

Carry this Flipper Card in your Snakebite Medical Kit

SNAKEBITE FLIPPER CARD



**EMERGENCY
CARE
PROVIDER**

**SNAKES
OF
ESWATINI**



eswatini
antivenom
foundation

This Flipper Card gives you all the information needed to treat a snakebite as an Emergency Medical Care (Prehospital) Provider

ASSESSING THE SNAKEBITE

SCENE SIZE UP

- **SCENE SAFETY** - Ensure everyone is safe from a second snakebite.
- **C-A-B**
- **CYTOTOXIC BITES:**

Remove constricting rings / jewellery and clothing.

MARK SWELLING - Circle the site of the bite with a pen if visible. Write the time of bite on the skin. Document progression of swelling from the first circle to the rest of the limb or affected area. The affected area should be **ELEVATED**.

RAPID transfer to a hospital is imperative.

- **NEUROTOXIC BITES:**

PRESSURE BANDAGES - are **ONLY USED IN NEUROTOXIC BITES**.

Ensure adequate circulation is present in the distal point of the limb if a pressure bandage is applied. **TOURNIQUETS** should only be used in **CONFIRMED MAMBA OR NEUROTOXIC BITES** and if you are more than **30 MINUTES**

AWAY from definitive care at a hospital. **DO NOT REMOVE** a tourniquet if it is in place **UNLESS** progressive swelling syndrome presents as per CPGs.

If an improvised tourniquet is in place, replace it with a commercial tourniquet **ABOVE** the improvised one.

VITALS

- Heart Rate
- Temperature
- Blood Pressure
- HGT
- ETCO₂
- Respiratory Rate
- Skin condition
- SpO₂
- GCS
- ECG monitoring

PHYSICAL EXAMINATION

- Fang marks - absence of fang marks does not rule out snakebite
- Signs and Symptoms - Swelling, Paralysis, Bleeding, etc.
- Signs of Shock?

HISTORY

SAMPLE

- Where on the body was the patient bit?
- How long has it been since the snakebite?
- Is there an identification/description of the snake?
- What activity was performed at the time of the bite?
- Has the patient sustained a snakebite before?

EMERGENCY CONTACT NUMBERS

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PLEASE REFER TO YOUR LOCAL EMERGENCY EXPERT CONTACTS

Snakebite Syndromes

Painful Progressive Swelling (PPS)

- Swelling due to cytotoxic venom starting at the bite site and progressing up the limb.
- Immense pain with the affected area being warm and hard.
- Complications include: blistering, discoloration, bleeding under the skin, necrosis, pseudo compartment syndrome, nerve and vessel entrapment, deep vein thrombosis, hypotension, and hypovolaemic shock. True compartment syndrome is rare in snakebite.
- **SPECIES RESPONSIBLE:** Snouted Cobra, Puff Adder, Mozambique Spitting Cobra (VO), Rinkhals (VO), Stiletto Snakes and Night Adders
VO = Venom Ophthalmia

Progressive Weakness (PW)

- Progressive weakness and paralysis due to neurotoxic venom.
- This syndrome can lead to complete paralysis, respiratory failure and cardiac arrest.
- Complications include: muscle spasms, drooling, incontinence, salivation, lacrimation, diaphoresis, dilated pupils, dyspnoea, respiratory failure and death.
- **SPECIES RESPONSIBLE:** Black Mamba, Snouted Cobra, Rinkhals (VO)
VO = Venom Ophthalmia

Bleeding (B)

- History may include the need for the snake to be “pulled off” the bite site (back-fanged).
- Bleeding tendencies are caused by haemotoxic venom.
- This syndrome eventually leads to widespread internal bleeding.
Bite site bleeding early on.
- Later complications include: Haematuria, haemoptysis, melena, epistaxis, cerebral haemorrhage, hypotension, and hypovolaemic shock. (12-36 hours).
- **SPECIES RESPONSIBLE:** Boomslang, Vine Snake, Puff Adder

Mixed Painful Progressive Swelling & Bleeding (PPS & B)

- Mix of complications from the Painful Progressive Swelling as well as Bleeding Syndromes.
- **SPECIES RESPONSIBLE:** Puff Adder

