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Secondary Care

General Assessments

Temperature Related Injuries

Slips, Falls, Secondary Assessment

Fractures and Splinting

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General Assessments

First aid is the medical care for injuries or illnesses that are not immediately life threatening

Care delivered after initial assessment for life threatening conditions is collectively referred to as secondary care

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General Assessments

General First-aid Assessment

- State of health and well-being
- Respiratory effort
- Appearance of skin

Illness Assessment

- What are the person's complaints?
- When did symptoms begin?

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General Assessments

Taking a History (review)

S - Signs/symptoms
A - Allergies
M - Medications
P - Pertinent medical history
L - Last oral intake
E - Events leading to the current situation

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General Assessments

Illness Assessment

Note the following:

- Breathing difficulties
- Complaints of chest pain
- Complaints of abdominal pain
- Altered or changing level of consciousness

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Medical Emergencies

Asthma

Non-contagious respiratory condition characterized by airway narrowing

Heart Attack

Coronary artery blockages – symptoms may include:

- Heavy pressure or squeezing in center of chest or back
- Shoulder, arm or neck/jaw pain
- Nausea, vomiting
- Shortness of breath
- Indigestion, heartburn
- Sweating
- Sense of impending doom

NOTE: Not all heart attacks are painful

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Signs of Hypoglycemia	Signs of Hyperglycemia
hunger	increased thirst
tremors or seizures	headaches
anxiety	difficulty concentrating
sweating	blurred vision
dizziness or lightheadedness	frequent urination
sleepiness	fatigue (weak, tired feeling)
confusion and/or changes in level of consciousness	
difficulty speaking	
nervousness	
weakness	

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Medical Emergencies

Diabetic Emergencies

Two classes – high blood sugar and low blood sugar

High blood sugar = Hyperglycemia

Rarely needs emergent treatment

More of a long term problem

Low blood sugar = Hypoglycemia

May quickly become a serious medical emergency

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confusion and/or changes in level of consciousness	
difficulty speaking	
nervousness	
weakness	

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Medical Emergencies

Diabetic Emergencies

If a known diabetic **behaves in an uncharacteristic manner, is confused or shaking**, suggest they check their blood sugar (blood glucose).

Treatment for hypoglycemia if able to swallow without choking **provide high sugar concentration**

- Glucose tablets
- Candy/Jelly beans
- Fruit leather
- Orange juice

If the diabetic cannot swallow, call 911 for assistance.

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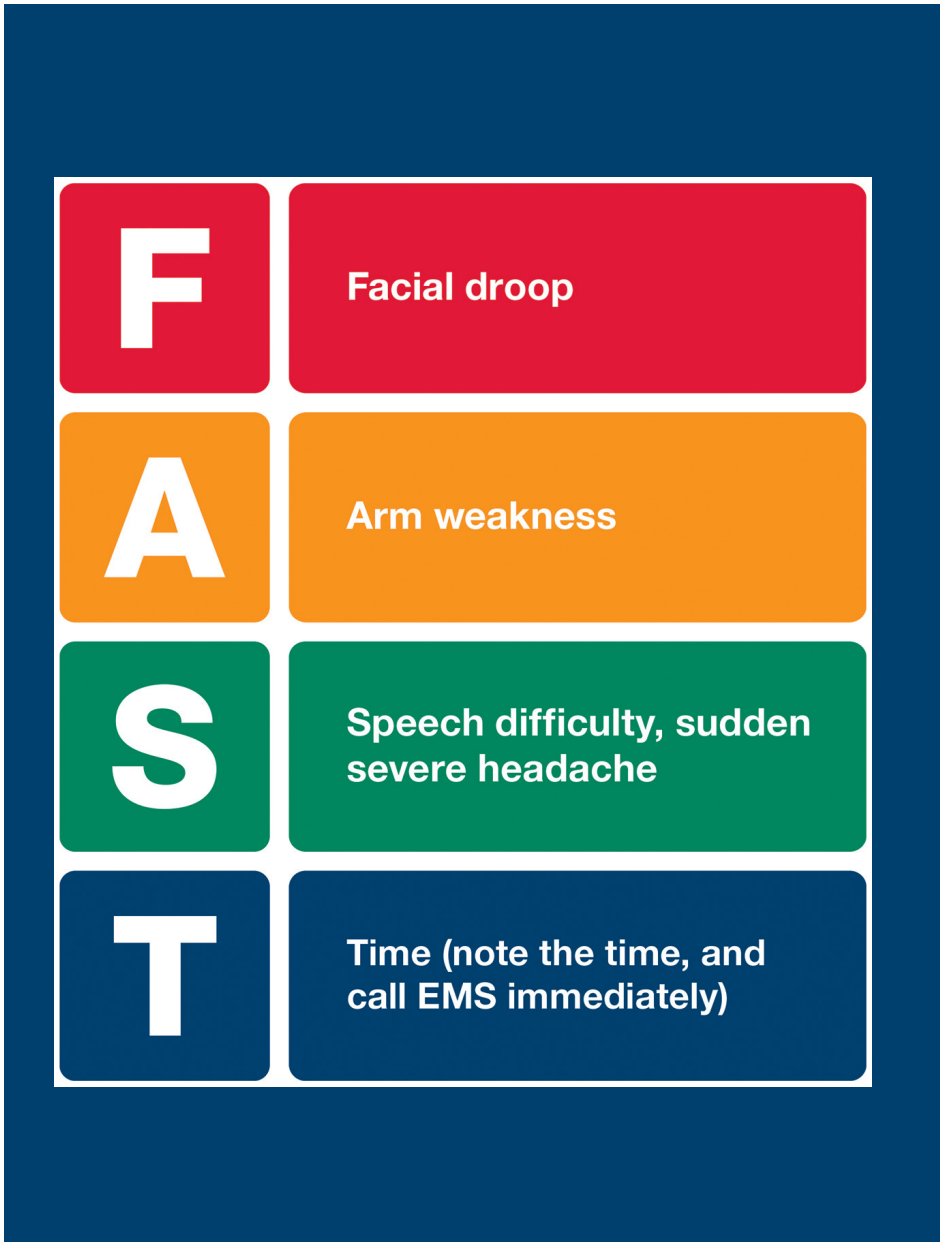

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Medical Emergencies

Stroke

- Leading cause of long-term disability
  - Third leading cause of death
- Suspect stroke in absence of head trauma if:
  - Sudden loss of motor function
  - Inability to understand or formulate words
  - Loss of visual field

Think F-A-S-T to assess for possibility of stroke

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Medical Emergencies

Seizures

Result from a sudden massive electrical discharge in the brain

- First-aid priority is to move objects that may be struck, cause injury

Poisoning

Can be eaten, inhaled, injected or absorbed

- Call EMS immediately if suspected
- Signs/Symptoms
  - Nausea, vomiting
  - Abnormal blood pressure
  - Headache
  - Abdominal pain
  - Altered pupils
  - Altered mental status

