

ANZCOR First Aid Guideline Changes April 2021

Guideline Number	Guideline Title	2021 Significant Changes
9.1.1	First Aid for Management of Bleeding	<ul style="list-style-type: none"> No significant change
9.1.5	First Aid Management of Harness Suspension Trauma	<ul style="list-style-type: none"> No significant change More experimental evidence of harm from keeping person upright
9.2.1	Recognition and First Aid Management of Suspected Heart Attack	<p>ANZCOR recommends:</p> <ul style="list-style-type: none"> Against routine administration of oxygen. Only administer oxygen if evidence of shock or hypoxia is present. Locate the closest Automation external defibrillator (AED). Suggests to administer aspirin, although the strength of recommendation in 2020 ILCOR CoSTR has gone from strong to weak since 2015 CoSTR.
9.2.2	First Aid for Suspected Stroke	<p>There have been significant changes in the first aid management of stroke involving the use of glucometers (when available and first aiders are trained in their use) and the use of oxygen.</p> <p>The major changed recommendations are:</p> <ul style="list-style-type: none"> We suggest the use of the Facial drooping, Arm weakness, Speech difficulties and Time to call emergency services (FAST) stroke assessment for individuals with suspected acute stroke when blood glucose measurement is not feasible (based on CoSTR 2020, weak recommendation, low certainty of evidence).² We suggest that when blood glucose measurement is feasible, the use of a stroke assessment tool that includes blood glucose measurement, such as the Melbourne Ambulance Stroke Screen (MASS) or the Los Angeles Prehospital Stroke Screen (LAPPS) (based on CoSTR 2020, weak recommendation, low certainty evidence).² We recommend against the routine administration of oxygen to persons with stroke.² Administer oxygen only if there are obvious signs of shock or evidence of low oxygen saturation according to Use of Oxygen in Emergencies (refer to ANZCOR Guideline 9.2.10).
9.2.10	The Use of oxygen in Emergencies	<p>There have been changes in the recommendations for the use of oxygen and the use of oximeters by first aiders where available and first aiders trained in their use. The recommendations now are:</p> <ul style="list-style-type: none"> Basic Life Support measures should never be delayed whilst waiting for oxygen or other equipment. (Good practice statement) The administration of supplemental oxygen should be limited to individuals with specific training in oxygen administration.^{1,2} (CoSTR 2015, values and preferences statement)

		<ul style="list-style-type: none"> When bag-valve mask oxygen resuscitation is used by trained but occasional operators, a minimum of two trained rescuers are required to provide ventilation for a non-breathing person. (Good practice statement) Persons who require supplemental oxygen in a first aid setting need to be further evaluated by a health care professional. (Good practice statement)
9.2.12	Recognition and First Aid Management of Seriously Ill Person including Sepsis	<ul style="list-style-type: none"> This is a new guideline and recognises the difficulty in diagnosing sepsis and other serious illness even in the health care setting, but also recognises the benefit of early diagnosis and intervention. Advises early referral to a health professional without need for diagnosis by recognising the red flags.
9.3.5	First Aid and Resuscitation for Divers who have Breathed Compressed Gas	<ul style="list-style-type: none"> Continued use of 100% oxygen in distinction to most other first aid guidelines (where target oxygen saturation for first aid guidelines is >92%, if pulse oximetry is available, and only if cyanosis, shock, decompression illness or carbon monoxide poisoning, if no oximetry is available).
9.4.1	First Aid Management of Australian Snake Bite	<ul style="list-style-type: none"> No significant change Recent systematic review by Avau et al deemed to be insufficient reason to change recommendation for Pressure Bandage and Immobilisation despite difficulties applying effective pressure bandage in literature reviewed by Avau et al.
9.4.2	First Aid Management Spider Bite	<ul style="list-style-type: none"> No significant changes
9.5.1	First Aid Management of Poisoning	<p>There has been considerable debate on the management of the risk to first aiders from the poison during CPR. The guideline now contains the following recommendations:</p> <p>ANZCOR recommends:</p> <ul style="list-style-type: none"> Rescuers should perform chest compressions for all those who are unresponsive and not breathing normally (refer to ANZCOR Guideline 8) (CoSTR 2015, strong recommendation, very-low-quality evidence). For those trained in their use, a self-inflating bag-valve mask apparatus is the safest way for the rescuer to provide ventilation. If there is poison remaining on the person's lips, if corrosive chemicals have burnt the lips and chin, or if the rescuer is unsure of the nature of the poison, continue to perform chest compressions without providing any ventilation. Inhaled poisons are unlikely to pose a risk during mouth-to-mouth ventilation unless the person is contaminated with the liquid form of the inhaled poison.
9.5.4	First Aid Management of Suspected Opioid Overdose	<p>This is new guideline which details the use of naloxone by lay rescuers. The recommendations are:</p> <ul style="list-style-type: none"> Start Cardiopulmonary resuscitation (CPR) without delay for any unconscious person not breathing normally (refer to ANZCOR Guideline 8). (Good practice statement) We suggest that lay rescuers administer naloxone in suspected opioid related respiratory or circulatory arrest when trained in its use, (Weak recommendation, based on expert consensus).¹ We suggest that people who regain normal consciousness and respiratory function after naloxone rescue be transported to hospital for observation. (Weak recommendation, based on expert consensus)

ANZCOR Guideline 9.1.1 – First Aid for Management of Bleeding

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. Firm pressure on or around the wound is the most effective way to stop most bleeding. [Good Practice Statement]
2. In life-threatening bleeding, control of bleeding takes priority over airway and breathing interventions. [Good Practice Statement]
3. We suggest to use an arterial tourniquet for life-threatening limb bleeding that is not controlled by direct wound pressure.¹ [CoSTR 2020, weak recommendation, very low certainty of evidence]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)
CPR	Cardiopulmonary Resuscitation

1 External Bleeding

The use of pressure on or around the wound is usually the fastest, easiest and most effective way to stop external bleeding.^{1,2,3,4} [Good Practice Statement] Other methods should be used if direct pressure alone does not control severe bleeding. The aim is to stop further bleeding whilst waiting for help to arrive. There is no evidence that elevating a bleeding part will help control bleeding^{1,5} and there is the potential to cause more pain or injury.

Bleeding should be managed as severe, life-threatening bleeding in the following situations:

- amputated or partially amputated limb above wrist or ankle
- shark attack, propeller cuts or similar major trauma to any part of the body
- bleeding not controlled by local pressure
- bleeding with signs of shock, i.e. pale and sweaty plus pulse rate >100, or capillary refill > 2 sec and/or decreased level of consciousness

1.1 Management

- Use standard precautions (e.g. gloves, protective glasses) if readily available.
- Management of all bleeding begins with application of pressure on or around the wound.
- If bleeding is severe or life-threatening, controlling the bleeding takes priority over airway and breathing interventions. Lie the person down, apply pressure and call for an ambulance.
- If there is severe, life threatening bleeding from a limb, not controlled by pressure, we suggest to apply an arterial tourniquet above the bleeding point, if trained in its use and one is available.¹ [CoSTR 2020: weak recommendation, very low certainty of evidence]
- If there is severe, life-threatening bleeding from a wound site not suitable for tourniquet, or from a limb when a tourniquet is not available or has failed to stop the bleeding, we suggest to apply a haemostatic dressing, if trained in its use and one is available.^{1,5} [CoSTR 2020: weak recommendation, low quality evidence]
- For the majority of non-life-threatening cases, first aiders should follow the sequence of DRSABCD, where control of bleeding follows establishing airway and commencing CPR if required.
- If the person is unresponsive and not breathing normally, follow the Basic Life Support Flowchart. [Refer to ANZCOR Guideline 8]

1.2 Direct Pressure Method

Where the bleeding point is identified, the rescuer, a bystander or the injured person should control bleeding by:

- Applying firm, direct pressure sufficient to stop the bleeding. Pressure can be applied using hands or a pad over the bleeding point.
- If bleeding continues, apply a second pad and a tighter bandage over the wound. If bleeding still continues, check that the pad and bandage are correctly applied, directly over the bleeding. If not, it may be necessary to remove the pad(s) to ensure that a specific bleeding point has not been missed. Applying firmer pressure, only using 1 to 2 pads over a small area, will achieve greater pressure over the bleeding point than continuing to layer up further pads.

To assist in controlling bleeding, where possible:

- Advise the person to lie down and remain still
- Restrict movement by immobilizing a bleeding limb

1.3 Embedded Objects

If there is an obvious embedded object causing bleeding, use pressure around the object. [Good Practice Statement]

- Do not remove the embedded object because it may be plugging the wound and restricting bleeding.
- Apply padding around or on each side of the protruding object, with pressure over the padding.

Pressure application methods may be insufficient to control bleeding. It may still be necessary to use other measures including an arterial tourniquet or haemostatic dressings.

1.4 Arterial tourniquet

- Arterial tourniquets should only be used for life-threatening bleeding from a limb, where the bleeding cannot be controlled by direct pressure. Ideally, a tourniquet **should not** be applied over a joint or wound, and **must not** be covered up by any bandage or clothing.
- Commercially manufactured windlass tourniquets such as those based on military designs are more effective than improvised tourniquets¹. An example of a military tourniquet is shown in Fig 1 below. Effective use of commercial tourniquets is optimal when first aid providers are trained in proper application techniques.
- All arterial tourniquets should be applied in accordance with the manufacturer's instructions (or 5 cm above the bleeding point if no instructions) and tightened until the bleeding stops.
- If a tourniquet does not stop the bleeding its position and application must be checked. Ideally the tourniquet is not applied over clothing nor wetsuits and is applied tightly, even if this causes local discomfort.
- If bleeding continues, a second tourniquet (if available) should be applied to the limb, preferably above the first.
- If a correctly applied tourniquet(s) has failed to control the bleeding consider using a haemostatic dressing in conjunction with the tourniquet. ^{1,5} [Good Practice Statement]
- An elastic **venous** tourniquet (designed to assist drawing blood samples or inserting intravenous cannulae) is **not** suitable for use as an arterial tourniquet.
- Improvised tourniquets are unlikely to stop all circulation to the injured limb without risk of tissue damage. Improvised tourniquets which do not stop all circulation can increase bleeding. Nonetheless, in the context of life-threatening bleeding, an improvised tourniquet is likely to be better than no tourniquet. Tourniquets, ideally of a similar broad width to commercial types, can be improvised using materials from a first aid kit (e.g. triangular bandage, elastic bandage) from clothing, a surfboard leg rope or other available similar items. Improvised tourniquets should be tightened by twisting a rod or stick under the improvised tourniquet band, similar to the windlass in commercial tourniquets.
- The time of tourniquet application must be noted and communicated to emergency/paramedic personnel. Once applied, the person requires urgent transfer to hospital and the tourniquet should not be removed until the person receives specialist care.

Figure 1: Combat Application Tourniquet

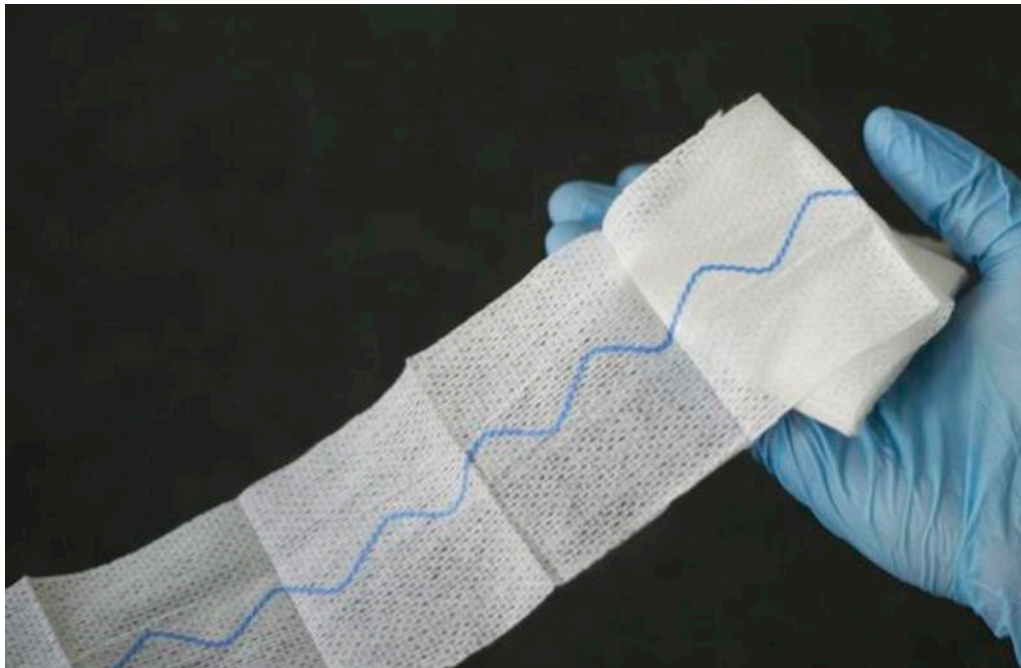


1.5 Haemostatic dressings

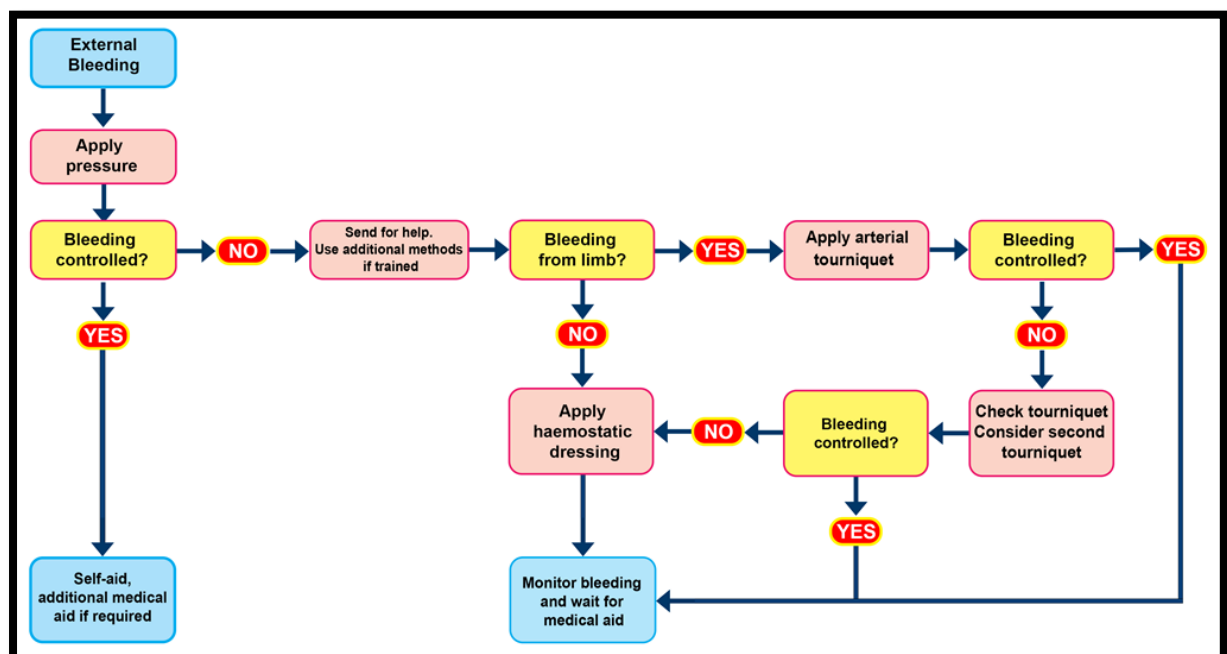
- Haemostatic dressings are impregnated with agents that help stop bleeding. The haemostatic dressings included in the CoSTR 2015 recommendations contained the products kaolin and chitosan.⁶ They are commonly used to control bleeding in the surgical and military settings but their use in the civilian, non-surgical setting is becoming more common. An example is shown in Fig 2 below.
- When available and the first aid provider is trained in their use, we suggest that haemostatic dressings are of most value in the following situations [CoSTR 2015: weak recommendation, very low quality evidence]:⁵
 - Severe, life-threatening bleeding not controlled by wound pressure, from a site not suitable for tourniquet use.
 - Severe, life-threatening bleeding from a limb, not controlled by wound pressure, when the use of a tourniquet(s) alone has not stopped the bleeding, or a tourniquet is not available.
- Haemostatic dressings must be applied as close as possible to the bleeding point, held against the wound using local pressure (manually initially) then held in place with the application of a bandage (if available). Haemostatic dressings should be left on the bleeding point until definitive care is available.

The need to control the bleeding is paramount. The risks associated with the first aid use of tourniquets and haemostatic dressings are less than the risk of uncontrolled severe, life-threatening bleeding. These adjuncts provide temporary bleeding control and rapid transfer to hospital remains critically important.

Figure 2: Kaolin impregnated gauze (an example of a haemostatic dressing)



1.6 Flow Chart for First Aid Control of External Bleeding



2 Internal Bleeding

2.1 Recognition

Internal bleeding may be difficult to recognise, but should always be suspected where there are symptoms and signs of shock. [Refer to ANZCOR Guideline 9.2.3]

Internal bleeding includes bruising, locally contained bleeding (e.g. an “egg on the head”) and the bleeding associated with injury or disease of organs in the abdomen or chest, as well as fractures. Severe bleeding may also occur from complications of pregnancy.

Symptoms and signs may include:

- pain, tenderness or swelling over or around the affected area
- the appearance of blood from a body opening, eg:
 - bright red and/or frothy blood coughed up from the lungs
 - vomited blood which may appear bright red or as dark brown “coffee grounds”
 - blood-stained urine
 - vaginal bleeding or bleeding from the penis
 - rectal bleeding which may be bright red or black and “tarry”
- shock in the case of severe bleeding

2.2 Management

Severe internal bleeding is life-threatening and requires urgent treatment in hospital.

- Send for an ambulance.
- Lie the person down
- Treat shock [Refer to ANZCOR Guideline 9.2.3]

2.3 Closed Bleeding in a Limb

- If there is bruising to a limb and no external bleeding, we suggest to use pressure and a cold pack if available.⁵ [CoSTR 2015: weak recommendation, low quality evidence]
- If closed bleeding in a limb is causing severe swelling or pain, or the person is showing signs of shock [Refer to ANZCOR Guideline 9.2.3], send for an ambulance [Good Practice Statement]

3 Nose Bleed (Epistaxis)

For a nose bleed:

- Pressure must be applied equally to both sides of the nose, over the soft part below the bony bridge (usually between the thumb and index finger).
- The person should lean with the head forward to avoid blood flowing down the throat.
- Encourage the person to spit out blood rather than swallow it as swallowed blood irritates the stomach, and causes vomiting which can worsen the bleeding.
- The person should remain seated at total rest for at least 10 minutes. On a hot day or after exercise, it might be necessary to maintain pressure for at least 20 minutes.
- If bleeding continues for more than 20 minutes seek medical assistance.

4 Management of All Severe Bleeding

- Call for an ambulance
- Reassure the person
- Assist the person into a position of comfort, preferably lying down
- Keep the person warm
- Monitor the vital signs at frequent intervals
- Administer oxygen if available and trained to do so [Refer to ANZCOR Guideline 9.2.10]
- **Do not** give any food or drink orally, including medications
- Treat shock [Refer to ANZCOR Guideline 9.2.3]
- If the person is unresponsive and not breathing normally, follow the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8]

References

1. Nathan P. Charlton, Janel M. Swain, Jan L. Brozek, Maja Ludwikowska, Eunice Singletary, David Zideman, Jonathan Epstein, Andrea Darzi, Anna Bak, Samer Karam, Zbigniew Les, Jestin N. Carlson, Eddy Lang & Robby Nieuwlaat (2020): Control of Severe, Life-Threatening External Bleeding in the Out-of-Hospital Setting: A Systematic Review, Prehospital Emergency Care, 2020, DOI: 10.1080/10903127.2020.1743801
2. Walker S.B., Cleary S., Higgins M. Comparison of the FemoStop device and manual pressure in reducing groin puncture site complications following coronary angioplasty and coronary stent placement. International Journal of Nursing Practice. Dec. 2001. 7(6):366-75.
3. Simon A., Bumgarner B., Clark K., Israel S. Manual versus mechanical compression for femoral artery hemostasis after cardiac catheterization. American Journal of Critical Care. Jul 1998. 7(4):308-13.
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5. Zideman, D. A., Singletary, E. M., De Buck, E., et al. (2015). Part 9: First aid: 2015 International Consensus on First Aid Science with Treatment Recommendations. Resuscitation, 95, e225. [http://www.cprguidelines.eu/assets/downloads/costr/S0300-9572\(15\)00368-8_main.pdf](http://www.cprguidelines.eu/assets/downloads/costr/S0300-9572(15)00368-8_main.pdf) Accessed 21/11/2015
6. Devlin JJ, Kircher S, Kozen BG et al. Comparison of ChitoFlex®, CELOX™, and QuickClot™ in Control of Hemorrhage. 2011. Journal of Emergency Medicine. 2011;41(3), 237-245

Further Reading

- ANZCOR Guideline 9.2.3 Shock
- ANZCOR Guideline 9.1.4 Head Injury
- ANZCOR Guideline 9.2.10 The Use of Oxygen in Emergencies

About this Guideline

Search date/s	ANZCOR search: October 2020
Question/PICO:	<p>Population: Adults and children with severe, life- threatening external bleeding in an out-of-hospital setting. Bleeding from both compressible and non- compressible external sites were included. Nasal and oral bleeding were excluded.</p> <p>Intervention: All bleeding control methods applicable for use by trained or untrained first aid providers including manufactured or improvised tourniquets, hemostatic dressings or agents, cryotherapy, direct manual pressure, pressure points, pressure dressings or bandages, or elevation of the injured area.</p> <p>Comparisons: Direct manual pressure alone or any other management technique listed in Intervention, if a comparison was available.</p> <p>Outcomes: Outcomes were prioritized for importance a priori, as per the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach (Table 1).</p> <p>Study Designs: Randomized controlled trials (RCTs) and non-randomized comparative studies were included. If there were no or limited comparative studies, then case series of 4 or more subjects and simulation studies were also included. Conference abstracts and trial protocols were excluded. All languages were included where an English abstract was available.</p>
Method:	Systematic Review (ILCOR First Aid Task Force, CoSTR) published April 20
Primary reviewers:	Finlay Macneil
Other consultation:	Nil
Worksheet	See https://www.ilcor.org/
Approved:	April 2021
Guidelines superseded:	ANZCOR Guideline 9.1.1 - July 2017

ANZCOR Guideline 9.1.4 – Head Injury

Guideline

Who does this guideline apply to?

This guideline applies to adult, child and infant victims.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid providers.

1 Introduction

Head injury may be caused by a number of mechanisms including, falls, assaults, motor vehicle crashes, sporting injuries and, less commonly, penetrating injuries. A victim may sustain a significant head injury without loss of consciousness or loss of memory (amnesia). Therefore, loss of consciousness or memory loss should not be used to define the severity of a head injury or to guide management.¹

The initial first aid for a victim with head injury includes assessing and managing the airway and breathing, whilst caring for the neck until expert help arrives.