Mixed Painful Progressive Swelling & Progressive Weakness (PPS & PW)

- Mix of complications from the Painful Progressive Swelling as well as Progressive Weakness Syndromes.
- **SPECIES RESPONSIBLE:** Snouted Cobra, Rinkhals (VO)
VO = Venom Ophthalmia

HYPOTENSION

Systolic BP <90mmHg with a bradycardia (<60bpm)

Fix underlying causes. Administer Oxygen if hypoxic and consider airway control if airway is unprotected

Autonomic dysfunction is common with neurotoxic bites

If pulse remain <60bpm consider 1mg Atropine repeated every 5 minutes up to 3mg (adults dose). Consider adrenaline infusion if hypotension persists and patient non-responsive

Systolic BP <90mmHg with a normal pulse rate (60-100bpm)

Fluid Resuscitation 1000-2000ml fluid boluses (maximum 30ml/kg) as per SEPSIS-3 guideline (snakebite is not trauma)

Should the BP remain <90mmHg initiate adrenaline infusion. Titrate to effect

Adult Adrenaline Infusion Chart - No Syringe Driver

Prepare	Weight	Range (ml/hr)		
		Lowest	Mid	Highest
3 x 1mg/ml (1:1000) Adrenaline + 47ml 0.9% Normal Saline	2	0.3ml/hr	1ml/hr	1 ml/hr
	4	0.4ml/hr	2ml/hr	4ml/hr
	6	0.6ml/hr	3ml/hr	6ml/hr
	8	0.8ml/hr	4ml/hr	8ml/hr
	10	1ml/hr	5ml/hr	10ml/hr
	20	2ml/hr	10ml/hr	20ml/hr
	25	2.5ml/hr	12.5ml/hr	25ml/hr
	30	3ml/hr	15ml/hr	30ml/hr
	35	3.6ml/hr	17.5ml/hr	35ml/hr
	40	4ml/hr	20ml/hr	40ml/hr
	45	4.5ml/hr	22.5ml/hr	45ml/hr
	50	5ml/hr	25ml/hr	50ml/hr
	55	5.5ml/hr	27.5ml/hr	55ml/hr
	60	6ml/hr	30ml/hr	60ml/hr
	65	6.5ml/hr	32.5ml/hr	65ml/hr
	70	7ml/hr	35ml/hr	70ml/hr
	75	7.5ml/hr	37.5ml/hr	75ml/hr
	80	8ml/hr	40ml/hr	80ml/hr
	85	8.5ml/hr	42.5ml/hr	85ml/hr
	90	9ml/hr	45ml/hr	90ml/hr
95	9.5ml/hr	47.5ml/hr	95ml/hr	
100	10ml/hr	50ml/hr	100ml/hr	
110	11ml/hr	55ml/hr	110ml/hr	
120	12ml/hr	60ml/hr	120ml/hr	

Adult Adrenaline Infusion Chart - No Syringe Driver

Prepare	Mix 2 x 1mg (1:1000) Adrenaline + 198ml 0.9% Normal Saline in a 200ml drip with a 60 Dropper administration set. Titrate to effect		
Dosage (2-10ug/min) 2	2ug/min = 1drop every 5 seconds	5ug/min = 1drop every 2 seconds	10ug/min = 1drop every second

AIRWAY CONTROL

If simple airway manoeuvres and supplemental O₂ has been administered and imminent respiratory compromise is confirmed by assessing the respiratory rate, SpO₂, ETCO₂, heart rate and other signs of shock.

Options for airway control

Manual Control
BVM

Alternative Airway
LMA, LTA, iGel

RSI
Laryngoscopy
(2-3 attempts)

Surgical Airway
Last resort should other options fail

RSI MEDICATION

mg/kg	INDUCTION
1-2	Ketamine
0.1-0.3	Etomidate
mg/kg	NEUROMUSCULARBLOCKER
1-2	Suxamethonium - AVOID
1-1.2	Rocuronium - only if needed

POST RSI MAINTENANCE

mg/kg	MAINTENANCE
1-2 mg/kg/hr	Ketamine
	500mg/50ml
Titrate to effect	
Avoid Morphine and Midazolam	