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Medical Emergencies

Other Medical Emergencies

Exertional Dehydration

- Due to vigorous exercise and profuse sweating
- Results in loss of electrolytes
- Attempt rehydration with 5-8% carbohydrate-electrolyte solutions

Concussion

- Mild traumatic brain injury
- Symptoms may include feeling dazed, dizzy, unsteady, headache, visual disturbances, confusion, memory loss
- Must be evaluated by a health care provider
- Activity must be restricted until released by a doctor

Dental Avulsion

- Greatest chance of tooth survival is reimplantation within an hour
- Store tooth in a noted solution; seek immediate care

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Temperature Related Injuries

Hypothermia (cold) –

body core temperature <95° F/35° C

First-aid Response

Prevent further heat loss

Remove wet clothing

Provide warm dry coverings

Consider use of hot-water bottles or heating pads

Activate EMS for moderate to severe cases

AVOID rough handling

- May cause heart arrhythmias

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Temperature Related Injuries

Hyperthermia (hot) –

- body is overheated and normal cooling mechanisms are overwhelmed

Heat rash – pimple-like rash

- Due to excessive sweating
- Cool individual
- Keep area dry

Heat Cramps – muscle spasms

- Due to excessive fluid loss due
  - Associated with strenuous activity
- Stop all activity
- Rest in cool place
- Drink clear fluids (sport drinks)

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Temperature Related Injuries

Heat Exhaustion

- Also due to excessive fluid loss

Warning signs

- Heavy sweating
- Nausea/Vomiting
- Headache
- Muscle cramps

- Fatigue
- Weakness
- Fainting

First Aid

- Remove from heat
- Rest
- Remove unnecessary clothing
- Place in cool environment
- Drink clear liquids (sport drinks)
- Cool with sponging head, neck, torso

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Temperature Related Injuries

Heat Stroke **Life-threatening condition**

Body core temperatures may exceed 106°F/41°C

Warning signs

- Rapid pulse
- Red, hot, often dry skin
- Strange behavior
- Hallucinations
- Confusion
- Seizures
- Coma
- Death

First Aid

- Remove from heat
- Activate EMS
- Rest
- Remove unnecessary clothing
- Place in cool environment
- Aggressive cooling
  - Cold packs, water-soaked towels
  - Fans/Vents

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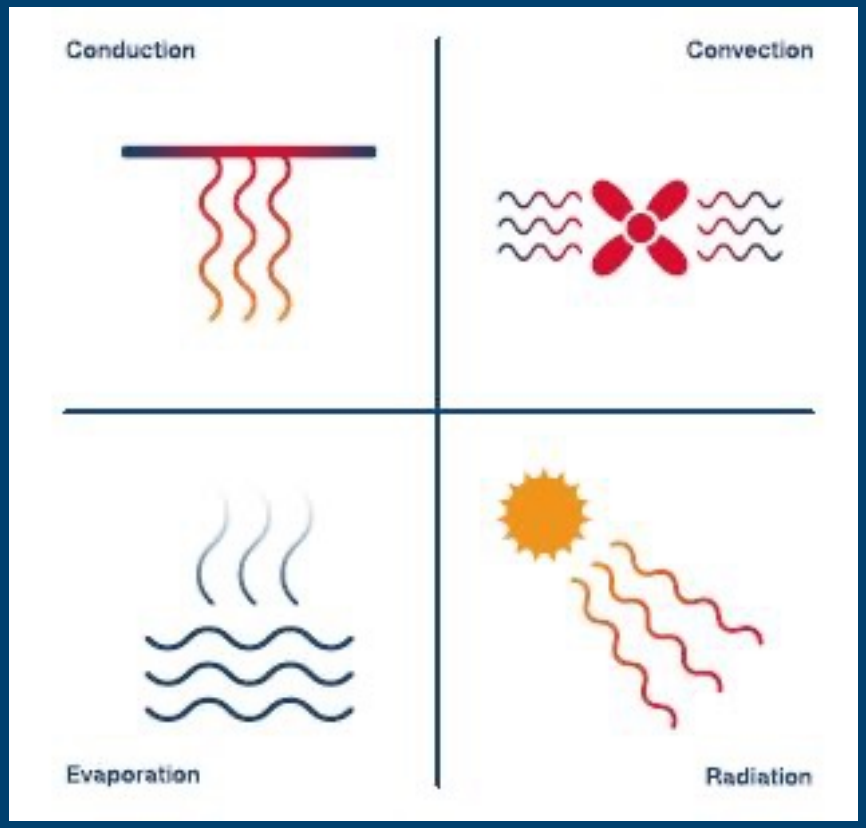

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Temperature Related Injuries

Cooling Measures - **mechanisms for heat loss**

Conduction

- transfer from warmer object to cooler object by direct contact

  Ex: bath or shower

Convection

- response to movement of fluid or gas

  Ex: fan or air conditioning

Evaporation

- heat absorbed by sweat then released/removed as gas

  Ex: sponging

Radiation

- transfer of electromagnetic energy from warmer to cooler

  Ex: move to shady location

  out of sun

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Slips, Falls and Fractures

Prevention

- Proper drainage
- Rubber matting
- Non-skid surfacing
- Warning signs
- Check stair risers
- Handrails

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Secondary Assessment

- **Assure** your own safety
  - Remember S-A-F-E
- **Leave** injured person in position found
- **Head-to-toe** evaluation

  looking for injuries
- **Gently palpate** in a systematic manner
  - Use personal protective equipment
  - Technique provided in student handbook
- **Call EMS** if any injury is identified

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Splinting

- For use when EMS is delayed or not immediately available
- Immobilize joint in position found
- Use commercial or improvised splinting materials
- Pad around injury with roller gauze or other material
- Monitor peripheral circulation

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First Degree

Second Degree

Third Degree

Fourth Degree

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Burns

Tissue damage caused by heat, chemicals, electricity, sunlight or radiation

Superficial burns (first degree burns)
- Limited to outermost layer of skin
- Redness, mild swelling and discomfort

Partial thickness burns (second degree burns)
- Varies in depth of tissue involvement
- Blister formation and blanching possible

Full thickness burns (third degree burns)
- Involves all layers of skin; may extend deeper
- White, waxy appearance; often without blisters; insensate

Fourth degree burns
- involves muscle and/or bone tissue
- Often the result of high-voltage or thermal injury

