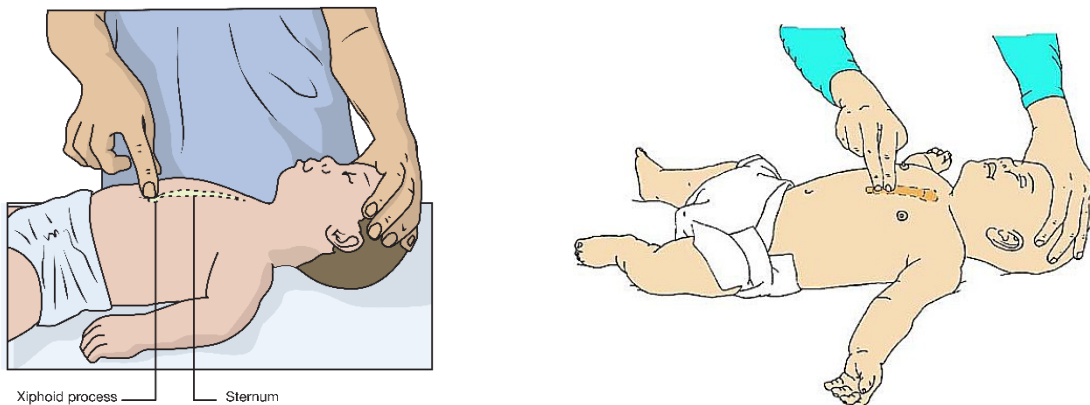


3 Method of Compression

3.1 Infants

In infants, ANZCOR suggests the two finger technique should be used by lay rescuers in order to minimise transfer time from compression to ventilation. Having obtained the compression point the rescuer places two fingers on this point and compresses the chest (Figure 2). [Good practice statement]

Figure 2: Method of compression for infants



(adapted courtesy of European Resuscitation Council)

3.2 Children and Adults

Either a one or two hand technique can be used for performing chest compressions in children.⁵⁻⁸ (Figure 3) [Good practice statement]

Figure 3: Administering compressions using one- and two-handed techniques



(adapted courtesy of European Resuscitation Council)

Interruptions to chest compressions must be minimized.^{3,4} [2015 CoSTR, weak recommendation, low-quality evidence] A person requiring chest compressions should be placed on their back on a firm surface before commencing chest compressions to optimise the effectiveness of compressions.^{1,2,10} [2020 CoSTR, weak recommendation, very-low-certainty evidence] Compressions should be rhythmic with equal time for compression and relaxation. The rescuer must avoid either rocking backwards and forwards, or using thumps or quick jabs. Rescuers should allow complete recoil of the chest after each compression.^{1,2,11} [2020 CoSTR, weak recommendation, very-low-certainty evidence]

3.3 Pregnant women

There are no published studies of optimum positioning in pregnant women undergoing cardiopulmonary resuscitation (CPR) so recommendations to date are extrapolated from manikin studies or studies of pregnant women who are not in cardiac arrest. Good quality, uninterrupted chest compressions as described above should be the immediate priority in all pregnant women who are unresponsive and not breathing normally.^{1,2,4,9} [Good practice statement]

In noticeably pregnant women, standard CPR should be commenced immediately. Once CPR is in progress, if there are sufficient resources available, rescuers should place padding such as a towel, cushion or similar object under the right hip to tilt the woman's hips (approximately 15-30 degrees) to the left but leave her shoulders flat to enable good quality chest compressions. The reason for this position in pregnant women is to move the weight of the pregnant uterus off of her major blood vessels in the abdomen. If a tilted position is not possible or tilting the hips compromises the quality of chest compressions, then chest compressions should be performed as described as above with the woman on her back.