There is insufficient evidence to support or refute the use by first aiders of simplified concussion scoring systems such as the Sport Concussion Assessment Tool (SCAT), the Glasgow Coma Scale (GCS) or Alert, Voice, Pain, Unresponsive (AVPU) versus standard first aid without a scoring system. (CoSTR 2015)² The serious consequences of not recognising concussion in the first aid environment warrants advising all victims who have sustained a head injury, regardless of severity, to seek assessment by a health care professional or at a hospital.

2 Recognition

A brain injury should be suspected if the victim has a reported or witnessed injury, has signs of injury to the head or face such as bruises or bleeding, or is found in a confused or unconscious state. A victim may have a brain injury without external signs of injury to the head or face. Serious problems may not be obvious for several hours after the initial injury.

3 Management

- **Call an ambulance** if there has been a loss of consciousness or altered consciousness at any time, no matter how brief.
- A victim who has sustained a head injury, whether or not there has been loss of consciousness or altered consciousness, should be assessed by a health care professional.

- Check for response: an unconscious victim should be managed according to ANZCOR Guideline 3.
- Ensure that the airway is clear (ANZCOR Guideline 4).
- Protect the neck whilst maintaining a clear airway (ANZCOR Guideline 9.1.6).
- Identify and control any significant bleeding with direct pressure if possible (ANZCOR Guideline 9.1.1).

All victims who appear to have suffered a head injury (including a minor head injury) should be assessed by a health care professional before continuing with sport or other activity.

If the victim is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart (ANZCOR Guideline 8).

References

1. Reed D. Adult Trauma Clinical Practice Guidelines: Initial Management of Closed Head Injury in Adults, 2nd Ed. 2011. NSW Institute of Trauma & Injury Management: North Sydney. http://www.itim.nsw.gov.au/images/3/3d/Closed_Head_Injury_CPG_2nd_Ed_Full_document.pdf Accessed 19/11/2015
2. Zideman, D. A., Singletary, E. M., De Buck, E., et al. (2015). Part 9: First aid: 2015 International Consensus on First Aid Science with Treatment Recommendations. *Resuscitation*, 95, e225. [http://www.cprguidelines.eu/assets/downloads/costr/S0300-9572\(15\)00368-8_main.pdf](http://www.cprguidelines.eu/assets/downloads/costr/S0300-9572(15)00368-8_main.pdf) Accessed 19/11/2015

Further Reading

ANZCOR Guideline 2 Managing an Emergency

ANZCOR Guideline 3 Recognition and First Aid Management of the Unconscious Victim

ANZCOR Guideline 4 Airway

ANZCOR Guideline 5 Breathing

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.1.6 Management of Suspected Spinal Injury

ANZCOR Guideline 9.2.3 Shock

ANZCOR Guideline 9.1.5 – First Aid Management of Harness Suspension Trauma

Summary

Who does this guideline apply to?

This guideline applies to adults, adolescents and children

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers

Recommendations

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

1. Send for an ambulance [Good Practice Statement]
2. Rescue the person and place in a lying position as soon as it is safe to do so [Good Practice Statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation

1 Introduction

Suspension trauma, or orthostatic shock, has been reported to affect people who are suspended within a body harness for a prolonged period of time (more than 10 min).^{1,2,3} It may result in loss of consciousness or death. This is thought to occur as a result of low blood pressure due to blood pooling in the legs combined with an increase in the activity of a part of the nervous system that slows the heart (vagal tone).³

2 Recognition

The signs and symptoms of suspension trauma are the same as shock. Harness suspension trauma should be considered where the person has been suspended by a harness, and are exhibiting any of the following:⁴

- feeling faint or dizzy
- breathlessness
- sweating
- looking pale
- nausea
- low blood pressure
- loss of responsiveness

3 Management

- Call for an ambulance.
- If safe to do so, free the person from the harness.
- If not responding, manage as per ANZCOR Basic Life Support flow chart [Refer to ANZCOR Guideline 8]
- Rest the responding person in a position of comfort, ideally lying down, and provide reassurance.
- Loosen or remove harness.
- Administer oxygen if available.
- Look for and manage any associated injuries, particularly for those who may have fallen or been electrocuted.
- Monitor level of response and breathing at frequent intervals.

Some agencies have previously recommended that those with suspension trauma are maintained in a sitting position and avoid lying flat for 30 minutes⁵. This review has found no evidence to support this practice and it may be harmful.

References

1. Turner N.L., Wassell J.T., Whisler R., Zwiener J. Suspension tolerance in a full-body safety harness, and a prototype harness accessory. [Evaluation Studies. Journal Article] Journal of Occupational & Environmental Hygiene. 5(4):227-31, 2008.
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3. Rauch S, Schenk K, Strapazzon G, Dal Cappello T, Gatterer H, Palma M, Erckert M, Oberhuber L, Bliemsrieder B, Brugger H, Paal P. Suspension syndrome: a potentially fatal vagally mediated circulatory collapse—an experimental randomized crossover trial. European journal of applied physiology. 2019 Jun;119(6):1353-65.
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5. Raynovich B, Rwaili FT and Bishop P. (2009). Dangerous suspension. Understanding suspension syndrome & prehospital treatment for those at risk. JEMS : a journal of emergency medical services. 34(8):44-51, 53;

Further Reading

- ANZCOR Guideline 3 Recognition and First Aid Management of the Unconscious Person
- ANZCOR Guideline 4 Airway
- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ANZCOR Guideline 9.1.6 Management of Suspected Spinal Injury
- ANZCOR Guideline 9.2.3 Shock

About this Guideline

Search date/s	January 2020
Question/PICO :	For people suspended in a harness for a prolonged period awaiting rescue, what interventions are effective in the prevention of poor clinical outcomes
Method:	Scoping literature review
Primary reviewers:	Finlay Macneil
Other consultation:	Kevin Nation
Worksheet	https://resus.org.au/download/worksheets/worksheets_to_support_guidelines/g-l-9-1-5-harness-suspension-trauma-worksheet-final.pdf
Approved:	April 2021
Guidelines superseded:	ARC Guideline 9.1.5 - July 2009

ANZCOR Guideline 9.1.6 – Management of Suspected Spinal Injury

Guideline

Who does this guideline apply to?

This guideline applies to adult, child and infant victims.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid providers. This guideline is equally applicable to healthcare professionals working in the pre-hospital setting.

1 Introduction

The spine is made up of 33 separate bones, known as vertebrae, extending from the base of the skull to the coccyx (tailbone). Each vertebra surrounds and protects the spinal cord (nerve tissue). Fractures or dislocations to the vertebral bones may result in injury to the spinal cord. The direct mechanical injury from the traumatic impact can compress or sever the nerve tissue. This is followed by secondary injury caused by ongoing bleeding into the spinal cord as well as continued swelling at the injured site and surrounding area.

The possibility of spinal injury must be considered in the overall management of all trauma victims. The risk of worsening the spinal injury in the prehospital period is probably less than previously thought, yet to minimise the extent of the secondary injury, caution must be taken when moving a victim with a suspected spinal injury.

Spinal injuries can occur in the following regions of the spine:

- the neck (cervical spine)
- the back of the chest (thoracic spine)
- the lower back (lumbar spine).

The cervical spine is most vulnerable to injury, which must be suspected in any victim with injuries above the shoulders. More than half of spinal injuries occur in the cervical region.

Suspected spinal injuries of the neck, particularly if the victim is unconscious, pose a dilemma for the rescuer because correct principles of airway management often cause some movement of the cervical spine.

2 Recognition

The most common causes of spinal cord injury are:

- a motor vehicle, motor cycle or bicycle incident as an occupant, rider, or pedestrian
- an industrial accident (i.e. workplace)
- a dive or jump into shallow water or water with obstacles or being "dumped" in the surf
- a sporting accident (e.g. rugby, falling from a horse)
- a fall from greater than a standing height (e.g. ladder, roof)
- falls in the elderly population
- a significant blow to the head
- a severe penetrating wound (e.g. gunshot).

The symptoms and signs of a spinal injury depend on two factors: firstly the location of the injury and secondly, the extent of the injury – whether there is just bone injury or associated spinal cord injury, and whether the spinal cord injury is partial or complete. It will be difficult to elicit symptoms and signs in victims with an altered conscious state.

2.1 Symptoms

Symptoms of spinal injury include:

- pain in the injured region
- tingling, numbness in the limbs and area below the injury
- weakness or inability to move the limbs (paralysis)
- nausea
- headache or dizziness
- altered or absent skin sensation.

2.2 Signs

Signs of spinal injury include:

- head or neck in an abnormal position
- signs of an associated head injury
- altered conscious state
- breathing difficulties
- shock
- change in muscle tone, either flaccid or stiff
- loss of function in limbs
- loss of bladder or bowel control
- priapism (erection in males).

3 Management

The priorities of management of a suspected spinal injury are:

1. calling for an ambulance
2. management of airway, breathing and circulation
3. spinal care.

An awareness of potential spinal injury and careful victim handling, with attention to spinal alignment, is the key to harm minimisation.

3.1 The Conscious Victim

Tell the victim to remain still but do not physically restrain if unco-operative. Those with significant spinal pain will likely have muscle spasm which acts to splint their injury. Keep victim comfortable until help arrives.

If it is necessary to move the victim from danger (e.g. out of the water, off a road), care must be taken to support the injured area and minimise movement of the spine in any direction. Ideally, only first aid providers or health care professionals trained in the management of spinal injuries, aided by specific equipment, should move the victim.

3.2 The Unconscious Victim

Airway management takes precedence over any suspected spinal injury. It is acceptable to gently move the head into a neutral position to obtain a clear airway. If the victim is breathing but remains unconscious, it is preferable that they be placed in the recovery position.

The victim should be handled gently with no twisting. Aim to maintain spinal alignment of the head and neck with the torso, both during the turn and afterwards. In victims needing airway opening, use manoeuvres which are least likely to result in movement of the cervical spine. Jaw thrust and chin lift should be tried before head tilt.

4 Spinal Immobilisation Techniques and Devices

The clinical importance of prehospital immobilisation in spinal trauma remains unproven. There have been no randomised controlled trials to study immobilisation techniques or devices on trauma victims with suspected spinal cord injury. All existing studies have been retrospective or on healthy volunteers, manikins or cadavers¹.

Prehospital spinal immobilisation has never been shown to affect outcome and the estimates in the literature regarding the incidence of neurological deterioration due to inadequate immobilisation may be exaggerated. Spinal immobilisation can expose victims to the risks associated with specific devices and the time taken in application leads to delays in transport time.^{2,3,4}

4.1 Cervical Collars

The use of semi rigid (SR) cervical collars by first aid providers is not recommended (CoSTR 2015, weak recommendation, low quality evidence).⁵

ANZCOR recommends all rescuers in the pre-hospital environment review their approach to the management of suspected spinal injury with regards to SR cervical collars. Consistent with the first aid principle of preventing further harm, the potential benefits of applying a cervical collar do not outweigh harms such as increased intracranial pressure, pressure injuries or pain and unnecessary movement that can occur with the fitting and application of a collar. In suspected cervical spine injury, ANZCOR recommends that the initial management should be manual support of the head in a natural, neutral position, limiting angular movement (expert consensus opinion). In healthy adults, padding under the head (approximately 2cm) may optimise the neutral position.^{6,7}

The potential adverse effects of SR cervical collars increase with duration of use and include:

- unnecessary movement of the head and neck with the sizing and fitting of the collar
- discomfort and pain
- restricted mouth opening and difficulty swallowing⁸
- airway compromise should the victim vomit⁸
- pressure on neck veins raising intra-cranial pressure⁹ (harmful to head injured victims)
- hiding potential life-threatening conditions¹⁰.

4.2 Spinal Boards

Rigid backboards placed under the victim can be used by first aiders should it be necessary to move the victim. The benefits of stabilizing the head will be limited unless the motion of the trunk is also controlled effectively during transport.^{11,12} Victims should not be left on rigid spinal boards. Healthy subjects left on spine boards develop pain in the neck, back of the head, shoulder blades and lower back. The same areas are at risk of pressure necrosis.^{13,14,15} Conscious victims may attempt to move around in an effort to improve comfort, potentially worsening their injury.

Paralysed or unconscious victims are at higher risks of development of pressure necrosis due to their lack of pain sensation. Strapping has been shown to restrict breathing and should be loosened if compromising the victim.^{16,17}

Victims may be more comfortable on a padded spine board, air mattress or bead filled vacuum mattress; devices used by some ambulance services.^{18,19}

4.3 Log Roll

The log roll is a manoeuvre performed by a trained team, to roll a victim from a supine position onto their side, and then flat again, so as to examine the back and/or to place or remove a spine board.²⁰

4.4 Children

After road traffic accidents, conscious infants should be left in their rigid seat or capsule until assessed by ambulance personnel. If possible, remove the infant seat or capsule from the car with the infant/child in it. Children under eight years of age may require padding under their shoulders (approximately 2.5cm) for neutral spinal alignment.²¹

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Further Reading

ANZCOR Guideline 2 Priorities in an emergency

ANZCOR Guideline 3 Unconsciousness

ANZCOR Guideline 4 Airway

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.1.7 - First Aid Management of a Crushed Victim

SUMMARY

Who does this guideline apply to?

This guideline applies to adults, adolescents and children.

Who is the audience for this guideline?

This guideline is for bystanders, first aiders and first aid providers.

Recommendations

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

1. Removing all crushing forces as soon as possible.
2. Controlling external bleeding.
3. Avoiding routinely applying an arterial tourniquet prior to the removal of the crushing force unless there is actual or suspected life-threatening bleeding.

Level of Evidence

Level IV

Class of Recommendation

Class A - Recommended

1 Introduction

Crush injuries may result from a variety of situations, including vehicle entrapment, falling debris, industrial accidents or by prolonged pressure to a part of the body due to their own body weight in an immobile person.⁽¹⁻⁵⁾ *Crush syndrome* refers to the multiple problems that may subsequently develop, most commonly as a result of crush injuries to the limbs, particularly the legs.⁽¹⁾ Crush syndrome results from disruption of the body's chemistry and can result in kidney, heart and other problems. The likelihood of developing acute crush syndrome is directly related to the compression time, therefore crushed persons should be released as quickly as possible, irrespective of how long they have been trapped.^{1,2}

2 Recognition

Crush injury should be suspected whenever there is a crushing force. A crush injury should be suspected whenever a part of the body is crushed or compressed or when you are unable to fully see or examine a part of the body.

Crush injury can also result from prolonged pressure to a part of the body due to their own body weight in an immobile person and may show few symptoms or signs.

Persons with crush injuries may show symptoms and signs of bleeding (Guideline 9.1.1), shock (Guideline 9.2.3) and hypothermia (Guideline 9.3.3).

A person with a crush injury may not complain of pain and there may be no external signs of injury. Any person who has been subjected to crush injury, including from their own body weight, should be taken to hospital for immediate investigation. 2-4

3 Management

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

1. Ensure your safety and the safety of others
2. **Call an ambulance**
3. If it is safe to do so and physically possible, remove all crushing forces from the person as soon as possible¹
4. Control any external bleeding ^{5,6} (Guideline 9.1.1)
5. Treat other injuries
6. Maintain body temperature (prevent hypothermia).
7. Reassure and constantly re-check the person's condition for any deterioration
8. If the person is unconscious and breathing normally, follow ANZCOR Guideline 3.

4 Use of tourniquets ⁷

There is insufficient evidence to recommend the routine use of a tourniquet prior to the release of a crushing force to delay the onset of reperfusion injury. The application of a tourniquet is recommended where there is life-threatening bleeding from a limb before or immediately following the removal of the crushing force (Guideline 9.1.1). Bleeding may be significant following the release of a crushing force.

A tourniquet may be put into position prior to the release of the crushing force in anticipation of life-threatening bleeding but this should not delay the release of the crushed person.

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Further Reading

- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ANZCOR Guideline 9.1.1 Principles for the control of bleeding for first aiders
- ANZCOR Guideline 9.2.3 - Shock
- Guideline 9.3.3 - Hypothermia: First Aid and Management

About this Guideline

Search date/s	Jan 2013 – Feb 2019
Question/PICO:	P: Out of hospital crush injury I: i) All interventions ii) Early remove crushing force iii) Apply tourniquet before remove crushing force C: i) no intervention ii) Delayed removal crushing force iii) No tourniquet before remove crushing force O: i) Survival ii) Sudden cardiac arrest iii) Renal failure
Method:	Literature Review for evidence published since last review (2013) leading to NHMRC Level of evidence
Primary reviewers:	Finlay Macneil; Jason Bendall
Other consultation	None
Worksheet	https://resus.org.au/worksheets-to-support-guidelines/
Approved:	November 2019
Guidelines superseded:	9.1.7 (March 2013)

ANZCOR Guideline 9.2.1 – Recognition and First Aid Management of Suspected Heart Attack

Summary

Who does this guideline apply to?

This guideline applies to adults.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. First aiders should send for an ambulance if symptoms are severe, get worse quickly or last longer than 10 minutes. [Good Practice Statement]
2. First aiders should stay with the person until the ambulance or on-site resuscitation team takes over care. [Good Practice Statement]
3. We suggest that first aiders give aspirin (300 mg orally to adults with non-traumatic chest pain unless the person has known anaphylaxis to aspirin.¹ [CoSTR 2020: weak recommendation, very low certainty evidence]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)
AED	Automated External Defibrillator

1 Introduction

A person experiences a heart attack when there is a sudden partial or complete blockage of one of the coronary arteries that supply the heart muscle. As a result of the interruption to the blood supply, there is an immediate risk of life-threatening changes to the heart rhythm. If not corrected quickly there is also a risk of serious, permanent heart muscle damage. To reduce the chance of sudden death from heart attack, urgent medical care is required – “*every minute counts*”.

Heart attack is different from, but may lead to, cardiac arrest. Cardiac arrest is cessation of heart action.

Survival after heart attack can be improved by current treatments¹ and clot-dissolving medications that clear the blocked artery, restore blood supply to the heart muscle and limit damage to the heart. These therapies are most effective if administered as soon as possible following the onset of symptoms with these benefits declining with delays in treatment.

2 Recognition

For some people, sudden cardiac arrest may occur as the first sign of heart attack – however most experience some warning signs. It is important to note:

- a heart attack can occur in a person without chest pain or discomfort. The most common symptom of heart attack in a person without chest pain is shortness of breath
- a person who experiences a heart attack may pass off their symptoms as ‘just indigestion’

2.1 Warning signs/Red Flags

If the warning signs are severe, get worse quickly, or last longer than 10 minutes, **act immediately**. The person may experience one or more of these symptoms:

- pain or discomfort in the chest, neck, jaw or arms
- pale skin
- shortness of breath
- nausea or vomiting
- sweating
- feeling dizzy or light-headed.

Discomfort or pain in the centre of the chest may start suddenly or come on slowly over minutes. It may be described as tightness, heaviness, fullness or squeezing. The pain may be severe, moderate or mild. The pain may be limited to, or spread to, the neck, throat, jaw, either or both shoulders, the back, either or both arms and into the wrists and hands.

Atypical chest pain is defined as pain that does not have a heaviness or squeezing sensation (typical angina symptoms), precipitating factors (e.g., exertion), or usual location.

Some people are more likely to describe atypical² or minimal symptoms³ and include:

- the elderly
- women
- people with diabetes and/or chronic inflammatory conditions (eg Rheumatoid arthritis)
- Aboriginal and Torres Strait Islanders, Māori and Pasifika people

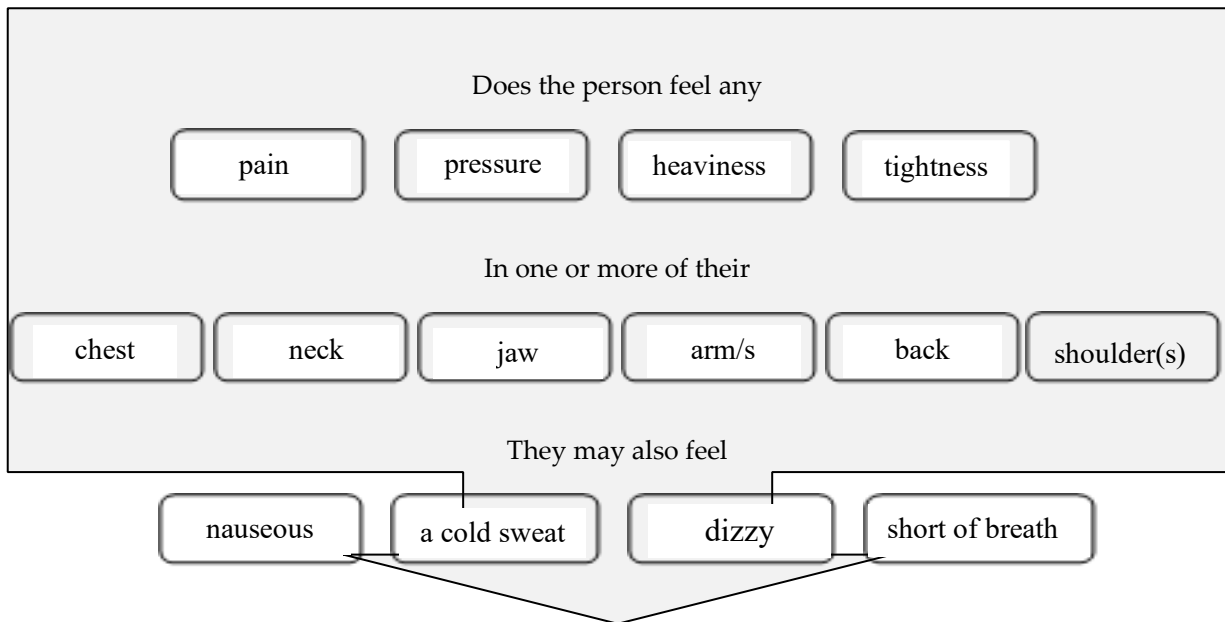
These people should seek urgent assessment by a health care professional if they have any warning signs of heart attack, no matter how mild.

3 Management

- Encourage the person to stop what they are doing and to rest in a comfortable position.
- If the person has been prescribed medication such as a tablet or oral spray to treat episodes of chest pain or discomfort associated with angina, assist them to take this as they have been directed.
- Send for an ambulance if symptoms are severe, get worse quickly or last longer than 10 minutes.
- Follow the instructions of the ambulance call taker/operator who will advise you what to do.
- Stay with the person until the ambulance or on-site resuscitation team arrives.
- ANZCOR suggests to give aspirin (300 mg orally to adults with non-traumatic chest pain unless the person has known anaphylaxis to aspirin [CoSTR 2020: weak recommendation, very low certainty evidence]
- ANZCOR suggests against the routine administration of oxygen in persons with suspected heart attack. [COSTR 2015, weak recommendation, very-low certainty evidence] Administer oxygen only if there are obvious signs of shock or evidence of low oxygen saturation according to [Refer to ANZCOR Guideline 9.2.10]^{5,6}
- If practical and resources allow, locate the closest AED and bring it to the person.

