Basic awareness on Snake ID & first aid remedies for snake bite

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3. Factors affecting the severity of snakebite (Snake related factors, patient factors, and treatment received).
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Cytotoxin-PPS
Puff adder, gaboon adder, spitting cobras, stiletto snake.

Neurotoxin-PW
Black mamba, green mamba, cape cobra, Forest cobra, ringkals,
content

- Haemotoxin-B

Boomslang and Twig snake

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Global objectives

• To be able to ID snakes with basic methods
• To preserve lives (of human and snake as well)
• To know different types of venom and their syndromes
• by the end of this lesson a learner is able to know the habit and habitat of snake
Specific objectives

• To be able to know what to do in front of a snake
• To alert competent services
• At the end of this course, learners are able to apply some basic first aid remedies in case of envenomation.
HOW TO IDENTIFY A SNAKE

• Please, note that there is simple rule you can apply to determine whether the snake you are looking at is dangerous or not.

• To identify a snake we use a combination of dentition, head shape, body shapes, scales on the snake’s body, size, colour, habitat and characteristics of a snake which include the threat display of the species of snake.
dentition

• We recognize four groups of dentition in snakes, namely proteroglyph, solenoglypg, aglyph and opistoglyph.

• **PROTEROGLYPH:** fixed front fanged snakes, this snake has enlarged hollow fangs situated on the front of the maxilla. The position of the fang is between the eye and the nostril.

• The base of the fang on the front surface has an entrance orifice where the duct from the venom gland will connect so the venom from its gland is forced under pressure through the hollow fang and into the tissue of the prey.
dentition

• Because these kind of snakes have short fangs, they may also hold onto their prey while injecting venom. These snakes are commonly called elapidae, means fixed front fanged snakes.

• These are the cobras, mambas, rinkhals, African garter snakes, and sea snakes.

• **Solenoglyph:** hinged front fanged snakes. These are the adders/vipers. With this snake the maxilla is greatly reduced in length. Normally a single fang will be present on the maxilla. This shortened maxilla hinges on the pre-frontal bone.
dentition

- This hinge is mobile because the fang can lay parallel against the pallet of the mouth when the last is at rest and then move through an arc greater than 90 degrees to bring the fang into a bite position when the snake strikes. Because of this hinge action of the maxilla, the fang can grow longer than what we see in other snakes. In fact a gaboon adder has the largest fangs of any snake on the African continent.

- The fang is also connected to the venom gland by a duct which will deliver venom from the gland to the base of the large fang, and then the venom travels through the hollow fang into the tissue of the prey.
dentition

- **Opistoglyph:** back fanged snakes, this snake have enlarged, grooved fangs situated at the very end of the maxilla bone of the upper jaw. The fangs can number 1, 2 or 3. These last have a shallow groove on the front surface of the fang.

- This groove allows the venom to run down the groove into the wound made by the fang. This fang is larger than the other teeth on the maxilla.

- This snake has small venom gland, called Duvernoy’s gland, which produces a small drop of venom. This small drop of venom would be deposited at the top of the groove and then run down the groove into the tissue of the prey.
dentition

• Because the venom is not injected under force, the snake needs to hold on when it bites and will often chew, thus keeping the fangs in the tissue and giving the venom a chance to enter the tissue.

• Aglyph: non venomous snake like house snake, pythons, and blind snake.
• **Distribution:** where the snakes is found. Very often to do with the preferred habitat of the snake, availability of food, water, shelter, the existing vegetation, climatic conditions like rainfall, elevation above sea level, and so on.
Description of the Dangerous snakes.

1. Black mamba

Description

A long slender snake, that on average reaches 2.0-2.5m with larger individuals reaching 3.0m. Maximum 4.3 meters. Can become quite bulky when large. The head is vertical sides and is coffin shaped and not very distinct from the neck. The colour is never pitch black, although it can become very dark almost black just before shedding. The normal colour is a light to dark black or very dark almost black just before shedding. The underside is lighter in colour, the inside of the mouth is black.
**Black mamba**

*Dentition*

Fixed front fangs, situated well forward in the mouth.

*Venom*

A very quick acting neurotoxin, causing a PW syndrome. Paralysis of the breathing leads to death.

*Distribution*

Zimbabwe, drc, kenya and the East of Africa.

*Habitat*

This snake prefers lowveld areas, below 1500m above sea level that has a mixture of trees and grass, large boulders or rocky outcrops and well-vegetated gorges.
Black mamba

Habits

This snake tries to avoid contact with humans, it does not attack unprovoked as is often reported, and is not an aggressive snake. The seriousness of this bite might not be underestimated, paralysis normally takes place 15 to 45 minutes after bite and death occurs 3 to 15 hours after bite. It is active during the day.

