Module # 11 – Component # 4

Basic First Aid for Snake Bite Envenomation

Objectives

The aim of this component is to provide the student with a concise and rational approach to the diagnosis, treatment and patient management of a person who has experienced snake bite envenomation.

Expected Outcomes

- To reassure your guests that the chances of encountering a medically venomous snake when walking through the bush are negligible.
- To account for the occurrence of most snake bites.
- To be able to ascertain whether a person has actually been bitten.
- To be able to ascertain whether envenomation has actually taken place.
- To be able to describe the correct procedure for the management of a snake bite victim.
- To be able to list the symptoms of eye envenomation.
- To account for the specific species responsible for each type of envenomation, whether it be Cytotoxic, Neurotoxic or Haemotoxic.
- To be able to describe the symptoms for each type of envenomation.
- To list the peculiarities of a berg adder bite.
IMPORTANT NOTE

IN ORDER TO QUALIFY FOR COMPLETE FGASA & THETA ACCREDITATION, A FULLY RECOGNISED AND COMPREHENSIVE FIRST AID COURSE MUST BE COMPLETED BY THE STUDENT. CONTACT EITHER THE RED CROSS OR YOUR LOCAL HOSPITAL FOR DETAILS.

However, in addition to this all Field Guides must be fully competent to recognise and treat all forms of envenomation (bites or stings received from animals).

This component will cover the basics of dealing with snake bites.

Insect, arachnid and other arthropod envenomation will be dealt with in the following component.

Introduction

Bites and stings by venomous animals have the potential to cause serious local effects and system wide toxic effects. Injuries caused by venomous animals can be divided into four categories:

- Local mechanical injury
- Local and systematic effects
- Hypersensitivity (allergic reactions)
- Infection
Snake Bite

Snake bite is perhaps the most feared of all injuries that may befall people when out in the bush. The fact that most people have an instinctive fear of snakes certainly contributes to this. However, as has been previously discussed (Module # 4, Component # 3), only 10% of South Africa’s rich diversity of snakes are venomous to the degree of being potentially dangerous. Recent statistics indicate that only a small fraction of those bitten are likely to die (1%) and this is mainly due to the fact that either no, or the incorrect, treatment was administered.

Prevention

In our earlier discussion on snakes, it was already mentioned that all snakes have a more instinctive fear of us than we do of them. When snakes are encountered in the field, guides should always make a concerted effort to avoid them. Snakes do not as a rule view humans as a prey species. The vast majority of snake bites occur when the snakes are tormented, handled or put into a position (deliberately or inadvertently) where they may view biting as their last option of defence.

As you will recall from Module # 2, Component # 3, all medically important snakes have been divided up into three groups on the basis of the effects of their venom. These are

- Cytotoxic
- Neurotoxic
- Haemotoxic
Procedure when a Bite Occurs

Certain steps must be followed by the field guide if it is thought that a snake bite has occurred.

1. Decide whether that victim has actually been bitten by a snake.

2. Decide whether envenomation has actually occurred, (remember only ± 10 % of South African species are venomous).

3. Provide basic life support in cases of severe envenomation. This should only become necessary if the introduction of anti-venom is delayed, or if the victim is hypersensitive.

4. Provide general support and symptomatic support (ONLY IF QUALIFIED TO DO SO).

5. Arrange for immediate removal of the patient to a proper medical facility for anti-venom administration.

6. DO NOT ATTEMPT TO ADMINISTER ANTI-VENOM YOURSELF UNLESS YOU HAVE BEEN SPECIFICALLY QUALIFIED TO DO SO !!!

7. However if the victim’s removal is delayed, and anti-venom (snake bite kit) is available, administer the anti-venom. Anyone that carries a snake bite kit should be thoroughly trained in its use.
1) Has the Person been Bitten?

- The victim or another witness may be able to verify that the bite has taken place.
- Look for bite marks. These are usually present, but may occasionally be difficult to locate. Where present, typically two puncture wounds are seen ± 10 – 20 mm [½ in] apart.
- The victim might be in shock.
- Initiate a cursory search of the immediate area in order to establish the identity of the snake. This will be helpful in the subsequent treatment of the victim.
- **DO NOT UNDERTAKE ANY “HEROIC” MEASURES IN IDENTIFYING THE SNAKE. THIS WILL ONLY LEAD TO ANOTHER VICTIM OF SNAKE BITE.**

2) Has envenomation occurred?

- General clinical features of envenomation include:
  - Fear and anxiety
  - Pain and / or numbness, swelling around the bite and local tissue damage (Specifically in Cytotoxic bites)
  - Weakness, nausea, vomiting, sweating and thirst.

3) Basic Life support, general support and evacuation.

The specifics of these procedures lie outside of the scope of this course and are **not included in the practical course**. It is **absolutely essential that the basic skills of first aid are acquired.** The location of where you find employment should have basic procedures in place to deal with emergency evacuation of casualties. **MAKE SURE THAT YOU FAMILIARISE YOURSELF WITH THESE PROCEDURES AS SOON AS POSSIBLE.**

The following section is a **presentation of the first aid measures** required for the management of snake bite. It is stressed that this is not a suitable substitute for formal training. It is the absolute responsibility of the student to attain a formal first-aid qualification.
Management of a snake bite victim

Follow the steps commonly known as:

