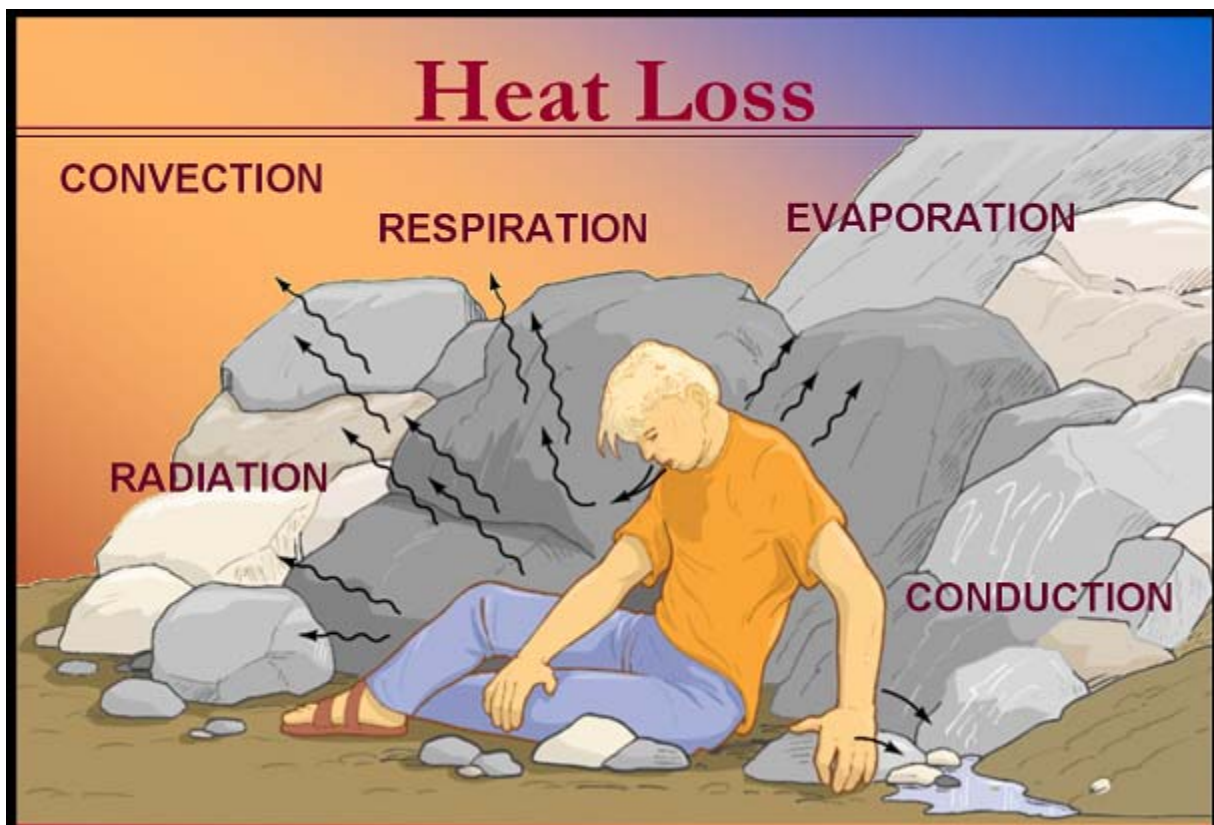


Environmental Emergencies

Normal Body temperature is 98.6°F

5 Ways the body can loose heat:

- Radiation- accounts for 60% of normal heat loss as the body gives off infrared heat rays
- Conduction- occurs as heat is transferred from one object to another as when the body contacts water through immersion
- Convection- occurs when the heat is transferred to a medium, such as air or water next to it. Currents than carry the warmed medium away from the body
- Evaporation-is the convection of a liquid to a vapor. It takes a large amount of heat and cools the body efficiently
- Respiration- occurs when the body breaths out warm air
- **Hypothermia**- low body temperatures < 95°F



| Stage | Core Temperature | Signs & symptoms |
|----------|------------------|---|
| Mild | 95 deg. F | Alert Shivering Body Movement |
| Mild | 90 deg. F | Shivering Stops Loss of simple coordination |
| Moderate | 85 deg. F | Lethargic Sleepy Slowing Pulse |
| Severe | 80 deg. F | Decreased vitals Weak/Slow pulse Respirations slow Cardiac arrhythmias Coma |
| Severe | <78 deg. F | Apparent Death Ventricular Fibrillation Cardiac Arrest Unresponsiveness |

“ NO ONE IS DEAD UNTIL THEY ARE WARM AND DEAD!”



