What were you thinking?
When Summer Fun Turns Dysfunctional...

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Objectives

1. describe the care of a patient who has sustained a venomous snake bite
2. differentiate the modalities of care between patients having heat exhaustion and heat prostration
3. state one fallacy related to sunburns
4. summarize current guidelines for care of the spinal cord injury patient
What were you thinking when you reached down to pick up that snake?

- **Snakebite**
  - Venomous snakes in the region
  - Crofab© therapy

- You really didn’t need to bring it with you—I believe you!
  - Beware of pillow cases
  - Jars
  - Brown paper bags
• **Snakebite:** in the US related to Crotalide aka pit vipers
  - Rattlesnakes, copperheads, cottonmouths, water moccasin's
  - **Venom** is tissue toxic
    - Affects cardiac, neuro, hemolytic
    - or
    - Any combination of two
    - or
    - All three!
S/S dependent on site and depth of bite, age of snake, size of snake, age of patient, amount of venom injected

– Seasonal considerations
– Gender considerations
– Age considerations
– Immediate Care:
  • Immobilize bite site below level of heart
  • DO NOT cut or attempt to draw out venom with the mouth
  • Please, don’t ice that snake bite
– Illness, pediatrics & geriatrics don’t blend with bites.
Treatment: ABCs
- aggressive IVFs
- coagulation studies
- Tylenol for pain
- tetanus immunization
- Monitor for compartment syndrome

Distributive Shock secondary to envenomation
- May have petechia, purpura, pallor, mottling, or cyanosis
- Hypotension (late sign)
- Tachypnea
- Bounding pulse
- Tachycardia (early sign)
- Flushed skin
  - Delayed capillary refill
- Cool/clammy skin
- Decreased UO (late sign)
- Decreased BP
- No or diminished peripheral pulses
Therapeutic Interventions and Crofab© therapy

• Immediate
  – IV’s (aggressive replacement)
  – Watch for hypoglycemia (glycogen stores)
  – Ionotrophs
    • Epinephrine
    • Dopamine

• Crofab©
  – Antivenin therapy for life-threatening bites
    • Limited use due to sensitivity reactions and anaphylaxis
    • MUST skin test before administration
    • Multiple vials reconstituted, 4-6 vials
    • Treatment should begin as soon as possible and preferably within 6 hours of envenomation
Crofab administration

I.V. over 60 minutes, at a rate of 25-50 mL/hour for the first 10 minutes

- If no allergic reaction is observed, increase rate to 250 mL/hour.
- Monitor closely for anaphylaxis
- Epinephrine and diphenhydramine should be available during the infusion. Decreasing the rate of infusion may help control some adverse effects
Compartment Syndrome

- Muscle compartment pressures exceed the intra-arterial hydrostatic pressure, causing collapse of the capillaries and venules and subsequent tissue necrosis.
- When compartment pressures > 20 mm Hg.
- S/S
  - HALLMARK - "severe boring pain"
  - pain increases with muscle stretching
  - delayed capillary refill
  - decreased function
  - myoglobinuria
  - renal failure

- Therapeutic Interventions
  - Removal of all external compression
  - DO NOT ELEVATE
  - DO NOT APPLY COLD
  - Urine for Myoglobinuria
  - Fasciotomy
Snake bite: true story

- Bit by snake 5 days prior
  - C/O numbness left hand
  - Left arm swollen 4+ with circumferential bruising
  - BP-150/92 P-88, RR 18, Temp.-100.6, Pulse ox 92%

What’cha gonna do when he comes to you?
What were you thinking when you dove into that wave so close to shore? And there were no Life Guards!

- **Spinal cord injury**
  - Mechanisms of injury
  - Current practice guidelines

- **Initial injury in the surf**
  - Don’t let them drown
  - Try to protect the spine as you pull them out of the surf
Mechanism of Injury

• Energy of the injury
  – Kinetic: Motion or Mechanical
  – Absence of oxygen
    • Drowning, Suffocation
Spine Anatomy - please recall that there are.....

