Module 11 – poisoning, venomous bites & stings

Poisons can enter the body as a result of a bite or sting from a venomous creature. They can be swallowed, inhaled as a gas, absorbed through the skin or injected using a syringe. These poisons can have a broad range of effects from mild discomfort to respiratory and cardiac arrest. Certain substances can cause a severe allergic reaction, known as anaphylaxis.
First Aid Instructor PowerPoint
by John Lippmann & David Natoli
© J. Lippmann & D. Natoli, 2007
All rights reserved. No part of this publication may be reproduced or transmitted in any
form or by any means, electronic or mechanical, including photocopy, recording or any
information storage or retrieval system without the prior written permission from the
authors.
Lippmann, John.

Published by J.L. Publications,
a Division of Submariner Publications P/L,
ABN 39 059 509 474
PO Box 387 Ashburton, Vic. 3147, Australia.
Tel/Fax: +61-3-9886 0200;
Email: jlpubs@bigpond.net.au
www.submarinerpublications.com

Acknowledgements
The authors wish to sincerely thank the following people for their contributions and
editorial comments: Dr. David Pescod, Assoc. Prof. John Williamson, Prof. Vic Callanan,
Assoc. Prof. Julian White, Dr. Peter Sullivan, Tony Walker and Mick Jackson.

Published for the Royal Life Saving Society Australia
Suite 6 Level 4 173-179 Broadway (cnr Mountain St), Broadway NSW 2007
Tel 02 8217 3111
Fax 02 8217 3199
www.royllifesaving.com.au

Royal Life Saving Society Australia wishes to acknowledge the contribution to this publication of RLSS-New South
Wales through Operations Manager Michael Ilinsky.

Royal Life Saving wishes to acknowledge the dedicated and professional team of staff and
volunteers who will use this valuable first aid publication to train and assess community
lifesavers in schools, communities, corporates and across various industries almost every day.
Poisons

• A poison is any substance which, once it makes its way into the body, will cause it harm.
• The method of transmission may be ingestion, injection, inhalation or absorption through the skin.
• The way the victim will present depends upon the type of poison involved and how much was taken.
Impacting factors

- Management of the victim will depend upon a number of factors, which include:
  - The ability of the first aider to control any associated dangers e.g. the victim in an enclosed space with a suspected poisonous gas present
  - The level of responsiveness of the victim
  - The type of poison involved e.g. was a corrosive or burning substance swallowed. Valuable information is on the bottles and other containers including contact phone numbers.
Poisons

• A responsive victim may tell you that they have taken poison or medication or drugs.

• With small children, or others with whom communication may be difficult, a first aid provider should look for changes in behaviour or responsiveness.

• The presence of containers for poisons or medication, or a syringe may also be an important indicator of potential poisoning.

SIGNS & SYMPTOMS

– Altered responsiveness e.g. drowsy, euphoric, aggressive or unresponsive

– Altered breathing rate

– Altered heart rate

– Change to the size of the victim’s pupils

– Stomach cramps, nausea, vomiting, diarrhoea

– Discolouration around the mouth
Ingested poison

Responsive - General management
- Conduct a Primary Survey and act accordingly.
- Comfort and reassure the victim.
- Continuously monitor victim vital signs.
- Try to identify the type and quantity of the poison taken, and when it was taken.
- Refer to Material Safety Data Sheet (MSDS) if available and follow recommended steps.
- If unsure if victim requires medical attention contact Poisons Information Centre.
- Seek medical assistance.
- Do not induce vomiting.
- If advised to do so by Poisons Information Centre (13 11 26) or other medical authority, diluting the poison with small amounts of water or milk may be appropriate.

Unresponsive Victim
- Arrive urgent medical assistance.
- Conduct a Primary Survey and follow the appropriate actions.
- Continuously monitor the victim.
- Try to identify the type and quantity of the poison taken, and when it was taken.
Absorbed & Inhaled poisons

**ABSORBED POISON – TREATMENT & MANAGEMENT**

- Consider potential dangers when conducting the Primary Survey
- Arrange urgent medical assistance
- Irrigate the affected area with copious amounts of water

**INHALED POISON – TREATMENT & MANAGEMENT**

- Consider potential dangers to ensure you are not also affected. You should not attempt a rescue if the victim is in a confined space. This should be done by appropriately trained people with the correct equipment.
- Organise urgent medical and other appropriate assistance.
- Victim should be removed to the fresh air prior to conducting a primary survey.