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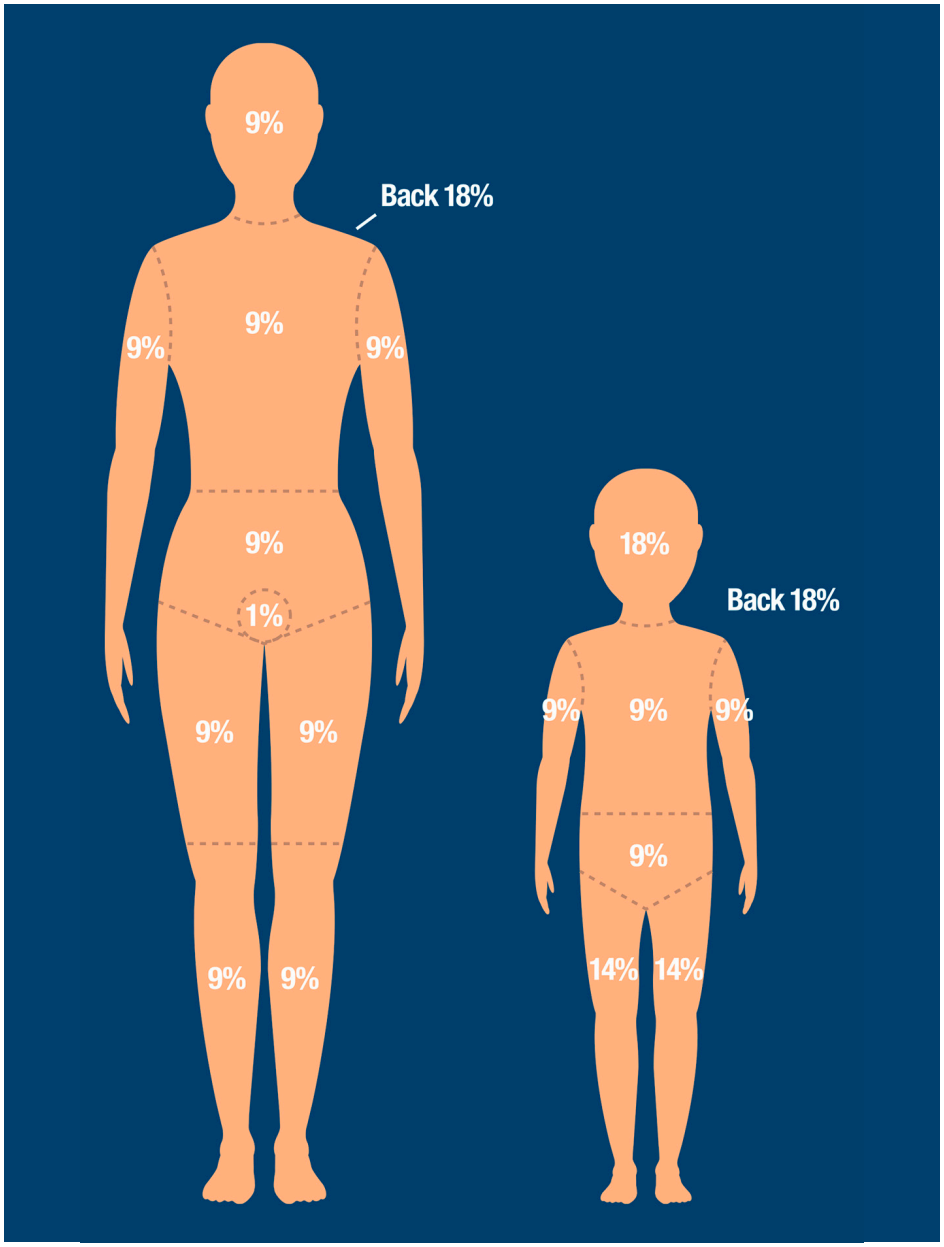

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Burns

Rule of Nines

For an adult:

- Head and neck 9%
- Anterior trunk (front of body) 18%
- Posterior trunk (back of body) 18%
- Each Arm (including the hand) 9% (total of 18%)
- Each leg (including the feet) 18% (total of 36%)
- Genitalia 1%

For a child:

- head and neck 18%
- anterior trunk 18%
- posterior trunk 18%
- arms (including hands) 9% each
- legs (including feet) 14% each

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Burns

First Aid

Remove patient from source of burn

Cool the burn for up to 15-20 minutes

Cover with clean, dry dressing

Do not

- Use ice to cool a burn
- Apply ointments, lotions or antiseptics
- Do not pop blisters

Call 911 for severe burns, especially those to face, hands, and feet

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Secondary Care

SKILLS

Secondary Assessment
Splinting

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Hazardous Marine Life Injuries

- Introduction to Hazardous Marine Life Injuries
- Envenomations and Toxins
- Traumatic Injuries
- Seafood Poisonings
- Life-threatening Complications
- Avoiding Hazardous Marine Life Injuries

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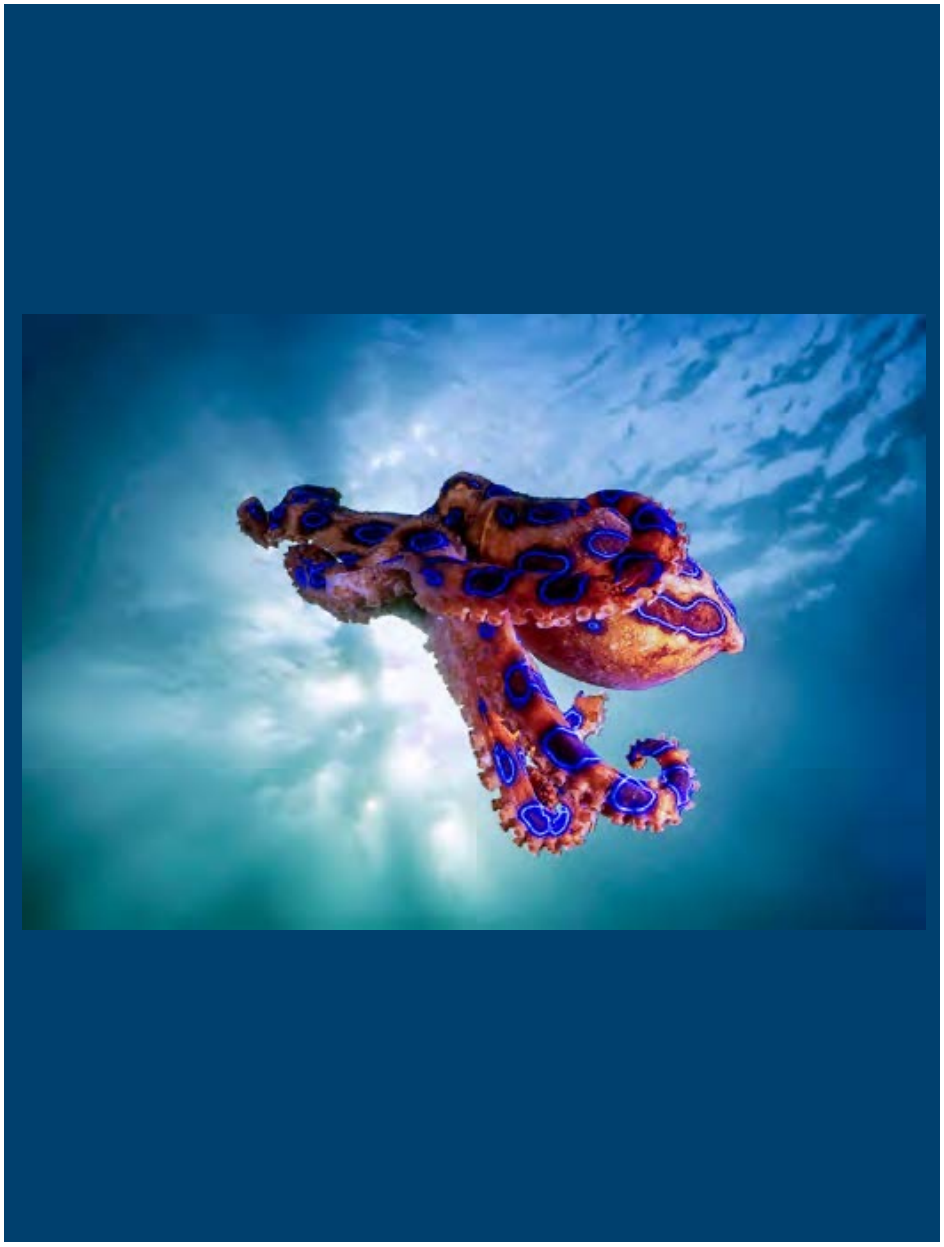