The estimated speed of this snake is probably 15 to 20 km/h, over a short distance, the speed of a man can be 37 km/h.
Black mamba images
GREEN MAMBA

• A long slender snake, with adults reaching a length of 1.8m, maximum is about 2.4m. The colour is a bright emerald green to grass green.

• Some species are lighter green and there may also be some scales that are yellow. The underside is a lighter green. The inside of the mouth is from pink to a light bluish colour on the bottom jaw and never black like a black mamba.

• **Dentition:**
  Fixed front fangs situated well forward in the mouth (proteroglyph).

**Distribution:**
Mozambique, eastern Zimbabwe, further into north Tanzania and Kenya and DRC.
Green mamba

- **Venom:**

A very quick acting neurotoxin combined with a cytotoxin, causing a PW syndrome, and paralysis of the breathing leading to death. The cytotoxic component of the venom causes considerable swelling of the bitten limb if a full bite was received. There does not appear to be any bite site necrosis with these bites. This snake does not bite as readily as a black mamba, and the bite isn’t nearly as deadly, but still serious.
Green mamba

- **Habits:**

  The green mamba is active in the day, and will emerge from a hollow tree refuge in the early morning to enjoy a bask in the sun, after which it will start foraging for its favorite prey, which consists of birds, their nesting young, squirrels or other rodents. Returns to its refuge in the late afternoon. This snake spends the majority of its time in trees, but will move on the ground to access other clumps of bush. Often lives closer to humans, seeking refuge under roofs, on top of the ceiling, from where it will live and hunt for many years if not disturbed.
Green mamba

• This snake is not an aggressive, there are very few bites for this green mamba, the majority are inflicted on snake catchers and keepers, when mistakenly bitten from feeding response from snake, or rough handling.

• It does not usually gape the mouth or flatten the neck. It will give vent to its displeasure by emitting a hollow-sounding hiss.

• Majority of bites are mild as the snake does not inject much venom, but this should not allow you to relax and a victim should be taken to medical care ASAP.
green mamba image
Cape cobra

**Dentition:**
Fixed front fangs (proteroglyph); This cobra does not spit its venom.

**Venom:**
A potent neurotoxin. The most venomous cobra in Africa.

**Habitat:**
A snake common in the more arid areas of the country, it seems to prefer dry scrub country. Attracted to human habitation by the presence of rats and mice, and also water.

**Habits:**
Active during the day, but may become active towards evening when conditions are very hot and dry.
Cape cobra

• Would normally try and escape, but if cornered it will face its aggressor, rear the front part of the body off the ground and spread a broad hood. From this position the snake will then lunge forward to deliver a bite to anybody too close.

• Will visit human habitation hunting rodents and other prey.

• A number of bites and deaths are reported every year from this very dangerous cobra. (the bite from this snake is a real medical emergency).

• This snake cause general weakness syndrome and paralyses of muscles controlling breathing. Medical help must be sought urgently after a bite from a cape cobra.
Cape cobra image

Very dangerous
Forest cobra

**Description:**
This snake has a normal length of 1,5 to 1,8m

**Dentition:**
Fixed front fangs, it does not spit.

**Venom:**
Report in scientific studies as potent neurotoxin with local tissue destruction around the bite area. Bites in south Africa has shown that this venom is more cytotoxic than neurotoxic. A very serious bite that needs immediate medical attention and large amount of antivenom to neutralize venom.
Forest cobra

• Distribution:

Mozambique and also eastern parts of Zimbabwe. Further northwards through Tanzania, Kenya, Angola, Zambia, Malawi, the DRC, and into West Africa.

Low lying coastal bush. As the bush gets drier the snouted cobra replaces it, although the two snakes could be found in the same areas.

This large cobra normally tries to flee and will also use trees to make good its escape. Climbs well. It is slow to strike, but if cornered it will rear as high as 80cm and spread a narrow hood. Can be very common locally.
Forest cobra

• Sometimes active during the day, main activity towards the evening,
a snake park worker was bitten in early 2001 and suffered serious neurological symptoms as well as tissue destruction at the bite site, with permanent scarring. Large amounts of antivenom will be required to neutralize the massive amount of venom these snakes are capable of injection.