Figure 4: Padding the noticeably pregnant woman



4 Depth of Compressions

The lower half of the sternum should be depressed approximately one third of the depth of the chest with each compression. This equates to more than 5cm in adults,^{1,2,4,9,11} approximately 5cm in children^{5,6,12,13} and 4 cm in infants.^{5,6,12,13} [2015/2020 CoSTR, weak recommendation, very-low-certainty evidence] ANZCOR places greater importance on adequate compression depth. Although there is some evidence suggesting detriment with compression depths greater than 6cm, the clinical reality of being able to tell the difference between 5 or 6 cm and adjust compressions accordingly is questionable. Inadequate compression depth is definitely associated with poor outcomes. ANZCOR has elected not to put an upper limit on compression depth as the risk of too shallow compressions outweighs the risk of compressions that are too deep.^{3,4} [Good practice statement]

5 Rate of Compressions

Rescuers should perform chest compressions for all ages at a rate of 100 to 120 compressions per minute (almost 2 compressions/second).^{1,2,4,9,11} [CoSTR 2015/2020, strong recommendation, very-low-certainty evidence] This does not imply that 100-120 compressions will be delivered each minute since the number will be reduced by interruptions for breaths given by rescue breathing. ANZCOR acknowledges that compression rates will vary between and within providers and survival rates are optimised at compressions rates of 100-120 compressions per minute. There is some evidence that compressions rates less than 100 or greater than 140 compressions per minute are associated with lower rates of survival.^{1,2,4,9,11}

6 CPR Quality

The compression rate and depth is variable among rescuers and compressions may be worse in the first 5 minutes of the arrest.¹⁴ One manikin study of rescuer CPR showed that compressions became shallow within one minute, but providers became aware of fatigue only after 5 min.⁷ When performing compressions, if feasible, change rescuers at least every two minutes to prevent rescuer fatigue and deterioration in chest compression quality, particularly depth.^{1,2,15-17} [Good practice statement] Changing rescuers performing chest compressions should be done with a minimum of interruptions to compressions.^{14,17}

7 Feedback

There is no high level evidence that the use of CPR feedback devices during real time CPR improves survival or return of spontaneous circulation.¹⁻⁴ CPR prompt / feedback devices may be considered for clinical use to provide data as part of an overall strategy to improve quality of CPR at a systems level.¹⁻⁴ [CoSTR 2015/2020, weak recommendation, very-low-certainty evidence]. ANZCOR places a higher value on resource allocation and cost effectiveness than widespread implementation of a technology with uncertain effectiveness during real time CPR. We acknowledge that data provided by CPR feedback devices may benefit other victims as part of a broader quality improvement system.¹⁻⁴

8 Risks

Rib fractures and other injuries are common but acceptable consequences of CPR given the alternative of death.¹⁵ [Good practice statement] CPR should be initiated for presumed cardiac arrest without concerns of harm to patients not in cardiac arrest.^{3,4} [CoSTR 2015, strong recommendation, very-low-certainty evidence] In making this recommendation, ANZCOR places a higher value on the survival benefit of CPR initiated by laypersons for patients in cardiac arrest against the low risk of injury in patients not in cardiac arrest.^{3,4}

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About this Guideline

Search date/s	ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents: Alternative Compression Techniques (BLS 374): Systematic Review https://costr.ilcor.org/document/alternative-compression-techniques-bls-374-tfsr Chest Compression Rate (BLS): Scoping Review https://costr.ilcor.org/document/chest-compression-rate-scoping-review Feedback for CPR Quality (BLS 361): Systematic Review https://costr.ilcor.org/document/feedback-for-cpr-quality-bls-361-tf-sr Firm Surface for CPR (BLS): Systematic Review https://costr.ilcor.org/document/firm-surface-for-cpr-tfsr-costr Hand Position During Compressions (BLS 357): Systematic Review https://costr.ilcor.org/document/hand-position-during-compressions-bls-357-tf-systematic-review Harm for CPR to Victims not in Cardiac arrest (BLS 353): Systematic Review https://costr.ilcor.org/document/harm-from-cpr-to-victims-not-in-cardiac-arrest-tfsr-costr-1 Rescuer Fatigue in CC Only CPR (BLS 349): Scoping Review https://costr.ilcor.org/document/rescuer-fatigue-in-cc-only-cpr-bls-349-scoping-review Starting CPR (ABC vs CAB) (BLS): Systematic Review https://costr.ilcor.org/document/rhythm-check-timing-tfsr-costr
Questions/PICOs:	Are described in the CoSTR documents (https://costr.ilcor.org)
Method:	Mixed methods including ARC NHMRC methodology before 2017 and ILCOR GRADE methodology described in ILCOR publications since 2017.
Principal reviewers:	Julie Considine, Hugh Grantham
Approved:	April 2021
Guideline superseded:	January 2016

