19. Bites (Animal & Human), Tetanus & Rabies

This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient's individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.

Animal Bites

If rabies is a concern, **scrub the wound with soap and water for at least 15 minutes**, then rinse and apply a disinfectant (e.g. iodopovidone) as soon as possible after exposure. The use of antibiotics in patients with **animal bites** is **controversial,** and some studies have shown **little benefit.** However, pre-emptive early antimicrobial therapy for **3–5 days** is recommended for patients who;

- are immunocompromised;
- are asplenic;
- have advanced liver disease;
- have pre-existing or resultant oedema of the affected area;
- have moderate to severe injuries, especially to the hand or face; or
- have injuries that may have penetrated the periosteum or joint capsule

ALL Human bites should receive;

- **prophylactic antibiotics**
- **consider post-exposure prophylaxis for HIV within 72hrs.** The **risk** associated with bite injuries has **not been quantified.** The victim is usually at low risk **unless the biter's saliva is contaminated with blood.** The risk is greater to the biter if blood is drawn from the victim's wound because of exposure to mucous membranes.
- **Hepatitis B vaccine** preferably ≤ 24 hours if not previously immunized

Treatment:

DO NOT SUTURE ANIMAL AND HUMAN BITES. The above wounds should be irrigated copiously, dressed, left open to drain, and examined daily to detect signs of infection. During the first few days after injury, elevation of the injured body part, especially if swollen, accelerates healing. This should be accomplished using a passive method (a sling for outpatients or a tubular stockinet and an intravenous pole for inpatients). **ALL infected wounds should be treated.** If no signs of infection, delayed primary closure may be done **72 hours after the injury.**

Antibiotics

Amoxicillin/Clavulanate 1gm BD x 5-7 days

In Penicillin Allergic Patients:

Clindamycin 300 mg PO QID/600 mg IV TDS **OR** Azithromycin 500mg PO OD for 3 days

PLUS

Tetanus Toxoid 0.5mg IM

Previous doses of Adsorbed Tetanus Toxoid	Clean and minor wounds		All other wounds	
	Tetanus toxoid	TIG	Tetanus toxoid	TIG
< 3 doses or unknown	Yes	No	Yes	Yes
≥ 3 doses	Only if last dose given ≥10 yrs ago	No	Only if last dose given ≥5 yrs ago	No

Rabies Post-Exposure Prophylaxis

The WHO rabies exposure categories are:

Category I	Touching or feeding animals, licks on intact skin
Category II	Nibbling of uncovered skin, minor scratches or abrasions without bleeding
Category III	Single or multiple transdermal bites or broken skin with saliva from animal licks, exposure due to direct contact with bats.

Rabies Immunoglobulin (RIG)	No Pre-EP	Pre-EP
RIG provides passive immunization and is administered in the wound site only once, as soon as possible after the initiation of PEP and not beyond day 7 after the first dose of vaccine	Human Ig - 20U/Kg **OR** Equine Ig - 40U/Kg	None

Rabies Vaccine	No Pre-EP	Pre-EP
Intradermal (ID) **Dose: 0.1ml** **Recommended sites: left and right deltoids, thigh or suprascapular areas**	**Days 0, 3, and 7** (2–2–2): injections of two 0.1 ml doses of vaccine at different intradermal sites	One Booster dose (intramuscular or intradermal) at one site on both **Days 0 and 3**. **OR** One Booster intradermal dose at four sites in one visit. This consists of four injections of 0.1 ml equally distributed over the left and right deltoids, thigh, or suprascapular areas at a single visit
Intramuscular (IM) **Dose: 1 vial** **Recommended sites:** Deltoids, lateral thighs or suprascapular areas that drain into regional lymph glands **Recommended sites for children aged <2 years:** the anterolateral thigh Rabies vaccine should not be administered in the gluteal area, as induction of an adequate immune response is less reliable.	Reduced 'Essen' vaccine schedule (1–1–1–1) on **Days 0, 3, 7, and 14** in healthy patients. A fifth dose is recommended for immunocompromised persons, between days 21 and 28.	
	Zagreb Regimen (2–0–1–0–1) on **Days 0, 7, and 21**. On day 0, two doses of vaccines are to be injected into two of the deltoid or thigh sites.	

Patients bitten by **healthy appearing domestic animals may delay rabies post exposure prophylaxis** if the animal is **quarantined**. These animals should be **observed for 10 days**, and if they show **no sign of infection** during the observation period they may be released, and the **patient does not need to be vaccinated**. Signs of infection in an animal include excessive salivation, aggression, paralysis, daytime activity in nocturnal animals, and impaired movement. If the animal shows any signs of infection, the patient should start the vaccination schedule and continue until the animal has been tested at an approved facility.