- **Note:** In Australia, it is necessary to keep a Materials Safety Data Sheet with hazardous substances. These sheets provide information on specific management for poisoning by such substances.
Venomous bites & stings

- Venoms can be injected into the body by stings or bites from various venomous creatures. These include certain snakes, spiders, bees, wasps, scorpions, ants, ticks, jellyfish, molluscs and fish.
- Venoms may spread through the body via the lymphatic and / or the circulatory system.
EVERYONE CAN BE A LIFESAVER

**P I T**

- Apply a broad pressure bandage firmly over the site.
- Apply second bandage starting at the fingers / toes, and ideally extending to the armpit / groin.
- Apply a splint to the limb to prevent movement.
- A sling may be used to help immobilise an envenomation to the hand or arm.
- Reassure and minimise movement.
- Seek urgent medical aid.
- Don’t remove bandages.
Snake bite

- Venoms from different poisonous snakes vary in their effect. Different components in the venom can affect multiple organs or body systems. Many of the venoms can interfere with skeletal muscle (i.e. muscle attached to bone) and lead to paralysis of these muscles.

- The respiratory muscles are often affected and progressive difficulty in breathing and can result in respiratory arrest.

- Other effects include coagulation failure, muscle damage, secondary kidney damage and the breakdown of red blood cells.
Snake bite

SIGNS & SYMPTOMS

- History
- Puncture mark(s) or scratches
- Headache
- Nausea, vomiting
- Abdominal pain
- Visual problems
- Difficulty in speaking, swallowing or breathing
- Limb weakness, paralysis or pain
- Difficulty in breathing, respiratory arrest

TREATMENT & MANAGEMENT

- Conduct a Primary Survey and act accordingly
- Immediately place firm pressure on the wound
- Apply pressure-immobilisation
- Keep the victim rested and reassure
- Arrange for communication with and transport to a medical facility (by ambulance if possible)
Spider bite – Funnel web

- The venom of the male “Sydney” funnel web spider can kill humans, monkeys and mice.
- The deadly component acts by attacking the nerve surfaces of vulnerable animals.
- Symptoms can appear within 10 minutes and can include violent muscle tremors, mental confusion, fluid in the lungs (pulmonary oedema), eventual coma, brain damage and possible death.
- An antivenom is available.
Funnel web

**SIGNS & SYMPTOMS**
- History
- Pain at bite site
- Tingling around mouth
- Copious secretion of saliva
- Profuse sweating
- Abdominal pain
- Muscular twiching
- Confusion
- Respiratory difficulty/arrest
- Coma

**TREATMENT & MANAGEMENT**
- Conduct a Primary Survey and act accordingly.
- Immediately place firm pressure on the wound.
- Apply pressure-immobilisation.
- Keep the victim at rest and reassure.
- Arrange for transport to a medical facility (by ambulance if possible).
Redback spider

- It’s venom is very slow acting and attacks the nervous system.
- The bite site should be cooled to provide pain relief.
- No pressure immobilisation bandage required.
- An antivenom is available and can be used if required.
- Children can be more severely affected than adults due to their smaller size.
Redback

SIGNS & SYMPTOMS

• Immediate pain at bite site which becomes hot, red and swollen
• Pain increases and spreads
• Profuse sweating, especially at bite site
• Nausea and vomiting
• Abdominal pain
• Swollen and tender glands near the envenomated limb

TREATMENT & MANAGEMENT

• Reassure the victim and keep under observation
• Apply an ice pack
• For pain relief
• Arrange for transport to a medical facility (by ambulance if possible).
Bee, wasp, scorpion & ant stings

• Can cause pain, swelling and discomfort.
• Around 90% of the population, the sting will not cause a serious threat to health unless the sting is in the airway or the victim is allergic to the venom.
• If a bee or wasp is swallowed and stings the base of the tongue or the back of the throat, the area can swell rapidly and close the airway.
  – This is a life threatening situation and urgent medical assistance is required.
Bee, wasp, scorpion & ant stings

SIGNS & SYMPTOMS

• History
• Intense local pain
• Local redness and swelling

• In allergic persons:
  – Itchy rash
  – Puffy eyelids, facial and limb swelling
  – Wheezing and difficulty in breathing
  – Nausea, vomiting, diarrhoea
  – Collapse