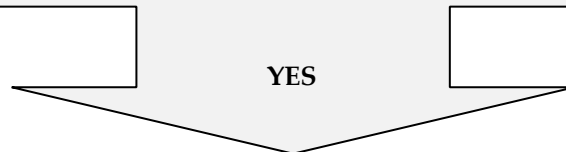
If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].

Warning Signs of Heart Attack Action Plan



1	STOP –stop the person from what they are doing and tell them to rest
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2	TALK – ask them what they are feeling
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>If they take angina medicine:</p> <ul style="list-style-type: none"> • Take a dose of medicine. • Wait 5 minutes. Still has symptoms? • Take another dose of angina medicine. • Wait 5 minutes. Still has symptoms? </div> <div style="width: 45%;"> <p>Or</p> <ul style="list-style-type: none"> • Are symptoms severe? • Getting worse quickly? • Have lasted for 10 minutes? </div> </div>	



3	CALL – an ambulance now – administer aspirin (300 mg) if available
	<ul style="list-style-type: none"> • In Australia: call 000 (or 112) • In New Zealand: call 111 • Don't hang up • Wait for the operator's instructions.

Adapted with permission from the National Heart Foundation of Australia. Warning signs action plan. Melbourne: National Heart Foundation of Australia, 2012

References

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Further Reading

- National Heart Foundation (Australia). Heart Attack Facts. <http://www.heartattackfacts.org.au>
- National Heart Foundation (Australia) Warning signs of heart attack action plan. http://www.heartattackfacts.org.au/action_plans/HeartAttackActionPlan-english.pdf
- ANZCOR Guideline 7 External Automated Defibrillation in Basic Life Support
- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ANZCOR Guideline 14 ACS: Overview & summary
- ANZCOR Guideline 14.1 ACS: Presentation with ACS
- ANZCOR Guideline 14.2 ACS: Initial Medical Therapy

About this Guideline:

Search date/s	October 2020
Question/PICO:	<p>Population: Adults who experience non-traumatic chest pain</p> <p>Intervention: early or first aid administration of aspirin</p> <p>Comparators: late or in-hospital administration of aspirin</p> <p>Outcomes: Survival, complications and incidence of cardiac arrest were ranked as critical outcomes. Cardiac functional outcome, infarct size and chest pain resolution were ranked as important outcomes.</p> <p>Study Designs: Randomized controlled trials (RCTs) and non-randomized studies (non-randomized controlled trials, interrupted time series, controlled before-and-after studies, cohort studies), case series of 5 or more subjects were eligible for inclusion. Unpublished studies (e.g., conference abstracts, trial protocols) were excluded.</p> <p>Timeframe: All years and all languages were included; unpublished studies (e.g., conference abstracts, trial protocols) were excluded. Literature search updated to October 22, 2019.</p>
Method:	Systematic Review (ILCOR First Aid Task Force, CoSTR) search in 2019
Primary reviewers:	Natalie Hood, Finlay Macneil
Other consultation:	Dion Stub
Worksheet:	See https://www.ilcor.org/
Approved:	April 2021
Guideline superseded:	ANZCOR Guideline 9.2.1 - August 2016

ANZCOR Guideline 9.2.2 – Stroke

Summary

This guideline has been updated based on updates to the 2020 International Liaison Committee on Resuscitation (ILCOR) evidence review,^{1,2} the National Stroke Foundation Clinical Guidelines³ and the Thoracic Society of Australia and New Zealand Oxygen Guidelines for Acute Oxygen Use in Adults.⁴

Who does this guideline apply to?

This guideline applies to adults and children.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].
2. If the person becomes unconscious but is breathing to lay the person on their side and ensure airway is clear [Refer to ANZCOR Guideline 3].
3. We recommend using a validated stroke assessment system to assist stroke recognition. ¹ [CoSTR 2020, strong recommendation, low certainty evidence]
4. We suggest the use of the Facial drooping, Arm weakness, Speech difficulties and Time to call emergency services (FAST) stroke assessment for individuals with suspected acute stroke when blood glucose measurement is not feasible. ² [CoSTR 2020, weak recommendation, low certainty of evidence]
5. We suggest that when blood glucose measurement is feasible, the use of a stroke assessment tool that includes blood glucose measurement, such as the Melbourne Ambulance Stroke Screen (MASS) or the Los Angeles Prehospital Stroke Screen (LAPPS). ² [CoSTR 2020, weak recommendation, low certainty evidence]
6. Send for an ambulance immediately if stroke is suspected, even if short duration of symptoms or if symptoms have resolved. [Good Practice Statement]
7. Do not routinely administer oxygen to persons with stroke.² Administer oxygen only if there are obvious signs of shock or evidence of low oxygen saturation according to Use of Oxygen in Emergencies [Refer to ANZCOR Guideline 9.2.10].
8. Do not give the person anything to eat or drink, as swallowing may be impaired. [Good Practice Statement] If the blood sugar is measured and low, treat according to ANZCOR Guideline 9.2.9.

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)
FAST	<ul style="list-style-type: none">• Facial weakness – ask the person to smile. Is their mouth droopy on one side?• Arm weakness – ask the person raise both arms. Can they only raise one arm or is one arm weaker?• Speech difficulty – ask the person to repeat a phrase. Is their speech slurred and can they understand what you say?• Time to act fast (Take Action) – if any of these signs are present send for an ambulance immediately
MASS	Melbourne Ambulance Stroke Screen
LAPSS	Los Angeles Prehospital Stroke Screen

1 Introduction

Stroke is a common cause of death and disability.⁵ A stroke occurs when the supply of blood to part of the brain is suddenly disrupted. Blood flow can stop through the artery when it gets blocked by a blood clot or when an artery ruptures. Without the oxygen that the blood supplies, surrounding brain cells are quickly damaged and die. A quick response is needed because 'Time is Brain'. If treatment is provided quickly, some of these damaged brain cells can survive. **This is why it is so important to recognise stroke quickly and to send for an ambulance immediately if stroke symptoms are present.**

A person with the symptoms of stroke should be transported by ambulance because paramedics can start the management for stroke and make sure the person is taken to the most appropriate hospital for specialist stroke management. Paramedics can also notify the receiving hospital, reducing time to the start of treatment.

2 Recognition

- **ANZCOR recommends using a validated stroke assessment system to assist stroke recognition.**
¹ [CoSTR 2020, strong recommendation, low certainty evidence] When there is doubt over the diagnosis, the person should be managed as having a stroke until proven otherwise.
- **ANZCOR suggests the use of the FAST stroke assessment for individuals with suspected acute stroke when blood glucose measurement is not possible.** ¹ [CoSTR 2020, weak recommendation, low certainty of evidence]

FAST⁶ is a simple way for remembering the most common signs of stroke.

- Facial weakness – ask the person to smile. Is their mouth droopy on one side?
- Arm weakness – ask the person raise both arms. Can they only raise one arm or is one arm weaker?
- Speech difficulty – ask the person to repeat a phrase. Is their speech slurred and can they understand what you say?
- Time to act fast (Take Action) – if any of these signs are present send for an ambulance immediately.

Other less common symptoms and signs of stroke include:

- numbness of the face, arm or leg
 - difficulty swallowing
 - dizziness, loss of balance or an unexplained fall
 - loss of vision, sudden blurred or decreased vision in one or both eyes
 - headache, usually severe and of abrupt onset or unexplained change in the pattern of headaches
 - drowsiness
 - confusion
 - reduced level of consciousness.
- **ANZCOR suggests, that when blood glucose level measurement is feasible, use a validated stroke assessment tool that includes blood glucose level measurement¹** such as the Melbourne Ambulance Stroke Screen (MASS)⁷ or the Los Angeles Prehospital Stroke Screen (LAPSS).⁸ [CoSTR 2020, weak recommendation, low certainty evidence]

Symptoms of stroke may also be caused by other conditions such as epilepsy, migraine or low blood glucose level (BGL). The measurement of a blood glucose level may improve the recognition of stroke from other conditions when used in conjunction with a stroke assessment tool.¹ Importantly, early recognition of a low blood glucose level enables early treatment according to ANZCOR Guideline 9.2.9 improving the outcome of this condition as well.

3 Management

- If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].
- If the person becomes unconscious but is breathing, lay the person on their side and ensure airway is clear [Refer to ANZCOR Guideline 3].
- Send for an ambulance for any person who has shown signs of stroke, no matter how brief or if symptoms have resolved. [Good Practice Statement].
- ANZCOR suggests against the routine administration of oxygen to persons with stroke.^{2, 10, 11} [CoSTR 2020, weak recommendation, low to moderate certainty of evidence] Administer oxygen only if there are obvious signs of shock or evidence of low oxygen saturation according to ANZCOR Guideline 9.2.10.
- Do not give anything to eat or drink, as swallowing may be impaired. [Good Practice Statement].
- If the blood glucose level is measured and low and the person is fully conscious and able to swallow, treat according to ANZCOR Guideline 9.2.9.

References

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Further Reading

- ANZCOR Guideline 2 Managing an Emergency
- ANZCOR Guideline 3 Recognition and First Aid Management of the Unconscious Victim
- ANZCOR Guideline 4 Airway
- ANZCOR Guideline 5 Breathing
- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ANZCOR Guideline 9.2.9 First Aid Management of a Diabetic Emergency
- ANZCOR Guideline 9.2.10 The Use of Oxygen in Emergencies

About this Guideline

Search date/s	September and October 2019
Question/PICO 1:	<p>Population: Adults with suspected acute stroke</p> <p>Intervention: Use of a rapid stroke scoring system or scale (or test) (as FAST, LAPSS, CPSS, OPSS, KPSS, MASS or others)</p> <p>Comparison: Basic first aid assessment without the use of a scale</p> <p>Outcomes:</p> <ul style="list-style-type: none">• Change time to treatment (e.g. symptom onset to hospital/emergency department arrival or hospital admission (9-Critical)• Recognition of stroke: (5-Important) high number considered beneficial for observational study; high sensitivity and high specificity considered beneficial for diagnosis study• Discharge with favourable neurologic status (increase considered beneficial) (5-Important)• Survival with favourable neurologic outcome (increase considered beneficial) (5-Important)• Increased public/layperson recognition of stroke signs (5-Important)
Question/PICO 2:	<p>Population: Adults with suspected acute stroke</p> <p>Intervention: Use of supplementary oxygen</p> <p>Comparators: No use of supplementary oxygen</p> <p>Outcomes: Clinical outcomes such as survival, neurological outcomes (e.g. NIHSS, Scandinavian stroke scale, modified Rankin scale score,</p>

	<p>etc.), and neurological recovery in the acute phase were ranked as critical outcomes. Quality of life (e.g. Barthel index, EuroQol, Nottingham ADL score, etc.) and hospital length of stay were ranked as important outcomes. Adverse effects and complications (pneumonia, pulmonary edema, necessity of non-invasive positive pressure ventilation, intubation with mechanical ventilation, etc.) were listed as important outcomes. Imaging outcomes such as magnetic resonance imaging (MRI) indicators (diffusion-weighted imaging, lesion volume, diffusion/perfusion mismatch, magnetic resonance spectroscopic indicators, etc.) and reperfusion rate were ranked as important outcomes. Laboratory outcomes such as oxygen saturation (highest, lowest, incidence or duration of oxygen saturation < 90% or 95%, etc.) were listed as good-to-know outcomes.</p> <p>Study Designs: Randomized controlled trials (RCTs) and non-randomized studies (non-randomized controlled trials, interrupted time series, controlled before-and-after studies, cohort studies) are eligible for inclusion. Unpublished studies (e.g., conference abstracts, trial protocols) were excluded.</p> <p>Timeframe: All years and all languages were included; unpublished studies (e.g., conference abstracts, trial protocols) were excluded. Literature search updated to Oct 16, 2019.</p>
Method:	Systematic Reviews (ILCOR First Aid Task Force, CoSTR)
Primary reviewers:	Natalie Hood, Finlay Macneil
Other consultation	Kevin Nation, Janet Bray
Worksheet	See https://www.ilcor.org/
Approved:	April 2021
Guideline superseded:	ANZCOR Guideline 9.2.2 - August 2016

ANZCOR Guideline 9.2.3 – Shock: First Aid Management of the Seriously Ill or Injured Person

Guideline

Who does this guideline apply to?

This guideline applies to adults, children and infants

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid providers.

Recommendations

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

1. Control any bleeding promptly (Guideline 9.1.1).
2. **Send for an ambulance.**
3. Reassure and constantly re-check the person's condition for any change.

Level of Evidence

Low quality

Class of Recommendation

Weak

1 Introduction

Shock is a loss of effective circulation resulting in impaired tissue oxygen and nutrient delivery¹ and causes life threatening organ failure. Any seriously ill or seriously injured person is at risk of developing shock.

2 Causes

Some conditions which may cause shock include²:

2.1 Loss of circulating blood volume (hypovolaemic shock), e.g.:

- severe bleeding (internal and / or external)
- major or multiple fractures or major trauma
- severe burns or scalds
- severe diarrhoea and vomiting
- severe sweating and dehydration.

2.2 Cardiac causes (cardiogenic shock), e.g.:

- heart attack
- abnormal heart rhythm.

2.3 Abnormal dilation of blood vessels (distributive shock), e.g.:

- severe infection (sepsis)
- severe allergic reactions (anaphylaxis)
- severe brain / spinal injuries
- fainting (generally short lived).

2.4 Blockage of blood flow in or out of heart (obstructive shock), e.g.:

- punctured lung causing increased pressure in chest causing reducing return of blood to the heart (tension pneumothorax)
- severe injury to the heart with weak heart muscle (cardiomyopathy) or blood around the heart reducing blood return to the heart (cardiac tamponade)
- blood clot in the lung (pulmonary embolus)
- compression of the large abdominal veins by the uterus in pregnancy.

3 Recognition

Early recognition of the seriously ill or seriously injured person should alert the first aider to the risk of developing shock.

The symptoms, signs and rate of onset of shock vary widely depending on the nature and severity of the underlying cause³. Shock is a condition that may be difficult to identify.

3.1 Symptoms may include:

- dizziness
- thirst
- anxiety

- restlessness
- nausea
- breathlessness
- feeling cold, shivering or chills.
- extreme discomfort or pain

3.2 Signs may include:

- collapse
- rapid breathing
- rapid pulse which may become weak or slow
- fever or abnormally low temperature
- cool, sweaty skin that may appear pale or discoloured
- skin rash
- confusion or agitation
- decreased or deteriorating level of consciousness
- vomiting
- decreased urine output

4 Management

4. Ensure safety of all at the scene
5. Lie the person down. If unconscious place the person on their side (Guideline 3).
6. Control any bleeding promptly (Guideline 9.1.1).
7. **Send for an ambulance.**
8. Administer treatments relevant to the cause of the shock.
9. Administer oxygen if available and trained to do so (Guideline 10.4).
10. Maintain body temperature (prevent hypothermia).
11. Reassure and constantly re-check the person's condition for any change.
12. If the person is unresponsive and not breathing normally, follow the Basic Life Support Flowchart (ANZCOR Guideline 8).

4.1 Positioning of people with shock

If possible, lie the person down rather than sitting them upright⁴ (CoSTR 2015, weak recommendation, low-quality evidence).

For individuals with shock who are in the supine (lying) position and with no evidence of trauma, the use of passive leg raise (PLR) may provide a transient (less than 7 minutes) improvement.

The clinical significance of this transient improvement is uncertain; however, no study reported adverse effects due to PLR⁴. Because improvement with PLR is brief and its clinical significance uncertain, ANZCOR recommends the supine (lying) position without leg raising for those in shock⁴ (CoSTR 2015, values and preferences statement).

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About this Guideline:

Search date/s	2015-2019 Evidence update
Question/PICO:	There was no PICO for the Evidence update
Method:	Both GRADE on SR (for CoSTR 2015) and recent literature review
Primary reviewers:	Jason Bendall; Natalie Hood
Other consultation	None
Worksheet	No worksheet
Approved:	November 2019
Guidelines superseded:	9.2.3 (January 2016)

GUIDELINE 9.2.4

FIRST AID MANAGEMENT OF A SEIZURE

INTRODUCTION

A seizure is a sign of abnormal brain activity, which can be caused by many problems. Up to 10% of the population is likely to experience a seizure at some time in their life.² A seizure may occur when the normal pattern of electrical activity of the brain is disrupted. This can cause changes in sensation, awareness and behaviour, or sometimes convulsions, muscle spasms or loss of consciousness. Seizures vary greatly and most are over in less than 5 minutes. Not all seizures are considered epilepsy.^{1,2}

A seizure may be associated with:

- lack of oxygen (hypoxia);
- onset of cardiac arrest;
- medical conditions affecting the brain, e.g. low blood sugar, low blood pressure, head injury, neurological diseases, epilepsy;
- trauma to the head;
- some poisons and drugs;
- withdrawal from alcohol and other substances of dependence;
- fever in children under six years.

RECOGNITION

Seizures may affect all or part of the body.² Seizure activity may take many forms, and symptoms may include:

- sudden spasm of muscles producing rigidity. If standing the victim will fall down;
- jerking movements of the head, arms and legs;
- Shallow breathing or breathing may stop temporarily;
- dribbling from the mouth; the tongue may be bitten leading to bleeding;
- incontinence of urine and/or faeces;
- changes in conscious state from being fully alert to confused, drowsy, or loss of consciousness;
- changes in behaviour where the victim may make repetitive actions like fiddling with their clothes.

Generalised seizures usually involve the entire body and cause a loss or marked alteration in consciousness. Some generalized seizures result in life-threatening problems with airway or breathing, or risk of trauma from muscle spasms or loss of normal control of posture and movement. During partial seizures, usually only part of the body is affected and the person retains consciousness but may be frightened or confused.

Febrile convulsions are associated with fever and usually resolve without treatment. They occur in approximately 3% of children at some stage between the age of six months and six years.^{3,4} Children who suffer from a febrile convulsion are not at increased risk of epilepsy as a result of experiencing febrile convulsions.^{3,4}

MANAGEMENT OF A SEIZURE

If the victim is unresponsive and not breathing normally, follow Australian Resuscitation Council and New Zealand Resuscitation Council Basic Life Support Flowchart (ARC Guideline 8).

If the victim is unconscious and actively seizing, the rescuer should:

- follow the victim's seizure management plan, if there is one in place;
- manage the victim according to (ARC Guideline 3);
- call an ambulance.

The rescuer should:

- managed as for any unconscious person (ARC Guideline 3);
- remove the victim from danger or remove any harmful objects which might cause secondary injury to the victim;
- note the time the seizure starts;
- protect the head;
- avoid restraining the victim during the seizure unless this is essential to avoid injury;
- lay the victim down and turn the victim on the side when practical;
- maintain an airway;
- reassure the victim who may be dazed, confused or drowsy;
- call an ambulance;
- frequently reassess the victim.

Do not

- put a child in a bath (to lower their temperature) during a convulsion as this is dangerous;
- do not force the victim's mouth open nor attempt to insert any object into the mouth.

A seizure in water is a life threatening situation. If the seizure occurs in water:

- support the victim in the water with the head tilted so the face is out of the water ²;
- remove the victim from the water as soon it is safe to do so²;
- call an ambulance;
- if the victim is unresponsive and not breathing normally, follow Australian Resuscitation Council and New Zealand Resuscitation Council Basic Life Support Flowchart (ARC Guideline 8).

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LEVEL OF EVIDENCE

Expert Consensus Opinion

CLASS OF RECOMMENDATION

Class A - Recommended

FURTHER READING

ARC Guideline 2 Priorities in an Emergency

ARC Guideline 3 Unconsciousness

ARC Guideline 4 Airway

ARC Guideline 8 Cardiopulmonary Resuscitation

ARC Guideline 9.1.4 Head Injury

ARC Guideline 9.2.2 Stroke

ARC Worksheet 9.4.2a

- In adults and children (P), who exhibit seizure activity (I) compared with victims who do not have a seizure (C) what proportion are related to cardiac arrest (O)?
- In adults and children (P), who exhibit seizure activity (I) compared with victims who do not have a seizure (C) what is the risk of cardiac arrest / sudden death (O)?

ARC Worksheet 9.4.2b

- In adults and children having a seizure (P), does giving oxygen (I) compared with not giving oxygen (C) improve outcome (O = mortality, seizure duration, incidence of post-seizure hypoxaemia)?

ANZCOR Guideline 9.2.5 –First Aid for Asthma

Guideline

Who does this guideline apply to?

This guideline applies to adult and child victims.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid providers.

1 Introduction ¹

Asthma is a disorder of the smaller airways of the lungs. People with asthma have sensitive airways which can narrow when exposed to certain 'triggers', leading to difficulty in breathing.

Three main factors cause the airways to narrow:

1. The muscle around the airway tightens (bronchoconstriction).
2. The inside lining of the airways becomes swollen (inflammation).
3. Extra mucus (sticky fluid) may be produced.

In asthma, symptoms are made worse by 'triggers'. Every person's asthma is different and not all people will have the same triggers. Triggers can include:

- Respiratory infection
- Irritants (e.g. cigarette, woodfire or bushfire smoke, occasionally perfumed or cleaning products)
- Inhaled allergens (e.g. dust mite, mould spores, animal danders, grass/tree pollen)
- Cold air, exercise, laughing/crying
- Non steroidal anti-inflammatory agents (e.g. aspirin, ibuprofen)
- Sulfite additives (food preservatives) – more common in those with poorly controlled asthma
- *Food allergy – while usually accompanied by other symptoms such as rash or vomiting, isolated severe asthma may occur as the only presentation and may result in death
- Food colours and flavours
- Emotional triggers such as stress.

*Most fatal cases of food-induced anaphylaxis occur in those with asthma. In patients with asthma known to be at risk from anaphylaxis, if it is uncertain whether the patient is suffering from asthma or anaphylaxis, it is appropriate to administer an adrenaline autoinjector first, followed by asthma reliever medication. No harm is likely to occur by doing so in a patient having asthma without anaphylaxis.

2 Recognition ¹

Asthma can be recognised by the following symptoms and signs:

- A dry, irritating, persistent cough, particularly at night, early morning, with exercise or activity
- Chest tightness
- Shortness of breath
- Wheeze (high pitched whistling sound during breathing).

2.1 Symptoms and signs of a severe asthma attack include some or all of the following:

- Gasping for breath (may have little or no wheeze due to little movement of air)
- Severe chest tightness
- Inability to speak more than one or two words per breath
- Feeling distressed and anxious
- Little or no improvement after using “reliever” medication
- ‘Sucking in’ of the throat and rib muscles, use of shoulder muscles or bracing with arms to help breathing
- Blue discolouration around the lips (can be hard to see if skin colour also changes)
- Pale and sweaty skin
- Symptoms rapidly getting worse or using reliever more than every two hours.²

As well as the above symptoms, young children appear restless, unable to settle or become drowsy. A child may also ‘suck’ in muscles around the ribs and may have problems eating or drinking due to shortness of breath. A child also may have severe coughing and vomiting.

An asthma attack can take anything from a few minutes to a few days to develop.

3 Managing An Asthma Attack

If the victim has a personal written asthma action plan then that plan should be followed.

If there is no action plan in place then use the following Asthma First Aid plan.

3.1 Asthma First Aid Plan

If a victim has any signs of a severe asthma attack, call an ambulance straight away and follow the Asthma First Aid Plan while waiting for the ambulance to arrive.