S. ➔ Safety
A. ➔ Airway
B. ➔ Breathing
C. ➔ Circulation

- Make sure that there is no danger to yourself before attempting to assist the victim.
- Make sure that there are no obstacles to breathing for the victim. Eg. A blocked airway.
- Ensure that the victim is able to breathe easily.
- Perform CPR (Cardio-pulmonary resuscitation) if necessary.
- Expose the area of the bite by cutting away overlying clothing.
- Wipe away any excess venom from the skin, using plenty of water.
- Cover the wound with a sterile dressing.
- Keep the victim calm and discourage movement.
- Remove rings or other items that may restrict circulation in the proximity of the wound.
- **DO NOT** squeeze or cut into the wound.
- **DO NOT** apply any local remedies.
- **DO NOT** attempt any electric shock treatment, as it is of no value.
- Suction of the wound may only be attempted if one is in possession of the correct apparatus Eg. *Aspivenin*. **DO NOT ATTEMPT TO SUCK OUT THE VENOM WITH YOUR MOUTH.**
- If a Neurotoxic or Haemotoxic bite is suspected, **apply a crepe bandage as tightly as possible**, as for a sprain, over the site of the bite and extend the bandage to cover the whole limb, with the exception of the digits. The bandage causes the collapse of local lymphatic drainage reducing the absorption of venom into the blood stream. It should not be so tight that it causes swelling or pain.
- **DO NOT** apply a crepe bandage in the case of a Cytotoxic snake bite.
- An arterial tourniquet may **ONLY** be applied for Neurotoxic and Haemotoxic envenomation, **IF** medical assistance is several hours away. Release and reapply the tourniquet every half hour.
- Immobilise the affected area (arm or leg) with a splint or sling.
- **DO NOT** let the victim drink if there is any difficulty in swallowing. With cytotoxic snake bite, maintaining body fluid is important in reducing the risk of shock.
- Monitor breathing and other vital signs continuously.
- **ARRANGE FOR IMMEDIATE REMOVAL OF THE VICTIM TO HOSPITAL.**
Eye Envenomation

The Rinkhals and spitting cobras are able to spray or spit their venom up to a distance of three meters [10 ft]. They are not specifically very accurate, rather generating a fine aerosol spray in the general direction of their aggressor. Only one droplet is sufficient to cause all of the symptoms listed below.

Symptoms of eye envenomation

- Immediate and severe burning pain
- Swelling
- Impaired vision
- Disorientation
- Itching

Treatment

- **Rinse the eyes** immediately with copious amount of water.
- Other types of bland liquid like milk, fruit juice or soft drinks may also be used. DO NOT use alcohol in any form. Urine may be used in the absence of anything else.
- Continue to rinse for 15 to 20 minutes.
- **DO NOT** rub the eyes.
- If available, apply local anaesthetic eye drops.
- Cover with an eye pad
- **ARRANGE IMMEDIATE REMOVAL OF THE VICTIM TO HOSPITAL.**
Cytotoxic Snake Bite

Snakes that are responsible for this type of envenomation include:

**Major Bites**
- Puff adders
- Gaboon adders
- Spitting cobras
- Rinkhals (some sources report their bite to be neurotoxic)

**Minor Bites**
- Horned adders
- Night adders
- Berg adders

**Symptoms of a Cytotoxic bite**
- An immediate, local and intense **pain** at the site of the bite.
- Marked **swelling** that gradually becomes pronounced.
- Subcutaneous **tissue necrosis** (the tissue around the bites dies and changes colour).
- Swelling may involve the entire limb.
- Substantial **fluid loss** may lead to circulatory failure.
- An **irregular heart beat** has been reported in Gaboon adder bites.
- Where the bite is considered minor, the effects may be similar, but reduced.
Neurotoxic Snake Bites

Snakes responsible for this type of envenomation include:

- Black mamba
- Green mamba
- Cape cobra
- Forest cobra
- Egyptian cobra
- Berg adder (discussed separately)

Symptoms of a Neurotoxic bite

- **Pain** at the site of the bite.
- Varying degree of minor local **swelling**
- The affected area may have a **blue discolouration**.
- Bite victims may present with a combination of **drowsiness, vomiting, hyper-salivation, sweating** and **trembling**.
- After 30 to 120 minutes, victims may also begin to exhibit **blurred or double vision, dilated pupils, slurred speech** and **difficulty in swallowing**.
- Within 1 – 3 hours, victims will begin to experience progressive **respiratory muscle paralysis** which ultimately leads to **respiratory failure** – the most serious effect of Neurotoxic envenomation.
- The stiletto snake, or burrowing asp species, is also a common cause of neurotoxic envenomation but not with life threatening symptoms. These bites are commonly characterised by a **single fang penetration**.
**Berg adder bite**

The envenomatory effects of a bite from this species are **very distinctive** in that its venom is both Cytotoxic and Neurotoxic. Symptoms of berg adder bites include:

- Loss of eye movement
- Loss of sense of taste and smell
- Selective paralysis of some cranial nerves
- Difficulty in swallowing.
- Respiratory failure.

Envenomation by berg adder bite is not generally considered life threatening. However, if introduced in sufficient quantities it might become so. In addition the **loss of taste and smell may persist** for up to 12 months and more.
Haemotoxic Bites

Snakes responsible for this type of envenomation include:

- Boomslang
- Vine snake

Symptoms of a Haemotoxic bite

The effects of a Haemotoxic bite revolve around the fact that the venom depletes the necessary blood compound (fibrinogen) that enables blood clotting. The venom is also responsible for breaking down internal blood vessels.

- **Minimal swelling** at the bite site.
- **Oozing of uncoagulated blood** from the bite site.
- Victims may also experience **lethargy, headache, confusion, sweating, nausea and vomiting**.
- After 12 – 36 hours victims may begin to present with **bleeding** from some or all orifices.
- The condition (if untreated) may then rapidly deteriorate into **multiple organ failure**.

In almost all cases **anti-venom is required** to treat cases of boomslang envenomation. It may therefore be necessary to transport the anti-venom to the victim. If this is the case contact the **South African Vaccine Producers** immediately on:

| 011 386 6000 [office hours] or 011 386 6078 [after hours] |