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)

1.0 | 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.

2.0 | 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 arrest[2]. 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.

3.0 | 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

1. Sutherland SK, Tibballs J. Australian Animal Toxins. Melbourne: Oxford University Press 2001.
2. Johnston CI, Ryan NM, Page CB, Buckley NA, Brown SG, O'Leary MA, Isbister GK. The Australian Snakebite Project, 2005-2015 (ASP-20). MJA. 2017;207: 119-125.
3. Welton, RE, Liew, D and Braitberg, G. (2017). Incidence of fatal snake bite in Australia: A coronial based retrospective study (2000–2016). Toxicon. 131:11-15.
4. Avau B, Borra V, Vandekerckhove P, De Buck E. The treatment of snake bites in a first aid setting: a systematic review. PLoS neglected tropical diseases. 2016 Oct 17;10(10):e0005079.

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://biomedicalsciences.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-expo- sure 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 (no link)
Approved:	April 2021
Guideline superseded:	ANZCOR Guideline 9.4.1 - March 2020

Referencing this guideline

When citing the ANZCOR Guidelines we recommend:

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https://www.anzcor.org/home/first-aid/guideline-9-4-1-first-aid-management-of-australian-snake-bite