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Hazardous Marine Life Injuries

General categories of injuries caused by marine life

- Envenomations - process by which venom or toxin is injected into another creature
- Traumatic injuries – physical injury due to bites or external force
- Seafood poisonings – result of ingestion of contaminated food or liquids

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Envenomation and Toxins

Envenomation – process by which venom or toxin is injected into another creature

Mechanisms of envenomation

- Stings
- Spines
- Bites
- Barbs

Why envenomations occur

- Animal's defensive action
- Accidental contact

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Envenomation and Toxins

Factors affecting injured diver's response to envenomation

- Venom potency
- Volume injected
- Area involved
- Individual's health status
- Sensitivity to venom
- Delays to treatment

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Part 1: Vertebrate Envenomations

Vertebrates

Characterized by backbones and spinal columns

- Fish
- Amphibians
- Reptiles
- Birds
- Mammals

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Part 1: Vertebrate Envenomations

Lionfish and Stonefish

- Characteristic physical attributes
- Two different groups
  - –Extravagant
    IE. lionfish or zebrafish.
  - –Well-camouflaged (or mimetic, indicating attempts to mimic their surroundings)
    IE. stonefish, scorpionfish, leaf fish

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Part 1: Vertebrate Envenomations

Lionfish and Stonefish Injuries

- Envenomation results from direct contact/puncture.
  - –Mimetic species tend to cause more serious reactions.
- Rapid and significant edema
- Pain
  - –May be severe
- Deep puncture wounds can become infected
  - – Tetanus can result

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Part 1: Vertebrate Envenomations

Stingrays

- Shy fish
- Closely related to sharks
- Not typically a risk to divers unless threatened, startled or stepped on

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Part 1: Vertebrate Envenomations

Stingray Injuries

- Injuries rarely fatal.
- Pain is scorching in nature and out of proportion to injury.
- Deep puncture wounds can become infected easily.
- Tetanus can result

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Part 1: Vertebrate Envenomations

Signs and symptoms

- Puncture or laceration
- Blisters around the puncture site
- Patches of purple or black skin coloration
- Immediate pain
- Swelling
  – can lead to compartment syndrome
- Other
  — Nausea
  — Vomiting
  — Shock (rare)
  — Respiratory arrest (rare)
  — Cardiac arrest (rare)

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Part 1: Vertebrate Envenomations

Treating venomous fish injuries

- Wash the area thoroughly with soap and fresh water
- Remove foreign material
- Control bleeding (if present)
- Pain control
  - immerse the affected area in non-scalding fresh water
  - administer pain-control medications if necessary
- Apply topical antibiotic ointment or cream
- Bandage as necessary
- Seek medical evaluation
  - may include sedatives, tetanus vaccination and antibiotics.

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Part 1: Vertebrate Envenomations

Sea snakes

Highly venomous air breathing animals

Well adapted to marine life

Related to land species such as cobras and coral snakes

Rarely a threat to divers or swimmers

Often curious and may approach divers in a fast and deliberate manner.

– Remain calm and swim in a different direction

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Part 1: Vertebrate Envenomations

Sea snakes

Venom rarely contains large quantities of tissue-toxic compounds that cause localized pain.

Venom does contain neurotoxic components, which may cause paralysis.

Prevent bites by avoidance
- don’t antagonize

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Part 1: Vertebrate Envenomations

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Venom does contain neurotoxic components, which may cause paralysis.

Prevent bites by avoidance
- don’t antagonize

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Part 1: Vertebrate Envenomations

Sea snake injuries

Bites can be painless and difficult to detect

Most bites do not result in envenomation

Neurotoxic venom may cause:

- difficulty speaking and swallowing
- weakness
- progressive flaccid paralysis
- respiratory distress/arrest
- cardiac arrest
- death

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Part 1: Vertebrate Envenomations

Treating Sea Snake Envenomations

Signs and symptoms

- Lacerations or punctures
- Bleeding
- Pain
- Shock
- Retained material in the wound

Early neurological warning signs

- Difficulty swallowing
- Double vision
- Drooping of the upper eyelid
- Dilatation of the pupils
- Difficult or painful speech
- Tongue twitching

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Part 1: Vertebrate Envenomations

Treating Sea Snake Envenomations

Initial treatment is symptomatic

Focus on three primary tasks:

- **Pressure immobilization** technique for affected limbs.
- **Limit all movement** as much as possible
- Hydration
- **Transportation** to a hospital capable of advanced life support and possibly antivenom administration.

Do not remove pressure immobilization bandage until injured individual is under medical care.

