Snakes
Objective

- To identify snakes
- Recognize sign symptoms
- Diagnosis
- First aid
- Treatment
- PM appearence
- MLI
More than 3500 species, but 250 poisonous

In India 216 species but 52 poisonous

About 15000-20000 people die every year out of 2 laks snake bite cases

The big four—Common Cobra  
   Common Krait  
   Russel’s Viper  
   Saw scaled Viper

50% Snake bites by venomous species are “Dry Bites” ~ No venom injected
Snakes

Poisonous

- **Viperidae** (viviparous)
  - Russel’s viper, Saw-scaled viper, Pit vipers, Rattle snakes, Adders

- **Colubridae** (oviparous)

- **Elapidae** (Land snakes)
  - Cobra, King cobra, Krait, Banded krait, mambas, copperhead

Non-poisonous

- **Crotalidae**
  - Rattlesnakes, pigmy rattlesnakes, copperheads, cottonmouths

- **Hydrophidae** (Sea snakes)
Identification of snakes

1. Look at the tail:
   1. If compressed and flat – Sea snake
   2. If cylindrical & non-compressed – could be venomous or non-venomous

2. Look at the belly scales
   1. Small, do not cover the entire breadth of the belly – non-venomous
   2. Large & cover entire breadth of belly – could be venomous or non-venomous

3. Look at the head scales
   1. Small head scales – Viper (pit/no pit, triangular head)
   2. Large head scales like shields – could be venomous or non-venomous
4. **Look at the labial scales**
   1. 3rd supra-labial largest and touches scales of eye and nostril
      1. Neck has hood and markings – Cobra
      2. Coral spots on belly – Coral snake
   2. Only 4 infralabials, 4th is the largest – Krait (dorsal central scales are hexagonal & enlarged, subcaudates are not divided)
   3. None of the above – Non-venomous
Non-poisonous snakes

Belly scales incomplete

No fangs, several small teeth

No hood, no flat tail, no pits

Bite mark: semicircular set
Viper:
Short & Stout
Diamond-shaped head
Prominent neck
Small scales
Pupils: slit-like
Fangs long, hollow – inject venom
Give birth to live young
Haemotoxica
Snake venom:

Clear, yellowish, water-soluble
Proteolytic enzymes
Phosphatidases
Neurotoxins
Erepsin
Cholinesterase
Hyaluronidase
Ribonuclease
Ophi-oxidase
Snake Venom

- **Source:** Toxic saliva secreted by modified parotid gland of a venomous snake
- **Physical appearance:** Clear, amber coloured fluid when fresh
- **Nature:**
  - Neurotoxic: Elapid snakes
  - Hemotoxic: Viperid snakes
  - Myotoxic: Hydrophid snakes
Fatal dose:
12 mg cobra venom
15 mg viper venom

Fatal period:
Colubrine: 20 min to 6 hours
Viperine: 2-4 days
# Yield and LD

<table>
<thead>
<tr>
<th>Species</th>
<th>Approximate yield of dry venom (mg)</th>
<th>i.v. LD (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Cobra</td>
<td>170 – 325</td>
<td>0.4</td>
</tr>
<tr>
<td>Common Krait</td>
<td>8 – 20</td>
<td>0.09</td>
</tr>
<tr>
<td>Russell’s Viper</td>
<td>130 – 250</td>
<td>0.08</td>
</tr>
<tr>
<td>Saw-scaled Viper</td>
<td>20 – 35</td>
<td>2.3</td>
</tr>
<tr>
<td>Pit Viper</td>
<td>40 – 60</td>
<td>6.2</td>
</tr>
</tbody>
</table>
**Prevention/ Safety**

- **WATCH YOUR STEP!!!**
- Do not touch dead snakes with bare hands. A detached snake head can still inflict a bite!
- Most snakes will only bite when startled, provoked, threatened, or cornered
- When working in wooded areas:
  - Wear sturdy over the ankle boots, durable pants, and use gloves to handle refuse
  - Tread heavily, snakes will hear you and flee
- Direct Encounters: Back away, keep your eyes on the snake
Prevention/Safety

- Do not blindly reach into wood piles, flip over rocks, etc.
- Avoid snakes appearing to be dead. They often use this as a defense mechanism.
- Contractors engaging in activities where snakes live should provide training, have a plan in case of snake bite to include locating nearest hospital and if they are experienced in treating bites, should train employees on prevention, and outfit workers properly.
First Aid

- SEEK MEDICAL ASSISTANCE IMMEDIATELY!!!!!
- Treat all bites as poisonous
- Keep person calm and as still as possible
- Remove all jewelry
- Wash wound with soap & water
- Apply suction device if person is more than an hour from treatment
- Immobilize limb below the heart
- Give 100% oxygen if available
- Perform CPR if necessary

