Spawls, S. et al., 2002. Field Guide to the Reptiles of East Africa.
Academic Press: London

APPENDIX 1: NOTES ON SNAKEBITE

This section was authored by Stephen Spawls
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by Stephen Spawls and Bill Branch

AVOIDING SNAKEBITE

In East Africa, snakebite is a hazard faced by most rural (and many urban) dwellers. Its effective prevention lies largely with raising living standards. Many rural dwellers farm using hand tools, move around barefoot and without lights at night and sleep on the ground, and thus face a high risk of snakebite. Most accidental snakebites in Africa are inflicted on the leg, below the knee, and most of the remainder on the hand or the wrist (in general, viper bites on the hand or foot, elapid bites may be higher up on the limb). The health worker concerned with preventing snakebite will be aware of the impracticality of telling the rural poor to always use a torch at night, not to use short farming tools and always wear strong footwear. However, they can help people lower the risk of snakebite by taking what precautions are practical, for example making sure there are no good hiding places for snakes near the home, raising beds off the floor and providing an obstruction to the entry of snakes into the buildings (a door or half door).

In general, where practical, the following precautions will reduce the risk of snakebite.

Homes should be kept free of hiding places for snakes. Such places include piles of stones, bricks, firewood, grass, rubbish tips, pits, etc. Open holes near homes should be blocked (especially any associated with termite mounds or squirrel warrens).

Large trees or bushes that touch against houses should be cut back (tree snakes will use them as passageways) and the lower branches of thick bushes cut away, and leaf litter cleared from beneath. Rubbish tips and rock piles attract rats and lizards, which may in turn attract snakes. Don't have dripping taps or open water sources; snakes may come to drink in the dry season, frogs may come for the water and snakes for the frogs. Domestic fowls, rabbits and cage birds kept outside or on verandas will also attract snakes.

When walking, look where you are going. Use a lamp or torch at night. Don't blunder through tall grass, overhanging bush or thick cover. Don't put your hands or feet into places you can't see, in particular under objects lying on the ground, into piles of rocks or logs, and take care stepping over rocks or logs. Don't gather firewood at night.

If possible, wear adequate footwear, something that covers the foot and the ankle, long trousers also help.

Don't sleep on the ground.

Don't tease or play with snakes, or molest them. Don't pick up or play with a supposedly dead snake – some species sham death, and even if fatally injured, snakes can still bite and kill – a case is known of a Puff Adder giving a venomous bite 30 minutes after it was cut in two. If you have to kill a snake, use something long - a long stick, hosepipe, panga or whip, or throw a rock or use a gun. Don't play with the body.

If you meet a snake at close quarters, try to remain calm, stand still. Don't lash out at it or make threatening gestures. Stay calm and move backwards slowly. Snakes never make unprovoked attacks.

If working or travelling in remote country, try not to go alone – a snakebite victim on their own is at much greater risk than a member of a group.

However, one thing is worth remembering. Snakebite is generally not a significant risk in East Africa, far more people die of diseases like malaria, AIDS, or in vehicle accidents than are killed by snakes. Fear of snakebite should not put off the potential visitor to remote East Africa. In rural areas, the local people may be at much greater risk (for the reasons detailed above), but nevertheless, compared with the risk from diseases like malaria, death from snakebite is a much smaller risk.

EAST AFRICA'S DANGEROUS SNAKES

At present, just under two hundred species of snake are known from East Africa. Of these, 41 are dangerous in that they have front fangs (5 burrowing asps, 14 elapids, 21 vipers and one sea-snake), 4 are back-fanged but are known to have life-threatening venom, and 2 are pythons, which grow big enough to constrict humans severely. That is a total of 47, 23.5% of the total. Of these, 18 species are known to have killed humans; they are the 2 big pythons, Boomslang, Savanna Vine Snake, Variable and Small-scaled Burrowing Asp, Egyptian Cobra, Forest Cobra, Black-necked Spitting Cobra, Mozambique Spitting Cobra, Green Mamba, Jameson's Mamba, Black Mamba, Puff Adder, Gaboon Viper, Rhinoceros Viper, North-east African Carpet Viper and Green Bush Viper.

However, of the 47 dangerous species, few pose any practical threat to people. The danger any particular species represents depends on (a) how common or widely distributed it is, (b) how potent its venom is, (c) how big it is, (d) how often it comes into contact with people on account of its habits. The Puff Adder, for example, is a highly dangerous species, because it is widely distributed and is common in savanna, it has a potent venom, it grows large and often comes in contact with people. On the other hand, the Kenya Montane Viper is not a dangerous snake in broad terms because it lives in a very restricted area, its venom isn't known to be potent, it is very small and because it lives on montane moorlands, it does not often come into contact with people.