Common Venomous Snakes of Kenya

FOR ALL **SNAKEBITES** VISIT A HEALTH FACILITY **IMMEDIATELY!**

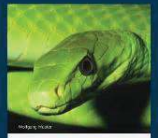
Black Mamba
Dendroaspis polylepis

Black Necked Spitting Cobra
Naja nigricollis

Blanding's Tree Snake female / male
Toxicodryas blandingii

Boomslang
Dispholidus typus

East African Garter Snake
Elapsoidia loveridgei



Eastern Green Mamba
Dendroaspis angusticeps

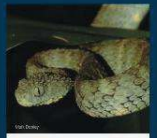
Egyptian Cobra
Naja haje

Forest Cobra
Naja melanoleuca

Forest Night Adder
Causus lichtensteinii

Gaboon Viper
Bitis gabonica

Gold's Tree Cobra
Pseudohaje goldii

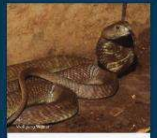


Green Bush Viper
Atheris squamiger

Jameson's Mamba
Dendroaspis jamesoni kaimosi

Kenya Horned Viper
Bitis worthingtoni

Kenya Montane Viper
Montatheris hindii



Large Brown Spitting Cobra
Holotype / *Naja ashei*

Mount Kenya Bush Viper
Atheris desaixi

North East African Carpet Viper
Echis pyramidum

Puff Adder
Bitis arietans

Red Spitting Cobra
Naja pallida

Rhinoceros Viper
Bitis nasicornis

Rhombic Night Adder
Causus rhombeatus

Rough-Scaled Bush Viper
Atheris hispida

Savannah Vine Snake or **Twig Snake**
Thelotornis massambicanus

Small-Scaled Mole Viper
Atractaspis microlepidota

Snouted Night Adder
Causus defilippi

Velvet Green Night Adder
Causus resimus

Yellow Bellied Sea Snake
Pelamis platurus

Common **Venomous Snakes** of Kenya

JAMES ASHE ANTIVENOM TRUST

GLOBAL SNAKEBITE INITIATIVE

HAI HEALTH ACTION INTERNATIONAL

EMERGENCY MEDICINE KENYA FOUNDATION
emergencymedicinekenya.org

Snake Bites

(BIO-KEN SNAKE FARM, +254 718 290 324 for information on correct antivenom. http://www.bio-ken.com/)

Syndrome	Cytotoxicity (Painful progressive swelling)	Neurotoxicity (Progressive weakness)	Haematotoxicity (Bleeding)
Important snakes	Puff adder, Gabon viper, Kenya Horned Viper, Rhinoceros Viper, Red Carpet Viper, Ashe's Spitting Cobra, Black-necked Spitting Cobra, Red Spitting Cobra	Eastern Green Mamba, Jameson's Mamba, Black Mamba, Egyptian Cobra, Eastern Forest Cobra, Gold's Tree Cobra	Coastal Boomslang, North East-African Carpet Viper (Echis), Vine Snake, Blanding's Tree Snake
Clinical Picture	**Mild:** slow progressive painful swelling **Severe:** rapidly progressive swelling and severe pain, ecchymosis, blisters, severe tissue necrosis, abscess formation, pseudo- and true compartment syndrome, nausea and vomiting, hypotension, bleeding tendency, shock, rhabdomyolysis, renal failure	Ptosis, diplopia, dilated pupils, difficulties in swallowing, salivation, progressive difficulty breathing, hypoxia	Bleeding from puncture sites, Minor lacerations, development of disseminated intravascular coagulopathy over time
Management	- Establish IV access - Give analgesia - Position the limb at the level of the heart - Give IV fluid for shock and renal failure - Treat local complication appropriately	- Establish IV access - Monitor oxygenation and ventilation closely (HDU) - Intubation and mechanical ventilation may be necessary	- Establish IV access - Give blood/blood component therapy if indicated - Heparin, antifibrinolytics, thrombolytics are of **no value** and may be dangerous
Indications for Antivenom **Antivenom is NOT INDICATED if the patient is ASYMPTOMATIC**	**Polyvalent antivenom** - Swelling progressive at **≥15cm/hr** - Swelling to a **knee or elbow** from a foot or hand bite **within 4 hours** - Swelling of a **whole limb** by **8 hours** - Swelling threatening the airway - An associated coagulopathy - Unexplained dyspnoea - Consider antivenom if snake is unknown but envenomation is severe.	**Polyvalent antivenom** - **Triad** of (either) 1. paraesthesia, 2. excessive salivation/metallic taste and sweating 3. dyspnoea in the absence of painful progressive swelling (mambas) - **Paresis** in the presence of **significant swelling (non-spitting cobras)**	**Monovalent antivenom** - Active bleeding - Positive 20 MINUTE WHOLE BLOOD CLOTTING TEST (20WBCT) • Take 2 ml of blood from the patient and pour it into a new, clean, dry glass test tube. • The test tube must be made of glass and NOT plastic. The tube MUST be new. Avoid old tubes that have been washed in detergent/soap. • Leave the test tube undisturbed at ambient temperatures for 20 min. • After waiting for 20 min gently tilt the test tube. • If the blood is all liquid (no clots) then the patient has incoagulable blood. - Laboratory evidence of coagulopathy

Administration of Antivenom:

- Give the first dose (**10ml**) of antivenom intravenously at the slow rate of **1-2 ml per minute**. Subsequent doses may be injected into a bag of saline drip, **no more than 20 ml per 500ml bag to run in 30 mins**. **Repeat until symptoms resolve.** Monitor breathing and other vital signs continuously. **Remember not to have the drip running direct into the wounded limb** which is already in danger from the pressure of swelling and should be kept elevated and well protected.
- Remember to have adrenaline (1:1,000) at the bedside in case of anaphylaxis. If the patient has known allergies (asthma etc.), draw up the adrenaline (0.3 - 0.5 ml for adults and 0.1 - 0.3 for children) and have antihistamine available in case allergic symptoms are overwhelming. Antihistamine is **NOT recommended as routine treatment** for snakebite.
- Monitor breathing and other vital signs continuously.
- **DO NOT** infiltrate the bite area with antivenom.