Source: WebMD
Outmoded Treatments

- Do not administer pain medication or give food
- Tourniquets
- Cutting the wound open
- Sucking out venom by mouth
- Snake stones
- Application of any chemicals
- Use of electroshock therapy
- Often field treatments by untrained personnel result in damage to victim or by the person applying treatment
Anti-snake venom serum
(20ml I.V. may be repeated.
Desensitization)
Polyvalent serum (for 4 common
Indian snakes)
Antivenin (Cobra or Russel’s viper)

Analgesics
Antibiotics
Inj. T.T.
Body warmth
Symptomatic treatment
Treatment of Snake bite

First aid:
- Reassurance
- Warmth, rest, immobilization
- Non-sedating analgesic for pain (No aspirin)
- Tourniquet/Sutherland wrap
- Bite site first aid –
  - Wipe site and cover loosely with clean piece of cloth
  - Suction
    - if medical help > 1 hr away or if done within few mins of bite
    - Using parallel incisions through fang marks, 1 cm long and not more than 3 mm deep
    - Using commercial suction device
Early Clues of Severe Envenomation:

- Snake identified as a very dangerous one
- Rapid early extension of local swelling from the site of the bite
- Early tender enlargement of local lymph nodes, indicating spread of venom in the lymphatic system
- Early systemic symptoms:
  - collapse (hypotension, shock), nausea, vomiting, diarrhoea, severe headache, "heaviness" of the eyelids, inappropriate (pathological) drowsiness or early ptosis/ophthalmoplegia
- Early spontaneous systemic bleeding
- Passage of dark brown urine
Treatment of Snake bite

- Hospital measures:
  - Observation – at least for 24 hours
  - Check for and monitor:
    - Pulse, Resp. rate, BP, WBC count – hourly
    - Bl. urea, S. creatinine, Urine output
    - Vomiting, diarrhoea, bleeding
    - Local swelling and necrosis
    - ECG, blood gas analysis
  - Antivenin therapy
Hospital measures (cont.):

- Other measures:
  - Clean bite site, no dressings
  - Leave blisters alone
  - Inj TT, Prophylactic antibiotic
  - Rehydration, etc.

- Special measures:
  - Blood/FFP, Vasopressors, O₂
  - Neostigmine 0.5mg ½ hrly for neuro-paralysis after administration of Atropine 0.6mg i.v. to block muscarinic effects
Anti-venom Therapy

- Not administered as a routine – only given if envenomation is evident
- Avoid unnecessary delay
- Only PVASV available in India, effective against – common cobra, common krait, Russell’s viper and saw scaled viper
- Procured from Haffkine Institute, Mumbai; CRI, Kasauli; Guindy Snake Park, Chennai and King’s Institute, Delhi.
- Available as lyophilized powder of horse serum to be reconstructed before use.
Indications
(recommended if and when a patient with proven or suspected snake bite develops one or more of the following signs):

- **Systemic envenomation**
  - Haemostatic abnormalities: spontaneous systemic bleeding, coagulopathy or thrombocytopenia
  - Neurotoxic signs: ptosis, external ophthalmoplegia, paralysis etc.
  - Cardiovascular abnormalities: hypotension, shock, cardiac arrhythmia, abnormal ECG
  - Acute renal failure: oliguria/anuria, rising blood creatinine/urea Haemoglobin-/myoglobin-uria - dark brown urine, other evidence of intravascular haemolysis or generalised rhabdomyolysis (muscle aches and pains, hyperkalaemia)
Anti-venom Therapy (contd)

- Indications (contd)
  - Local envenomation:
    - Local swelling involving more than half of the bitten limb (in the absence of a tourniquet)
    - Swelling after bites on the digits (toes and especially fingers)
    - Rapid extension of swelling (for example beyond the wrist or ankle within a few hours of bites on the hands or feet)
    - Development of an enlarged tender lymph node draining the bitten limb
Dosage and administration:
- Local swelling, No systemic features: 20 – 50ml
- Swelling beyond bite site, mild systemic features: 50 – 100 ml
- Marked local/systemic features: 100 – 150 ml
  - Added to 500 ml NS and given as i.v. infusion over 1 – 2 hours. Repeated if no improvement
  - Local injection at bite site is NOT EFFECTIVE.

Adverse effects:
- Anaphylaxis
Summary

- Watch your step in hazardous environment
- Wear protective clothing
- If a snake is encountered, leave it alone!
- In the event of a bite, seek medical assistance immediately