In general, East Africa's really dangerous snakes, in terms of the number of people they bite and the resulting number of fatalities and serious injuries, are savanna snakes with fairly wide distributions. Most of them are large (except the North-east African Carpet Viper). Snakes in this category are the Puff Adder, North-east African Carpet Viper (in northern Kenya), Black-necked Spitting Cobra, Egyptian Cobra, Mozambique Spitting Cobra (in south-eastern Tanzania) and Small-scaled Burrowing Asp. Two other snakes in this category might include the Gaboon Viper and Black Mamba. Most of the snakes in this group are willing to bite if molested, and have a fair number of deaths or injuries to their name. All except the burrowing asp are covered by some sort of antivenom and it is worth being able to identify them all. To the poor East African farmer the Puff Adder is probably East Africa's most dangerous snake, followed by the Black-necked Spitting Cobra, whilst the carpet viper is a major hazard to those who live in northern Kenya.

There are a number of dangerous East African snakes, some large, that have deadly venom but by virtue of their lifestyle (tree dwelling, burrowing, aquatic) and temperament (unwilling to bite, tend to flee) have caused few or no documented bites. These include Gold's Tree Cobra, the Water Cobra, the Forest Cobra, the Boomslang, both vine snakes, Blanding's Tree Snake, Jameson's and the Green Mamba, Red Spitting Cobra, the Sea Snake, and the Rhinoceros Viper. A bite from one of these could be potentially life threatening but few bites are known. The venom of some of these snakes is covered by antiserum. The only known bites from Blanding's Tree Snake, Boomslang and the vine snakes were inflicted on incompetent snake handlers; these snakes are totally non-aggressive. No bites from the Yellow-bellied Sea Snake are known.

There is a third group of dangerous snakes, mostly small, whose bite is not usually life threatening and victims may be expected to recover from their bite without use of antiserum, in fact for most no antiserum is available. Snakes in this group include most burrowing asps, all garter snakes, Udzungwa Viper, all bush vipers, Kenya Montane Viper, Floodplain Viper, Kenya Horned Viper and all night adders. Some of the snakes in this group have a few documented deaths to their name. Most of these are due, however, to unusual circumstances, in particular (a) victims being hypersensitive to the venom and suffering allergic shock (anaphylaxis), (b) victims being young children, the very old or those in poor health, (c) victims suffering multiple bites, often after rolling on the snake while asleep, (d) bites to the head or neck, or directly into a blood vessel, (e) complications setting in due to total absence of any medical treatment, or ill-advised local treatment.

HAZARDOUS TIMES AND SEASONS FOR SNAKEBITE

Certain seasons and times carry more risk of snakebite than others. In East Africa, hazardous seasons are the start of the rainy

season, especially after a long dry season, and after rainstorms in arid country. Many snake bites also occur when farmers begin to plough and to plant, during harvesting.

The most hazardous time for snakebite is the half hour before total darkness and the first two hours after, when night snakes emerge and are active on the ground. This, of course, is also the time that people are most active at night. Late at night, fewer snakes will be active, due to falling temperatures. Snakes are also often active just after rainstorms, especially if the rain falls during late morning or early afternoon.

What Happens When a Snake Bites?

A frightened snake will try to bite, especially if it is acutely threatened by someone coming very close, or if it is restrained (by being trodden on or seized), or if it is struck. If the snake isn't dangerous, the bite may simply cause some cuts, scratches or punctures. If a dangerous snake strikes, it does not always bite - it may miss, by accident or design, or simply bang the intruder with its snout.

If the snake does bite, venom may be injected, but not always, occasionally the fangs may be driven in but no venom released. However, if one or two fangs are embedded in the victim, venom is often injected simultaneously, as described on the previous page, the venom emerging from the fang through a little hole near the tip, into tissue; the snake then jerks back, withdrawing the fang. Clinical research has shown that 50 to 80% of snakebite victims are significantly envenomated; so "dry" bites where no venom is injected do sometimes occur.