ANZCOR Guideline 7 – Automated External Defibrillation in Basic Life Support

Summary

The importance of defibrillation has been well established as part of overall resuscitation, along with effective cardiopulmonary resuscitation (CPR). An Automated External Defibrillator (AED) must only be used for persons who are unresponsive and not breathing normally.

With cardiac arrest, time to defibrillation is a key factor that influences a person's chance of survival. A defibrillator should be applied to the person who is unresponsive and not breathing normally as soon as it becomes available so that a shock can be delivered if necessary.

Who does this guideline apply to?

This guideline applies to all persons who are unresponsive and not breathing normally.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. For all who are unresponsive and not breathing normally, chest compressions should be commenced immediately and continued until an AED is applied. The AED should be applied as soon as it becomes available so that a shock can be delivered if necessary.
2. The use of publicly accessible AEDs is recommended to increase survival rates in those who have cardiac arrest.
3. Pads are to be placed to ensure that a shock is delivered on an axis through the heart. Typical pad placement in adults and children is the anterior-lateral position.
4. Although AEDs are extremely safe, rescuers should take care not to touch a person during shock delivery.

Guideline

1 Background

The importance of defibrillation has been well established as part of overall resuscitation, along with effective cardiopulmonary resuscitation (CPR). An Automated External Defibrillator (AED) must only be used for persons who are unresponsive and not breathing normally. CPR must be continued until the AED is turned on and pads attached. The rescuer should then follow the AED prompts.

The time to defibrillation is a key factor that influences survival. For every minute defibrillation is delayed, there is approximately 10% reduction in survival if the victim is in cardiac arrest due to Ventricular Fibrillation (VF).¹ CPR alone will not save a person in VF. Hence a defibrillator should be applied to the person in need as soon as it becomes available so that a shock can be delivered if necessary.

The development of AEDs has made defibrillation part of basic life support. AEDs can accurately identify the cardiac rhythm as “shockable” or “non shockable”.

2 Which rescuers should use an AED?

AED use should not be restricted to trained personnel. Allowing the use of AEDs by individuals without prior formal training can be beneficial and may be life saving. Since even brief training improves performance (e.g. speed of use, correct pad placement), it is recommended that training in the use of AEDs (as a part of BLS) be provided.^{2,3} [Good practice statement]

The use of AEDs by trained lay and professional responders is recommended to increase survival rates in those who have cardiac arrest.²

3 Public Access to AEDs

ANZCOR recommends the implementation of public access AED programs for out-of-hospital cardiac arrest.^{4,5} [2020 CoSTR, strong recommendation, low-certainty evidence] Issues such as early detection of cardiac arrest, optimising AED availability, AED signage, novel delivery methods, public awareness, device registration, mobile apps for AED retrieval and personal access defibrillation should be considered as part of all PAD programs.^{4,5} [Good practice statement] ANZCOR suggests that AED signage is consistent with international recommendations. [Good practice statement]

Deployment of home AEDs for high-risk individuals who do not have an implantable cardioverter defibrillator (ICD) is safe and feasible, and may be considered on an individual basis, but has not been shown to change overall survival rates.² [Good practice statement] Use of AEDs in public settings (airports, casinos, sports facilities, etc.) where witnessed cardiac arrest is likely to occur can be useful if an effective response plan is in place.² An AED can and should be used on pregnant women who are in cardiac arrest.