Step	Australia (4 x 4 x 4)	New Zealand (6 x 6 x 6)
1	Sit the person comfortably upright. Be calm and reassuring. Do not leave the person alone.	
2	Without delay give four separate puffs of a “reliever”. The medication is best given one puff at a time via a spacer device. Ask the person to take four breaths from the spacer after each puff of medication.	Without delay give six separate puffs of a “reliever”. The medication is best given one puff at a time via a spacer device. Ask the person to take six breaths from the spacer after each puff of medication.
	If a spacer is not available, simply use the inhaler. Use the victim’s own inhaler if possible. If not, use the first aid kit inhaler if available or borrow one from someone else.	
3	Wait four minutes. If there is little or no improvement give another four puffs.	Wait six minutes. If there is little or no improvement give another six puffs.
4	If there is still no improvement, call an ambulance immediately.	
	Keep giving four puffs every four minutes until the ambulance arrives.	Keep giving six puffs every six minutes until the ambulance arrives.

No harm is likely to result from giving a “reliever” inhaler to someone without asthma.² [LOE: Expert Consensus Opinion].

If oxygen is available, it should be administered by a person trained in its use, following Use of Oxygen in Emergencies (ANZCOR Guideline 10.4). [LOE: Expert Consensus Opinion].

If a severe allergic reaction is suspected, follow Anaphylaxis – First Aid Management (ANZCOR Guideline 9.2.7)

If victim becomes unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart (ANZCOR Guideline 8).

4 Regional differences in recommended dose and intervals

There are differences in first aid treatment recommendations (e.g. doses and timing of relievers) between Australia and New Zealand. Additionally treatment recommendations for the clinical management of acute asthma by health professionals are different again.

In Australia, the National Asthma Council Australia recommends taking 4 puffs every 4 minutes (4 x 4 x 4)^{4,5} whereas in New Zealand, the Asthma and Respiratory Foundation NZ recommend taking 6 puffs every 6 minutes⁶ (6 x 6 x 6).

The 2015 International Consensus on First Aid Science did not provide any update on dosage or interval between doses. This guideline is not intended to contradict current recommendations of peak asthma bodies in Australia or in New Zealand – the ANZCOR recommended treatment in 3.1 accounts for these regional differences. This guideline does not seek to alter first aid practice (with respect to dosage or timing of reliever medication) in either Australia or New Zealand.

Diagrams for the use of devices



WITH SPACER

Assemble the spacer. Remove inhaler cap and shake well. Place the inhaler upright into the spacer. Place the spacer mouthpiece into the victim's mouth, between the teeth with the lips sealed around it. Press firmly on the inhaler to fire one puff into the spacer. Ask the victim to breathe in and out normally for four to six breaths via the spacer. Repeat this promptly until four to six puffs have been given. Remember to shake the inhaler before each puff.



WITHOUT SPACER

When a spacer is unavailable, shake the inhaler. Place the mouthpiece into the victim's mouth, between the teeth with the lips sealed around it. Press firmly on the inhaler to administer one puff as the victim inhales slowly and steadily. Slip the inhaler out of the victim's mouth. Ask the victim to hold their breath for four seconds or as long as comfortable. Breathe out slowly away from the inhaler. Repeat this promptly until four to six puffs have been given. Remember to shake the inhaler before each puff.



The most common reliever medication is salbutamol. Victim's own reliever medication may be used as an alternative.

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Further Reading

ANZCOR Guideline 5 Breathing

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.2.7 Anaphylaxis – First Aid Management

ANZCOR Guideline 10.4 The Use of Oxygen in Emergencies

ANZCOR Guideline 9.2.7 – First Aid Management of Anaphylaxis

Guideline

Who does this guideline apply to?

This guideline applies to adults, children and infant victims.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid providers.

1 Introduction

Anaphylaxis is the most severe form of allergic reaction and is potentially life threatening. It must be treated as a medical emergency, requiring immediate treatment and urgent medical attention. Anaphylaxis is a generalised allergic reaction, which often involves more than one body system. A severe allergic reaction usually occurs within 20 minutes of exposure to the trigger.¹ Severe allergic reactions may occur without prior exposure to a trigger. It is characterised by rapidly developing airway and/or breathing and/or circulation problems usually associated with swelling, redness or itching of the skin, eyes, nose, throat or mouth. Many substances can cause anaphylaxis but more common causes include:

- foods (especially peanuts, tree nuts, cow's milk, eggs, wheat, seafood, fish, soy, sesame)²
- drugs (e.g. penicillin³)
- venom from bites (ticks) or stings (e.g. bees, wasps or ants).

2 Recognition

Anaphylaxis encompasses a variety of symptoms and signs. Diagnosis is largely based on history and physical findings. Onset can range from minutes to hours of exposure to a substance.² Symptoms and signs are highly variable and may include⁴ one or more of the following:

- difficult / noisy breathing
- wheeze or persistent cough
- swelling of face and tongue
- swelling / tightness in throat
- difficulty talking and /or hoarse voice
- persistent dizziness / loss of consciousness and / or collapse
- pale and floppy (young children)
- abdominal pain and vomiting
- hives, welts and body redness.

3 Management

People with diagnosed allergies should avoid all trigger agents / confirmed allergens and have a readily accessible anaphylaxis action plan and medical alert device. Whenever possible, this information should be sought and implemented provided this does not delay emergency treatment and seeking medical assistance.

3.1 Emergency Treatment

The injection of adrenaline (epinephrine) is the first line drug treatment in life threatening anaphylaxis.^{4,5,6,7}

Adrenaline (epinephrine) autoinjectors are safe and effective management of anaphylaxis. People who have had a prior episode of anaphylaxis often have prescribed medication including adrenaline (epinephrine) in the form of an autoinjector and the early administration of adrenaline (epinephrine) is the priority in the emergency treatment.

If the victim's symptoms and signs suggest anaphylaxis the following steps should be followed.⁴

1. Lay the victim flat; do not stand or walk. If breathing is difficult, allow to sit (if able).
2. Prevent further exposure to the triggering agent if possible.
3. Administer adrenaline (epinephrine) via intramuscular injection^{4,6} (Class A; LOE 4) preferably into lateral thigh:
 - Child less than 5 years - 0.15 mg
 - Older than 5 years - 0.3mg.
4. **Call an ambulance.**
5. Administer oxygen, if available and trained to do so (Class B LOE Expert Consensus Opinion. ANZCOR Guideline 10.4).
6. Give asthma medication for respiratory symptoms.
7. A second dose of adrenaline (epinephrine) should be administered by autoinjector to victims with severe anaphylaxis whose symptoms are not relieved by the initial dose (CoSTR 2015: weak recommendation/very low quality evidence)⁸. The second dose is given if there is no response 5 minutes after the initial dose⁵.
8. If allergic reaction or anaphylaxis has occurred from an insect bite or sting follow Envenomation-Tick Bites And Bee, Wasp And Ant Stings (ANZCOR Guideline 9.4.3).
9. If victim becomes unresponsive and not breathing normally, give resuscitation following the Basic Life Support Flowchart (ANZCOR Guideline 8).

Acknowledgement

Instructional information regarding auto injectors can be accessed via the ASCIA (Australian Society of Clinical Immunology and Allergy) webpage:

<http://www.allergy.org.au/health-professionals/anaphylaxis-resources>

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Further Reading

ANZCOR Guideline 4 Airway

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.4.3 Envenomation – Bee, Wasp and Ant Stings

ANZCOR Guideline 10.4 The Use of Oxygen by First Aiders

ANZCOR Guideline 9.2.9 – First Aid Management of a Diabetic Emergency

Summary

Who does this guideline apply to?

This guideline applies to adults and children.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. When available, and trained to do so, use a blood glucometer to check the person's blood glucose level. [Good Practice Statement]
2. We recommend the use of oral glucose (swallowed) for individuals with suspected hypoglycaemia who are conscious and able to swallow.¹ [strong recommendation, very low certainty of evidence]
3. We suggest against buccal glucose administration compared with oral glucose administration for individuals with suspected hypoglycaemia who are conscious and able to swallow.¹ [weak recommendation, very low certainty of evidence]
4. If oral glucose (tablet) is not immediately available, we suggest a combined oral + buccal glucose (glucose gel) administration for individuals with suspected hypoglycaemia who are conscious and able to swallow.¹ [weak recommendation, very low certainty of evidence]
5. We suggest the use of sublingual glucose administration for suspected hypoglycaemia for children who may be uncooperative with the oral (swallowed) glucose administration route.¹ [weak recommendation, very low certainty of evidence]
6. When available, and trained to do so, use a glucagon injection to manage suspected hypoglycaemia in an unconscious or seizing person. [Good Practice Statement]
7. If unsure of the blood glucose level, manage the person as having suspected hypoglycaemia. [Good Practice Statement].

1 Introduction

Diabetes is a chronic, lifelong medical condition which occurs when the pancreas fails to produce sufficient insulin or the body develops a resistance to the action of its own insulin. Untreated, the absolute or relative lack of insulin will lead to a high blood glucose level. There are two main types of diabetes. 'Type 1 diabetes' is an auto-immune disease that often develops in childhood, and requires lifelong treatment with insulin. 'Type 2 diabetes' is more commonly recognised in adulthood, and requires a treatment combination of diet, exercise, oral medication, and sometimes insulin. 'Gestational diabetes' is a relatively common condition specific to pregnancy, and diabetes can also occur as a consequence of another disease or as a side effect of medication.

Normally the body tightly controls its blood glucose level within a 'normal' range. Having diabetes interferes with this control system, and people living with diabetes need to manage their own blood glucose levels by monitoring what they eat, adjusting their insulin or other medication doses, and frequently testing their own blood glucose levels.

When blood glucose levels become too high or too low, people with diabetes (and some other people without diabetes) may become unwell and need first aid, or treatment at a medical facility.

2 Low blood glucose (*hypoglycaemia* or 'a hypo')

2.1 Introduction

People with diabetes may develop low blood glucose levels as a result of:²

- too much insulin or other blood glucose lowering medication;
- inadequate or delayed carbohydrate intake after their usual insulin or oral medication dose;
- exercise without adequate carbohydrate intake; possibly delayed for up to 12 hours or more after exercise.
- in the setting of other illness; or
- excessive alcohol intake.

Competitors in ultra-marathon endurance events, who do not have diabetes, can also become energy deplete and develop low blood glucose levels requiring first aid management.

Hypoglycaemic events range from those that can be self-managed, to severe episodes, where medical help is needed.

2.2 Recognition

The brain requires a continuous supply of glucose to function normally. When blood glucose levels fall below normal levels symptoms and signs may include:

- sweating,
- pallor (pale skin), especially in young children¹
- a rapid pulse;

- shaking, trembling or weakness;
- hunger;
- light headedness or dizziness;
- headache;
- mood or behavioural changes, confusion, inability to concentrate;
- slurred speech;
- inability to follow instructions;
- unresponsive; or
- seizure

2.3 Management

If a person with diabetes has a diabetes management plan, then that plan should be followed.

If a person with diabetes reports low blood glucose level or exhibits symptoms or signs of *hypoglycaemia*:

- Stop any exercise, rest and reassure;
- If the person is able to follow simple commands and swallow safely, we recommend that first aid providers administer 15-20 grams glucose tablets (4 - 5 x 4 gram glucose tablets) for treatment of symptomatic hypoglycaemia.^{1, 3, 4, 5} [ILCOR CoSTR 2020 strong recommendation, very low certainty of evidence] If glucose tablets are not available, we suggest administering:
 - Confectionary including:
 - jelly beans (5 to 20 beans depending on the brand)
 - Skittles® (20 to 25 candies)
 - Mentos® (5 to 10 mints)³ [ILCOR CoSTR 2015, weak recommendation, very low certainty of evidence]
 - Sugary drinks or sugar-sweetened beverages (approx. 200 mL), but DO NOT administer 'diet' or 'low-cal' or 'zero' or 'sugar free' beverages;
 - Fruit juices (approx. 200 mL);
 - Honey or sugar (3 teaspoons);
 - Glucose gels (15 g of glucose gel)⁶; and
- Monitor for improvement. Resolution of symptoms would be expected within 15 minutes.

If symptoms or signs of hypoglycaemia persist after 10 to 15 minutes, and the person is still able to follow simple commands and swallow safely, administer a further 4 x 4g glucose tablets or alternatives as listed above. Once recovered, give a snack with longer acting carbohydrate, for example: 1 slice of bread OR 1 glass of milk OR 1 piece of fruit OR 2 to 3 pieces of dried fruit OR 1 snack size tub of yoghurt (not diet or 'sugar free' yogurt). If it is a usual meal time, then eat that meal.

If the person deteriorates, does not improve with treatment, is seizing or is unconscious, call for an ambulance.

- If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].
- If the person is unconscious but breathing, lie the person on their side and ensure the airway is clear [Refer to ANZCOR Guideline 3]

Insulin Pumps

If the person is wearing an insulin pump, then they themselves may 'suspend' their own pump if part of a personal diabetes management plan.

First aiders should *not* touch any insulin pump being worn by the person. They should manage and provide treatment for hypoglycaemia as listed above.

2.4 Use of glucagon to treat severe hypoglycaemia

Family members of, and carers for, people with diabetes may be trained in the use of the GlucaGen® HypoKit®. These kits contain an injection of glucagon, which works by triggering the liver to release stored glucose, resulting in raised blood glucose levels. The glucagon is administered by injection.

If trained to do so, give Glucagon in the case of a severe hypoglycaemic event, when the person is unconscious or seizing, and/or is unable to swallow safely.⁴



3 High blood glucose (*hyperglycaemia*)

3.1 Introduction

Hyperglycaemia means having a high blood glucose level. Common causes of hyperglycaemia include inadequate levels of insulin or incorrect doses of diabetes oral medications, infections, excess carbohydrate intake, and stressful situations. Hyperglycaemia can develop over hours or days, and many people do not experience symptoms from hyperglycaemia until their blood glucose levels are extremely high. Hyperglycaemia can also occur at the time of initial diagnosis of diabetes, and may go unrecognised until the person is clearly unwell. If untreated, the person gradually deteriorates, and can go into a coma.

3.2 Recognition

When blood glucose levels remain above normal levels symptoms and signs may include:

- excessive thirst;
- frequent urination;
- dry skin and mouth, with sunken eyes (signs of dehydration);
- recent weight loss;
- rapid pulse;
- nausea and vomiting;
- abdominal pain;
- rapid breathing;

- fruity sweet smell of acetone on the breath (similar to paint thinner or nail polish remover); and
- confusion, a deteriorating level of consciousness, or unresponsiveness.

3.3 Management

If a person with diabetes has a diabetes management plan then that plan should be followed. If the person has no management plan and has symptoms or signs of *hyperglycaemia* they should be assessed by a health care professional.

- If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8]
- If the person is unconscious but breathing, lie the person on their side and ensure the airway is clear [Refer to ANZCOR Guideline 3].

4 Management when unsure if the blood glucose level is high or low

When unsure if the person has a high or low blood glucose level, the safest option is to treat as for *hypoglycaemia* (low blood glucose level). Treatment may lead to a marked improvement if the blood glucose level is low, and is unlikely to do harm if the blood glucose level is high. [Refer to ANZCOR Diabetes fact sheet - appendix]

4.1 Use of blood glucose measuring devices (Glucometers)

If trained to do so and a glucometer is available, checking the person's blood glucose level will guide management, and can confirm *hypoglycaemia* or *hyperglycaemia*. Normal blood glucose concentrations are between 4.0 mmol/L and 7.8 mmol/L.

A blood glucose level between 3.0 mmol/L and 4.0 mmol/L is an “alert value”, meaning that to prevent progression to a more serious, clinically important hypoglycaemia, it is time for a normal food intake, either a snack or meal, depending on the time of day and usual food intake habits.⁵

Clinically important *hypoglycaemia* is defined as a blood glucose level less than 3.0 mmol/L, where there is decreased neuro-cognitive function (reasoning ability or orientation) and increased morbidity (illness) and mortality.⁵

Symptoms of hypoglycaemia may be mimicked by other conditions such as stroke, epilepsy, or migraine. If trained, checking a blood glucose will improve the accuracy of diagnosing hypoglycaemia. We suggest that if the blood glucose concentration is normal, and symptoms and signs of hypoglycaemia persist, other diagnoses need to be considered.³ [CoSTR 2015: weak recommendation/low quality evidence]

Hyperglycaemia is defined as a blood glucose level above the normal reference range. Severe hyperglycaemia is defined as a blood glucose level greater than 15 mmol/L.

References

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2. International Hypoglycaemia Study Group. Minimizing Hypoglycemia in Diabetes. *Diabetes Care*. August 2015. Volume 38: 1583-159
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Further Reading

- ANZCOR Guideline 2 - Managing an Emergency
- ANZCOR Guideline 3 - Recognition and First Aid Management of the Unconscious Victim
- ANZCOR Guideline 8 - Cardiopulmonary Resuscitation
- ANZCOR Guideline 9.2.2 – Stroke

About this Guideline

Search date/s	August 2018
Question/PICO:	<i>Population:</i> Adults and children with suspected hypoglycaemia (out-of-hospital, including healthy volunteers). Neonates are excluded, as we believe the identification of hypoglycaemia in this age group is a specialized diagnostic and treatment process well beyond First Aid.

	<p><i>Intervention:</i> Administration of glucose by any enteral route appropriate for use by first aid providers</p> <p><i>Comparators:</i> Administration of glucose by another enteral route appropriate for use by first aid providers</p> <p><i>Outcomes:</i></p> <ul style="list-style-type: none"> • Resolution of symptoms (critical) – defined as the reversal of the initial symptoms (dichotomous outcome; yes/no). • Time to resolution of symptoms (critical) - defined as the time from the administration of the sugar containing solution until the symptoms resolved (continuous outcome). • Blood or plasma glucose concentration at 20 minutes (critical) – defined as the glucose level as measured 20 minutes after the administration of the sugar substrate (continuous outcome) or as evidence of blood or plasma glucose elevation at 20 minutes (dichotomous outcome; yes/no). • Resolution of hypoglycaemia (Important) – defined as elevation of the blood glucose level to rise above the authors’ threshold for determining hypoglycaemia (dichotomous outcome; yes/no). • Time to resolution of hypoglycaemia (Important) - defined as the time from the administration of the sugar containing solution until the blood glucose concentration rose above the threshold for the authors’ definition of hypoglycaemia (continuous outcome). • Any adverse event (Important) – any event resulting from the administration as defined by the study authors (e.g. aspiration). • Administration delay (Important) – defined as the delay in administering the sugar containing solution as a result of the administration arm (dichotomous outcome; yes/no). <p><i>Study Designs:</i> Randomized and nonrandomized clinical trials, observational studies were included. Unpublished studies (e.g., conference abstracts, trial protocols, methods papers) were excluded.</p> <p><i>Timeframe:</i> All years and all languages were included provided there was an English abstract from inception to December 22, 2017 with an update performed on July 11, 2018.</p>
Method:	Systematic Review by ILCOR with CoSTR available at ILCOR.org
Primary reviewers:	Natalie Hood, Finlay Macneil

Other consultation	Nil
Worksheet	See https://www.ilcor.org/
Approved:	April 2021
Guidelines superseded:	ANZCOR GL 9.2.9 - November 2017

DIABETES FACT SHEET FOR FIRST AIDERS

Diabetes is a disorder of regulation and use of sugar. It is due to a lack of insulin production or resistance of the body to insulin, one of the hormones that controls the use of glucose (a simple sugar used by the body to provide energy for various functions). Untreated, the absolute or relative lack of insulin will lead to a high blood glucose level. There are two main types of diabetes. 'Type 1 diabetes' is an auto-immune disease (the body attacks and destroys part of itself) that often develops in childhood, and requires lifelong treatment with insulin. 'Type 2 diabetes' is more commonly recognised in adulthood, and requires a treatment combination of diet, exercise, medication, and sometimes insulin. Less commonly, 'gestational diabetes' may develop in pregnancy, and diabetes can also occur as a consequence of another disease or as a side effect of medication.

Normally the body tightly controls its blood glucose level within a 'normal' range. Having diabetes interferes with this control system, and people living with diabetes need to manage their own blood glucose levels by monitoring what they eat, adjusting their insulin or medication doses, and frequently testing their own blood glucose levels.

The reasoning behind the practice of assuming hypoglycaemia for a diabetic unwell due to the diabetes is based on the CoSTR (consensus on science and treatment recommendations) published in 2018¹ which made the following recommendations:

- We recommend the use of oral glucose (swallowed) for individuals with suspected hypoglycemia who are conscious and able to swallow (strong recommendation, very low certainty of evidence).
- We suggest against buccal glucose administration compared with oral glucose administration for individuals with suspected hypoglycemia who are conscious and able to swallow (weak recommendation, very low certainty of evidence).
- If oral glucose (e.g. tablet) is not immediately available, we suggest a combined oral + buccal glucose (e.g. glucose gel) administration for individuals with suspected hypoglycemia who are conscious and able to swallow (weak recommendation, very low certainty of evidence).
- We suggest the use of sublingual glucose administration for suspected hypoglycaemia for children who may be uncooperative with the oral (swallowed) glucose administration route (weak recommendation, very low certainty of evidence).

The problem is that most first aiders do not have a glucometer and are not trained in the use of one.

If a diabetic is unwell due to the diabetes, there are 2 possibilities, hypoglycaemia or hyperglycaemia. If oral glucose or glucagon is given to an unwell diabetic person with:

- hypoglycaemia and able to swallow, they will improve.
- hyperglycaemia, they will not get much worse in the short term

If oral glucose or glucagon is withheld from an unwell diabetic person with:

- hypoglycaemia, they will continue to deteriorate rapidly and may not be in a position to swallow safely in a short time
- hyperglycaemia, they will continue to deteriorate slowly till IV rehydration and insulin administration.

Thus there is no short term problems with giving oral glucose or glucagon to a person with diabetic emergency, but major problems if glucose or glucagon is withheld from some persons with a diabetic emergency. Hence ANZCOR recommends that first aiders treat an unwell person with diabetes for hypoglaemia.

Reference:

1. Borra V, Carlson JN, De Buck E, Djärv T, Singletary EM, Zideman D, Bendall J, Berry DC, Cassan P, Chang WT, Charlton NP, Hood NA, Meyran D, Woodin JA, Swain J. Glucose administration routes for first aid in case of symptomatic hypoglycemia. Consensus on Science and Treatment Recommendations [Internet] Brussels, Belgium: International Liaison Committee on Resuscitation (ILCOR) First Aid Task Force, 2018 Aug 27. Available from: <http://ilcor.org>

ANZCOR Guideline 9.2.10 – The Use of Oxygen in Emergencies

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. Basic Life Support measures should never be delayed whilst waiting for oxygen or other equipment. [Good Practice Statement]
2. The administration of supplemental oxygen should be limited to individuals with specific training in oxygen administration.^{1,2} [Good Practice Statement]
3. When bag-valve-mask oxygen resuscitation is used by trained but occasional operators, a minimum of two trained rescuers are required to provide ventilation for a non-breathing person. [Good Practice Statement]
4. Persons who require supplemental oxygen in a first aid setting be further evaluated by a health care professional. [Good Practice Statement].