The action is quick, but the actual mechanism varies. Vipers have long fangs, erected by a hinge action. As a viper strikes, the head is tipped back, so the curved fangs point forward; the snake strikes, usually horizontally or upwards, with wide open mouth; on contact the mouth is closed rapidly, driving the fangs in deep, venom is injected and the snake pulls back quickly. Vipers rarely try to chew, but may strike rapidly again if necessary. Elapids have fixed, short fangs; the snake lunges forward, mouth wide open, and snaps its mouth shut on the victim. Cobras may let go or chew. Black Mambas are known to make multiple rapid strikes (especially when pursuing prey). The rear-fanged colubrids (Boomslang and vine snakes) usually lunge, and if they want to bite, open the mouth wide, seize and chew vigorously, working their jaws over the victim, engaging the rear-fangs, and hanging on fiercely. The burrowing asps can't strike forwards, but bite humans the same way they bite their prey in a narrow hole: pushing the head past the target, moving the lower jaw sideways to free a single fang, which is then driven in by a backward pull – hence most victims of burrowing asp bite have only a single fang mark.

Venom is injected quickly into the tissues. If it enters directly into a blood vessel, its effects may be rapid and catastrophic, but usually it is injected into adipose tissue (sometimes muscle fibre). Such rapid injection usually results in a little sac of venom squeezed into a small area of tissue. If the movement of that tissue is greatly reduced, the entry of venom (in particular, the elements with large molecules) into the bloodstream or lymphatic system is slowed down, making more time available to get the victim to medical help. Hence the importance of immobilisation therapy (detailed in the first aid section). It should also be noted that, barring direct injection into a vein or an allergic reaction by the victim to the venom itself, snake bites by large elapids are most unlikely to kill in under 4 hours, and in viper bites, death in less that 24 hours is most unlikely. Time is available to get the victim to hospital.

How Bad Will It Be?

The symptoms, their severity and the outcome of a bite by a dangerous snake will depend on a number of factors. No venom might have been injected, so nothing will happen, although victims of such bites (and even people who have been bitten by harmless snakes) are known to have experienced not only alarming symptoms of shock but also appear to display known symptoms of venomous snakebite (in particular, neurotoxic symptoms – it is hard to fake the swelling and discolouration of adder bites!) So remember – a bite from a dangerous snake does not necessarily mean a dangerous snakebite!

In general, the severity and outcome of a bite depends on the following factors (among others!):

(A) How much venom was injected. A bite in defence may involve less venom than a feeding bite. A big snake may inject more venom than a small one.

(B) The age, size and state of health of the bitten person – little children, the very old and those with depressed immune systems are particularly at risk. The amount of venom – victim's mass ratio is significant here; the larger it is, the more serious the bite. Among normally healthy persons, the innate resistance to particular venoms also varies.

(C) The site of the bite. A face or neck bite will lead more rapidly to mechanical obstruction to breathing. A bite over a bone may impede fang penetration and impair or prevent venom injection. An intravenous bite will be rapidly catastrophic. A bite on a toe or finger will not be as serious as one on the trunk or upper limb.

(D) Whether the snake embedded one fang or two, struck more than once, or hung on and chewed – this relates to the amount of venom injected.

Also significant to the outcome of the bite is the first aid received (or lack of it) at the time of the bite. Bad first aid can aggravate a bite and can even kill. Good first aid saves lives. Also important is the time elapsed between the bite and the start of medical treatment – a particularly pertinent point in Africa, where victims may be a long distance from a doctor or clinic, and may not decide to try to get there until severe systemic symptoms appear, by which time the prognosis is worse. In addition, snakebite victims in Africa usually visit local healers, before going to hospital. Such healers often "treat" the bite with various harmless rituals and applications of various potions to the skin – but some may involve incision and the placing of unsterile substances into the wound, other preparations may be swallowed to induce vomiting or have laxative effect. These healers are not, as yet, known to have any effective cures, and their reputation rests with those victims who would have recovered anyway. However, they are often very skilled at spotting systemic symptoms – in West Africa, they watch most carefully for signs of internal haemorrhage. When a patient develops systemic symptoms, he or she is informed that for some imagined reason their case cannot be treated further. The victim then goes to hospital, meaning that the physician sees the case after a long delay, which considerably complicates the treatment.

WHAT HAPPENS AFTER A BITE - WHAT WILL YOU SEE?

Snakebite is a traumatic and frightening experience. The symptoms you can expect, if venom has been injected, are detailed for the various East African species (where known!) in the description, under the heading "venom". However, some general statements can be made about the effects of snake venoms on humans. The following points are also important.

If a person has been bitten (or stung) by something he or she didn't see, but the injury was followed by immediate intense or burning local pain, then consider the possibility that it might have been caused by a scorpion or some other venomous invertebrate rather than a snake. Snake bites, even if serious, don't always cause immediate intense local pain (but bear in mind the possibility of imagined intense pain from a genuine snake bite).