Note: Also used for Cone Snail and Blue Ringed Octopus envenomations (next section)

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Part 2: Invertebrate Envenomations

Invertebrates

- Animals without backbones
- Comprise more than 98 percent of earth's animal species
- Injuries include envenomation and localized tissue trauma (cuts and scrapes)
- Envenomations occur via stings and punctures

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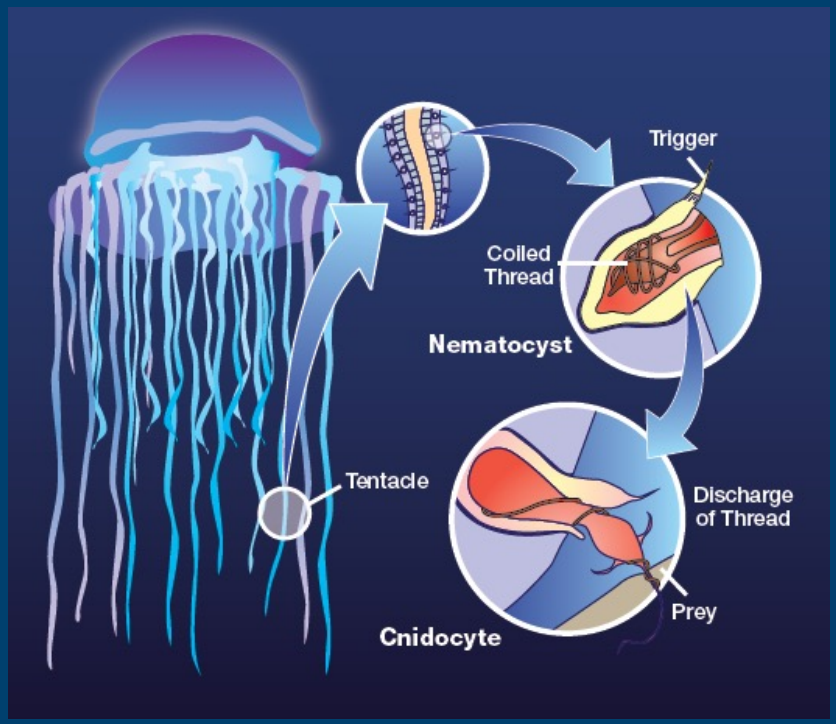

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Part 2: Invertebrate Envenomations

Cnidarians

Multiple nematocyst-carrying species

Responsible for more envenomations than any other marine phylum

Contain tentacles with numerous stinging cells, called nematocysts.

- Harpoon-like devices excel at venom delivery.

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Part 2: Invertebrate Envenomations

Jellyfish

Cause the most frequent and severe human injuries

- Result from direct contact
- Painful but not usually life-threatening

Prevent by proper exposure protection

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Part 2: Invertebrate Envenomations

Box Jellyfish

Also known as Sea Wasps

Considered the most venomous of all sea creatures

- Cause more human fatalities than any other marine organism
- Toxin is absorbed rapidly and can lead to death in minutes

Lightweight dive skin can provide adequate protections

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Part 2: Invertebrate Envenomations

Box Jellyfish Injuries

Signs and Symptoms

- Extreme Pain
- Significant welts and discoloration of skin
- Rapid progression of symptoms
  - May lead to death in minutes

There is a specific anti-venom for box jellyfish

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Part 2: Invertebrate Envenomations

Irukandji Syndrome

- Caused by specific tiny box jellyfish
- Extremely painful stings
- Rarely fatal
- Systemic symptoms require immediate medical attention

Signs and Symptoms

- Pain initially moderate but progresses to excruciating pain all over body
- Anxiety and restlessness
- Feeling of impending doom

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Part 2: Invertebrate Envenomations

Portuguese Man-O-War

Floating cnidarians that sail along the surface of open ocean

Two species

- Atlantic
- Bluebottle
  - Tropical Pacific and Indian Ocean

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Part 2: Invertebrate Envenomations

Portuguese Man-O-War Injuries

Signs and Symptoms

- Localized pain
- Pain with breathing
- Redness
- Abdominal cramps and back pain
- Constitutional symptoms
- Affected tissue can become necrotic

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Part 2: Invertebrate Envenomations

Fire Coral, Anemones, Hydroids

- All are stinging cnidarians
- Fire coral may also be associated with mechanical injury (scrapes and cuts)
- Anemones usually harmless but may cause skin irritations
- Hydroids, soft coral only result in mild irritations for most individuals

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Part 2: Invertebrate Envenomations

Treating Cnidarian Injuries

General first-aid approach

NOTE: ***Nematocysts are mechanically activated. It is extremely important to avoid further envenomation while performing first aid.***

- **Inactivation -** Irrigate the area with generous amounts of household vinegar
- **Removal –** Carefully remove visible tentacles or filaments with the aid of fine tweezers and protective barriers.
- **Wash/irrigate -** Wash area with saline solution or seawater.
  - Avoid rubbing or use of fresh water to avoid stimulating nematocyst discharge.
- **Symptomatic treatment -** Control pain, bleeding Apply anti- inflammatory meds and topical anesthetics.

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Part 2: Invertebrate Envenomations

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Part 2: Invertebrate Envenomations

Mollusks

Nearly 85,000 recognized species of mollusks

Only two potentially harmful to humans

- Cone Snail
- Blue-ringed octopus

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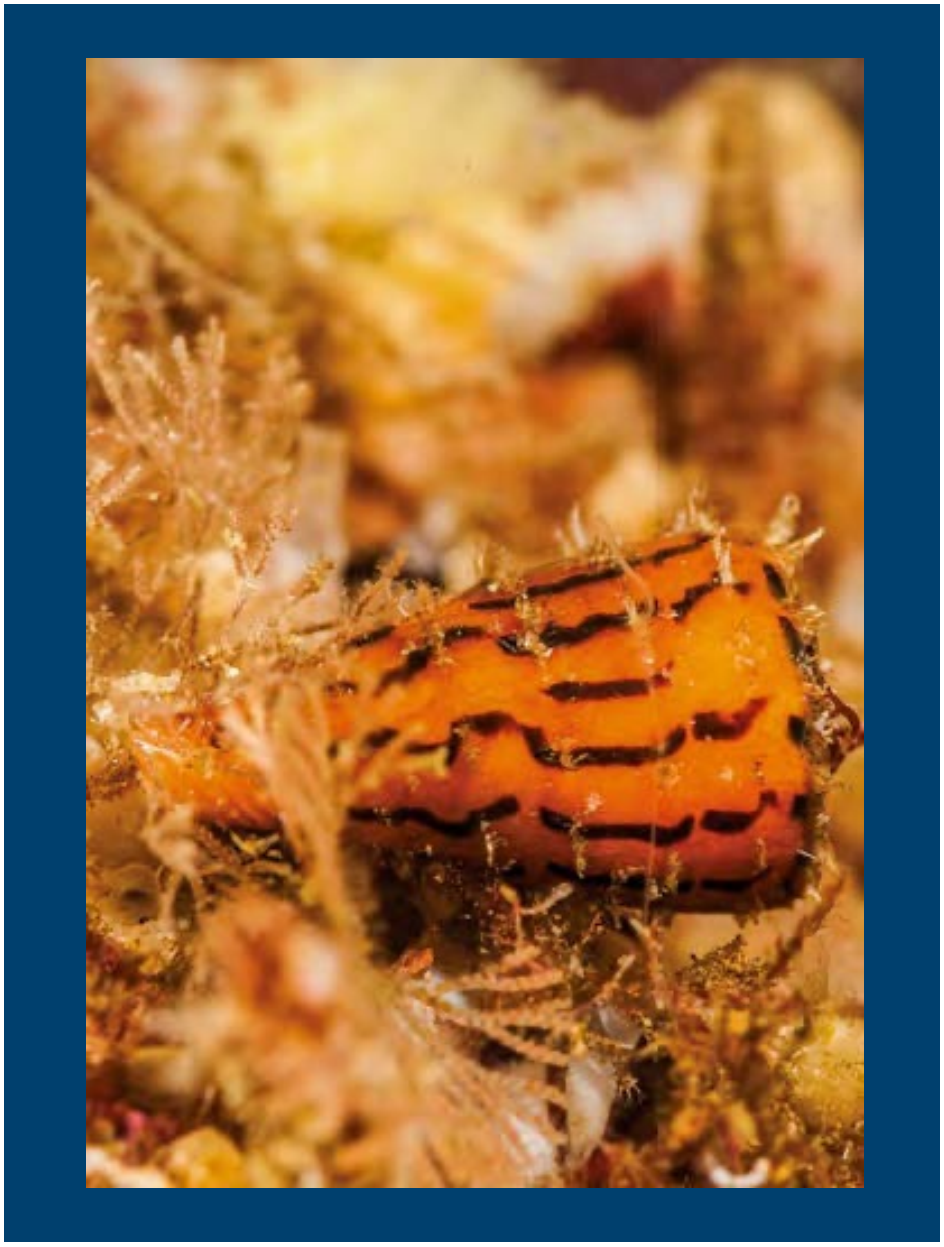

