

# STATE TOXINOLOGY SERVICES

Toxinology Dept., Women's & Children's Hospital, North Adelaide SA 5006 AUSTRALIA

## SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT

www.toxinology.com record number SN0183

Family Elapidae  
Scientific name combined *Naja melanoleuca*

Common name Black Cobra , White-lipped Cobra , Forest Cobra , Black and White-lipped Cobra , Black-lipped Cobra

Global region in which snake is found  
Sub-Saharan Africa

### CLINICAL OVERVIEW

Forrest cobras cause comparatively minor local effects and are not necrotic, but can cause severe neurotoxic flaccid paralysis requiring antivenom and respiratory support. The large size of these snakes, and toxicity of the venom, makes them potentially very dangerous, but recorded bites are few.



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## **SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT**

### **SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT (continued)**

#### *Naja melanoleuca*

#### **First aid**

1. After ensuring the patient and onlookers have moved out of range of further strikes by the snake, the bitten person should be reassured and persuaded to lie down and remain still. Many will be terrified, fearing sudden death and, in this mood, they may behave irrationally or even hysterically. The basis for reassurance is the fact that many venomous bites do not result in envenoming, the relatively slow progression to severe envenoming (hours following elapid bites, days following viper bites) and the effectiveness of modern medical treatment.
2. The bite wound should not be tampered with in any way. Wiping it once with a damp cloth to remove surface venom is unlikely to do much harm (or good) but the wound must not be massaged. For Australian snakes only, do not wash or clean the wound in any way, as this may interfere with later venom detection once in a hospital.
3. All rings or other jewellery on the bitten limb, especially on fingers, should be removed, as they may act as tourniquets if oedema develops.
4. If the bite is on a limb, a broad bandage (even torn strips of clothing or pantyhose) should be applied over the bitten area at moderate pressure (as for a sprain; not so tight circulation is impaired), then extended to cover as much of the bitten limb as possible, including fingers or toes, going over the top of clothing rather than risking excessive limb movement by removing clothing. The bitten limb should then be immobilised as effectively as possible using an extemporised splint or sling.
5. If there is any impairment of vital functions, such as problems with respiration, airway, circulation, heart function, these must be supported as a priority. In particular, for bites causing flaccid paralysis, including respiratory paralysis, both airway and respiration may be impaired, requiring urgent and prolonged treatment, which may include the mouth to mask (mouth to mouth) technique of expired air transfer. Seek urgent medical attention.
6. Do not use Tourniquets, cut, suck or scarify the wound or apply chemicals or electric shock.
7. Avoid peroral intake, absolutely no alcohol. No sedatives outside hospital. If there will be considerable delay before reaching medical aid, measured in several hours to days, then give clear fluids by mouth to prevent dehydration.
8. If the offending snake has been killed it should be brought with the patient for identification (only relevant in areas where there are more than one naturally occurring venomous snake species), but be careful to avoid touching the head, as even a dead snake can envenom. No attempt should be made to pursue the snake into the undergrowth as this will risk further bites.
9. The snakebite victim should be transported as quickly and as passively as possible to the nearest place where they can be seen by a medically-trained person (health station, dispensary, clinic or hospital). The bitten limb must not be exercised as muscular contraction will promote systemic absorption of venom. If no motor vehicle or boat is available, the patient can be carried on a stretcher or hurdle, on the pillion or crossbar of a bicycle or on someone's back.
10. Most traditional, and many of the more recently fashionable, first aid measures are useless and potentially dangerous. These include local cauterization, incision, excision, amputation, suction by mouth, vacuum pump or syringe, combined incision and suction ("venom-ex" apparatus), injection or instillation of compounds such as potassium permanganate, phenol (carbolic soap) and trypsin, application of electric shocks or ice (cryotherapy), use of traditional herbal, folk and other remedies including the ingestion of emetic plant products and parts of the snake, multiple incisions, tattooing and so on.

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### SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT (continued)

*Naja melanoleuca*

#### Clinical summary

As a group, cobras present two major clinical profiles; minimal local reaction, but with progressive flaccid paralysis OR significant local reaction (pain, swelling, discolouration, blistering, even necrosis) with, or more usually without even mild flaccid paralysis. Most older textbooks listing snakebite will only mention the first (neurotoxic) profile, but both in Africa and Asia, it is the second profile which dominates. The majority of medically important cobras (ie those causing most bites) cause local tissue injury, ± paralysis. However, there are a few species that seem never to cause significant tissue injury, but only paralysis. *Naja melanoleuca* falls into this latter category. Some species can cause either profile, making diagnosis difficult, because purely paralytic snakebite in some areas, such as India & Sri Lanka, is typical of krait bite, with which this type of cobra bite can easily be confused.