Even if the bite is serious, systemic symptoms hardly ever appear in under 30 minutes, save some local pain, discoloration and swelling. So symptoms (and signs) such as pain (tenderness), nausea (vomiting), postural dizziness (hypertension), inability to breathe (dyspnoea), palpitations (irregular pulse), and anxiety, sweating and dry mouth, which appear within minutes of a bite are usually a result of fear/shock, and can often be alleviated by reassurance, immobilisation and a warm sweet drink; a physician might consider a placebo injection. But remember, a small minority of snakebite victims do react suddenly to venom, and death can follow rapidly.

Fangs are sharp and may be long; they can tear and puncture the skin, and may break off in the wound, as may solid teeth. Pain akin to being stabbed with blunt or dirty pins may be present and can be quite unpleasant, especially if a fang has snapped off in the wound, but such pain is not connected with the action of the venom. Much has been written on the information you can get from the punctures, teeth marks and so on, most of it is absolute nonsense. Usually, all you find is one or two tiny holes, with a bite from a small snake no puncture may be visible. But if there are two

punctures, their distance apart may give some clues as to the size of the snake.

It may be helpful, if someone has been bitten by a snake, to write down any details of the snake that they noticed, such as its size and colour, bearing in mind that fear may affect the victim's description. If practical, you should find out if they knew what species it was (or its local name), when the bite occurred, (or at least by day or by night), where the snake was (on ground, in tree, in hole) – these may help with identification, and what symptoms the victim is experiencing. These details may be useful to the physician treating the bite, especially if the victim becomes unconscious.

The general symptoms (none, some or all of which may present) after a successful bite by a dangerous snake are:

Python – pain, bleeding, lacerated wounds, sepsis – but no symptoms of venom.

Boomslang and vine snakes (and possibly Blanding's Tree Snake) – a haemorrhagic/coagulopathic venom; slight initial pain (save that of the bite), but within a few hours severe headache, bleeding from the fang punctures, after a few more hours bleeding from cuts and scratches and mouth injuries, blood in saliva, urine, vomit and faeces. Within 24 – 48 hours, bruises under the skin may be huge and purple, or small spots. Victim sees in shades of yellow (due to bleeding in the eye), weakness, hypotension, vomiting, unconsciousness, convulsions and death.

Burrowing asps – a cytotoxic venom, but weak. Slight initial pain, slow swelling, painful lymph nodes, dull throbbing pain and discoloration at the bite site after some hours, blood blisters may form, some necrosis at bite site, nausea and vomiting. Death most unlikely, but mild liver dysfunction has been recorded. Bites from the Small-scaled Burrowing Asp may cause heart abnormalities – impaired conduction, arrthymias, etc.

Mambas and some cobras (including tree and water cobras, but NOT spitting cobras) – powerful neurotoxin. Initial slight local pain (described as "burning" in some cases) and sometimes some slight local swelling. If the first systemic symptoms appear in under an hour, the bite is going to be severe and life threatening. Such symptoms include pytosis (drooping eyelids), loss of control of tongue and jaw, drooling slurred speech, mental confusion, blurred vision and dilated pupils, flaccid paralysis of all muscle groups and loss of tendon reflex, drowsiness, then respiratory distress. The victim struggles to breath, the chest feels tight and painful; the respiratory muscles become paralysed, so the lungs cannot inflate; convulsions and coma precede death.

Spitting cobras – neurological symptoms often absent, but severe swelling and local pain present, blistering and necrosis.

Garter snakes – neurotoxin, not usually fatal. Local swelling, "tingling" sensations, pain, nasal congestion, pain in lymph nodes and glands, nausea and vomiting

Sea snakes – myotoxin. However, no known bite cases from the only species found in East African waters.

Vipers – cytotoxins. Swelling and pain within a few minutes of the bite. The pain may be sharp, but is often strong but dull, similar to that experienced after a blow with a blunt instrument. Swelling and pain are local, and gradually become severe; swelling may be massive and spread up the bitten limb, particularly with Puff Adder bites. The area around the fang puncture(s) becomes discoloured reddish, purple, blue or dark; blood blisters appear near the bite and may spread. Tissue may darken and die and then slough. Early signs of irreversible tissue death is demarcated, anaesthetic areas of skin, which may be hyper or hypo-pigmented with an associated smell of putrefaction. Blood may appear in saliva, vomit and urine and symptoms of general shock related to this haemorrhage may present. Crucial clinical signs of circulating haemorrhaging activity is spontaneous systemic bleeding from the gums. Diarrhoea and vomiting may occur.