Treatment

- Maintain ABC's- administer warm humidified oxygen
 - Prevent further heat loss
 - Only actively rewarm if patient is responsive
 - Remove patients from cold environment
 - Remove wet clothing
 - Cover the patient
 - CPR???
- Check a pulse for a full minute
-Pulse may be extremely slow

Factors that determine the severity of cold injury

- Duration of the exposure
- Temperature the patient was exposed to
- Wind velocity
- Inadequate insulation
- Restricted circulation
- Fatigue
- Poor nutrition
- Alcohol or drug use

Frostnip- cold injury in which the surface of the skin may be frozen but the underlying tissues are not effected

- Not painful
- Pale, blanched skin
- Most often effects the ears, nose, and hands

Immersion or Trench foot- cold injury caused by prolonged exposure to cold water.

- Skin wrinkled, pale, and cold

Treatment

- Remove the patient from the cold
- Remove wet clothing
- Rewarm the area

Frostbite- cold injury in which the deeper tissues are frozen

- Skin may be hard-to the touch (frozen)
- Skin-white, yellow, or blue
- Gangrene- damaged cells die because of the freezing

Treatment

- Remove from the cold
- Handle gently **-NEVER RUB** the area to rewarm
- Remove wet clothing
- Evaluate for hypothermia
- Support ABC's
- Do not rewarm
- If completely necessary: rewarm with water bath 100°-112° F

Heat exposure- Patients that are at the greatest risk of heat illness are children, elderly, patients with cardiac history, patients with neurological impairments and patients with limited mobility.

Heat Cramps- painful muscle spasms that occur after vigorous exercise

- Loss of electrolytes (calcium, potassium, and sodium ions)
- Dehydration

Treatment

- Remove the patient from the hot environment
- Rest the cramping muscles
- Do not give salt tablets
- Replace the fluids
 - * Water or diluted sports drink (i.e. Gatorade)

Heat Exhaustion- heat illness in which the body loses electrolytes and fluid from heavy sweating

Heat prostration or heat collapse

Sweating without the release of heat

-wearing heavy clothing that traps heat

-high humidity climate

Mild Hypovolemic shock

-skin cold and clammy

-pale or gray face

-dizzy, weak, or faint feeling

-nausea or headache

-rapid pulse

Temperature slightly elevated 100°- 104° F

Treatment

Remove the patient from the environment

Loosen or remove all tight clothing

If the patient is alert- replace the fluids



Heat Stroke- heat illness where the body is subjected to more heat than it can compensate for and the body's temperature rises

The heat destroys body tissue

Hot, DRY skin (may continue to sweat)

Core temperature is as high as 106°F

Patient may become irritable or unresponsive

Treatment

Remove the patient from the environment

Cool the patient by any means

-Place wet towels

-Have a fan blow on the patient

Drowning- death/suffocation by submersion in water

Near Drowning- Survival at least temporarily, after a suffocation in water, little water may enter the lungs, since a laryngeal spasm occurs when foreign matter is introduced into the larynx.

Panic / Drowning cycle

- Something goes wrong - panic **CO₂** retention
- Patient struggles, becomes fatigues/exhausted
- Unconsciousness

Spinal injuries

If the patient is in the water unconscious

- Turn the patient face up
- Restore airway and begin ventilations
- Board the patient
- Compressions once on land

Rescue Safety

"Throw, Tow, Row, Go"

Hypothermia

- Not dead until warm and dead

Diving problems

Diving reflex- hyperventilates, hold breath and black out

Ascent problems

Air Embolism

- Can occur as shallow as 6 ft
- Holds breath and ascends
- Lung pressure high chest pressure decreases
- Alveoli rupture acts as a plug

Decompression sickness (The Bends)

- Nitrogen is forced into the bloodstream in liquid form, under pressure
- Rapid ascent results in decreased external pressures causing the nitrogen to return to a gaseous state
- Causing air bubbles to form in the bloodstream and tissues
- Abdominal and/or joint pain
- Can appear many days or weeks after a dive, divers usually recognize the symptoms
- Decompression chamber, Oceana Naval Base, may not be available. Duke university and now St Mary's now has a full body chamber.
- DAN (Divers Alert Network) located at Duke University-available 24 hours a day for diving emergencies 1-800-446-2671- available to help locate and transport a patient to the nearest chamber