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Part 2: Invertebrate Envenomations

Cone Snail

~600 different species of cone snails

Shells are characteristically cone shaped

All are poisonous.

Initial Signs and Symptoms of Injury

vary widely - some may be no worse than a bee sting, others may cause severe systemic effects.

Local effects

- Immediate mild to moderate pain
- Edema and/or erythema
- Numbness/sensation changes

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Part 2: Invertebrate Envenomations

Blue Ring Octopus

Small, rarely exceed 8 inches (20 cm) diameter

Distinctive brown bands when at rest

Iridescent blue rings expressed when disturbed or on the prowl

Envenomation occurs when they are handled

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Part 2: Invertebrate Envenomations

Blue Ring Octopus Injuries

Initial Signs and symptoms

- Confusion
- Weakness
- Nausea and vomiting

Usually resolve within 24 hours

May be associated with generalized itching, wheals/hives and joint swelling.

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Part 2: Invertebrate Envenomations

Mollusk Injuries

Additional Signs and symptoms

- Blurred or double vision
- Difficulty speaking or swallowing
- Slurred speech
- Numbness and fullness around the mouth, neck and throat
- Paralysis
- Death

NOTE: Injured persons who live through the first 24 hours generally go on to make a complete recovery.

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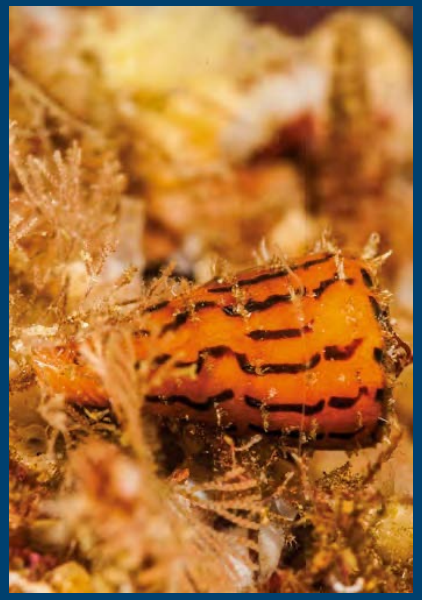

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Part 2: Invertebrate Envenomations

Treating Mollusk Injuries

- Clean thoroughly with soap and fresh water.
- Remove any foreign material
- **Pressure immobilization** technique for affected limbs.
- **Limit all movement** as much as possible
- **Immediately seek advanced medical support**.
  —advanced medical support may be required , including mechanical ventilation.
- **Monitor** breathing and airway.

Do not remove pressure immobilization bandage until injured individual is under medical care.

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Part 2: Invertebrate Envenomations

Echinoderms

Comprised of about 7,000 species

Most are poisonous

Only a few cause venous injuries to humans

- Crown of thorns
- Sea Urchins
- Sea Cucumbers

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Part 2: Invertebrate Envenomations

Crown-of-thorns

Unique appearance

Voracious appetite.

Injuries occur as a result of contact with its spines.

Sea urchins

Contact with spines primary hazard

Not necessarily venomous, but sharp spines easily penetrate skin, wetsuits and shoes

- brittle enough to quickly break off once embedded

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Part 2: Invertebrate Envenomations

Sea cucumbers

- Found in every ocean
- Resemble cucumber or large caterpillar
- Injury results from contact with toxic chemical released to deter predators

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Part 2: Invertebrate Envenomations

Echinoderm Injuries

Signs and symptoms

- Sharp stinging pain
- Localized swelling
- Redness
- Tissue damage

  - may have spines protruding from skin

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Part 2: Invertebrate Envenomations

Treating Echinoderm Injuries

- Thoroughly wash affected area with soap and water.
- Remove foreign material
  - Seek medical attention if spines have entered joint spaces.
- Tetanus coverage is recommended.
- Monitor for signs of infection

Prevent injuries by avoiding contact

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Part 2: Invertebrate Envenomations

Other Phylum - Sea sponge

Contact dermatitis is most common injury

Skin lesions may take two to three weeks to resolve

Envenomations can occur even after the sponge has been removed from the sea, provided it remains moist.

Dry sponges are apparently harmless,

- reports indicate that rehydration can reactivate toxins

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Part 2: Invertebrate Envenomations

Other Phylums - WORMS

Injuries result from accidental contact or deliberate handling.

Can result when the worm's bristles, embed in the contact skin.

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Part 2: Invertebrate Envenomations

Sponge and Worm Envenomations

Signs and symptoms

- Sharp stinging pain
- Localized redness, skin irritation
- Bleeding associated with cuts/scrapes
- Mild to severe itching
- Edema
- Burning and numbness
- Blisters

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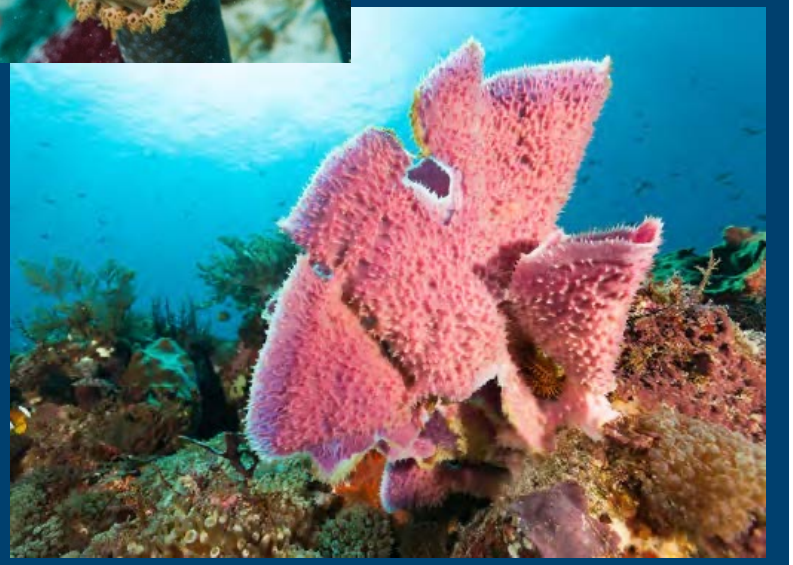