TREATMENT & MANAGEMENT

• Conduct a Primary Survey and act accordingly
• Remove a sting by scraping it sideways with a sharp edge taking care not to squeeze the venom sac
• Apply an ice pack for pain relief
• If the victim has history of allergy to bites or shows signs of an allergic reaction, apply pressure-immobilisation and, arrange urgent medical assistance
Tick bites

- Bites from an adult female tick can cause serious paralysis.
- The tick remains attached to the victim, feeding on their blood and becoming engorged.
- Waste products and its saliva are injected back into the victim.
- It is this saliva which contains a toxin that can affect the nervous system of the victim.
- An antivenom is available.
Tick bite

SIGNS & SYMPTOMS

• History
• Local irritation
• Lethargy, muscle weakness (especially in children)
• Visual disturbances, unsteady gait
• Difficulty swallowing
• Wheezing, difficulty breathing
• Allergic reaction in susceptible persons (rarely)

TREATMENT & MANAGEMENT

• Locate the tick(s) by carefully checking the whole body of the victim.
• Carefully remove the tick by levering it outwards using fine, curved forceps, or equivalent.
• Do not squeeze or pull on the tick as more venom may be released or the tick may not be removed completely.
• Seek medical advice. If the victim has a rash, persistent headache, fever, aching joints or history of allergy, seek urgent medical assistance.
Jellyfish, coral & hydroid stings

- Belong to a group of animals known as cnidarians. Some, such as jellyfish, are free swimming, others, such as hydroids and corals, are generally attached and stationary.
- All cnidarians have nematocysts or stinging capsules for incapacitating prey.
- These tiny capsules, normally found on the tentacles, all contain venom and thousands of them fire darts upon contact with the victim.
- The injury that results depends on the potency of the venom, and the size of the sting area.
Jellyfish, coral & hydroid stings - reactions

- Reactions range from a mild local discomfort, an immediate stinging pain, redness, swelling, weals and skin destruction.
- Serious envenomation can affect the victim’s respiration, heart and brain which has resulted in death.
- After a sting, there may still be many unfired nematocysts left on the victim and it is important to prevent more of these from discharging and causing further envenomation.
Vinegar!

- Household vinegar (4-6% acetic acid), has been shown to deactivate the nematocysts from box type jellyfish. It may however, discharge the nematocysts of other species.
- Recent studies on the Portuguese Man-O-War have indicated that any water if applied to dry tentacles, can cause undischarged nematocysts to fire. Vinegar may also cause these to fire.
- Although vinegar will prevent further envenomation from a box-type jellyfish, it will not provide pain relief. Ice or cold can provide pain relief from cnidarian stings. Effective Australian antivenom is available for box jellyfish stings.
Jellyfish, coral & hydroid stings

**SIGNS & SYMPTOMS**

- History
- Stinging sensation, acute local pain
- Red rash, weals
- Pain in lymph glands
- Shock
- Breathing difficulty /breathing stops
- Unresponsiveness/cardiac arrest

**TREATMENT & MANAGEMENT**

**Within tropics**
- Pour vinegar over sting area
- If no vinegar is available pick off any adherent tentacles

**For all jellyfish stings**
- Conduct a Primary Survey and act accordingly
- Keep victim at rest, reassured if conscious, and under constant observation
- Do not allow rubbing of the sting area.
- Seek immediate medical aid if:
  - Responsiveness or breathing are impaired
  - Local pain is unrelieved
  - Generalised pain develops
  - The sting area is large (half a limb or more).
- Apply cold (e.g. cold pack / wrapped ice) for pain relief. Reassess after 10 minutes
- Immerse in hot water (blue bottle)
- Do not wash sting area with water
- Pick off any adherent tentacles with fingers if necessary (this should not harm the rescuer, but wash hands afterwards).
Blue-ring octopus

- Shy animal found in sheltered waters, inhabiting rock pools, crevices, shells and discarded materials such as tins and bottles.
- Camouflages itself with its surroundings but is often light brown with darker brown patches.
- Iridescent blue rings appear on the darker patches when angry, disturbed or excited.
Blue-ringed octopus – bite!