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)
ANZTS	Australia and New Zealand Thoracic Society

Guideline

1 Introduction

Administration of supplemental oxygen is traditionally considered essential for individuals presenting with shortness of breath, difficulty breathing, or hypoxemia (low oxygen level in the blood). In certain circumstances, oxygen supplementation might have adverse effects that complicate the disease course or even worsen clinical outcomes.¹ The administration of supplemental oxygen should be limited to individuals with specific training in oxygen administration.^{1,2} [Good practice statement]

There is evidence to support the use of oxygen as part of first aid management of decompression illness¹ and for shortness of breath (dyspnoea) in cancer patients with hypoxaemia.¹

The use of oxygen delivery devices, such as bag-valve-mask equipment and oxygen powered resuscitation equipment, should also only be undertaken by those who are trained in their use (with current training and certification). [Good Practice Statement]

2 Equipment

There are many types of oxygen delivery devices available, ranging from the simple oxygen mask, which can be used with very little training, to the more complex bag-valve-mask ventilation equipment.

It is recommended that when bag-valve-mask oxygen resuscitation is used, a minimum of two trained people are required to provide ventilation for a non-breathing person: one to manage the airway, mask and seal, and the second to operate the bag.³ [Good Practice Statement]

If two trained people are not available to provide ventilation for a non-breathing person then mouth-to-mask breathing using a resuscitation face mask with supplemental oxygen will provide adequate oxygenation and ventilation.⁴ [Refer to ANZCOR Guideline 5].

3 Management

Basic Life Support measures should never be delayed whilst waiting for oxygen or other equipment.⁶ [Good Practice Statement]

In the non-breathing person, oxygen may be used if available by mouth-to-mask, bag-valve-mask or positive pressure oxygen delivery system, if the appropriate equipment and personnel with current training and certification in its use are available. [Good Practice Statement]

A person who requires supplemental oxygen in a first aid setting requires further assessment by a health care professional so an ambulance must always be sent for.

3.1 Use of pulse oximetry

It is best practice that the use of supplemental oxygen is guided by pulse oximetry^{2,5} [TSANZ Grade C recommendation: “Body of evidence provides some support for recommendation(s) but care should be taken in its application”].⁵

Oxygen should be administered to persons with an oxygen saturation of less than 92%.⁵

Oxygen should be given to persons signs with cyanosis (blue colouration of skin), shock including from major injury,² decompression illness⁶ or a situation suggesting carbon monoxide poisoning⁷ (eg. house fire) irrespective of their oxygen saturation level or whether pulse oximetry is available.

3.2 Oxygen administration in specific circumstances

Conditions where oxygen is recommended include:

- during cardiopulmonary resuscitation [Refer to ANZCOR Guideline 11.1.1 and ANZCOR Guideline 12.2]
- bleeding [Refer to ANZCOR Guideline 9.1.1]
- burns [Refer to ANZCOR Guideline 9.1.3]
- shock [Refer to ANZCOR Guideline 9.2.3]
- asthma [Refer to ANZCOR Guideline 9.2.5]
- anaphylaxis [Refer to ANZCOR Guideline 9.2.7]
- drowning [Refer to ANZCOR Guideline 9.3.2]
- decompression illness [Refer to ANZCOR Guideline 9.3.5]
- poisoning [Refer to ANZCOR Guideline 9.5.1].

Oxygen use in persons with stroke [Refer to ANZCOR Guideline 9.2.2] and heart attack [Refer to ANZCOR Guideline 9.2.1] who do not have signs of shock should be guided by pulse oximetry as excessive oxygen may be harmful in these conditions.^{2,5,8-10} ANZCOR suggests against the routine administration of oxygen in persons with stroke.^{11,12} [2020 CoSTR, weak recommendation, low-to-moderate certainty evidence] ANZCOR suggests that for persons with stroke, the routine use of oxygen is not recommended if the oxygen saturation is >92% on room air [National Stroke Foundation: weak recommendation, moderate-to-high certainty evidence].⁸

ANZCOR suggests against the routine administration of oxygen in persons with chest pain.¹³ [2015 CoSTR, weak recommendation, very-low certainty evidence] For persons with heart attack, routine use of oxygen is not recommended if the oxygen saturation is >93% [National Heart Foundation of Australia & Cardiac Society of Australia and New Zealand: practice advice].⁹

References

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13. Nikolaou NI, Welsford M, Beygui F, et al. Part 5: Acute coronary syndromes 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation* 2015; **95**: e121-e46.

About this Guideline

Search date/s	November 2020
Method:	Evidence update based on British Thoracic Society and Thoracic Society of Australia and New Zealand Guidelines
Primary reviewers:	Julie Considine
Other consultation:	Finlay Macneil
Worksheet:	See BTS and TSANZ publications
Approved:	April 2021
Guideline superseded:	ANZCOR Guideline 9.2.10 - January 2016

ANZCOR Guideline 9.2.11 – First Aid Management of The Agitated Person

Summary

Who does this guideline apply to?

This guideline applies to adults, adolescents and children

Who is the audience for this guideline?

This guideline is for bystanders, first aiders and first aid training providers

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) recommends:

1. ensuring your safety and the safety of others; send for help early (Ungraded, Good practice statement)
2. attempt de-escalation strategies/techniques only if experienced in these techniques (Ungraded, Good practice statement)
3. identify and treat any medical conditions and/or injuries when safe to do so (Ungraded, Good practice statement)
4. avoid physical restraint for an aggressive, agitated/behaviourally disturbed person (Ungraded, Good practice statement)

Guideline

1 Introduction

First aiders and first aid providers may encounter persons presenting with abnormal behaviour including agitation, aggression and abnormal thinking or thoughts. Behavioural disturbances can range from mild to life threatening. Professional healthcare assessment is needed to determine the most likely cause of the abnormal behaviour to guide appropriate treatment.

The immediate goals of first aid for the agitated/behaviourally disturbed person is keeping yourself, others and the person safe from harm.

Severe behavioural disturbance is behaviour that puts the disturbed person or others at immediate risk of serious harm and may include threatening or aggressive behaviour, extreme distress, and serious self-harm which could cause major injury or death. ¹

2 Causes

Agitation or behavioural disturbance can have many causes and may or may not be related to a mental health disorder or other illness. There are many causes of agitation / behavioural disturbance including:

- medical conditions e.g. head injury, hypoxia (low oxygen levels in blood), infections (e.g. meningitis), seizures, metabolic derangements (e.g. low blood sugar, electrolyte disturbance), organ failures (e.g. liver & kidney), dementia and delirium
- intoxication / withdrawal e.g. alcohol, hallucinogens, stimulants (e.g. amphetamine type substances, cocaine), cannabis, synthetics, opioids, sedatives
- mental health conditions e.g. psychotic disorders (e.g. schizophrenia), anxiety disorders, and personality disorders
- others: developmental disorders e.g. intellectual disability, autism spectrum disorders, grief, situational stress and pain.

These causes may be applicable to the person requiring first aid and/or others at the scene such as a parent, friend, partner or family member. The first aid management of agitation / behavioural disturbance may apply to one or more people at the same time².

3 Recognition

Agitation / behavioural disturbance encompasses a variety of symptoms and signs alone or in combination. Diagnosis is largely based on history and physical findings. Symptoms and signs are highly variable but include:

- increased arousal (e.g. agitation, excitement, restlessness, pacing, tearful, wringing hands, screaming, yelling, frightened, frantic)
- a rigid body language (an indicator of an intense effort to control themselves)
- abnormal or unusual thinking, perception or ideas (e.g. hallucinations)
- inappropriate clothing for the climate or context
- altered conscious state
- aggressive / violent / argumentative / bizarre behaviour.

A severe and potentially life-threatening form of behavioural disturbance is present when the person has:

- an elevated body temperature, is hot to touch or is sweating profusely
- insensitivity to pain (e.g. may be walking with a broken leg or severe injury)
- a rapid respiratory rate and rapid pulse rate
- extreme arousal with aggression or violence.

4 Management ¹⁻⁵

The initial approach to a person with agitation / behavioural disturbance should be focused on safety. The initial approach to a person with agitation / behavioural disturbance should be focused on safety. De-escalation strategies are extremely difficult without training and experience. They can exacerbate the situation if not performed properly. They should not be attempted unless trained and skilled at the technique. The important point is to stay safe and seek help. The points below are given as information on how to avoid further danger to first aiders and bystanders.

Principles

- Ensure your safety and the safety of others – seek appropriate support and assistance early (e.g. ambulance, security services, police, mental health professionals).
- Reassure – empathise and listen actively, if it is safe and trained to do so. Listen closely and non-judgementally to what the person is saying and feeling.
- Seek advice or assessment from a healthcare professional.
- If the person deteriorates or becomes unconscious, manage the person according to ANZCOR Guideline 3.
- If the person becomes unresponsive and not breathing normally, give resuscitation following the Basic Life Support Flowchart (ANZCOR Guideline 8).

5 Staying safe

Staying safe is a priority. Be aware of the potential danger and ensure safety of first aiders, others and the behaviourally disturbed person. If you are unsure or feel threatened in any way, remove yourself and others from the situation, seek a safe space and send for appropriate support and assistance.

- Avoid being alone with the person and when possible keep at least two arm lengths away.
- Always face the person, maintain visual contact and never turn your back.
- Be vigilant for signs of violence or escalation.
- Make sure there is access to two exits if possible and avoid blocking exits.
- Remove any object that could be used as weapons.
- People who are calming may be of assistance and try to keep conflict partners away from the person.
- Speak politely and with non-threatening body language.
- Reduce external stimuli such as noise, odour, light, and background movement.
- Be aware of the person's cultural background to avoid words or actions that are taboo or could shame the person.
- It is helpful to find someone the person knows and trusts to help with their care, but do not leave the scene to find that person.
- Be aware the person may act on a delusion or hallucination and this may not make sense to the first aider.

- If a person does become violent or you feel unsafe; stop managing them, move to safety and send for appropriate support and assistance.
- Watch for decreasing level of consciousness.

6 Behavioural disturbance in children

The effective management of behavioural disturbance in children is difficult and requires specialised training and extensive experience, increasing the need to seek appropriate support and assistance early. The same general principles of management apply as described above modified to the child's age and needs.

The initial focus of management should be on your safety, the safety of others and the safety of the child. Involvement of the child's family/ carer (if available and appropriate) will generally be helpful in the first aid setting. The child's family / carer will be able to provide advice and assistance to determine the most likely effective de-escalation strategies such as age appropriate distraction techniques (e.g. toys).

7 Physical restraint

Physical restraint is associated with potential harm to both the aggressive or agitated / behaviourally disturbed person and the care provider. The risks of physical restraint typically outweigh the benefits. ANZCOR recommends avoiding the physical restraint of aggressive, agitated/behaviourally disturbed persons by bystanders / first aiders and first aid providers.

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Further Reading

- ANZCOR Guideline 2 - Managing an emergency
- ANZCOR Guideline 8 - Cardiopulmonary Resuscitation
- ANZCOR Guideline 9.5.1 - Emergency management of a person who has been poisoned
- Kitchener BA, Jorm AF, Kelly CM. Mental Health First Aid Manual. 4th ed. Melbourne: Mental Health First Aid Australia; 2017

About this Guideline

Search date/s	November 2019
Question/PICO:	(Aggression or agitation) (and (in out of hospital setting)) – used as later filter (P), does any intervention (I) vs none [C], affect outcome (O)
Method:	Scoping literature review plus consensus of experts on ANZCOR and Red Cross consulted by first author and advice in Kitchener, Iorm and Kelly. Mental Health First Aid Manual. 4 th ed. Melbourne: Mental Health First Aid Australia; 2017
Primary reviewers:	Tom Clark, Jason Bendall, Finlay Macneil
Other consultation	NSW Health Policy Document PD2015_004 (accessed 1 November 2019) Hugh Grantham, Tracy Kidd and Ella Tyler
Approved:	20 November 2020
Guidelines superseded:	N/A new guideline

ANZCOR Guideline 9.2.12 – Recognition and First Aid Management of the Seriously Ill person including Sepsis

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. First aiders learn to recognise a seriously ill person [Good Practice Statement]
2. If serious illness is suspected, send for an ambulance – delayed treatment can quickly lead to more serious illness and death. [Good Practice Statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation

1 Introduction

There are many conditions that present in the community that need urgent assessment and treatment by health care professionals. The nature of most of them is obvious but some are difficult to diagnose even under ideal circumstances in hospital. One frequent example is sepsis. There are a number of other conditions that are hard to distinguish from sepsis. However, the diagnosis of the exact condition is not important for the first aider because these conditions share a common set of symptoms and signs. It is more important to recognise that a person needs urgent medical care than to diagnose the nature of the illness. There is very little published about the first aid management or recognition of these conditions. There is a growing body of evidence about how health care professionals should “recognise the deteriorating patient.” The purpose of this guideline is to help the first aider recognise the person in need of urgent medical care but is not intended for the diagnosis of illnesses.

More information on sepsis can be found on the Australian Sepsis Network website (<https://www.australiansepsisnetwork.net.au>)

2 Causes

Anyone can deteriorate quickly with a serious illness, but certain people are at higher risk including¹:

- children under 10¹
- people over 65 years of age^{2,3,4}
- people with chronic diseases
- people with weakened immune systems
- Aboriginal and Torres Strait Islander Peoples, Maori and Pasifika

3 Recognition

Early recognition of serious illness is critical as early treatment improves outcomes. These symptoms and signs set out below may indicate serious illness. These symptoms and signs are common to many conditions and it is their combination that alerts health professionals to the possibility of serious illness and prompts further investigation and treatment. The more signs and symptoms in combination, the higher the risk that the underlying problem is a serious illness. Perhaps the most important indicator is that the person with a serious illness feels “not right” or say they might feel they are “going to die”.⁹ This is even more significant if the people that know this person have noticed a change in their behaviour.⁶

3.1 Red Flags for serious illness.

The more red flags present, the greater the concern that the person is seriously ill.

The bulk of the evidence related to serious illness in adults is from in-hospital studies, so the indicators of serious illness in adults are extrapolated from that evidence. The indicators of serious illness in adults include:⁸⁻¹³

- rapid breathing (breathing rate ≥ 22 / minute) is the most reliable indicator of serious illness in adults
- breathlessness or feeling short of breath
- restlessness, agitation, dizziness, decreased level of consciousness, confusion, slurred speech or disorientation
- shivering or shaking, fever or feeling very cold

- unexplained muscle pain or discomfort
- passing little or no urine
- rapid heart rate
- nausea and or vomiting
- new rash or blotchy, pale, or discoloured (often described as mottled) skin;
- person may say they 'don't feel right' or they might say they feel like they 'are going to die'.

3.2 Serious illness in children and infants

Children and infants with serious illness can deteriorate quickly. Symptoms and signs of serious illness in infants and children may include:¹⁴

- rapid breathing, weak cry or grunting
- hard to wake, lethargic or floppy
- seizure or fits
- a rash that doesn't fade when pressed
- discoloured, mottled, very pale or bluish skin
- fever, feeling cold or cold to touch
- vomiting repeatedly
- not passing urine (or no wet nappy) for several hours
- not feeding or drinking.

Children often cannot express how they feel so look for the combination of an infection with any of the signs and symptoms listed.

In children, parental concern that this illness is more severe or different and care providers thinking "something is wrong" are predictive of the presence of sepsis.⁵

4 Management

Serious illness is a medical emergency and typically requires in-hospital management and the prompt administration of medications or an operation which targets the infection or other illness.

Send for an ambulance if:

- you suspect sepsis or other serious illness;
- an infection related illness is not improving;
- carer is concerned that this illness is more severe or different;
- care providers (including first aiders) think "something is wrong".

4.1 Those that are unresponsive, unconscious or fitting

Send for an ambulance.

- if the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8];
- if the person is unconscious but breathing, lie them on their side, ensure the airway is clear [Refer to ANZCOR Guideline 3] and keep them under observation;
- if the person is having a seizure, lie them on their side, ensure the airway is clear [Refer to ANZCOR Guideline 3 and Guideline 9.2.4] and keep them under observation;
- administer oxygen only if there are obvious signs of shock or evidence of low oxygen saturation according to use of Oxygen in Emergencies [Refer to ANZCOR Guideline 9.2.10].

4.2 Those that are conscious

Send for an ambulance.

- lie the person down if comfortable lying down;
- treat shock if present [Refer to ANZCOR Guideline 9.2.3], but do not cover with a blanket if the person already feels hot to touch;
- consider administering oxygen if indicated as per ANZCOR Guideline 9.2.10;
- reassure and constantly re-check the person's condition for any change.

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About this Guideline

Search date/s	November 2019
Question/PICO:	In adults, children and infants [P], is there any reliable method of recognizing sepsis available to a first aider in out of hospital setting?
Method:	Scoping review
Primary reviewers:	Jason Bendall, Finlay Macneil, Natalie Hood, Hugh Grantham
Other consultation	Australian Sepsis Network
Approved:	April 2021
Guidelines superseded:	N/A – new guideline

ANZCOR Guideline 9.3.2 – Resuscitation in Drowning

Summary

Who does this guideline apply to?

This guideline applies to adults, children, and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders, and first aid training providers.

Summary of Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations in managing those who are drowning:

1. If the person is not out of the water, only attempt a rescue if it is safe to do so; rescue from land or craft is safest [Good Practice Statement]
2. All drowning persons who are out of the water and unresponsive should be assessed on their back. If the person is not breathing normally, start cardiopulmonary resuscitation (CPR). Resuscitation should not be delayed while waiting for oxygen equipment or an automatic external defibrillator (AED) to arrive [Good Practice Statement]
3. If the airway is obviously obstructed, promptly roll the person onto their side to allow any foreign material to drain using gravity. Do this with a minimal interruption to CPR [Good Practice Statement]
4. Do not clear the upper airway of froth that may re-accumulate during resuscitation [Good Practice Statement]
5. Rescue breaths or ventilation should be administered as part of CPR [Good Practice Statement]
6. All persons involved in a drowning incident require medical assessment even if seemingly minor or they appear to have recovered [Good Practice Statement].

Abbreviations

Abbreviation	Meaning/Phrase
AED	Automated External Defibrillator
CPR	Cardiopulmonary Resuscitation
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)

Guideline

1 Introduction

The WHO definition of drowning is: “Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid; outcomes are classified as death, morbidity and no morbidity”¹. For first aiders this can be paraphrased as: Drowning is the process of being unable to breathe usually as a result of liquid entering the lungs. The outcome from drowning is classified as either fatal or non-fatal drowning.² Other terms such as near-drowning, delayed drowning, wet drowning, dry drowning, salt/freshwater drowning, active drowning, passive/silent drowning, and secondary drowning have previously been used to describe incidents. These terms are inaccurate and should not be used as they either describe medical conditions that do not exist or more importantly, do not alter the initial management of drowning by rescuers.³

Early rescue and resuscitation by trained first responders or first aiders offer the person the best chance of survival. As some drowning persons may still be in the water, additional safety measures are required to avoid rescuers getting into difficulty themselves while attempting rescue.

The most important consequence of drowning is an interruption of the brain's oxygen supply. For this reason, prompt initiation of CPR including rescue breathing is important if the person is unresponsive and not breathing normally.

The management of drowning is summarised in the Drowning Chain of Survival.⁴



2 Prevention

Drowning is a serious public health issue and a leading cause of unintentional injury and mortality worldwide.⁵ The United Nations passed its first ever Resolution on Global Drowning Prevention (A/75/273) in April 2021, urging all countries to take action to prevent drowning⁶. Not all drowning is fatal, but some survivors suffer long-term or permanent disability. Prompt rescue and resuscitation on-scene offers persons the best chance of survival, however, prevention is the most important step in the Drowning Chain of Survival.⁴ With drowning an ever-present risk at beaches, rivers, lakes, pools, bathtubs and even buckets for infants, first aiders, first responders, and health professionals play a critical role in drowning prevention.

The World Health Organization has identified ten evidence-based interventions and strategies that set out in simple terms the measures that need to be employed to address the drowning problem at the community, regional, state, or national level.⁷ Pool fencing has been shown to significantly reduce the risk of drowning in children, and the International Task Force on Open Water Drowning Prevention has produced a series of messages to keep yourself and others safe in, on, or around water.^{8,9}

<i>Keep Yourself Safe</i>	<i>Keep Others Safe</i>
1. Learn swimming and water safety survival skills	1. Help and encourage others, especially children, to learn swimming and water safety survival skills
2. Always swim with others	2. Swim in areas with lifeguards
3. Obey all safety signs and warning flags	3. Set water safety rules
4. Never go in the water after drinking alcohol	4. Always provide close and constant attention to children you are supervising in or near water
5. Know how and when to use a lifejacket	5. Know how and when to use lifejackets, especially with children and weak swimmers
6. Swim in areas with lifeguards	6. Learn first aid and CPR
7. Know the water and weather conditions before getting in the water	7. Learn safe ways of rescuing others without putting yourself in danger
8. Always enter shallow and unknown water feet first	8. Obey all safety signs and warning flags

3 Management

3.1 Removal from the water

Remove the person from the water as soon as possible but do not endanger your own safety. Throw a rope or something that floats, e.g., life-ring, lifejacket, buoyant cool box lid, body board or inflated ball to provide buoyancy to the person and interrupt the drowning process. Call for help; plan and effect a safe rescue. Rescue from land or craft is safest; only enter the water with some form of flotation.⁴ If it is not safe to enter the water, wait for rescue services to arrive.

3.2 Assessment of the responsive person

In minor incidents, removal from the water is often followed by coughing and the return of normal breathing. Although the incidence of post-drowning complications resulting in death is rare, these people still require health professional assessment, discharge advice, and in some cases, observation before they can be released.¹⁰ If the person has required treatment, even if they appear fully recovered, send for an ambulance.

3.3 Assessment of the unresponsive person

In more serious incidents, assess the person on the back with their head and the body at the same level, rather than in a head-down position. This decreases the likelihood of regurgitation and vomiting and is associated with increased survival.¹¹ The person should not be routinely rolled onto the side to assess airway and breathing.

3.4 Rescue Breaths

ANZCOR recommends rescuers perform CPR with rescue breaths for all those who are unresponsive and not breathing normally (Refer to ANZCOR Guideline 8). This should continue until ambulance or rescue personnel take over.

3.5 Positioning

Assessing the person's airway without turning onto the side (i.e. leaving the person on the back or in the position in which they have been found) has the advantages of taking less time to perform, simplified teaching, and minimises movement of the person (Refer to ANZCOR Guideline 4).

The exceptions to this would be where the airway is obviously obstructed with fluid or particulate matter (sand, debris, vomit). In this instance, the person should be promptly rolled onto the side to clear the airway. The mouth should be opened and turned slightly downwards to allow any foreign material to drain using gravity (Refer to ANZCOR Guideline 4).

3.6 Vomiting and regurgitation

Vomiting and regurgitation often occur during the resuscitation of a drowned person. If the person has been rolled to the side to clear the airway, then reassess their condition. If breathing commences, the person can be left on the side with appropriate head-tilt. If not breathing normally, the person should be promptly rolled onto their back and resuscitation recommenced as appropriate (Refer to ANZCOR Guideline 4).