BASELINE VENTILATOR SETTINGS

Mode	SIMV
Tidal Volume	7ml/kg
PIP	12-14cm H ₂ O
PEEP	5
I:E	1:2
Rate	12bpm (adults), 20bpm (paediatrics), 25bpm (neonates)

POST INTUBATION CHECKLIST

- ETT secured at correct depth
- ETCO₂ Monitor attached
- Ventilator set & attached
- Analgesia administered
- Sedation administered
- Vital signs rechecked
- ETT cuff pressure checked
- Analgosedation infusion prep: (Ketamine 500mg./50ml Titrate to effect at around 1-2/kg/hr **AVOID** Morphine and Midazolam)
- Functional IV line for resuscitation

EYE CARE

- Flush affected eye/eyes with a bland liquid, 0.9% Sodium Chloride solution preferred
- If a local anaesthetic is available, mix 1ml of 2% Lignocaine into a 1000ml 0.9% Sodium Chloride. Connect an administration set and run it into the medial canthus of the eye.
- Cover the eye with a bandage to prevent light sensitivity.
- Transport to a hospital for assessment.

SNAKEBITE AND ANTIVENOM IN PAEDIATRICS

- Dose of antivenom administered in **PAEDIATRICS** is the same as for adults.
- Antivenom is designed to neutralize a fixed venom dose, which the snake injects indiscriminately into humans large or small, including neonates.
- Higher dose of venom is relative to their body weight compared to adults.
- Venous access may be difficult, Intraosseous route may be required.
- Coagulopathies occur sooner as does weakness and respiratory failure due to a faster evolution of envenomation.
- Frequent reassessment of snake bitten children is necessary.

SNAKEBITE AND ANTIVENOM IN PREGNANCY

- Antivenom is **NOT** contraindicated in pregnancy.
- Indications for antivenom administration remain the same as with non-pregnant patients.
- Snakebite envenomation increases the chance of foetal loss in first and early second trimester.
- Envenomation can cause foetal bradycardia in viable gestation pregnancies - thus foetal monitoring is indicated.
- Envenomation by haemotoxic snakebite may increase the chance of bleeding complications such as antepartum and postpartum haemorrhage.

SNAKEBITE AND ANTIVENOM IN THE ELDERLY

- The elderly are no different than younger patients when it comes to snakebite.
- May be more prone to hypotension.
- Therapeutic fluid overload and adverse effects of adrenaline (epinephrine) and are more likely from intercurrent and unrelated chronic illnesses such as hypertension, cardiovascular diseases, chronic obstructive bronchitis, and diabetes mellitus.

Patients bitten by snakes should be observed in hospital for **at least 24 hours** after the bite.

For **Bleeding Syndrome Patients**, monitor for at least **48 hours** after the bite.

DISCLAIMER : The **EMERGENCY CARE PROVIDER Flipper Card** has been adapted for West Africa by The Eswatini Antivenom Foundation, drawing from the latest evidence-based practices outlined in Snakebite Management: Eswatini Antivenom Foundation Guidelines and South African Consensus Guidelines 2022, updated 2023 (SA5S).

The authors and editor have exerted every effort to ensure that the clinical procedures and recommendations described herein are based on current knowledge and state-of-the-art information obtained from acknowledged authorities, texts and journals. However, they cannot be considered absolute and universal recommendations. Each patient's situation must be considered individually, using a **SYNDROMIC** approach. The reader is urged to check the package inserts of drugs and equipment and the manufacturer's recommendations for indications, contraindications, proper usage, warnings and precautions before use. The authors and editor disclaim responsibility for any adverse effects resulting directly or indirectly from information presented in this booklet, undetected errors or misunderstandings by the readers.