Radiation Exposure

- Alpha radiation- the low energy radiation that will not penetrate cloth or thick clothing. Its greatest danger is from ingest ion or inhalation
- Beta radiation- medium energy radiation, which can be stopped by metals or thick clothing. It generally causes less damage than alpha particles though it can still be harmful if ingested or inhaled
- Gamma radiation—a high-energy radiation, which will penetrate clothing and the entire body. It is very harmful and can induce extensive cell damage
- Neutron radiation- the most powerful, penetrating and dangerous radiation. Fortunately it exists only in the close proximity of a nuclear reactor

Conditions to consider in radiation exposure

- Time of exposure
- Type of radiation
- Distance from source
- Type of shielding used

Treatment

- Protect yourself and your crew
- Consider the need for specialty teams
- Maintain ABC's
- Treat for soft tissue injuries (burns)

Stings

Signs and symptoms

Pain at the site

Swelling around the site

Redness and warmth around the area

Wheal-raised, whitish elevation

Itching

Cellulitis- redness and swelling of the skin (may occur)

Treatment

Ice at the site may help pain and swelling

Remove honeybee stinger with a scraping motion

Warm moist packs for cellulitis

Anaphylactic shock- violent hypersensitivity reaction

- Sensitized to an agent
- Reactions develop in minutes or hours



Special signs

Skin

- Urticaria (hives)
- Edema (swelling) face and tongue

Respiratory

- Dyspnea (difficulty breathing)
- Fluid and mucus are secreted to combat the agent
- Wheezing
- Bronchioles constrict

Circulatory

- Peripheral vessels constrict

Treatment

- Support ABC's
- Treat for shock
- Anaphylactic- drugs to combat agent
 - epinephrine
 - benadryl- antihistamine

Scorpions- have a venom gland and a stinger at the end of the tail

Signs

- Severe pain and discoloration at the site

Arizona scorpions- produce severe systemic reactions

Signs

- Circulatory collapse
- Severe muscle contractions
- Excessive salivation
- Hypertension
- Convulsions
- Cardiac failure

Treatment

- Maintain ABC's
- Antivenin

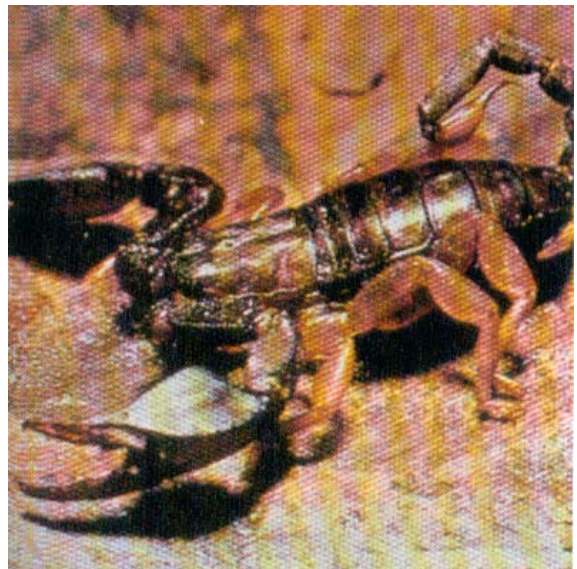
Spider bites

Black Widow spider-small black spider with red or white hour glass on the abdomen

- Found in all states except Alaska
- Prefer dry, dim places around buildings
- Neurotoxin

Signs and symptoms

- Pain and numbness at the site



Systemic symptoms

- Severe cramps
- Board like rigidity of the abdomen
- Tightness in the chest
- Difficulty breathing

Treatment

- Maintain ABC's
- Ice at the site to slow the adsorption
- Identify the spider if possible
- Transport to the hospital—Antivenin

Brown Recluse Spider-small brown spider with black violin on the back

- Found mostly in southern and central United States
- Prefer dark areas, comers, under rocks and in woodpiles
- Produce local skin necrosis

Signs and symptoms

Severe tissue damage

- Red, swollen, and tender
- Develop into pale, mottled skin that forms a blister

Treatment

- Maintain ABC's -possible systemic reactions
- Identify the spider if possible
- Transport to hospital—surgical excision of the area



Snake Bites

- Death from snake bites is extremely rare
- Serious Envenomation-only occur in about 1/3 of snake bites
- Remember the where one snake is that another may be near



Pit Vipers

- Have triangular, flat heads with small pits behind the nostrils and in front of the eye. The pupil of the eye is vertical and slit like.
- Pit vipers inject the victim with venom using two fangs
- Envenomation causes localized destruction of tissue and interference with the bodies clotting mechanism

Rattle Snake-identified by the rattles (shedded skin) in the tail and the diamond pattern to the skin markings

Copperheads

- Identified by the reddish, coppery color with brown or red cross bands
- Inhabit woodpiles and abandoned dwellings