Avoid delays or interruptions to CPR. Do not empty a distended (swollen) stomach by applying external pressure. Do not attempt to expel or drain frothy fluid that may re-accumulate in the upper airway during resuscitation.

3.7 Post-resuscitation care

People who have been rescued and resuscitated require close monitoring in case they deteriorate. This can occur in the minutes or hours following recovery due to persisting lung damage and injury to the heart from low oxygen levels.¹² Send for an ambulance for all those involved in a drowning incident, even if seemingly minor or they appear to have recovered.

4 Other considerations in drowning

4.1 Chest compression-only CPR

The primary cause of cardiac arrest in drowning is a lack of oxygen. Chest compression-only CPR circulates oxygen-poor blood and fails to address the person's need for immediate ventilation.

It is strongly discouraged in a drowned person and should only be used temporarily if the rescuer is unable or unwilling to perform rescue breathing before the arrival of a barrier device, face mask, or bag-mask device or a person willing and able to perform rescue breathing [Good Practice Statement].¹³

4.2 Use of the AED

During drowning, prompt initiation of rescue breaths and starting CPR is very important. Do not delay starting CPR while waiting for an AED to arrive. As soon as it is available, the AED should be attached, and the prompts followed. Dry the person's chest if feasible before applying the pads. Although the cardiac rhythm following drowning is usually non-shockable, the AED may be lifesaving in the small number of those drowned who have a shockable cardiac rhythm.¹⁴ Defibrillation on a wet surface, for example poolside, is not dangerous.¹⁵

4.3 Oxygen

In the unresponsive person with abnormal breathing, oxygen should be used if available by mouth-to-mask, bag-mask, or positive pressure delivery system if the appropriate equipment and trained personnel with current training and certification in its use are available (Refer to ANZCOR Guideline 9.2.10). However, CPR should not be delayed while waiting for oxygen equipment to arrive.

Supplemental oxygen should be used in accordance with ANZCOR Guideline 9.2.10. The use of supplemental oxygen in drowning includes if the person has cyanosis (blue colouration of skin), has difficulty breathing, or has been successfully resuscitated irrespective of their oxygen saturation level or whether pulse oximetry is available. Pulse oximeters may be unreliable if the person is wet or cold, so continue to administer oxygen until the ambulance arrives.

4.4 Medical conditions leading to sudden incapacitation in the water

Not all water-related deaths are due primarily to drowning. Sudden incapacitation leading to swim failure, unconsciousness, and subsequent water in the airway can occur due to heart attacks, cardiac rhythm disturbances, seizures, hyperventilation, drugs and alcohol, dementia, frailty, decompression illness in scuba divers and other conditions causing loss of consciousness, e.g., low blood glucose levels in a person with diabetes. These conditions should be suspected in competent swimmers found drowned unexpectedly

4.5 Spinal injuries occurring in the water

Spinal injury occurring with drowning is rare but should be suspected if the person dived into shallow water, is found in an area of dumping surf, rocks, or after an incident involving a boat or other aquatic craft.¹⁶ Remove the person from the water while minimising movement of the spine in any direction by manual in-line immobilisation (Refer to ANZCOR Guideline 9.1.6), noting that speed of rescue and airway management take priority over a possible spinal injury. Therefore, an unresponsive person who is not breathing normally should be removed from the water immediately by whatever means possible.

4.6 Hypothermia

There is no evidence that drowning in colder water has an increased survival rate than those in warmer water and the temperature of the water should not alter the initial actions of rescuers. There are reports of people, who had normal oxygen levels before they became hypothermic and rescued from icy waters making a full recovery even after extended periods of cardiac arrest.

However, time under water (submersion time) is the only variable that has been shown to affect survival rates.^{17, 18} Hypothermia in Australia and New Zealand is more likely due to prolonged time in the water and ongoing cooling during resuscitation, in a wet, open environment. If the person is unresponsive and not breathing, CPR should continue until ambulance or rescue personnel take over.

4.7 In-water resuscitation

Remove the person from the water as soon as possible. Only deliver in water resuscitation if trained to do so and immediate removal from the water is delayed or impossible. Rescue breaths in deep water requires a highly trained rescuer and a flotation aid. Chest compressions are ineffective in water and should never be attempted

5 Reporting

Organisations teaching and managing first aid of drowning should collect data on the incidents managed in their organisation using data collection methods of their organisation. It should be noted that there is an Utstein data set for drowning.¹⁹

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About this Guideline

Search date/s	February 2021
Question/PICO 1:	N/A.
Method:	Evidence update based on ILCOR drowning scoping review
Primary reviewers:	Jonathon Webber, Kevin Nation
Other consultation	Finlay Macneil
Worksheet	See "Resuscitation and emergency care in drowning: A scoping review." Bierens, J., Abelairas-Gomez, C., Barcala Furelos, R., Beerman, S., Claesson, A., Dunne, C., Elsenga, H., Morgan, P., Mecrow, T., Pereira, J., Scapigliati, A., Seesink, J., Schmidt, A., Sempstrott, J., Szpilman, D., Warner, D., Webber, J., Johnson, S., Olasveengen, T., Morley, P. and Perkins, G., 2021. Resuscitation and emergency care in drowning: A scoping review. Resuscitation, 162, pp.205-217.
Approved:	12 November 2021
Guideline superseded:	9.3.2 (2014)

ANZCOR Guideline 9.3.3 - First Aid Management of Hypothermia and Cold-Related Injuries

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants but excludes newborns in the first minutes to hours following birth.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations in managing those who have, or may have, **hypothermia**:

1. ANZCOR recommends rescuers perform cardiopulmonary resuscitation (CPR) for those who are unresponsive and not breathing normally (ANZCOR Guideline 8). This should continue until ambulance or rescue personnel take over.
2. ANZCOR suggests for those with severe hypothermia who are unresponsive and not breathing normally, where it is not possible to start CPR (for example if initially moving the person to a safer location), rescuers may consider delaying the onset of CPR for up to 10 minutes⁴ [Good practice statement].
3. ANZCOR suggests for those with severe hypothermia who are unresponsive and not breathing normally, only where it is not possible to maintain the continuity of CPR (for example during transport), performing periods of at least 5 minutes of CPR with periods of no more than 5 minutes without CPR. Uninterrupted CPR should be resumed as soon as feasible⁴ [Good practice statement].
4. ANZCOR suggests preventing further heat loss using barriers that use a combination of an insulation layer, such as woollen blankets, and a vapor barrier such as plastic wrap^{5,6,7} [Good practice statement].
5. ANZCOR suggests that if the person is not shivering the rescuer should begin active rewarming.⁸ [Good practice statement].
6. ANZCOR suggests that a person with hypothermia who is shivering will also derive benefits (comfort, reduced cardiovascular stress) from active rewarming⁸ [Good practice statement].

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations in managing those who have, or may have, **cold injury**:

1. ANZCOR suggests, if possible, remove jewellery from the affected area and elevate the affected part [Good practice statement].

2. ANZCOR suggests rewarming the affected part immediately. Affected fingers may be placed in the opposite armpit, the armpit of a companion, or a warm hand over a frostbitten cheek or ear. Feet can be rewarmed on the warm abdomen (under clothing) of a companion [Good practice statement].
3. ANZCOR suggests NOT to rub the affected tissue, use radiant heat, or break blisters⁹ [Good practice statement].
4. ANZCOR suggests avoiding walking on affected feet. Rest with the feet elevated⁹ [Good practice statement].
5. ANZCOR suggests ensuring that re-freezing does not occur. Once colour and consistency of the skin have been restored the person can safely resume normal activity provided they increase their insulation and take precautions against recurrence [Good practice statement].

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations
CPR	Cardiopulmonary resuscitation

1 Introduction

Exposure to cold conditions can lead to generalised cooling of the body, **hypothermia**, or localised cold injury. For normal function of most body systems and organs the human body temperature is kept controlled between narrow limits (about 37°C). Hypothermia occurs when the body gets very cold and cannot warm up on its own.

Shivering is a mechanism that the body uses to prevent hypothermia. A person who is cold and shivering with a core temperature above 35°C is *cold stressed* but does not have hypothermia. Those that are cold stressed and able to move should reduce further heat loss and take active steps to rewarm³.

Cold injury may be either **freezing cold injury** (frostbite) or **non-freezing cold injury** (NFCI) or trench foot.

2 Hypothermia

Hypothermia occurs when the body temperature is below 35°C. As the body temperature falls, systems and organs progressively fail until death occurs. Infants and elderly people are at greater risk. Hypothermia may develop acutely, for example by falling into icy water. More commonly hypothermia is a gradual process, an example of this is those who have prolonged exposure to cold conditions such as cold weather or lying on a cold floor without adequate protection.

Cooling reduces the resting oxygen consumption of most human tissues, and can protect the brain from injury due to low oxygen levels. There are reports of people with normal oxygen levels before they became hypothermic making a full recovery, even after extended periods of cardiac arrest.³ For those in cardiac arrest due to hypothermia, immediate uninterrupted CPR is the objective, but this is not always possible or may be suboptimal when evacuating a person on a stretcher, transferring into and out of a vehicle, and at altitude. Delayed and interrupted CPR may be of benefit to those with severe hypothermic cardiac arrest where uninterrupted CPR is impossible.^{3,4}

To accomplish passive rewarming the person's body temperature regulation mechanisms must be intact and they need adequate energy stores in order to create their own body heat through shivering.¹ Shivering during mild hypothermia can increase heat production by three to five times.² Drinks with a high-carbohydrate content will fuel shivering and thus heat production, which will minimize or prevent further core cooling. Warm drinks will not provide a significant thermal benefit to the body's core. In fact, a warm drink may temporarily inhibit shivering through the competing responses of increasing comfort in contrast to its effectiveness, which results in a decreased heat balance.⁸

In general, when external heat is applied to people who are vigorously shivering (mildly hypothermic), skin warming inhibits shivering heat production by approximately the same amount of heat that is donated, such that core rewarming rates are similar between shivering only and external warming. If external heat is available there is a benefit of increased comfort, decreased energy requirements and reduced stress on the heart and other body systems.⁸

People with severe hypothermia who are not shivering have a greatly reduced ability to produce their own body heat. Wrapping methods can reduce further heat loss, however, active rewarming methods are required to rewarm the person's core temperature effectively.¹

2.1 Hypothermia Prevention

Hypothermia may occur due to unavoidable circumstances but in many cases it can be prevented.

When planning outdoor activities ensure:

- adequate equipment and protection from cold, wind and moisture. Wear appropriate clothing, stay dry and be aware of any potential for 'wind chill'
- a regular intake of food and non-alcoholic drinks. Eat appropriate energy food such as fruit or warm sweet fluids, if available, and drink regularly
- a plan for the terrain and environment, that everyone is adequately trained, and that there is experienced leadership.

Further information on prevention, refer to:

- New Zealand Mountain Safety Council www.mountainsafety.org.nz
- Snow Safe www.snowsafesafe.org.au

2.2 Hypothermia Recognition

If temperature measurement is not possible, rescuers should use the following criteria to assess the hypothermic status of the affected person:

Mild hypothermia (32-35°C):

- shivering
- pale, cool skin
- impaired coordination
- slurred speech
- responsive, but possibly with delayed responses.

Moderate (28-32°C) to severe (less than 28°C) hypothermia:

- absence of shivering
- increasing muscle stiffness
- confusion and/or a progressive decrease in responsiveness
- slow/irregular pulse
- low blood pressure.

In more severe cases there may be dangerous heart rhythms and cardiac arrest. The person may have fixed and dilated pupils and appear dead, particularly if they have a weak slow pulse.

2.3 Management

ANZCOR recommends:

- rescuers perform CPR for those who are unresponsive and not breathing normally (ANZCOR Guideline 8). This should continue until ambulance or rescue personnel take over.

ANZCOR suggests:

- for those with severe hypothermia who are unresponsive and not breathing normally, where it is not possible to start CPR (for example if initially moving the person to a safer location), rescuers may consider delaying the onset of CPR for up to 10 minutes⁴ [Good practice statement]
- for those with severe hypothermia who are unresponsive and not breathing normally, only where it is not possible to maintain the continuity of CPR (for example during transport), performing periods of at least 5 minutes of CPR with periods of no more than 5 minutes without CPR. Uninterrupted CPR should be resumed as soon as feasible⁴ [Good practice statement]
- moving the person to a warm, dry shelter as soon as possible. Keep the person lying flat and minimise their physical activity³

- removing any wet clothing and replace with dry clothes and protect the person against wind and draughts. Whenever possible, the ambient temperature should be raised to reduce further heat loss³
- sending for an ambulance or rescue team
- preventing further heat loss using barriers that use a combination of an insulation layer, such as woollen blankets, and a vapour barrier such as plastic wrap^{5,6,7} [Good practice statement]
- if the person is responsive, they should be given glucose containing (“sugary”) oral fluids^{7,8} and food, avoiding alcohol and caffeine [Good practice statement]
- if the person is not shivering, the rescuer should begin active rewarming⁸ [Good practice statement]. Active rewarming may include:
 - the use of body-to-body contact by maximizing skin-to-skin contact between the back of the person who is hypothermic and the front of a person with a normal temperature⁸
 - chemical heat packs applied inside insulation/vapour barrier material.⁷ Charcoal-burning heat packs, hot water bags and electrical heating blankets may also be used in a safe manner. External heat should be applied to the armpit and on the chest and/or back (if possible) as these are the locations that provide the most efficient heat transfer.³ Some external rewarming methods pose a risk of burning the skin if they are applied directly. The manufacturer’s directions must be followed, especially those that suggest placing appropriate insulation between the heat source and the skin⁸
- active rewarming should also be applied to people with hypothermia who are shivering, due to benefits of increased comfort, decreased energy requirements and reduced cardiovascular stress⁸ [Good practice statement]
- rescuers should be aware of their own risk of developing hypothermia in cold environments and should monitor their own status and that of any companions as well as that of the affected person [Good practice statement].

3 Cold Injury

Freezing Cold Injury (Frostbite)

Frostbite occurs when tissues freeze. This happens in cold environments when blood vessels constrict and reduce blood flow and oxygen to the tissues. Frostbite usually affects body parts that are farther away from the body core, and therefore normally have less blood flow. These include the feet, toes, hands, fingers, nose, and ears. However, it can affect any part of the body. When there is less blood flow and internal heat delivered to body tissue this results in ice crystals forming in cells, which causes cell death. Damage to the affected tissue is worst when there is prolonged cold weather exposure and the tissue slowly freezes.

Frostbite injury is classified as either superficial or deep, depending upon the depth of injury. Deep frostbite extends beyond the superficial skin tissues and involves tendons, muscles, nerves and bone.

Non-Freezing Cold Injury

There are some conditions that occur without freezing the skin, such as chilblains and frostnip. Prolonged exposure of limbs to low temperatures above zero degrees may lead to “trench foot” or “immersion foot”. The injured part may be pale, pulseless, immobile and lack feeling, but is not frozen. Although there is no formation of ice crystals in the tissue, the cold temperature alone may cause damage to nerves and to the lining of small blood vessels, leading to poor or no blood flow.

3.1 Management

ANZCOR suggests:

- applying general management principles regarding shelter, ambient temperature, and sending for help, as outlined in the management of hypothermia above
- if possible, remove jewellery from the affected area and elevate the affected part [Good practice statement]

- rewarming the affected part immediately. Affected fingers may be placed in the opposite armpit, the armpit of a companion, or a warm hand over a frostbitten cheek or ear. Feet can be reheated on the warm abdomen (under clothing) of a companion [Good practice statement]
- DO NOT rub the affected tissue, use radiant heat, or break blisters⁹ [Good practice statement]] avoid walking on affected feet. Rest with the feet elevated⁹ [Good practice statement]
- ensuring that re-freezing does not occur. Once the colour and consistency of the skin have been restored, the person can safely resume normal activity, provided they increase their insulation and take precautions against recurrence [Good practice statement].

For those specifically trained in rescue in cold environments (alpine, polar, tundra) ANZCOR suggests:

- rewarming of deeply frozen body parts only if there is no risk of refreezing^{10,11,12} [Good practice statement]. For severe frostbite, rewarming should be accomplished within 24 hours
- if tissue is frozen, best tissue outcomes can be achieved from placing the injured part in warm water with circulating water 37 - 39°C until the affected part thaws. [Good practice statement] This may take 30 minutes or more and is best achieved under hospital conditions where infection control and adequate pain relief can be provided [Good practice statement]
- chemical warmers should not be placed directly on frostbitten tissue as they can reach temperatures that can cause burns. Following rewarming, efforts should be made to protect frostbitten parts from refreezing and to quickly evacuate the person for further care¹⁰ [Good practice statement]
- if tissue has spontaneously thawed (as is often the case), the water bath is not required, but affected tissue can be cleaned and bathed at a more comfortable temperature (30-35°C) [Good practice statement].

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5 About this Guideline

Search date/s	March 2020
Method:	<p>The following search strategy for updating Guideline 9.3.6 Cold Injury was developed for the EMBASE.com platform, which includes both the Medline and Embase bibliographic databases (Table 4.1). Search strings were developed that capture the following alternative conditions and terms:</p> <ul style="list-style-type: none"> • cold injury • frostbite • frostnip • trench foot • chilblains/perniosis • cold panniculitis <p>The EMBASE controlled vocabulary thesaurus (EMTREE) includes terms specific for cold injury, frostbite and trench foot. The records identified with these EMTREE terms and text searches for population terms were refined with limits for study subjects (not animals), publication types (conference abstracts were excluded) and publication date (2009 onwards). It was clear that filtering with generic first aid intervention terms would risk missing relevant studies of specific interventions such as tissue plasminogen activator, which was included in the 2010 ILCOR CoSTR. Therefore, no filtering with first aid terms was used on these records.</p>
Primary reviewers:	Kevin Nation, Jonathon Webber
Other consultation	Rowena Christiansen, Finlay Macneil
Approved:	31 August 2021
Guidelines superseded:	9.3.3 and 9.3.6

ANZCOR Guideline 9.3.4 – Heat Induced Illness (Hyperthermia)

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

The ANZCOR recommends that:

- First aiders send for an ambulance early in the treatment of heat induced illness (ungraded, good practice statement).
- First aiders cool the person by the best means available whilst waiting for more advanced care (strong recommendation, weak level of evidence).
- Give cool/cold water to drink if fully conscious and able to swallow. For exertional dehydration, ANZCOR suggest a 3-8% carbohydrate electrolyte fluid (e.g. any commercially available “sports drink”) (weak recommendation, very low quality evidence).

1 Introduction

Heat induced illness may be caused by:

- excessive heat absorption from a hot environment
- excessive heat production from metabolic activity
- failure of the body's cooling mechanisms
- an alteration in the body's set temperature.

Mild elevation in body temperature is normally controlled with sweating, which allows cooling by evaporation. Once the individual becomes too dehydrated to sweat, body temperature can rise rapidly and dramatically.

Factors which may contribute to heat induced illness include:

- excessive physical exertion
- hot climatic conditions with high humidity
- inadequate fluid intake
- infection
- persons who are overweight or obese
- unsuitable environments (e.g. unventilated hot buildings, parked motor vehicles)
- wearing unsuitably heavy, dark clothing on hot days
- drugs which affect heat regulation.

The very young^{1,2,3} and very old⁴ are more prone to heat induced illness. For workers in outdoor or potentially hot environments, there are occupational health guidelines relevant to the particular environment. Work environments that may be particularly prone to precipitating hyperthermia and heat induced illness include those in which there is a high ambient temperature with reduced air movement, where the worker is exposed to radiant heat and there is difficulty in maintaining adequate hydration.

2 Prevention

At no time should children, the disabled or the elderly be left unattended in parked motor vehicles.

On warm, humid or hot days:

- keep infants and the elderly in cool, ventilated areas and provide ample oral fluids
- wear light coloured, loose-fitting clothing during physical exertion and hats during outside activities
- drink adequate fluids during exertion on hot days.

For participants in, and organisers of sporting events:

- allow six weeks for acclimatisation with progressive exercise before competition
- avoid vigorous exercise if suffering from an infection

- plan to conduct events in the early morning or late evening or in the cooler months of the year
- provide regular drink stations
- follow the support guidelines relevant to specific activities.

First aid providers may need to prepare for the potential for heat induced illnesses for specific high-risk events, such as events held in high temperatures. Preparation for such events should include the ability to measure temperatures and provide first aid management.

3 Recognition

Heat induced illness presents with a spectrum of severity. The person may show the signs of exertion (hot, sweaty and breathless) but also have some of these indicators/red flags:

- Inability to continue the activity
- High body temperature
- Dizziness and faintness
- Nausea, vomiting or diarrhoea
- Pale skin and other signs of shock (See GL 9.2.3)
- Dry skin
- Poor muscle control or weakness
- Decreasing levels of consciousness, confusion or seizures.

The lack of sweating is a sign of serious illness, but only seen in a proportion of the more serious cases.

4 Management

If the person is not responding and is not breathing normally, commence resuscitation following the ANZCOR Basic Life Support Flowchart (Guideline 8). [Strong recommendation; Moderate quality of evidence]

The management of heat induced illness is aimed at cooling and hydration.

Cooling the person should be done as soon as practicable, but should not delay sending for an ambulance. (ungraded, good practice statement).

During cooling management, level of consciousness and the ability to maintain an airway should be continuously assessed (ungraded, good practice statement).

Cooling management should aim to remove the cause and assisting the normal cooling mechanisms of evaporation, conduction, radiation and convection. Cooling methods will vary depending on availability and circumstance. A combination of cooling methods may be most effective if immersion is not available (strong recommendation, weak level of evidence).

Cooling management

- Lie the person in a cool environment or in the shade.
- Loosen and remove excessive clothing.

Send for an ambulance if not improving quickly.

While waiting for professional assistance for individuals over 5 years of age:

- Immerse (i.e. whole-body from the neck down) in cold water (a bath if possible, as cold as possible) for 15 minutes. This is the most effective method of cooling (strong recommendation, weak level of evidence). If this is not available, a combination of the following methods should be used:
- Wet the person with cold or cool water, under a shower if safe, or with a hose or other water source
- Apply ice packs (groin, armpits, facial cheeks, palms and soles).
- Repeatedly moisten the skin with a moist cloth or atomizer spray.
- Fan continuously.

While waiting for professional assistance for children 5 years of age and under a combination of the following methods should be used:

- Cool in a tepid (lukewarm) bath sponging frequently¹⁰ if bath available (Ungraded, good practice statement) or:
- Repeatedly moisten the skin with a moist cloth or atomizer spray (Ungraded, good practice statement).
- Fan continuously (Ungraded, good practice statement).