Use of AEDs is reasonable to facilitate early defibrillation in hospitals.² Studies to date have shown AEDs are effective in decreasing the time to first defibrillation during in-hospital cardiac arrest.²

4 Pad Placement

4.1 Pad placement – Adults

Effective pad placement ensures that a shock is delivered on an axis through the heart. Place pads on the exposed chest in an anterior-lateral position: one pad slightly below the collar bone on the person's right chest and one pad on the person's left side below the arm pit (Figure 1). Acceptable alternatives are the anterior-posterior position, where one pad is placed on the upper back between the shoulder blades and the other on the front of the chest (slightly to the left, if possible); and apex-posterior.^{1,4,5}

In large-breasted individuals it is reasonable to place the left electrode pad lateral to the left breast to avoid breast tissue.^{1,4,5} All pads have a diagram on the outer covering demonstrating the area suitable for pad placement.¹ [Good practice statement] Pad to skin contact is important for successful defibrillation. Rescuers may need to remove moisture or excessive chest hair prior to the application of pads but emphasis must be on minimizing delays in shock delivery.^{1,4} [Good practice statement]

Figure 1: Anterior-lateral pad placement



Avoid placing pads over implantable devices. If there is an implantable medical device the defibrillator pad should be placed at least 8cm from the device.¹ Do not place AED electrode pads directly on top of a medication patch because the patch may block delivery of energy from the electrode pad to the heart and may cause small burns to the skin. Remove medication patches and wipe the area before attaching the electrode pad.¹

4.2 Pad placement – Children and Infants

Standard adult AEDs and pads are suitable for use in children older than 8 years. Ideally, for those under 8 years (including infants < 1 year) paediatric pads and an AED with a paediatric capability should be used (see guideline 12.1). These pads also are placed as per the adult and the pads and come with a diagram of where on the chest they should be placed.⁶

If the AED does not have a paediatric mode or paediatric pads then it is reasonable to proceed with standard adult AED pads.² Ensure the pads do not touch each other on the child's chest.⁶ Apply the pad firmly to the bare chest in the anterior-lateral position as shown for adults in Figure 1. If the pads are too large (a particular risk in younger children and infants) and there is a danger of pad-to-pad arcing, use the front-back position (antero-posterior): one pad placed on the upper back (between the shoulder blades) and the other pad on the front of the chest, if possible slightly to the left.⁷

5 Defibrillation Safety

Rescuers should follow the prompts: care should be taken not to touch the person during shock delivery. There are no reports of harm to rescuers from attempting defibrillation in wet environments.² [Good practice statement] In the presence of oxygen, there are no case reports of fires caused by sparking when shocks were delivered using adhesive pads.² [Good practice statement]

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Further Reading

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 11.4 Electrical Therapy for Adult Advanced Life Support

ANZCOR Guideline 12.6 Techniques in Paediatric Advanced Life Support

Search date/s	ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents: Automated External Defibrillator use in Drowning (BLS 856):? Scoping Review https://costr.ilcor.org/document/bls-856-automated-external-defibrillator-use-in-drowning-aed-use-tf-scoping-review CPR Prior to Defibrillation (BLS): Systematic Review https://costr.ilcor.org/document/cpr-prior-to-defibrillation-tf-sr-costr Pad Size, Orientation and Placement (BLS): Scoping Review https://costr.ilcor.org/document/pad-size-orientation-and-placement-scoping-review
Questions/PICOs:	Are described in the CoSTR documents (https://costr.ilcor.org)
Method:	Mixed methods including ARC NHMRC methodology before 2017 and ILCOR GRADE methodology described in ILCOR publications since 2017.
Principal reviewers:	Julie Considine, Hugh Grantham
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ANZCOR Guideline 8 – Cardiopulmonary Resuscitation (CPR)

Summary

Who does this guideline apply to?