Cottonmouth (water moccasins)

- Olive or brown in color with black cross bands and yellow under surface
- Inside of mouth is bright white looks like a cotton ball

Signs of Envenomation

- Localized pain and swelling at the site
- Ecchymosis
- Systemic signs
 - Weakness
 - Sweating
 - Fainting
 - Shock

Coral snake

- Identified by bright red, yellow, and black bands
- "Red on Yellow kills a fellow, Red on Black Venom lack"
- Found in Florida and in the desert south west
- Injects its venom by chewing at its victim
- Powerful neurotoxin



Treatment

- Maintain ABC's
- Treat for shock
- Supine position
- Calm and reassure the patient (snake bite rarely cause death)
- Flush the area if the bite with warm water
- Venous constricting bands above and below the site- contact medical control
- Immobilize the extremity
- Do not apply ice
- Do not cut the site and try to "suction" the venom out
- Identify the snake and bring to hospital if possible (dead)
- Transport to the hospital
- Treat for soft tissue injuries

Other bites

Dog bites and rabies

- Danger comes from infection and disease that the dog may carry
- Treat soft tissue injuries as normal
- Have animal control try and bring the animal in for testing

Rabies- an acute viral infection of the central nervous system

Human bites

- Danger results from infection or disease that may be transmitted
- Treat soft tissue injuries as normal

Injuries from Marine animals

- Treat soft tissue injuries as normal
- Meat tenderizer to relieve the stinging

Tentacle injuries

- Rinse the area with rubbing alcohol
- Neutralize the cells with meat tenderizer
- Sprinkle the area with talcum powder and scrape away

Spiny fish injection

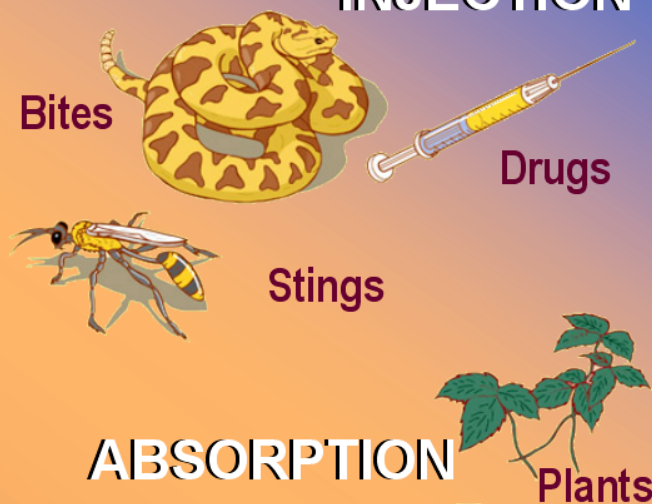
- Soak the area with warm water to neutralize toxins

Routes of Exposure

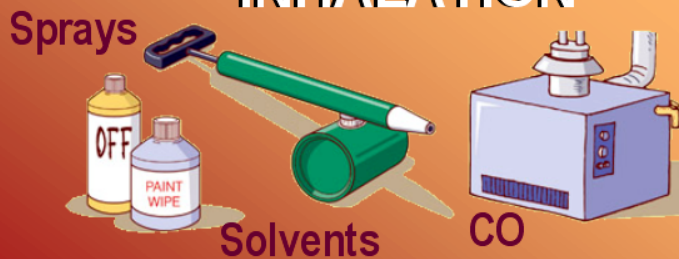
INGESTION



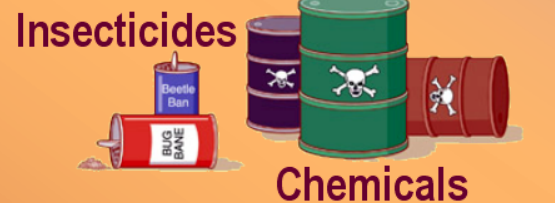
INJECTION



INHALATION



ABSORPTION



BRADY

Prehospital Emergency Care
Poisoning Emergencies

21-6



Day 3

The following illustrates the progression of a brown recluse spider bite. The affected skin actually dies on his body.



Day 5

Some of the pictures towards the end are pretty nasty, but take a look at the last one -- it is a picture of the spider itself.



Day 6

The Brown Recluse Spider is the most dangerous spider that we have here in the USA.



Day 9

A person can die from it's bite. We all should know what the spider looks like



Day 10

Send this around to people you love, because it is almost summertime.

People will be digging around, doing yard work, spring cleaning, and sometimes in their attics.