Hydration management

Oral hydration should only be given if fully conscious and able to swallow. Give cool or cold water to drink if fully conscious and able to swallow. For exertional dehydration, ANZCOR suggest a 3-8% carbohydrate electrolyte fluid (e.g. any commercially available “sports drink”) (CoSTR 2015, weak recommendation, very low quality evidence).⁸

Revised in March 2020

This guideline has been revised to include cooling by immersion in cold water and a combination of other cooling methods following publication of a draft Consensus on Science and Treatment Recommendations (CoSTR) by ILCOR in December 2019. The evidence for immersion has been assessed as very low quality and relates to studies of the rate of cooling in adults with exertional heat exhaustion. The ILCOR systematic review found immersion (i.e. whole-body from the neck down) in cold water the fastest method of cooling adults with exertional heat illness⁹. The ILCOR 2020 CoSTR⁹ did not rank other cooling methods, but describes passive cooling (e.g. moving to cooler environment, removing clothing) as slower at reducing body temperature compared to other active cooling methods (e.g. ice packs, cold showers, ice sheets/towels, fanning, evaporative cooling, cooling vests and jackets). There has been no examination of the effect of the rate of cooling on recovery rate. There was no recommendation on the treatment of hyperthermia in children.

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Further Reading

ANZCOR Guideline 2 Priorities in an Emergency

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.2.4 First Aid Management of a Seizure

About this Guideline

Search date/s	ILCOR search updated to July 11, 2019. ⁹
Question/PICO:	See ILCOR CoSTR webpage for ILCOR PICO ⁹ https://costr.ilcor.org/document/first-aid-cooling-techniques-for-heat-stroke-and-exertional-hyperthermia
Method:	Mixed methods, GRADE for ILCOR CoSTR ⁹
Primary reviewers:	Finlay Macneil
Secondary reviewers:	Janet Bray, Tony Celenza
Approved:	12 September 2020
Guideline superseded:	Guideline 9.3.4 – April 2020

ANZCOR Guideline 9.3.5 – First Aid and Resuscitation for Divers who have Breathed Compressed Gas

Summary

Who does this guideline apply to?

This guideline applies to adults and children over 8 years old who have dived while breathing compressed gas during the previous 24 hours or have travelled to altitude (e.g. by aircraft) within 24 hours of diving and have developed symptoms and signs which could be related to the diving.

Who is the audience for this guideline?

This guideline is for use by divers, dive professionals, bystanders, first aiders and first aid training providers.

Recommendations

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

1. Send for an ambulance early in the treatment of suspected decompression illness or pulmonary barotrauma and promptly contact the nearest public hospital Diving and Hyperbaric Medicine Unit (in Australia) or Diving Emergency Service Hotline (New Zealand) for specialist diving medical advice. [Good Practice Statement]
2. Provide near-100% oxygen to the person as soon as possible and continue oxygen administration until relieved by medical personnel. (Near-100% oxygen should be administered even if pulse oximetry indicates a high oxygen saturation). [Good Practice Statement]
3. Manage the person in a horizontal position if early onset decompression illness is suspected. Otherwise, and in the event of breathing difficulty, the person can be managed in a position of comfort. [Good Practice Statement]
4. Record details of the dive(s), the symptoms and signs, first aid provided and response. [Good Practice Statement]
5. An alert and stable person suspected of having decompression illness may drink non-alcoholic fluids as advised by the diving doctor. [Good Practice Statement]
6. Keep the person thermally comfortable. [Good Practice Statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
SSBA	Surface Supplied Breathing Apparatus
DCI	Decompression Illness
PBT	Pulmonary Barotrauma
DCS	Decompression Sickness
CPR	Cardiopulmonary Resuscitation
CAGE	Cerebral Arterial Gas Embolism
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)

1 Introduction

'Compressed gas' divers breathe gas (usually air) while underwater. Most commonly, divers use self-contained underwater breathing apparatus (scuba) and breathe from cylinders carried underwater. However, the breathing gas can also be supplied from the surface via a surface supplied breathing apparatus (SSBA). Divers are vulnerable to a variety of potential injuries and illnesses which include ear injuries, drowning, carbon monoxide poisoning, and heart attack, among others. These can be managed by the usual first aid and resuscitation protocols outlined in various ANZCOR Guidelines. However, breathing compressed gas underwater can lead to several unique medical problems, the most significant being decompression illness (DCI) and pressure damage of the lungs called pulmonary barotrauma (PBT). Australian hyperbaric units treat an average of 125 cases of DCI a year.¹ Twenty-nine percent of calls to an Australian based diving emergency hotline were due to suspected DCI, compared to 1% from PBT.²

Decompression illness and pulmonary barotrauma require special first aid considerations, including the prompt and continued administration of near-100% oxygen. This is different from most other first aid uses of oxygen as detailed in ANZCOR Guideline 9.2.10, which should be read in conjunction with this guideline.

2 Background

2.1 Decompression Sickness

During an air dive, oxygen and nitrogen from the inhaled gas is dissolved in the diver's blood and body tissues. The oxygen is used by the body but the nitrogen remains dissolved in the diver's blood and tissues. Unless the diver ascends slowly enough to allow excess nitrogen to leave the body gradually through the lungs, nitrogen comes out of solution and may form bubbles in the diver's blood and body tissues. The physical effects of these bubbles, and biochemical changes incited by them, can cause lack of blood supply (ischaemic) and inflammatory tissue damage. This is known as decompression sickness (DCS). Some deep divers breathe mixtures of gas containing helium and may face the same problems due to helium bubbles.

2.2 Pulmonary Barotrauma

As a diver ascends, the gas in the lungs expands with reducing ambient pressure and, unless expanding gas is adequately exhaled, the diver's lungs can distend and tear. This can result in a collapsed lung (pneumothorax) and/or trapping of gas in the mediastinum (mediastinal emphysema), or under the skin (subcutaneous emphysema). Escaped gas may also enter the arterial circulation and distribute to the cerebral circulation causing cerebral arterial gas embolism (CAGE), causing stroke-like symptoms and signs.

2.3 Decompression Illness

The term decompression illness (DCI) is used to collectively describe both DCS and CAGE. In the emergency setting it is unnecessary to differentiate between these as the first aid and more advanced treatment is the same for both conditions.

3 Recognition

3.1 Decompression Illness

DCI is associated with a wide range of potential symptoms and signs, from minor to rapidly fatal. Common symptoms and signs include:

- pain (often at or near joints)
- numbness/tingling
- extreme fatigue/feeling unwell
- dizziness/vertigo
- muscle weakness in one or both arms and/or legs
- mottled skin rash
- poor co-ordination
- altered consciousness

3.2 Pulmonary barotrauma

- chest pain
- difficulty breathing
- coughing
- blueness of lips and tongue (cyanosis)
- voice changes
- difficulty swallowing
- 'crackly' skin around neck (crepitus)
- symptoms and signs of decompression illness may also be present.

4 Management

- If the person is not responding and is not breathing normally, commence resuscitation following the ANZCOR Basic Life Support flowchart [Refer to ANZCOR Guideline 8]. [Good Practice Statement] A person with DCI may regain consciousness and appear to have recovered but still needs to be managed for suspected DCI due to the possibility of relapse.
- Promptly provide as close to 100% oxygen as possible if available and trained to do so and continue to do so until the ambulance/evacuation personnel arrives and takes over management.^{3, 4, 5} Near-100% oxygen should be administered even if pulse oximetry indicates a high oxygen saturation. [Good Practice Statement]
- If early-onset DCI is suspected (within 30 minutes of surfacing), lay the person flat if possible.^{3, 6-8} [Good Practice Statement]
- Seek immediate diving medical advice by calling the nearest public hospital diving and hyperbaric medicine unit (in Australia), or the Diver Emergency Service (0800 4 DES 111 in New Zealand).³ [Good Practice Statement]
- Assist with any transfer to a recompression chamber if requested to do so.
- The consulting diving doctor may advise that an alert and stable person thought to be suffering from DCI may freely drink non-alcoholic fluids, such as water or isotonic/electrolyte fluids (as long as they have no stomach cramps, nausea, urinary retention or paralysis).^{3, 9, 10} [Good Practice Statement]
- The person should be kept thermally comfortable (warm but not hyperthermic).^{3, 6, 11} [Good Practice Statement]
- Record details of the dive(s), the symptoms and signs (and their timing) the first aid given and the response to the first aid. [Good Practice Statement]

Rationale

A flat (horizontal) posture without leg elevation is recommended in persons suspected of DCI as it has been shown to increase the rate of inert gas elimination.⁶ It may also reduce the likelihood of arterial bubbles distributing to the brain.⁸ An unconscious diver should be managed in the 'recovery position'. However, a conscious person having increased difficulty breathing when supine can be placed in a position of comfort.

Administration of 100% oxygen reduces the size and number of gas bubbles in the blood and tissues by helping to eliminate the inert gas.^{5, 12}

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- Lippmann J. *Oxygen First Aid for Divers*. Melbourne: Submariner Publications; 2016.
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About this Guideline

Search date/s	18 September 2020
Question/PICO:	P: Divers using compressed gas requiring (resuscitation OR first aid) I: Any first aid or first responder intervention (out of hospital) other than standard CPR C: Standard CPR O: (Survival to discharge neurologically intact) OR (survival to admission to hospital) OR (return of spontaneous circulation) S: Any study T: 2000-present
Method:	Evidence update following systematic review Mitchell et al 2018
Primary reviewers:	John Lippmann, Simon Mitchell, Michael Bennett
Secondary review	Finlay Macneil
Worksheet	Hereco spreadsheet
Approved:	April 2021
Guidelines superseded:	ARC Guideline 9.3.5 - November 2011

ANZCOR Guideline 9.4.1 – First Aid Management of Australian Snake Bite

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. Send for an ambulance. [Good Practice Statement]
2. Keep the person immobilised (still), reassured and under constant observation. [Good Practice statement]
3. Apply pressure bandaging with immobilisation. [Good Practice Statement]
4. Sudden collapse with cardiac arrest requires immediate CPR. [Good Practice Statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CPR	Cardiopulmonary Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)

1 Introduction

Many of the snakes found in Australia are capable of lethal bites to humans. These include Taipans, Brown snakes, Tiger snakes, Death Adders, Black snakes, Rough Scaled snakes and many Sea snakes.¹

There are no snakes native to New Zealand, but snake bite may rarely occur in New Zealand for example, in zoos or at ports.

Snakes produce venom in modified salivary glands and the venom is forced out under pressure through paired fangs in the upper jaw. Snake venoms are complex mixtures of many toxic substances which can cause a range of effects in humans.

The greatest threat to life and cause of over half of deaths is early cardiovascular collapse.² In the 16 years to 2016, 16 Australians were recorded as dying of snake bite in Australia.³

Other significant effects include:

- major bleeding due to inability to clot blood;
- nerve paralysis leading to respiratory muscle paralysis;
- muscle damage;
- kidney failure due to microscopic blood clots.

2 Recognition

The bite may be painless and without visible marks. Other symptoms and signs of a snake bite may include:

- paired fang marks, but often only a single mark or a scratch mark may be present; (localised redness and bruising are uncommon in Australian snake bite)
- headache;
- nausea and vomiting;
- abdominal pain;
- blurred or double vision, or drooping eyelids;
- difficulty in speaking, swallowing or breathing;
- swollen tender glands in the groin or armpit of the **bitten** limb;
- limb weakness or paralysis;
- respiratory weakness or respiratory arrest.

The most common cause of death from snake bite is collapse with cardiac arrest². This can occur within 10 to 60 minutes of a bite with envenomation, is most often pre-hospital, and requires immediate CPR.

An occasional feature of a brown snake bite is initial collapse or confusion followed by apparent partial or complete recovery. It often occurs as the only finding after a bite from a brown snake and may be the only evidence of envenomation. This information may be useful when providing handover to the treating health practitioner who is considering administration of antivenom.

3 Management

If the person is unresponsive and not breathing normally, follow the ANZCOR Basic Life Support Flowchart and ANZCOR Guideline 8. If the person is unconscious and breathing normally, follow ANZCOR Guideline 3.

- Send for an ambulance for any person with a suspected snake bite;
- Keep the person immobilised (still), reassured and under constant observation;
- Apply pressure bandaging with immobilisation [Refer to ANZCOR Guideline 9.4.8];
- Commence CPR [Refer to ANZCOR Guideline 8] if person is unresponsive and not breathing normally. There is no risk of transmission of venom to rescuer by providing CPR.

Note:

- DO NOT cut or incise the bite
- DO NOT use an arterial tourniquet
- DO NOT wash or suck the bite

Snake identification

Many of Australia's snakes are protected species. It is strongly recommended that no attempts be made to kill the snake due to the risk of multiple bites or another person being bitten. A digital photograph of the snake may be helpful in identification if safe to do so.

Antivenom is available for all venomous snakes native to Australia, but must be given under health professional supervision in a properly equipped medical facility. Antivenom is not routinely available in New Zealand.

References

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Further Reading

- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ANZCOR Guideline 3 Recognition and First Aid Management of the Unconscious Victim
- ANZCOR Guideline 9.4.8 Envenomation - Pressure Immobilisation Technique
- "A Clinician's Guide to Australian Venomous Bites and Stings" (Prof Julian White) [BioCSL 2013] Available at https://biomedsciences.unimelb.edu.au/data/assets/pdf_file/0004/3216739/A-Clinicians-Guide-to-Venomous-Bites-and-Stings-2013.pdf

Rationale For Pressure Bandaging with Immobilisation

Most snake venom reaches the blood stream via the lymphatic system. Laboratory research has shown that very little venom reaches the circulation, even after several hours, if the pressure bandaging with immobilisation (PIB) is applied immediately and maintained. **The correct application of the pressure bandage is difficult to achieve,⁴ but its use is supported for the snakes encountered in the wild in Australia.**

About this Guideline

Search date/s	May 2020
Question/PICO:	For the population (P), studies concerning people with snakebites or healthy volunteers with “mock” snakebites were included. The interventions (I) that were included in this systematic review were interventions for the first aid management of snakebites that can be applied by lay- people without medical background. We excluded interventions for the management of snake- bites that are not feasible to be performed in a first aid setting where laypeople are the first aid providers. We selected studies that compared (C) the interventions to any other first aid intervention or no intervention. Concerning the outcomes (O), we included (1) survival, functional recovery, pain, complications, time to resumption of usual activity, restoration of the pre-exposure condition, time to resolution of symptoms or other health outcome measures (including adverse effects) for studies involving snakebite victims, (2) spread of mock venom for studies investigating the efficacy of pressure immobilization and (3) quality of the bandage applied and tension generated for studies investigating the feasibility of pressure immobilization.
Method:	Evidence update, not scoping or systematic review. The PICO shown above was rerun in Pubmed, Cochrane, Embase and Medline databases in May 2020, but search extended to include papers using viper instead of snake and snake bite as well, yielding an extra 186 papers since 2016. The papers found and notes are shown in the attached Excel spreadsheet. The details of the searches are in the attached worksheet.
Primary reviewers:	Natalie Hood, Finlay Macneil
Other consultation:	Geoff Isbister, Jim Tibballs
Worksheet	Evidence update from SR by Avau et al, 2016 – May 2020
Approved:	April 2021
Guideline superseded:	ANZCOR Guideline 9.4.1 - March 2020

ANZCOR Guideline 9.4.2 - First Aid Management of Spider Bite

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

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

1. If serious symptoms or signs develop from any spider bite, transport the person to hospital.
2. If funnel-web spider bite is suspected:
 - Send for an ambulance. [Good Practice Statement]
 - Keep the person immobilised (still), reassured and under constant observation. [Good Practice Statement]
 - Apply pressure bandaging with immobilisation. [Good Practice Statement]
 - Sudden collapse with cardiac arrest requires immediate CPR. [Good Practice Statement]
3. If other spider bite, apply ice pack for pain relief, transport to medical care if unwell. [Good Practice Statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CPR	Cardiopulmonary Resuscitation

Guideline

1 Introduction

The bites of many different Australian spiders may cause pain but only bites from some funnel-web spiders are an immediate threat to life, although the Redback spider bite may be a threat to life in the very young or very old. There are no spiders native to New Zealand that are considered a threat to life, however, Australian Redback spiders may be encountered in some areas of New Zealand.

If serious symptoms or signs develop from any spider bite, transport the person to hospital.

2 Funnel-web Spiders

A bite from a large (> 2cm), dark-coloured spider ("big black spider"), especially in the regions of Sydney, Blue Mountains, central, northern, southern highlands or south coast of NSW, or south-eastern Queensland, should be considered a dangerous bite and immediate treatment given.^{1,2,3}

Recognition

Symptoms and signs of funnel Web spider bite may include:

- pain at the bite site, but little local reaction
- tingling around the mouth
- profuse sweating
- copious secretion of saliva
- abdominal pain
- muscular twitching (called fasciculation)
- breathing difficulty
- confusion leading to unconsciousness



Note:

Life threatening effects may occur within 10 minutes.

Sydney funnel web spider, *Atrax robustus*,
Photo copyright Prof Julian White

Management

The rescuer should:

- Send for an ambulance [Good Practice Statement]
- Apply pressure bandage with immobilisation and immobilize the person immediately [see Refer to ANZCOR Guideline 9.4.8] [Good Practice Statement]

Attempts to capture the spider may result in further bites. Do not bring a live spider to hospital. A photo on a phone may help in identification but should not delay the first two steps of management. [Good Practice Statement]

If the person is unresponsive and not breathing normally, follow Australian Resuscitation Council and New Zealand Resuscitation Council Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].

Note:

Antivenom is available for treatment of funnel-web spider envenomation in areas where these spiders are encountered in Australia.

3 Redback Spider

This spider (approximately 1cm body length) has a characteristic red, orange or pale stripe on the back of its abdomen. A bite may threaten the life of a child, but apart from pain, is rarely serious for an adult.¹

Recognition

Symptoms and signs may include:

- immediate pain at the bite site which becomes hot, red and swollen
- intense local pain which increases and spreads
- nausea, vomiting and abdominal pain
- profuse sweating, especially at the bite site
- swollen tender glands in the groin or armpit of the envenomated limb.



Red back spider, *Latrodectus hasseltii*,
Photo copyright Prof Julian White

Management

The first aider should:

- keep the person under constant observation
- apply an ice or cold compress to lessen the pain (for periods of no longer than 20mins)
- transport the person to a medical facility, preferably by ambulance, if the person is a young child or collapse occurs or pain is severe.

[Good Practice Statement]

Note:

Local pain develops rapidly at the bite site and may become widespread, but the venom acts slowly so a serious illness is unlikely in less than 3 hours. Pain can be treated with antivenom^{3,4,5,8} in a hospital where resuscitation facilities are available. [Good Practice Statement] A related species, the Cupboard Spider (resembles the redback spider without the stripe) may be treated with the Redback spider antivenom.^{1,5} [Good Practice Statement]. The Pressure Immobilisation Technique is **not** used because the venom acts slowly and any attempt to slow its movement tends to increase local pain.

4 White-Tailed Spider Bite

Although the bite of the White-tailed spider may cause severe inflammation,⁷ contrary to popular opinion it has caused very few cases of severe local tissue destruction.^{1,7} An ice pack may be used to relieve pain. [Good Practice Statement]

The Pressure Immobilisation Technique should **not** be used. [Good Practice Statement]



White-tailed spider,
Photo copyright Prof Julian White

5 Other Australian Spider Bites

All other spider bites should be treated symptomatically: apply ice or cold compress to lessen the pain.
[Good Practice Statement]

6 Spider Bites in New Zealand

Spider bites in New Zealand are much rarer than Australia and only the Katipo spider is considered dangerous to people; but this spider is not aggressive and rarely bites humans.⁹ However, the more aggressive Australian redback spider has been introduced into New Zealand and populations of the spider are described in Central Otago and New Plymouth and these bites may be encountered. Spider bites in New Zealand should be treated symptomatically: apply ice or cold compress to lessen the pain.⁹ If redback spider bite is suspected in the young or elderly, send for an ambulance. [Good Practice Statement]

References

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Further Reading

- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ARC Guideline 9.4.8 Envenomation - Pressure Immobilisation Technique

About this Guideline

Search date/s	Sept 2020
Question/PIC O:	P: For adults, children and infants I: Any first aid intervention C: No first aid O: Morbidity or mortality
Method:	Scoping review. The papers found and notes are shown in the attached Excel spreadsheet. The details of the searches are in the attached worksheet.
Primary reviewers:	Finlay Macneil
Other consultation:	Geoffrey Newman-Martin
Worksheet	https://resus.org.au/download/worksheets/worksheets_to_support_guidelines/anzc-cor-spider-bite-gl-9-4-2-worksheet-aug-2020.pdf
Approved:	April 2021
Guideline superseded:	ARC Guideline 9.4.2 - July 2014

ANZCOR Guideline 9.4.3 – Envenomation from Tick Bites and Bee, Wasp and Ant Stings

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Summary of Recommendations

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

1. The major immediate risk to the health of persons bitten or stung by insects is anaphylaxis (severe allergic reaction), although this is rare. First aid should be focused on prevention, recognition and treatment of anaphylaxis [Good Practice Statement]
2. For insect stings where there is no history or evidence of allergy, treatment should be symptomatic with local measures such as cold packs [Good Practice Statement] except for ticks as the cold pack placement may disturb the tick, triggering an allergic reaction
3. Tick bite treatment should be freezing the tick in place and further treatment by a healthcare professional according to the advice at www.allergy.org.au and www.tiara.org.au^{1,2} [Good Practice Statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
ASCIA	Australasian Society of Clinical Immunology and Allergy
TiARA	Tick-induced Allergies Research and Awareness
CoSTR	Consensus on Science with Treatment Recommendations
ILCOR	International Liaison Committee on Resuscitation

Guideline

1 Introduction

Single stings from a bee, wasp or ant, while painful, seldom cause serious problems except for persons who have a severe allergy to the venom. Multiple insect stings can cause severe pain and widespread skin reaction. Multiple stings around the face can cause severe local swelling and difficulty breathing even if the person is not known to be allergic to that insect.

It is important to remember that bee stings leave behind the venom sac and sting which continues to inject venom into the skin, whilst a wasp or ant may sting multiple times without leaving a venom sac attached.^{3,4}

Ticks can inject a toxin that may cause local skin irritation or a mild allergic reaction, however **most** tick bites cause few or no symptoms.

In susceptible people, a tick bite may cause a severe allergic reaction or anaphylaxis, which can be life threatening. This can also occur in people with no previous exposure or known susceptibility. This means that the management of all tick bites requires caution as advised by Australasian Society of Clinical Immunology and Allergy (ASCIA).¹

2 Recognition

Symptoms and signs may include:

2.1 Minor

- Immediate and intense local pain.
- Local redness and swelling.

2.2 Major/Serious

- Severe allergic reaction/anaphylaxis may occur with insect and tick bites. (Refer to ANZCOR Guideline 9.2.7) The symptoms may also include abdominal pain, vomiting or other symptoms of gastroenteritis. (ANZCOR Guideline 9.2.7)
- Airway obstruction may result from swelling of the face and tongue due to anaphylaxis, or from insect stings in or around the mouth. This may occur immediately or over several hours and always requires urgent medical care
- While by far the majority of medically important tick bites are due to allergic reactions, in rare cases, potentially dangerous neurotoxic paralysis may develop over a period of time due to the venom of the Australian paralysis tick (genus *Ixodes*). In all cases where the person is unwell, refer for urgent medical review."
- In rare cases, potentially serious mammalian (red) meat allergy may develop due to a tick bite

3 Management

- If the person is unresponsive and not breathing normally, commence resuscitation, follow the Basic Life Support Flowchart (ANZCOR Guideline 8).
- Move the person to a safe place.