- The venom itself paralyses skeletal muscle (muscle attached to bone) and hence can cause progressive muscular paralysis, including paralysis of the respiratory muscles.
- The venom does not affect cardiac muscle so the heart of a victim will continue to beat as long as an adequate blood and oxygen supply is maintained.
- The brain is not directly affected by the venom and a victim who may appear unconscious and paralysed may in fact be conscious and aware but unable to move.
- If breathing stops (which can occur within 10-15 minutes of being bitten), respiration must be supported until the effects of the venom wear off, which can be up to 12 hours.
- However, if the bite site is washed and Pressure-Immobilisation is promptly applied, the victim should suffer minimal effects of envenomation.
- Currently, there is no antivenom for blue-ringed octopus bite.
Blue-ringted octopus

SIGNS & SYMPTOMS

- History
- Small, painless bite which may look like a blood blister
- Numbness (initially around mouth and neck)
- Nausea, vomiting
- Visual disturbances, droopy eyelids
- Difficulty swallowing, difficulty breathing
- Blue Lips
- Incoordination, muscular paralysis.
- Breathing stops

TREATMENT & MANAGEMENT

- Conduct a Primary Survey and act accordingly
- Immediately place firm pressure on the wound
- Apply Pressure-Immobilisation
- Keep the victim at rest and reassure
- Arrange for transport to a medical facility (by ambulance if possible)
Cone shell

- Cone shells are found throughout the world, with many of the venomous species located in the tropical or sub-tropical waters of the Indo-Pacific Region, and some in the Red Sea off Florida and in the Caribbean.

- Although there are several hundred species of the cone shell, relatively few are known to be harmful to man. The dangerous species to humans are mainly the fish-eating cones, such as the Geography Cone.
Cone shell — venom!

- The animal has two tubes that may protrude from the base of the shell at the animal’s head. One tube is a siphon used to suck in water. The other, called the proboscis contains up to 20 radula teeth. These radula can penetrate skin and light clothing. The sting is painful.

- Some venoms paralyse only skeletal muscle and can cause respiratory paralysis. This paralysis appears to subside after some hours so a victim should recover if adequately ventilated.

- There is no antivenom for cone shell stings.
Cone shell

SIGNS & SYMPTOMS

- History
- Sometimes pain
- Numbness, tingling, weakness, muscular paralysis
- Visual disturbances
- Difficulty swallowing, difficulty breathing
- Breathing stops

TREATMENT & MANAGEMENT

- Conduct a Primary Survey and act accordingly
- Immediately place firm pressure on the wound
- Apply Pressure-Immobilisation
- Keep the victim at rest
- Arrange for transport to a medical facility (by ambulance if possible)
Fish spine injuries

• There are many fish throughout the world that have spines to protect them from their predators or to assist them in incapacitating their prey. Many of these spines have venom sacs and are capable of injecting venoms.

• Stingray deaths can result from the barb penetrating organs, but rarely from the effects of the venom. Envenomation by certain other fish may have occasionally proved fatal, usually from secondary complications of the wound.
Fish spine injuries - venom

- Various venoms affect different body organs, nerves and muscles. Therefore a variety of effects including respiratory depression, paralysis and blood pressure changes may occur.

- Although venoms vary greatly between species, they have certain similarities and many appear to be destroyed by heat (heat labile), for this reason, immersion in water around 45-50ºC generally provides significant pain relief and is a valuable first aid measure.
Fish spine injuries

- Pressure-Immobilisation or constrictive bandages are not recommended.
- Some venoms, such as the stonefish, tend to disperse slowly.
- Localisation of the toxin via bandaging is likely to worsen the pain and initiate local tissue damage.
Fish spine injuries

SIGNS & SYMPTOMS

- History
- Immediate pain (acute of venomous)
- Puncture wound/laceration, bleeding
- Swelling
- Grey/blue discolouration around puncture site (stonefish)
- Nausea, vomiting
- Shock
- Irrational behaviour, panic
- Altered responsiveness

TREATMENT & MANAGEMENT

- Control any severe bleeding, if present.
- Remove the spine, if present, but only if easily removed.
- Immerse the wound in hot, but not scalding (around 45ºC) water. Test the water temperature yourself before immersing the victim’s wound. Leave immersed for 30-90 minutes for pain relief. This may be repeated if pain recurs.
- Should hot water not provide relief, apply ice/cold packs to the wound.
- Treat for shock.
- Analgesics as directed.
- Clean the wound by scrubbing it with soap and fresh water, then rinse it thoroughly with fresh water.
- Seek medical advice.