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POLYVALENT ANTIVENOM SPECIES

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BLACK MAMBA (*Dendroaspis polylepis*)

- **Distribution:** Eswatini
- **Colour:** Dark Olive, greyish brown, gunmetal grey
- **Length:** 2.8-3.2m up to 4.5m
- **Venom:** **Highly Neurotoxic**
- **Syndrome:** **PW**
- **Venom Effects:** Progressive Weakness & Paralysis with or without minor swelling

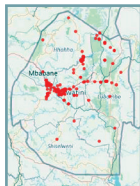


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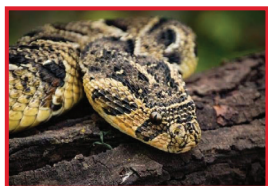


SNOUTED COBRA (*Naja annulifera*)

- **Distribution:** Eswatini
- **Colour:** Yellowish brown with a yellow belly, or black & cream bands
- **Length:** 1.8-2.5m
- **Venom:** **Predominantly Cytotoxic & Mildly Neurotoxic**
- **Syndrome:** **PPS & PW**
- **Venom Effects:** Painful Progressive Swelling, Progressive Weakness & Paralysis

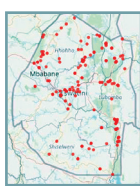


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PUFF ADDER (*Bitis arietans*)

- **Distribution:** Eswatini
- **Colour:** Colour varies, V-shaped markings down the back pointing towards the tail
- **Length:** 0.9-1.2m up to 1.4m
- **Venom:** **Predominantly Cytotoxic & Mildly Neurotoxic**
- **Syndrome:** **PPS & B**
- **Venom Effects:** Painful Progressive Swelling & Bleeding

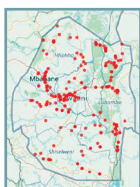


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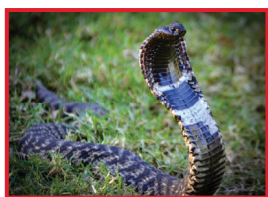


MOZAMBIQUE SPITTING COBRA (*Naja mossambica*)

- **Distribution:** Eswatini
- **Colour:** Brown with an orange/salmon belly & black bands on the neck
- **Length:** 1.2-1.6m
- **Venom:** **Cytotoxic**
- **Syndrome:** **PPS**
- **Venom Effects:** Painful Progressive Swelling



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RINKHALS (*Hemachatus haemachatus*)

- **Distribution:** Eswatini
- **Colour:** Black, brown or olive with white throat bands or black & yellow/orange body bands with yellow throat bands
- **Length:** 1.0-1.5m
- **Venom:** **Predominantly Cytotoxic & Mildly Neurotoxic**
- **Syndrome:** **PPS & PW**
- **Venom Effects:** Painful Progressive Swelling, Progressive Weakness & Paralysis



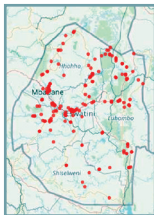
MONOVALENT ANTIVENOM SPECIES

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BOOMSLANG (*Dispholidus typus*)

- **Distribution:** Eswatini
- **Colour:** Grey, Brown, Green, Red, Blue, Green with Black "bands", black backs with yellow bellies
- **Length:** 1.5-2.0m
- **Venom:** **Haemotoxic**
- **Syndrome:** **B**
- **Venom Effects:** Bleeding



OTHER VENOMOUS SPECIES

Even though localized symptoms could seem extreme, there is no antivenom for the treatment of vine, stiletto and night adder bites

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VINE SNAKE (*Thelotornis capensis*)

- **Distribution:** Eswatini
- **Colour:** Cryptically coloured resembling a stick
- **Length:** 1.2-1.5m
- **Venom:** **Haemotoxic**
- **Syndrome:** **B**
- **Venom Effects:** Bleeding



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RHOMBIC NIGHT ADDER (*Causus rhombeatus*)

- **Distribution:** Eswatini
- **Colour:** Dark brown Rhombic markings on the back. Body colour varies from light grey to brown. Characteristic "V" shape marking on the head
- **Length:** 1.40-60cm, max 1m
- **Venom:** **Cytotoxic**
- **Syndrome:** **PPS**
- **Venom Effects:** Moderate local swelling & pain



© Tyrone Ping



BIBRON'S STILETTO (*Atractaspis bibronii*)

- **Distribution:** Eswatini
- **Colour:** Body brown to blackish, belly may be white
- **Length:** 40-60cm, max 98cm
- **Venom:** **Cytotoxic**
- **Syndrome:** **PPS**
- **Venom Effects:** Moderate swelling with potential of causing local tissue necrosis