This guideline applies to all persons who are unresponsive and not breathing normally.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals, excluding those specifically trained in paediatric basic or advanced life support. Those trained in paediatric BLS and ALS should refer to guidelines 12.1 and 12.2, respectively.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. Rescuers must start CPR if the person is unresponsive and not breathing normally.
2. Bystander CPR should be actively encouraged.
3. Compression-to-ventilation ratio be 30:2 for all ages.
4. All rescuers perform chest compressions for all who are not breathing normally. Rescuers who are trained and willing to give rescue breaths are encouraged to do so.
5. Chest compressions should be provided at a rate of approximately 100 – 120 /min.
6. Rescuers should aim to minimise interruptions to chest compressions.

Guideline

1 What is Cardiopulmonary Resuscitation?

Cardiopulmonary resuscitation (CPR) is the technique of chest compressions combined with rescue breathing. The purpose of CPR is to temporarily maintain a circulation sufficient to preserve brain function until specialised treatment is available. Rescuers must start CPR if the person is unresponsive and not breathing normally.^{1,2} Even if the person takes occasional gasps, rescuers should start CPR.^{1,2} [Good practice statement] CPR should commence with chest compressions.¹⁻⁴ [2015/2020 CoSTR, weak recommendation, very-low-certainty evidence] and interruptions to chest compressions must be minimised.^{3,4} [2015 CoSTR, weak recommendation, low-certainty evidence]

1.1 Bystander CPR

Early high-quality CPR saves lives.¹⁻⁴ ANZCOR recommends that CPR is started for presumed cardiac arrest without concerns of harm to persons not in cardiac arrest.¹⁻⁴ [CoSTR 2015/2020, strong recommendation, very-low-certainty evidence]

2 Compression-to-Ventilation Ratio

ANZCOR suggests a compression–ventilation ratio of 30:2 compared with any other compression–ventilation ratio in people in cardiac arrest.¹ [CoSTR 2015, weak recommendation, low-certainty evidence] Compressions must be paused to allow for ventilations.

3 Steps of Resuscitation

Initial steps of resuscitation are:

DRS ABCD

- | | |
|-------------------|---|
| 1. DANGERS | Check for danger (assess and manage risks to the rescuer and others) |
| 2. RESPONSIVENESS | Check for response (if unresponsive) |
| 3. SEND | Send for help |
| 4. AIRWAY | Open the airway |
| 5. BREATHING | Check breathing (if not breathing / abnormal breathing) |
| 6. CPR | Start CPR (give 30 chest compressions followed by two breaths) |
| 7. DEFIBRILLATION | Attach an Automated External Defibrillator (AED) as soon as available and follow the prompts. |

3.1 Chest Compressions

All rescuers should perform chest compressions for all those who are unresponsive and not breathing normally. [CoSTR 2015, strong recommendation, very-low-certainty evidence] ANZCOR suggests that those who are trained and willing to give breaths do so for all persons in cardiac arrest. [CoSTR 2015, weak recommendation, very-low-certainty evidence]

When rescuers perform chest compressions they should be at a rate of approximately 100 – 120 /min.³ [CoSTR 2015/2020, strong recommendation, very-low-certainty evidence] (See ANZCOR Guideline 6 Compressions)

3.2 Minimise Interruptions to Chest Compressions

CPR should not be interrupted to check for response or breathing. ANZCOR places a high priority on minimising interruptions to chest compressions. We seek to achieve this overall objective by balancing it with the practicalities of delivering 2 effective breaths between cycles of chest compressions to the patient without an advanced airway.¹ [Good practice statement]

3.3 Multiple Rescuers

When more than one rescuer is available ensure:

- that an ambulance has been called
- all available equipment has been obtained (e.g. AED).

3.4 Duration of CPR

The rescuer should continue cardiopulmonary resuscitation until any of the following conditions have been met:¹

- the person responds or begins breathing normally
- it is impossible to continue (e.g. exhaustion)
- a health care professional arrives and takes over CPR
- a health care professional directs that CPR be ceased.