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Part 2: Invertebrate Envenomations

Treating Sponge and Worm Envenomations

- **Clean** the affected area with soap and fresh water.
- **Remove** any foreign material.
  - — Cellophane tape may aid in bristle removal.
- **Leave blisters** intact if present.
  - — Keep the area clean, dry and aerated until the blisters dry out and peel off.
- If eye contact occurs, flush with copious quantities of fresh water, and seek medical attention.
- Steroid ointments may prove useful in reducing skin irritation.
- **Monitor** for signs of infection.

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Envenomations and Toxins

Skills

Injury Management

Pressure Immobilization Technique

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Traumatic Injuries

Bites

Most human-associated marine animal bites result from the following circumstances:

- Animal feels threatened
- Humans mistakenly identified as prey
- Humans engaged in spear-fishing or feeding

Marine animals known to bite include:

- Sharks
- Barracuda
- Moray eels
- Triggerfish

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Traumatic Injuries

Bites

Severity depends on

- bite location
- size of animal
- extent of blood loss
- treatment delays

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Traumatic Injuries

Direct Pressure

- **Apply with a gloved hand** to control bleeding
- Use **clean or sterile gauze** to aid
- Continue to **hold** **firm pressure** until bleeding is controlled
- Use **additional gauze** as necessary
  - Do not remove any gauze already in place over wound
- **Bandage** only after bleeding stops
- Seek medical assistance if indicated
  - tetanus booster may be indicated
- **Monitor** for signs of infection
  - of particular concern due to marine bacteria

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Traumatic Injuries

Tourniquets

Should be:

- Utilized only when direct pressure is not effective
- Wide (at least 2" wide if an improvised tourniquet is used)
- Well-padded (6-8 layers of a bandaging material)
- Placed 1-2" proximal to the wound

Mark the injured person's forehead with a *T or TK* and time of placement

DO NOT REMOVE TOURNIQUET

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Traumatic Injuries

Tourniquets

Should ***NOT*** be:

- Placed directly over knees, elbows or other joints. Place the tourniquet 1-2" proximal to the joint.
- Made of wire or rope, narrow, excessively tight or insufficiently padded band as it may cause local damage to tissues in minutes.
- Removed until advanced medical care is available

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Traumatic Injuries

Tourniquets

Other styles

- One style of tourniquet uses a ratcheting mechanism rather than a windlass

- Apply as you would any other tourniquet

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Traumatic Injuries

Hemostatic Dressings

- May be used in conjunction with a tourniquet or wound packing
- Should be used where tourniquets cannot be utilized
- Usually has a wavy blue line in the gauze
- Other dressing material must be removed to allow direct contact of hemostatic agent with bleeding site
- Advise medical personnel a hemostatic agent was utilized

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Traumatic Injuries

Wound Packing

- In the case of penetrating wounds such as propeller injuries or knife wounds,
- bleeding is occurring inside the wound.
  - Direct pressure on the external surface of the wound will not provide pressure at the source of the bleeding.
- For these wounds, dressing material should be packed into the wound
- lateral pressure applied and maintained during the wound packing process.

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Traumatic Injuries

Special Circumstances

Bandaging Joints

When applying bandages across joints, keep the limb in a comfortable position, and try to keep the joint immobilized to minimize further discomfort or bandage displacement.

Eyes

With eye injuries, it may be necessary to cover the injured eye to minimize pain and to provide comfort.

Fold clean gauze over the closed eyelids, then place tape over the eyes with anchors at the forehead and cheek.

Bandage both eyes in a manner that eliminate gaps at edges of bandage to prevent the injured eye from moving with the uninjured eye.

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Traumatic Injuries

Wound infections

Skin is most effective defense against infection.

When breached, allows introduction of

- bacteria
- fungi
- viruses
- other organisms

Source of injury important as organic material increases risk of wound infection and delayed healing.

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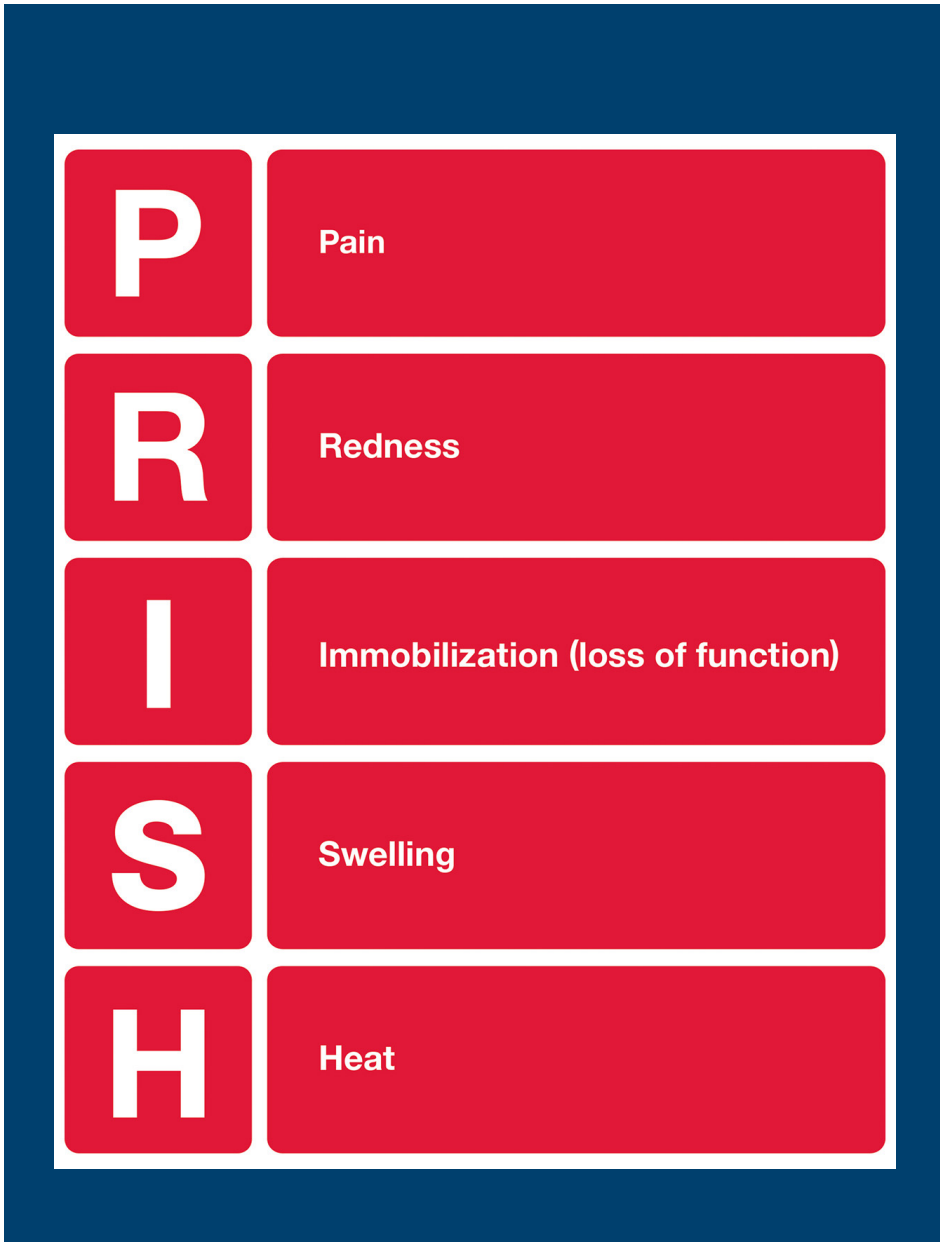