First Aid for Snakebite

Most snake bites - more than 95% - are not only not fatal, but would not be fatal even if untreated. The body can often deal with the venom, if given the chance. A useful policy following a snakebite is "immediate hospitalisation followed by masterly inactivity" – if someone has been bitten by a

snake, it is best to watch for definite symptoms of poisoning before attempting any invasive medical treatment. Injection of serum involves risks. However, it is highly desirable that (a) sensible first aid is carried out before the victim reaches the hospital (unless the hospital is less than 5 minutes away), (b) the victim IS taken rapidly to hospital, in ALL snakebite cases, and is monitored, for at least a day in most cases.

It is most important that if a snakebite has occurred, it is accepted as a medical emergency, and plans altered accordingly. **Do not wait for symptoms to appear, do not rely on your own treatment and do not continue with normal activities in the hope that nothing is going to happen.** Even if the bite has occurred in the hours of darkness, take action straight away, do NOT wait until daylight. If a child says they have been bitten by a snake, **believe them and take action immediately.**

WHAT TO DO FIRST?

The competent lay person can do a lot to aid snakebite victims before they reach hospital. However, a lot of first aid techniques recommended in the past (or even recently) have been shown to be useless, time wasting or even highly detrimental to the patients' health. So, to start, here are things you should NOT do; the first seven may be summarised: **LEAVE THE WOUND ALONE!**

Don't make any cuts, either across, or along, or near the bite. Infection may be introduced; tendons, vessels and nerves may be damaged. Some venoms cause non-clotting blood, and the cut won't stop bleeding.

Don't apply a tourniquet. In adder bites, they greatly increase tissue damage, and may kill limbs and increase haemorrhage.

Don't inject potassium permanganate solution or magnesium sulphate, or rub potassium permanganate into the wound. These chemicals have no neutralising effect and may cause tissue damage or poisoning of their own.

Don't pack the wound with ice or try to keep it cold.

Don't give an electric shock with a stun gun, cattle prod, car plug lead or any other improvised electrical device; it has no effect on the venom and the shock will certainly traumatise and may kill the victim.

Don't bother with poultices, herbs, snake stones, etc. They are all useless. Never rub anything into the wound.

Don't rub, massage or heat up the wound site.

Don't give alcohol.

Don't give pain relievers containing aspirin, which reduces platelet adhesiveness.

WHAT YOU SHOULD DO NEXT

A recent authoritative study shows that in snakebite cases, the single most important thing to do is to arrange rapid, safe transfer to hospital. However, while this is being organised, the following activities should be carried out (unless the hospital is very close). Obviously the parts of this section that can be carried out will depend on how many there are in the party, but do as many as possible, as rapidly as possible.

Get the victim to lie down immediately. Reassure them and try to get them to relax while you start pressure bandaging. Quote the statistics on snakebite – most victims recover without treatment, you've got plenty of time, etc. Point out how important it is to stay calm and relaxed. Keep talking, stay calm yourself, don't leave the victim alone if possible.

If the snake was a non-spitting cobra or a mamba, then put on a pressure bandage, as described below. If the snake was unseen, then put the bandage on, but watch carefully for swelling; if this starts to become gross you may have to remove the bandage (viper bite causes considerable swelling and (except in rare cases) isn't going to kill you in under 24 hours, so rather than bandage put your effort into getting rapidly to hospital). If you haven't got a crepe bandage, strips of clothing, towel or sheet will do. It is a medical fact that a firm bandage applied over the bitten area significantly delays the movement of venom, and if this is combined with immobilising the limb, very little venom reaches the bloodstream. So apply a broad pressure bandage over the bite site as soon as possible, by wrapping the bandage firmly around the bitten limb. Start at the bite site and work

upwards, wrapping the limb as you would a sprain. Don't take off trousers or shirt as the movement of doing so will assist the venom to enter the bloodstream. Keep the bitten limb still. The bandage should be as tight as you would apply to a sprained ankle, i.e. very firm, but not tight enough to cut off circulation. Extend the bandage as high as possible. Apply a splint to the limb (a walking stick, snake stick, firm bit of wood, etc. will do). Bind the splint firmly to as much of the leg or arm as possible. If the bandages and splint are applied properly, they will be comfortable and may be left on for several hours; they should not be taken off until the victim reaches hospital – their removal may cause venom to move quickly into the bloodstream, so the doctor should have the appropriate drugs ready before the bandage is taken off.

