Snake poison
Types of snakes

- Poisonous
- Nonpoisonous
Poisonous snakes

Elapids (neurotoxin)
- King cobra, cobra
- Common krait, banded krait
- Corals

Vipers (vasculotoxin)
- Pit viper
  - Rattle snake, bamboo snake
- pit less vipers
  - Russel viper, saw scaled

Sea snakes (myotoxin)
Snakes in Pakistan

• 72 snake species prevalent in Pakistan
• 14 marine and 12 terrestrial snake species are poisonous

• **Common snakes**
  - common krait
  - Sindh krait
  - Northern Punjab krait
  - Indian cobra
  - Brown cobra
  - Russell's snake
  - Saw scaled
Toxins and their activities

- Neurotoxin
- Cholinesterase
  - Presynaptic
  - Postsynaptic
- Anticholinesterase
- Myotoxin
- Hemostatic system toxin
- Hemorrhagins
- Nephrotoxin
- Cardiotoxin
- necrotoxin
Toxins in elapid snake

- **Presynaptic**
  - damage terminal axon at the neuromuscular junction
  - this type of paralysis not reversed by antivenom therapy

- **Postsynaptic**
  - bind to acetylcholine receptors at the muscle end plate, so paralysis may be reversed by antivenom therapy

- **Coagulopathy**
  - procoagulant and anti-coagulant
Elapid snake bite

- Neurotoxic flaccid paralysis
- Myolysis
- Coagulopathy
- Renal damage
- Local tissue injury
- Venom spit opthalmia
Clinical feature

Mild local symptoms
• Slight burning
• Lethargy
• Weakness of legs
• Difficulty in speaking/swallowing
• Ptosis
• Necrosis of skin and tissues
• Death due to respiratory failure
Clinical feature

- Muscular weakness
  - Paralysis of face, throat and respiration
  - Krait venom cause only muscular paralysis
  - Neurotoxin of cobra cause both convulsion and paralysis
Viper snake

**Toxin**
- Enzymes that clot fibrinogen
- Enzymes that degrade fibrinogen
  - Plasminogen activator
  - Prothrombin activator
  - Factor v activator
  - Factor x activator
- Enzyme which degrade plasma serine proteinase inhibitor
  (antithrombin III, α₁-proteinase)
Vasulotoxic venom

- Destruction of cell wall
- Coagulation disorder
- Destruction of endothelium of blood vessel
- Lysis of red cell
- Oozing of hemolytic blood
- Cellulitis
- Hemorrhage from external orifices
- Convulsion due to hemorrhage
Viper bite

• **Severe local symptoms**
  • Intense local pain, swelling, ecchymosis
  • Oozing of hemolytic blood
  • Haemoglobinuric nephritis
  • Bleeding from gums, hemoptysis
• Myolysis
• Renal damage
• Cardiac toxicity
• Anaphylactic reaction
Sea snake

- **Myotoxic**
- Neurotoxic
- Nephrotoxic
- hemolysis
Toxins

- Acetylcholinesterase
- Hyaluronidase
- Leucine amino peptidase
- Phosphodiesterase
- Phospholipase
Clinical features

- Painless bites or minimal discomfort
- 1-4 fang marks
- Muscle destruction
- Flaccid paralysis
- Dysphagia
- Trismus
- Ptosis
- Fasciculation
- Seizures
- Death due to respiratory paralysis
- Rhabdomyolysis, renal failure
Diagnosis of snake bite

- History
- Physical examination
  - Bite marks

**Following point should be noted**
- Precise date and time of incident
- Geographic location at the time of incident
- Description of snake
- What first aid, if any was used
- List of symptoms observed by patient
Physical examination

- Vital signs should be measured
- Check the bite or sting site for evidence of bite mark
- Regional lymph nodes should be palpated
- Examine for specific venom effect
diagnosis

- Snake venom detection kit (not available in Pakistan)
- Coagulation studies
  - whole blood clotting time
  - Prothombin time
  - INR and APTT (ACTIVATED PARTIAL THROMBOPLATIN TIME)
  - fibrinogen, fibrin degradation product
  - complete picture/platelet count
- Plasma serum electrolyte
Renal function
- k level
- creatinine and urea level

CK (CREATINIE KINASE)

Urine
- blood
- microscopy
Management

Field management

- Alleviate anxiety
- Look for evidence of snake bite
- Don’t let the patient move
- Hold bitten part at or below the level of heart
- Pressure immobilization
OTHER FIRST AID METHODS

- tourniquets
- cutting and suction
- application of chemicals
- use of cryotherapy or electric shock
  - No value or potentially harmful
Anti venom

- **Specific antidote to venom**
  - monovalent
    - (against single specie of animal)
  - polyvalent
    - (against variety of species)

- **Three major types of anti venoms**
  - whole IgG
  - F(ab)$_2$ known as croFab
  - Fab (require continuous infusion)
Complication of antivenom

- Anaphylaxis
- Rash
- Febrile reactions
-Delayed reactions
- Serum sickness
Non anti venom treatment

- Anticholinesterase
  Edrophonium and neostigmine
- Tetanus protection

- Fasciotomy
  (compartment syndrome)

- Inj epinephrine
  (anaphylaxis)

- In case of allergic reaction
  - anti histamine
  - corticosteroids