[Good practice statement]

4 Risks

CPR should be initiated for presumed cardiac arrest without concerns of harm to persons not in cardiac arrest.¹ [CoSTR 2015, strong recommendation, very-low-certainty evidence] In making this recommendation, ANZCOR places a higher value on the survival benefit of CPR initiated by rescuers for persons in cardiac arrest against the low risk of injury in persons not in cardiac arrest.¹ [CoSTR 2015, values and preferences statement]

The risk of disease transmission during training and actual CPR performance in normal non pandemic circumstances is very low.³ A systematic review found no reports of transmission of hepatitis B, hepatitis C, human immunodeficiency virus (HIV) or cytomegalovirus during either training or actual CPR when high-risk activities, such as intravenous cannulation were not performed.³ If available, the use of a barrier device during rescue breathing is reasonable.³ [Good practice statement] After resuscitating a person, the rescuer should reassess and re-evaluate for resuscitation-related injuries.³ [Good practice statement]

References

1. Olasveengen TM, Mancini ME, Perkins GD, et al. Adult Basic Life Support: 2020 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation* 2020;142:S41-S91.
2. Olasveengen TM, Mancini ME, Perkins GD, et al. Adult Basic Life Support: International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation* 2020;156:A35-A79.
3. Perkins GD, Travers AH, Berg RA, et al. Part 3: Adult basic life support and automated external defibrillation. 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation* 2015;95:e43-e69.
4. Travers AH, Perkins GD, Berg RA, et al. Part 3: Adult Basic Life Support and Automated External Defibrillation 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation* 2015;132:S51-S83.

Further Reading

ANZCOR Guideline 2 Priorities in an Emergency
ANZCOR Guideline 3 Unconsciousness
ANZCOR Guideline 4 Airway
ANZCOR Guideline 5 Breathing
ANZCOR Guideline 6 Compressions
ANZCOR Guideline 7 External Automated Defibrillation (AED) in Basic Life Support (BLS)
ANZCOR Guideline 9.3.2 Resuscitation of the Drowning Victim

About this Guideline

Search date/s	<p>ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents:</p> <p>Chest Compression rate (BLS): Scoping Review https://costr.ilcor.org/document/chest-compression-rate-scoping-review</p> <p>CPR: Chest Compression to Ventilation Ratio – Adult (BLS): Systematic Review https://costr.ilcor.org/document/cpr-chest-compression-to-ventilation-ratio-adult</p> <p>CPR Prior to Defibrillation (BLS): Systematic Review https://costr.ilcor.org/document/cpr-prior-to-defibrillation-tf-sr-costr</p> <p>CPR: Compression to Ventilation Ratio – Bystander – Adult (BLS): Systematic Review https://costr.ilcor.org/document/cpr-compression-to-ventilation-ratio-bystander-adult</p> <p>CPR: Compression to Ventilation Ratio – Dispatch Assisted–Adult (BLS): Systematic Review https://costr.ilcor.org/document/cpr-compression-to-ventilation-ratio-dispatch-assisted-adult</p> <p>Feedback for CPR Quality (BLS): Systematic Review https://costr.ilcor.org/document/feedback-for-cpr-quality-bls-361-tf-sr</p> <p>Starting CPR (ABC vs CAB) (BLS): Systematic Review https://costr.ilcor.org/document/starting-cpr-abc-vs-cab-tf-sr-costr</p>
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Basic Life Support

D

Dangers?

R

Responsive?

S

Send for help

A

Open Airway

B

Normal Breathing?

C

Start CPR

30 compressions : 2 breaths

D

Attach Defibrillator (AED)

as soon as available, follow prompts

**Continue CPR until responsiveness or
normal breathing return**



**NEW ZEALAND
Resuscitation Council**
WHAKAHAUORA AOTEAROA