Some species of cobra (a subgroup of those causing local tissue injury) can also spit their venom, causing venom spit ophthalmia. *Naja melanoleuca* does not spit its venom.

Purely neurotoxic cobras such as *Naja melanoleuca* generally cause minimal to moderate local pain or swelling at the bite site, and local lymphadenopathy can develop. A variable time later they develop symptoms of systemic envenoming, such as headache, nausea, vomiting and abdominal pain, occasionally with a period of collapse. They develop progressive flaccid paralysis, commencing <1hr, up to >6hrs after the bite, with ptosis, then ophthalmoplegia, dysarthria, dysphagia, drooling, fixed dilated pupils, then limb weakness and finally respiratory paralysis, the latter sometimes taking >24 hrs to become evident. Muscle spasms are sometimes seen. Once paralysed, these patients may need respiratory support for several days, sometimes > a week, unless specific antivenom is given to reverse paralysis. Antivenom will not always be effective at reversing paralysis.

## SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT

### SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT (continued)

#### *Naja melanoleuca*

#### Treatment summary

Cobra bites vary from species to species. Many in both Africa and Asia cause major local effects, including swelling, pain, blistering and necrosis. Some of these also cause flaccid paralysis in a minority of cases. Other species cause flaccid paralysis without major local effects. *Naja melanoleuca* is in this latter group.

For all cases, admission to an ICU, urgent triage and assessment are required. If there is evidence of respiratory distress or paralysis, intubation and ventilation takes precedence. Establish an IV line, give an initial IV fluid load, take blood for routine tests, monitor fluid input/output. The local wound, if significant, should be managed as for bites by other snakes causing local tissue injury. However, bites by *Naja melanoleuca* are not expected to cause major local effects, so if significant effects, and especially tissues necrosis develops, re-evaluate the identification of the snake.

The role of antivenom in cobra envenoming is not entirely clear. For cases developing significant paralysis, it is the treatment of choice, though the correct antivenom must be used, where available, as there are considerable differences between species. For paralysis, in addition to antivenom, it is appropriate to try the tensilon test and if positive, to use neostigmine + atropine as an adjunct to antivenom. The initial and (if required) subsequent doses of antivenom will vary from antivenom to antivenom, but in all cases it must be given IV. For *Naja melanoleuca*, the current recommended antivenom is the South African polyvalent product (SAVP, ex SAIMR). Initial dose is uncertain, some authors suggesting at least 5 vials. In any case with significant envenoming, an initial dose of 8 vials may be appropriate, but be prepared to give more if flaccid paralysis extends.

For local tissue injury, not expected with this species, the role of antivenom is less certain, but it is generally accepted it may be useful, especially if used early. Again, it must be used IV, not IM and definitely not injected locally.

The following applies to management of locally necrotic bites, unlikely to be applicable to this species: Blisters should be drained with a syringe. If necrosis develops, surgical debridement is appropriate. Compartment syndrome is unlikely to develop, but if it is suspected, ensure it is confirmed by direct manometry or Doppler US before considering fasciotomy. The extensive wounds possible following snakebite necrosis are subject to secondary infection and if chronic, later development of squamous cell carcinoma. Both for functional reasons and to avoid the latter complication, surgical repair is required, even just skin grafting being useful. If there is evidence of infection, ensure a swab is performed for culture & sensitivity prior to commencing any antimicrobial therapy.

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### **SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT (continued)**

*Naja melanoleuca*

#### **Available antivenoms**

SAVP (SAIMR) Polyvalent Antivenom  
South African Vaccine Producers (Pty) Ltd  
Postal -  
P.O. Box 28999  
Sandringham 2131  
Gauteng Province

Physical -  
1 Modderfontein Road, Sandringham  
Johannesburg  
South Africa  
Phone: ++27-11-882-9940  
Fax: ++27-11-882-0812  
Email: [savpunit@global.co.za](mailto:savpunit@global.co.za) / [savpqual@global.co.za](mailto:savpqual@global.co.za)  
Website: [www.savp.co.za](http://www.savp.co.za)