As with all cobras, these snakes hang on and chew when they bite, and they must be forcibly removed. A non-spitter.
Forest cobra

- "Stands" tall and spreads a narrow hood
- Often has faint dark edged scales on the head
- Head, neck and front half of the body usually yellowish brown, with black flecks
- From midbody to the tail, snake becomes darker. Tail tip usually shiny black
- Underside is creamy white to yellow, often with splotches
- Very shiny appearance

Distribution is important
Mozambique spitting cobra

- **Description of dentition:**

proteroglyph, the fangs have a modified L shaped canal that runs through the fang. This modified canal ensures the venom exits on the front of the fang, which gives this snake the ability to spray its venom towards an attacker’s eyes as a form of defense.

The venom can be ejected from a reared up position or from down on the ground without rearing up. The snake simply gapes the mouth and sprays in wind direction of the attacker. Effective range for adult snakes is from 1,8-3,0m. Wind direction plays a big part in how far the venom can travel.
Mozambique spiting cobra

- **Venom:**

  - A cytotoxic that causes extensive, usually superficial, skin and subcutaneous destruction. Some victims may have multiple bites.
  
  - This cobra mistakes human body heat for prey. Bites can be anywhere on the body. Not just on the lower leg as in typical snakebites.

A bite on the back of the hand or top of the foot will result in the bones being exposed, with the result that this needs to be repaired by skin grafts, a prolonged hospital stay is the result of this skin damage.
Mozambique spitting cobra

- Antivenom can be used for up to 6 hours from the time of bite, to prevent or limit the amount of tissue destruction, children are at risk of dying form the neurotoxic component in the venom.
- Tanzania, Mozambique, Limpopo, Mpumalanga, Zimbabwe, Namibia, DRC etc.

This snake prefers open bushveld areas, with grass, rocks.

It can be active during the day, but becomes more active towards evening. Will eat almost anything and is fond of frogs, toads, rodents, birds and their eggs and nestlings as well as other snakes.
Mozambique spitting cobra
Ringhals

This snake is closely related to the true cobras, but differs from them in scales, in producing live young and in maxilla bone only carrying the fangs.

In all other respects it acts like a cobra, being able to rear up and spread a hood. This snake is more robust in build, compared to similar size cobras, and a specimen of 1,2m becomes quite bulky.

It is proteroglyph. The fangs have a modified L shaped canal that runs through the fang. This modified canal ensures the venom exits on the front of the fangs, which gives this ability to spray its venom towards an attacker’s eyes as a form of defense.
Ringkals

- Its venom is both neurotoxin and cytotoxin. The effects are not as potent as those of other cobras, and there are few bites as this snake tends to spit rather than bite.

- The bite presents as a PPS syndrome and the local effects of a bite can be quite severe. The risk of a finger amputation is quite high if a serious bite sustained on such an extremity. Neurological effects will also manifest and include general paralysis and impairment of breathing, which can lead to death.

- This snake prefers moist high lying grassland areas that fall within the forest belt. It avoids bushveld areas.
Rinkhals

• *Habits:*

The rinkhals is active during the day, this snake usually flee, but if cornered it will face its attacker, rear the front of the body off the ground and spread a broad hood, exposing the black with white bands on the throat. A very impressive sight! From this position it will lunge forward and spray its venom at an attacker, its body hitting the ground and at the same time emits a loud hiss. If the threat from an attacker is kept up, the snake may drop to the ground and turn the front of its body over, open the mouth and lay there as if dead.
Rinkhals

A very effective ploy that has fooled many people as well as dogs to leave it alone. If the snake senses that there is no more movement around it, it will come to life again, right itself and move off careless handling while the snake is playing dead, could result in a bite.
PUFF ADDER

• **Description:**
A short fat snake, with a triangular head and covered with small keeled scales. With hinged front fangs about 15-18mm in length in adults.

**Venom:**
Mainly cytotoxic venom which attacks body tissue, causing pain and swelling and superficial to deep tissue damage at the site of bite. The swelling is very painful and can progress from an extremity right up into the trunk of the body. The syndrome is described as PPS and the venom is slow acting,
Puff adder

• It would normally take 24 hours to kill a person. Death is caused by the loss of fluids from the circulation, causing a fatal shock (hypovolemic shock). About 5% of bites would be fatal if not treated properly. Bleeding and kidney complication may occur.

• Habits:
This very common snake is responsible for many of the snakebites in southern Africa because of its habit of remaining immobile when approached and also because it is so common. An extremely painful bite, with a painful swelling syndrome developing after the bite.
Puff adder

• A puff adder can be found around human habitation, where it will hunt prey like rodents and amphibians. Can be locally very common and often gets killed in large numbers on our roads.

• Active mainly at night, but does also emerge during the day to bask in the sun. The name puff adder comes from this snake’s habit of inhaling air and expelling it forcefully through the nostrils to produce a loud hiss. This is a warning that the snake’s patience is running out, and if not heeded the snake will strike out.
Puff adder
A large adder with adults reaching 1.8m, the tail is very short. With hinged front fangs normally 20-30mm this snake holds the world record for fang length. A very large snake 1.8 m in length from Kenya, had fangs of 50mm in length.