If the bite is on a hand or arm, remove all jewellery immediately, especially rings.

Get someone to telephone or radio the nearest hospital, to get an ambulance or flying doctor if possible, to warn the hospital you're on your way with a snakebite case.

Do not start trying to find the snake, or kill it; two bites are worse than one. Just make sure no-one else is in danger of being bitten (i.e. if the snake is close, chase it away; if it is hidden, move away from where it is hiding. If you can see it, take a careful look but DON'T interfere with it. Most antiserums are polyvalent, so the doctor doesn't have to know the snake's identity.

Do not interfere with the wound; this may cause local infection and increases local bleeding and absorption of venom.

Get the victim to hospital. If possible, they should be carried or transported by vehicle, with the bitten limb (if the bite was on a limb) immobile. If this is impossible, try to minimise movement of the bitten limb (although obviously, if you're alone and have been bitten on the foot, you're going to have to use it).

If necessary, be prepared to give artificial respiration. In a severe cobra or mamba bite, the respiratory muscles become paralysed but the lungs are still functional, and the heart continues to beat; artificial respiration may keep the victim alive until hospital treatment and a respirator become available (a danger sign of impending respiratory failure is if the victim cannot blow out a match held at arm's length). It is best to learn artificial respiration from a qualified instructor, but important points are: the method used should be mouth-to-mouth or mouth-to-nose, the victim's head should be tipped right back and the initial rate should be 30 times per minute, and then 15 times per minute (but even 4 or 5 good breaths per minute will suffice). Start mouth-to-mouth or mouth-to-nose when and if the patient turns blue.

Treatment for Spitting Cobra Venom in the Eyes

The most effective treatment, if a spitting cobra has spat venom into someone's eye, is to wash the eye gently with large quantities of water; this will remove residual venom. The easiest way to do this, if the victim can stand, is to position the eye under a gently flowing tap, rotate the eye and move the head around, while holding the eyelid open, so water enters from all directions and reaches all parts of the eyeball. Alternatively, get the victim to put his/her face under water (if there is venom in both eyes, this is the best method) in a big bowl, sink or natural water source and then hold the eyes open and rotate them, and blink vigorously. If the victim is in severe pain and can't control themselves, lay them down on their back and get someone to hold them while someone else gently pours water into the eyes. Treatment should be started as soon as possible after the accident, but will be beneficial even if started many hours later, and should be continued for at least 20 minutes. In the absence of water, fluids such as beer, soft drinks, cold tea, saliva or urine can be used, and milk is very suitable and soothing. But NEVER use potassium permanganate solution or petrol which could damage the eye.

It may be helpful to thoroughly wash down the face, neck and hands, in case any venom is still present and then gets accidentally wiped into the eye (although venom on unbroken skin is not harmful, nor is venom in the mouth, provided it is spat out promptly). Anaesthetic eye drops would be most useful for the pain, but the victim will find it difficult not to rub the eye, and if it is anaesthetised, much damage could be done, so keep the victim's hands away from their eyes. Put a soft cotton wool pad and a soft bandage over the eye, or wear a pair of very dark glasses. Analgesic drugs don't do much good, but 1% adrenaline drops relieve the pain

dramatically. Venom in the eye is not life-threatening, merely very painful, and there is no need to inject serum. However, the victim must visit an eye clinic or a hospital, where slit lamp microscopy and/or fluorescein staining may be undertaken to see if there is any corneal damage. Such damage often occurs and until the cornea regenerates, it is prone to secondary bacterial infection; this can result in permanent blindness and if the hit is in one eye and sympathetic opthalmia develops, the other eye is at risk. Always, if possible, use an antibiotic eye ointment for prophylaxis.

Anti-snake-venom serum is available directly from:

South African Vaccine Producers (Pty) Ltd
1 Modderfontein Road
Edenvale
P.O. Box 28999
Sandringham 2131
South Africa
Tel: South Africa 011 882 9940
Fax: South Africa 011 882 0812

Physicians interested in the treatment of African snakebite may wish to consult the following excellent summative monographs by two doctors highly experienced in this field

Colin R Tilbury 1993 A Clinical Approach to Snakebite and Rationale for the Use of Antivenom. Die Suider-Afrikaanse Tydskrif Vir Kritieke Sorg. Volume 9, No 1: pp 2 – 4 and 15

David A Warrell 1999 Snake Bite in Sub-Saharan Africa. Africa Health. Volume 21, No.5: pp 5 – 9