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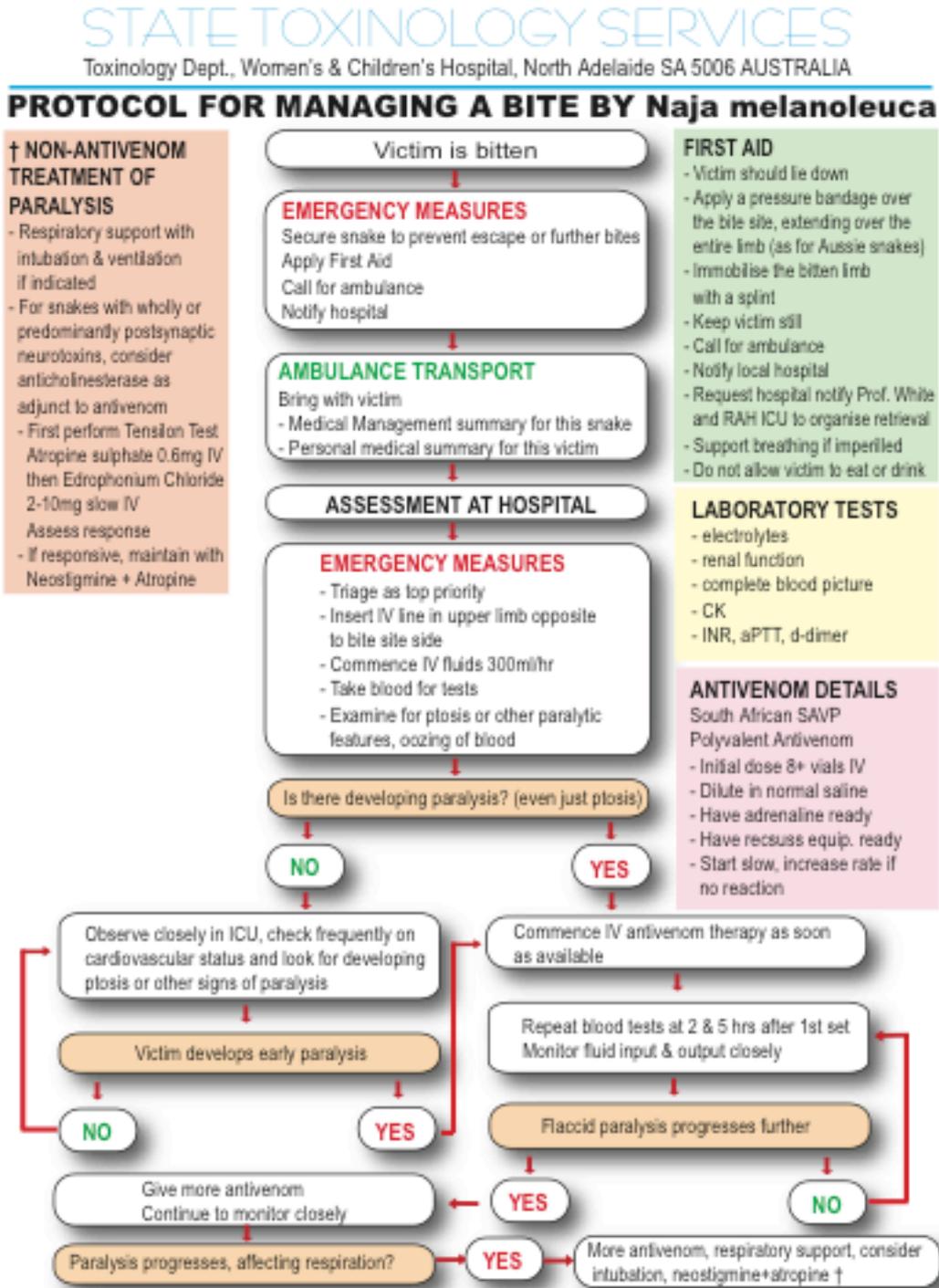
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### SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT (continued)

*Naja melanoleuca*

#### Management Flowchart



Observe closely in ICU, check frequently on cardiovascular status and look for developing ptosis or other signs of paralysis

Victim develops early paralysis

NO

YES

Give more antivenom  
Continue to monitor closely

Paralysis progresses, affecting respiration?

YES

Commence IV antivenom therapy as soon as available

Repeat blood tests at 2 & 5 hrs after 1st set  
Monitor fluid input & output closely

Flaccid paralysis progresses further

YES

NO

More antivenom, respiratory support, consider intubation, neostigmine+atropine †