**Venom:**
The venom acts mainly as a cytotoxin. In its action in humans, with the normal disfiguring result at the bite area that is associated with this type of venom. The combination of large fangs with a large quantity of venom would make for a far more serious bite than that of the puff adder.
Gaboon adder

- A victim human can collapse within 15 minutes that has been recorded after this snake’s bite. The venom also contains a cardio toxin that causes arterial arrhythmia. The venom also inhibits platelet aggregation and converts fibrinogen to fibrin, causing a bleeding syndrome.

**Habits:**

this large adder is potentially very deadly, but it has a mild disposition and rarely bites, even when pressed to do so. This is a good thing as a bite is very serious and a medical emergency.
Gaboon adder

- Few bites were recorded throughout Africa. Some bites have been recorded to snake handlers, with mixed results from mild to very serious. In one case the victim was bitten when he wanted to remove a water dish from the snake cage. This was probably a feeding response from the snake mistakenly thinking the hand was a rat. The victim collapsed 15 minutes after bite, large amount of polyvalent antivenom was intravenously, saved the victim’s life.

the snake activity is at night
Puff adder
STILETTO SNAKE

• Description:

  when the stiletto snake want to bite the bottom jaw is retracted inwards, exposing the pallet. The snake also arches the neck, which is its stricke pose, a tell tale sign of stiletto snake. Now the fang is dropped out of the bottom jaw and the snake strikes downwards and backwards, using the fang as a gaff.

  Because of this unique method of bitting, stiletto snakes cannot be held behind the head as other snakes. If you attempt to hold it behind the head the snake will put a fang into your fingers.
Stiletto snake

25% of stiletto snakebites to a finger extremity will lead to the amputation of that digit. Although our stiletto snakes are not deadly, the bite is very painful and accompanied by swelling which will soon send people bitten by this snake to the hospital.

There is no antivenom for this snakes.
Description:
A long slender snake, growing to 1,8m in length with a large blunt head that is distinct from the neck. It has a very large eye. The females is normally grey or brown, and the males green with black edging to the scales giving it a barred effect, or black on the dorsum with a yellow spot on each scale and a yellow belly. The juveniles are grey, with a brown head and white jaw, with the eye bright green.

The maxilla bone carries from 1,2 or 3 large groove fangs on the rear section of the maxilla bone. The fangs are situated below the snake's eye.
A haemotoxin that causes internal hemorrhage. It is produced in minute quantities of about 1-15mg. The venom is slow acting, with death occurring from 24-72 hours or even longer after the bite. The famous herpetologist KARL.P Schmidt of the Chicago museum of natural history received a single fang bite from a 75cm specimen and died 24 hours after the bite.

A tree snake.

The snake is active during the day. It avoids contact with human contact and rarely bites, but will demonstrate its displeasure by inflating the front part of the body when molested.
From this position it may strike out at its aggressor. The fangs are large, and the gap of the mouth is considerable, allowing the snake to get its teeth into an aggressor with not too much difficulty, and although venom may not be injected in this instance, as the snake prefers to chew to get the venom into its victim’s flesh, the venom is so potent that just a scratch could cause serious symptoms.

The boomslang bite very rarely, and most of the recorded bites are on snake catchers because it is back fanged.
• Boomslang will be attracted to human habitations because of trees and water and also people keeping aviary birds, which this snake is partial to, and often gets killed because of its inability to escape through the mesh of the aviary, once a bird has been swallowed.
Boomslang images
TWIG SNAKE

• A very slender snake, with a long, thin tail. The colour is various shades of grey, resembling a twig or vine with lighter banding on the rear body. The head is lance-shaped and is distinct from the neck. The top of the head can be green with black and brown spots. The eye has a horizontal pupil and is keyhole-shaped. With enlarged, grooved fangs are situated at the rear of the maxilla bone. A very potent haemotoxin, causing the blood to become incoagulable with a DIC and, as a result of this, internal bleeding.
Twig snake

• This arboreal snake is active during the day when it will move around in search of its favorable prey like lizards, and chameleons. It will also hunt reed frogs and will raid birds' nests for hatchlings. An inoffensive snake, this snake has never been implicated in any legitimate snakebites. When annoyed it will inflate the front part of the body, similar to the boomslang, and from this position strike sideways towards its attacker. This snake must bite and chew to get the fangs into play. As there is no antivenom available to treat this bite. Treatment is symptomatically, with replacement of blood being the main treatment.