- If the person has signs of anaphylaxis, follow First Aid Management of Anaphylaxis Guideline (ANZCOR Guideline 9.2.7).⁵
- In the case of a bee sting, remove the sting, by any means without compressing the venom sac e.g. scrape it out, as quickly as possible^{3,4}.
- In the case of a tick bite, follow the advice of ASCIA.² For small ticks (larvae and nymphs) use permethrin cream (available at pharmacies). For adult ticks, freeze with an ether containing spray-see www.tiara.org.au. Avoid the use of freezing or permethrin cream for ticks close to the eyes, genitals or in ear canal
- For tick bite, if in a remote location, or freezing is not possible, consultation with healthcare professionals is recommended. If this is not possible, assess whether there is a history of anaphylaxis to tick bite. If there is a history of anaphylaxis to tick bite, the person should be carrying an adrenaline (epinephrine) auto-injector (eg EpiPen™) and this should be used according to ANZCOR Guideline 9.2.7. If attempting removal of ticks in remote locations where there is no known anaphylaxis to tick bite, do not squeeze the body of the tick; use the most fine tipped forceps available to grasp the tick as close as possible to the skin.⁵
- For all bites and stings, apply a cold compress to help reduce pain and swelling (except in the case of tick bites).
- Monitor the person for signs of severe allergic reaction (difficulty speaking, breathing difficulties, collapse, abdominal symptoms and generalized rash).
- Send for an ambulance if multiple stings to the face or tongue have occurred or there is a history of anaphylaxis to the sting or tick.

Instructional information regarding auto injectors can be accessed from the Australasian Society of Clinical Immunology and Allergy (ASCIA) webpage: <http://www.allergy.org.au/health-professionals/anaphylaxis-resources>.

Instructional information regarding killing and removing ticks can be accessed from the web link: Tick-induced Allergies Research and Awareness (TiARA) www.tiara.org.au and at www.allergy.org.au

Rationale for freezing ticks and removal by health professional

The recently published CoSTR from ILCOR on the removal of ticks advised against freezing ticks because it did not result in removal of any ticks⁶ In other countries, the rationale is that the greatest risk from tick bites is severe infections, such as Rickettsia infections, for which ticks are vectors. However, the problem in Australasia is tick allergy. Tick anaphylaxis is much more common in Australia than other countries (546 cases in a single Australian database, compared to 1 case report in the USA, 1 in France, 4 in Spain and 12 cases in Japan).⁷ It is a newly recognized allergy like mammalian meat allergy after tick bite. The goal in Australasia is killing the tick *in situ*, to prevent transmission of tick allergens, which can be followed later by removal of the entire tick.⁷ Tick bites in Australasia should be treated by freezing if possible and referred to a health professional for further treatment in distinction to the advice in the 2021 ILCOR CoSTR.

Acknowledgements

Australian Society of Clinical Immunology and Allergy (ASCIA)

Further Reading

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.2.7 First Aid Management of Anaphylaxis

References

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7. Invited Opinion A Prof S van Nunen, ASCIA member, Convenor TiARA, received June 2021 available in worksheets at <https://resus.org.au/worksheets-to-support-guidelines/>.

About this Guideline

Search date/s	Sept 2020
Question/PICO:	P: For adults, children and infants, all hymenoptera bites and stings, including bees, wasps and ants I: Any first aid intervention C: No first aid O: Morbidity or mortality
Method:	1. Scoping review for all hymenoptera bites and stings, including bees, wasps and ants, but excluding ticks. The papers found and notes are shown in the attached Excel spreadsheet. The details of the searches are in the attached worksheet. 2. Systematic review of tick removal ILCOR CoSTR Feb 21. 3. Invited opinion from A Prof Sheryl van Nunen, ASCIA member, Convenor TiARA
Primary reviewers:	Finlay Macneil
Other consultation:	Geoffrey Newman-Martin, Sheryl van Nunen
Worksheet	https://resus.org.au/worksheets-to-support-guidelines
Approved:	12 November 2021
Guideline superseded:	ARC Guideline 9.4.3 - 2016

ANZCOR Guideline 9.5.1 – First Aid Management of Poisoning

Summary

Who does this guideline apply to?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) make the following recommendations for managing those that have or may have been exposed to poison:

1. Take active steps at home and in the workplace to prevent exposure to poisons. [Good Practice Statement]
2. Recognise potential risks and send for an ambulance early. [Good Practice Statement]
3. Remove the person who has been poisoned from the source or remove the source from the person if it is safe to do so. [Good Practice Statement]
4. If the person is not responding and is not breathing normally, commence resuscitation if safe to do so, following the ANZCOR Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].
5. If the person is unresponsive and breathing normally, position them in a lateral, side-lying recovery (lateral recumbent) position ([Refer to ANZCOR Guideline 3]).
6. Contact the National Poisons Centre for specific advice (available 24 hours)
 - i. Australian Poisons Information Centre call **13 11 26**
 - ii. New Zealand Poisons Centre call **0800 764 766** (0800 POISON)
7. Decontaminate only if it is safe to do so. [Good Practice Statement]
8. Ensure the poison is secured and ambulance personnel are advised of any information on poison. [Good Practice Statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CPR	Cardiopulmonary Resuscitation
PPE	Personal Protective Equipment
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)
HAZMAT	Hazardous Materials

Guideline

1 Introduction

A *poison* is a substance (other than an infectious substance) that is harmful if ingested, inhaled, injected, or absorbed through the skin. Substances that have no effect or may be therapeutic at low levels (for example, medicines and herbal remedies) may be poisonous at higher concentrations.

Toxins are poisons that are produced by living organisms. *Venoms* are toxins that are injected by an organism. For information on Bites and Stings go to ANZCOR Guideline 9.4.3 - First Aid Management of Envenomation from Tick Bites and Bee, Wasp and Ant Stings.

Poisoning is a common problem with many events reported in Australia and New Zealand. Most cases are unintentional and one third are children aged 1 to 4 years.¹ The best treatment for poisoning is constantly evolving. Advice you may have received in the past may no longer be the recommended treatment, hence the advice to call the Poisons Information Centre in your country.

2 Prevention

- Many poisons are substances that also have a useful purpose. Poisoning is particularly common in children and vulnerable adults so ensuring poisons are only accessible to those who need and know how to use them reduces their risk of harm.
- It is useful to make a survey of the home or workplace and identify all poisonous substances.
- The amount of poisonous substances stored in a home should be kept to a minimum.
- Unwanted poisons or medicines should be removed. Chemicals should be disposed of safely using the accompanying directions for guidance. Medicines should be returned to a pharmacy for safe and environmentally friendly disposal. The National Poisons Information Centre can also advise on methods of safe disposal.
- Poisonous substances must be stored in their original containers in locked or child-resistant cupboards or containers out of reach of children. Medicines should not be stored in the refrigerator unless advised to do so by a pharmacist.
- Non-poisonous cleaning products and insecticides should be used where possible.
- When possible, choose substances available in child-resistant packaging. However, do not rely on child-resistant packaging to prevent a child's access to a poison, because child-resistant containers are not completely child proof.
- Closely supervise children around the home.
- Don't call medicines 'lollies' when giving medicine to children
- Do NOT decant chemicals into drink bottles
- Read medicine labels and use according to the directions. When medicines are taken ensure the right:
 - medication
 - person
 - dose
 - route of administration
 - reason for administration
 - time and frequency of administration
- The recommended personal protective equipment (PPE) should be used when using toxic or caustic chemicals, for example spraying, painting, or oven cleaning. For industrial or commercial products this information can be found in the Safety Data Sheet for the product.

For many non-commercial consumer products, the labeling may contain first aid instructions and safety directions, including recommended PPE.

- Eating and drinking should be avoided near poisons.

3 Recognition

- Poisons can cause harm by a wide range of mechanisms and can cause a wide range of symptoms including reduced levels of responsiveness, difficulty breathing, cardiac arrest, nausea, vomiting, burning pain in the mouth or throat, headache, blurred vision, seizures and burns to skin, eyes, mouth, nose and throat.
- The circumstances of the incident may give an indication that poisoning has occurred. A person may complain of physical symptoms without realising these are due to a poison. Alternatively, they may exhibit abnormal behaviour, which may be misinterpreted as confusion or mental health disturbance.
- Most medicines are poisonous in overdose. The point at which overdose becomes harmful is substance/medicine specific and varies greatly, but many medicines are lethal if less than a single pack is taken simultaneously.
- The speed of effect of a poison is determined by the chemical and physical properties of the toxic material, the concentration of the toxic material, the route of exposure (oral, skin, eyes, inhalation, injection), and the length of time of exposure. The effects may be rapid, but they may also be delayed.
- It is important to seek medical assessment after exposure to a poison, even if symptoms are initially mild or absent.
- Poisoning can mimic other conditions such as intoxication, seizures, stroke
- If poisoning is suspected, look for clues – empty pill bottles/packets, scattered pills
- With children, consider the possibility of swallowed button battery or medicinal patches (normally applied to the skin)

4 Management

The principles of managing a person who has been poisoned are:

- Recognise **Danger**, maintain safety and prevent poisoning of the first aid provider.
- **Send** for an ambulance and possibly fire services for containment and decontamination where necessary
- **Resuscitation** and supportive care, using the ANZCOR Basic Life Support Flowchart (Guideline 8]. If unresponsive and breathing normally, position in a lateral, side-lying recovery (lateral recumbent) position and ensure airway is clear [Refer to ANZCOR Guideline 3]. If not responding and not breathing normally, commence resuscitation if safe to do so, following the ANZCOR Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].
- **Decontamination** of the skin or eyes if they have been exposed to poison and if it is possible and safe to do so. (Refer to section 4.3 below)
- If possible, ascertain what poison or medicine has been taken, how much, and when.
- **ANZCOR recommends specific management** of particular poisons including antidotes, techniques to remove the poison from the body, and the treatment of complications of the poison which is most commonly undertaken in the hospital setting. [Good Practice Statement]

4.1 Recognising Danger, maintaining safety

During first aid and subsequent treatment, the suspected poison should be identified and safely handled to minimise further exposure. The person exposed to a poison may pose a danger if the poisonous substance can be transferred to the rescuer for example, by contact with contaminated clothing.

- If the poisoning occurs in an industrial, farm or laboratory setting suspect particularly dangerous agents and take precautions to avoid accidental injury. Attempt to identify the area that is contaminated, limit spread of contaminated material, and establish a cordon around this area using any practical means such as tape, markers, or control points on access roads.
- If more than one person simultaneously appears affected by a poison, there is a high possibility of dangerous environmental contamination.
- The rescuer may need to wear personal protective equipment (PPE) during decontamination and resuscitation. The need for PPE will be guided by knowledge of the likely poison. If equipment is not available to decontaminate and treat a person safely, rescue might not be possible.
- The rescuer should approach the poisoned person from upwind, particularly for poisons in a gaseous state.

4.2 Sending for an ambulance and other assistance

Send for an ambulance promptly. The ambulance service will be able to offer advice on management of the person before the ambulance arrives. The National Poisons Information Centre (Australian call 13 11 26, New Zealand call 0800 764 766 or 0800 POISON) is available 24 hours and can also offer advice before an ambulance arrives. If suspected area/environmental contamination consider sending for fire service attendance to contain the agent and decontaminate the area and affected people. If possible, ascertain what poison or medicine has been taken, how much, and when.

4.3 Decontamination

Separate the person from the poisonous substance. How this is done will depend on the type of the poison. Examples are listed below.

- If the poison is **SWALLOWED**
 - Get the person who has swallowed the poison to wash out their mouth with water
 - **ANZCOR recommends to NOT try to make them vomit or give syrups or solutions that induce vomiting^{2,3,4}** [Good Practice Statement]
 - Do not attempt to get the person to ingest any substance to try to neutralise acids or alkalis.
- If the poison is **INHALED**
 - Immediately get the person to fresh air, without placing yourself at risk.
 - Avoid breathing fumes. Special breathing apparatus may be required in the presence of poisonous gas or chemicals.
 - If it is safe to do so, vent the area by opening doors and windows wide.
 - Avoid using electrical appliances or turning on light switches if inflammable gases are suspected
- If the poison enters the **EYE**
 - Flood the eye with 0.9% sodium chloride, contact lens solution or cold water, continuing to flush for 15 minutes, holding the eyelids open.

- If the poison contacts the **SKIN**
 - Remove contaminated clothing, taking care to avoid contact with the poison. Place the clothing in a plastic bag, using caution to contain the poison unless certain of the type of poison, type of plastic, and the interaction of the two.
 - Do not attempt to neutralise acids or alkalis on the skin. Flood the skin with running water ensuring to keep the person warm or irrigate with copious amounts of water or 0.9% sodium chloride.
 - Wash gently with soap and water and rinse well. Having the person do this themselves reduces the risk to rescuers.

Those poisoned by environmental contamination will have to be removed from the environment. Once trained personnel arrive, a management plan defining three zones will allow this to be done safely.

1. The “hot” zone contains the environmental contaminant.
2. The “warm” zone is where contaminated persons are taken to be decontaminated. Rescuers and health care workers will require PPE in the warm zone. The poisonous material is present here, but it is contained.
3. The “cold” zone is where people are taken once they have been decontaminated and pose no risk.

4.4 Resuscitation and supportive care

- *Send for an ambulance (Refer to section 4.2 above).*
- If unresponsive and breathing normally, position the person in a lateral, side-lying recovery (lateral recumbent) position [Refer to ANZCOR Guideline 3] and ensure the airway is clear.
- Rescuers should perform chest compressions for all those who are unresponsive and not breathing normally [Refer to ANZCOR Guideline 8].¹⁹ [CoSTR 2015, strong recommendation, very-low-quality evidence].
- For those trained in their use, a self-inflating bag-mask apparatus is the safest way for the rescuer to provide ventilation.
- If there is poison remaining on the person’s lips, if corrosive chemicals have burnt the lips and chin, or if the rescuer is unsure of the nature of the poison, continue to perform chest compressions without providing any ventilation.
- Inhaled poisons are unlikely to pose a risk during mouth-to-mouth ventilation unless the person is contaminated with the liquid form of the inhaled poison.

4.5 Specific Management of particular poisons

- If possible, ascertain what poison or pharmaceutical has been taken, how much, and when.
- Check for opened packets of medications in cases of suspected self-poisoning and try to collect vomitus, if any, in a plastic container, and send them to hospital with the person.
- Look for signage (HAZMAT placards) on the fences or doors to industrial sites or laboratories or on the rear of trucks. This signage can provide information about hazardous materials that are classed, categorised and colour coded. When calling the emergency services, they may ask for this information to determine the response.
- Obtain advice from the ambulance service (000 in Australia or 111 in New Zealand) promptly. Other sources of medical advice will depend on the situation but may include:
 - National Poisons Information Centre (available 24 hours)
 Australian Poisons Information Centre call **13 11 26**
 New Zealand Poisons Centre call **0800 764 766** (0800 POISON)

- Occupational health facilities
 - A general practitioner or urgent care medical centre
 - A hospital emergency department
- Some poisons have specific antidotes. With some exceptions these are rarely used outside of a hospital. However, accurate identification of the poison will help treatment. If there are packets or bottles, they should be secured and go with the person to hospital.
 - Industries that have an increased risk of exposure to particular poisons may stock specific antidotes. Those working in these environments may have specialised training and protocols for the administration of these antidotes. Hospitals may not always stock specific antidotes to poisons so a supply of the antidote should accompany the poisoned person to hospital.

4.6 If unable to get advice, or while waiting for help to arrive:

- ANZCOR recommends to monitor the person, especially their airway, level of response and breathing, and manage according to the ANZCOR Basic Life Support Flowchart [Refer to ANZCOR Guideline 8]. [Good Practice Statement]

Further Reading

- ANZCOR Guideline 8 Cardiopulmonary Resuscitation
- ANZCOR Guidelines 9.4.1 to 9.4.8 Envenomations
- For information on specific poisons, consult the Australian Poisons Information Centre on 13 11 26 or New Zealand poisons centre 0800 764 766 (0800 POISON)

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About this Guideline

Search date/s	2010 - 2018
Question/PICO:	Original literature review undertaken on management of cyanide poisoning, not included in this guideline
Method:	Scoping review for new publications since 2010 on all except cyanide, no significant new publications found
Primary reviewers:	Michael Reade, Kevin Nation
Other consultation	Finlay Macneil, Geoffrey Newman-Martin
Approved:	April 2021
Guidelines superseded:	ANZCOR Guideline 9.5.1 - July 2011

ANZCOR Guideline 9.5.2 – First Aid Management of Opioid Overdose

Summary

Who does this guideline apply to?

This guideline applies to adults and children

Who is the audience for this guideline?

This guideline is for people who wish to assist another person who is unwell as a consequence of ingested, injected, transdermal or inhaled opioids, who are not healthcare professionals or trained first aiders, but have participated in overdose-response training (“overdose witnesses”).

This guideline may also be used by members of staff at “medically supervised injecting facilities” where they exist.

This guideline specifically does not apply to healthcare professionals (except staff at medically supervised injection facilities) community first aid providers, workplace first aiders, volunteers, or employees of first aid organisations or those providing first aid on a community bystander basis. These people are supported by ANZCOR Guideline 9.5 - Poisoning.

Recommendations

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

1. Start CPR without delay for any unconscious person not breathing normally [ANZCOR Guideline 8] [Good practice statement]
2. Lay rescuers can administer naloxone in suspected opioid related respiratory or circulatory arrest when they are trained in its use.¹ [Good practice statement]
3. People who regain normal consciousness and respiratory function after naloxone rescue should be transported to hospital for observation.¹ [Good practice statement]

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation
CPR	Cardiopulmonary Resuscitation
CoSTR	Consensus on Science with Treatment Recommendations (from International Liaison Committee on Resuscitation - ILCOR)

1 Introduction

Opioids are a class of drug which are generally used as pain-killing medications, but are also used for recreational drug use. Examples include morphine, codeine, oxycodone, hydrocodone, heroin, and fentanyl. Different preparations of opioids can be ingested, injected, transdermal or inhaled.

Opioid overdose is a common and important type of poisoning in the community. Overdose can lead to unconsciousness, slowing or stopping of breathing, and can potentially cause cardiac arrest.

Naloxone is an antidote to opioid poisoning. Recent advances in availability of naloxone to community members have improved the care of persons affected by opioid overdose. This guideline recommends the prompt provision of CPR to persons who are unconscious and not breathing normally, and the administration of naloxone by community members who have received appropriate training in the context of naloxone availability programs.

2 Opioid ingestion and injection

Opioid use is an increasing cause of illness across the world. Australia has observed an increasing incidence of opioid overdose in the community. Opioid use resulting in life-threatening side effects can occur in a variety of circumstances, including deliberate administration, accidental ingestion, iatrogenic error and prescription by healthcare professionals.

2.1 Signs and symptoms

The presence of evidence of opioid use (for example, opioid medications or packets, injecting materials, prescriptions or recent recorded medication administration should raise the possibility of opioid use. This can produce symptoms including:

- reduced conscious state or unconsciousness;
- confusion;
- slow or slurred speech;
- reduced respiratory rate;
- pinpoint pupils.

2.2 General Treatment including CPR

First aid for opioid ingestion or injection has traditionally been managed using standard techniques for managing unconscious person. These principles are still of vital importance.

- If the person is unconscious but is breathing, lay person on their side and ensure airway is clear [Refer to ANZCOR Guideline 3].
- If the person is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support Flowchart [Refer to ANZCOR Guideline 8].

A delay in starting CPR for patients with cardiac or respiratory arrest may be fatal. Sometimes a person may not be breathing normally and have ineffective breaths, they need CPR commenced despite these ineffective breaths [Refer to ANZCOR Guideline 8]

2.3 Naloxone

Naloxone has been used in pre-hospital (paramedic) and hospital practice for many years as an intramuscular or intravenous injection. It has not traditionally been available to first aiders or bystanders. Recently, the legal requirements around the possession and use of naloxone have changed in some parts of Australia, making naloxone more available in the community.

Naloxone distribution to likely witnesses of opioid overdose has been trialled overseas, with no serious adverse events noted. Naloxone is now available for intra-nasal administration (atomisation) as well as intra-muscular injection. Intra-nasal atomisation is now the preferred route of administration given superior ease of use and safety. Government programs in Australia have started distributing naloxone to likely witnesses of opioid overdose, in conjunction with appropriate training.

ANZCOR believes it is appropriate for witnesses of opioid overdose to administer naloxone where their suspicion of opioid overdose is high, and they are trained to do so, provided this action is not at the expense of providing CPR and calling an ambulance.

2.4 Follow up after successful naloxone rescue

A person who experiences opioid overdose and responds to first aid measures including CPR and naloxone should be referred to the ambulance service.

Where the ingested medication is long-acting (for example, Heroin or long-acting oral opioid preparations), there is a significant risk that the duration of action of the administered naloxone will be shorter than the ingested opioid, and the person may subsequently deteriorate, making referral essential.

Strong consideration should be given to transporting the person to hospital by ambulance, both to ensure that the risk of deterioration can be safely managed, and to allow the person to access further doses of naloxone. The person should be watched closely for evidence of recurrence of the respiratory depression until handed over to the paramedics.

3 Training requirements for naloxone use by non-medical responders

Emerging evidence has suggested that many people in the community can successfully deliver the intervention after brief training. Organisations running naloxone-access programs should ensure that training provided is adequate for the purpose and equips participants specifically to safely deliver naloxone. Trainers should ensure that participants are adequately trained, including in CPR, safe management of persons during and after overdose, and safe infection control and injection hygiene practices.

There remains a significant risk that naloxone administration may be prioritised over CPR, or that starting CPR might be delayed, and training programs should address this risk.

4 Other implications

4.1 Cost

Naloxone in Schedule 3 preparations in Australia is costly and this may function as a barrier to access for people most likely to benefit from the intervention.

Organisations running naloxone-access programs should ensure that cost does not exclude community members from accessing naloxone treatment.

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About this Guideline

Search date/s	October 2019
Question/PICO:	<p><i>Population:</i> Adults and children with suspected opioid-associated cardio / respiratory arrest in the pre-hospital setting</p> <p><i>Intervention:</i> Bystander naloxone administration (intramuscular or intranasal), in addition to standard CPR</p> <p><i>Comparators:</i> Conventional CPR only</p> <p><i>Outcomes:</i> Survival to hospital discharge with good neurological outcome and survival to hospital discharge were ranked as critical outcomes. Return of spontaneous circulation (ROSC) was ranked as an important outcome.</p> <p><i>Study Designs:</i> Randomized controlled trials (RCTs) and non-randomized studies (non-randomized controlled trials, interrupted time series, controlled before-and-after studies, cohort studies) are eligible for inclusion.</p> <p><i>Timeframe:</i> All years and all languages were included as long as there was an English abstract; unpublished studies (e.g., conference abstracts, trial protocols) were excluded. Literature search updated to Oct, 2019.</p>
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