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Traumatic Injuries

Wound infections

Signs of infection appear within hours, days or even several weeks following injury.

- Pain
- Redness
- Immobility (loss of function)
- Swelling
- Heat (elevated warmth of the infected area)

Other signs of infection:

- Pus and yellowish discharge
- Foul smell
- Swollen lymph nodes
- Fever
- Non-healing wounds
- Chills

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Traumatic Injuries

Internal bleeding

Internal bleeding can be a life-threatening condition. It requires immediate medical attention

It often results from blunt trauma, sudden deceleration injuries (such as a car collision), or certain bone fractures (e.g., femur or pelvis).

The following may indicate internal bleeding:

- Rigid or swollen abdomen
- Vomiting or coughing blood
- Blood in urine
- Bloody or tarry stool
- Intense muscle pain
- Difficulty moving the related joints
- Fainting or dizziness
- Low blood pressure
- Signs of shock

To treat the injured person for internal bleeding:

1. Open the airway if needed
2. Activate EMS (if not already activated)
3. Minimize movement of the injured person
4. Apply ice to the affected area (unless the internal bleeding is in the skull)
5. Evacuate to EMS as soon as possible

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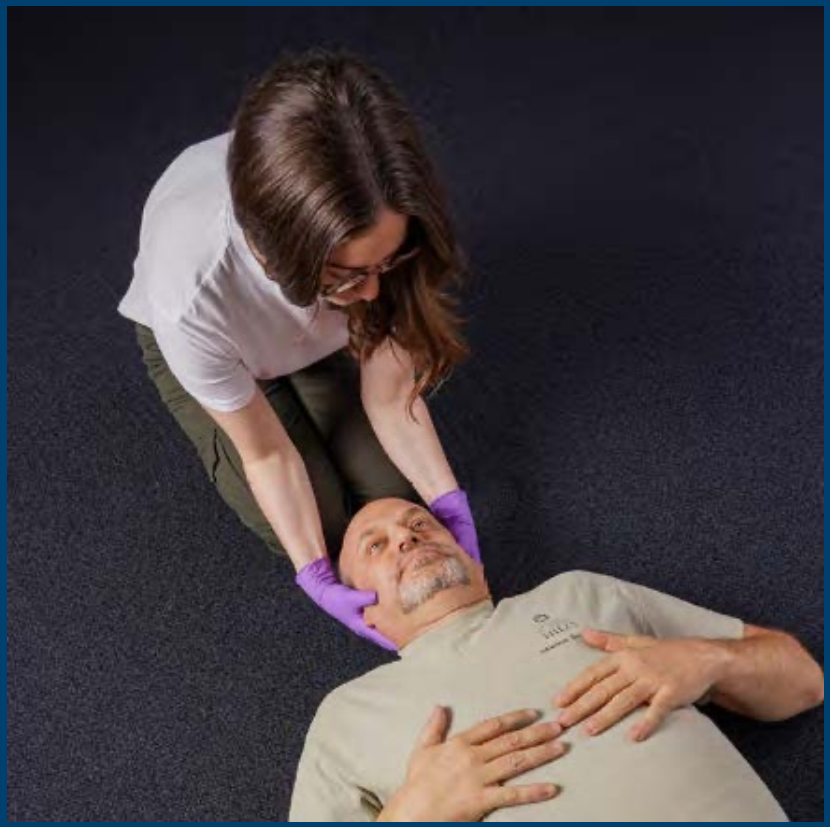

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Traumatic Injuries

Spinal Injury Management

If the injury mechanism is such that you suspect a spinal injury, your primary duty to the injured person is to deal with any immediate threats to their life.

Perform CPR if necessary. If CPR is not necessary, your role is to keep the injured person calm and still.

Activate EMS if you have not done so.

Kneel at the person's head

Place your hands on both sides of the person's head to keep them

immobile.

Do not attempt to straighten or realign the head unless the airway is compromised.

Be sure to talk to and reassure the person as you wait for EMS to arrive.

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Traumatic Injuries

Amputations

Sometimes a trauma involves the removal of a part of the body. Amputation injuries could range from a finger getting pinched in the hinge of a dive boat ladder to the severing of an entire limb.

With an amputation, control bleeding as necessary using the techniques

Be ready to treat for shock or provide CPR if necessary.

If the amputation is **incomplete** and the skin, muscle or tendons are still attaching the body part, immobilize it using a splint and bulky gauze. Never detach an incomplete amputation.

If the amputation is **complete**, attempt to preserve the parts, no matter how damaged they appear to be.

Wrap them in saline-moistened gauze, seal them in a plastic bag and place it in a container with ice.

Do not place the amputated part directly on or in the ice.

Ensure the amputated part is transported with the injured person.

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Traumatic Injuries

Open Chest Wound

Sometimes the injured person has a severe injury to their chest. Trauma to the chest can lead to a condition called pneumothorax, in which a leak in the lung causes air to collect.

In diving this can be caused by rapid ascent or breath-holding during ascent.

Sometimes this trauma generates a hole in the chest wall that allows air exchange between the chest cavity and the outside air.

Use an **occlusive dressing –** cover the wound with clear plastic and tape on three sides. This makes a flap for exhaled gas to escape.

If clear plastic is not available, use foil, a (clean) garbage bag, or a commercially available product like HyFin©.

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Traumatic Injuries

SKILLS

Control of External Bleeding

Applying a Tourniquet

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