- **33 Vertebrae**
  - 7 Cervical
  - 12 Thoracic
  - 5 Lumbar
  - 5 Sacral
  - 5 Coccyx
  - Fused

- **Spinal Cord Itself**
  - C1 – L2 Contains CSF
Fracture Sites and Losses

- **C1-4**  Quad, total loss of respiratory function
- **C4-5**  Quad, possible phrenic nerve involvement
- **C5-6**  Quad - gross arm movement, spares diaphragm - diaphragmatic resp
- **C6-7**  Quad - biceps movement intact, diaphragmatic resp
- **C7-T1** Quad - triceps/biceps intact, no hand function
- **T1-L2** Paraplegia - loss of varying amounts of intracostal and abd. muscles
- **Below L-2** Mixed amounts of motor/sensory loss, mixed bowel and bladder function
• Extrinsic
  – Bony and soft tissue damage

• Intrinsic
  – Hemorrhage, edema, hypoxia, biochemical changes

• Complete injuries
  – Trans-section of the cord
  – No motor or sensory function below the injury

• Incomplete injuries
  – Anterior cord
  – Posterior cord
  – Central cord syndromes
  – Brown – Sequard
    • Hemisection of the cord in the anteroposterior plane
    • Related to penetrating injuries
Initial Immobilization

- Patient on long board with cervical collar
- Immobilization based on mechanism
- Immobilization devices alone are only 50% effective.
- Do not restrict chest or airway
- Don't be in a hurry to remove C-collar
Current therapy includes

- High dose over the first 24 hours - still debate as to best practice!
  - Methylprednisolone
    - Loading dose of 30 mg/kg over 15 minutes
    - 45 minutes later - 5.4mg/kg/hr for 23 hours
- Aspen Collar then skeletal traction
  - Crutchfeld tongs
  - Gardner-wells tongs
  - Halo traction
- Psychosocial Care
  - Never the same again
  - Family and patient anxiety and fears
Autonomic Dysreflexia

- **Complication of SCI above T-6**
  - Full bladder, full rectum, decubitus ulcer, acute abd, kidney stones

- **Sudden headache, HTN, sweating, cardiac dysrhythmias, flushing above level of injury, coolness below level of injury, nasal stuffiness, anxiety**

- **Treat The Cause of Problem!** Relieve pressure sores, empty bladder, disimpact, treat B/P, flush through kidney stones
What were you thinking when you went to Jolly Roger without wearing sunscreen?

- Sunburns that turn nasty
- Treatment modalities
Initial care

• Differentiate the burn
  – 1st, 2nd, 3rd
  – Isolate from source of burning
  – Cover
  – Protect
  – Hydrate
Fallacy’s

Only white folks get sunburned

Only white folks will peel
A true story...

• 27 year old black female went to *Jolly Roger* on a Family Fun Day
  – Out in the sun for 6+ hours
  – Out on the “Lazy River” all day long
  – A new cute bathing suit but no cover-up
  – No sunscreen, no hat but having a good time
  – A really, really good good time!
She was initially “tender” and thought “NO way I got sunburned- we don’t sunburn!”

Home, into the AC, showered and noticed blisters and swelling to face, across the chest and back

– Took Motrin, went to bed

Next am- more blisters, some weeping but still needed to work so in she came
Nauseated, chills, so she signed in to be seen in the ED

Assessment:
- Weeping blisters
- Marked inflammation and swelling of the arms, hands, face, neck, anterior chest wall and the upper back
  - Nothing on the legs or lower torso because had been in an inner tube in the water

Diagnosis: 2\textsuperscript{nd} degree Sunburn
• Treatment:
  – Prednisone for inflammation- one week intensive therapy, 40 mg/day w/o taper
  – Motrin 600 mg for pain
  – Benadryl OTC for irritation
  – Instructions re care of blisters- don’t pop them, keep skin dry as possible
    • No creams, no lotions, hypo-allogenic soap
    • Try not to sweat
  – No creams, no lotions, hypo-allogenic soap
Followed up with PCP 3 days later
  – PCP expressed initial disbelief then “Oh”
  – Peeling and raw skin
  – Benadryl not working for itch relief
  – Started on Vistaril PO 12.5 mg

Took 5+ weeks to heal, continued to work
  – meticulous care, all cotton clothing
3 years later:

Still has extreme sensitivity to sun exposure

- L Arm begins to “prickle” when driving
- Sunny day skin begins to itch
- When out in the sun for prolonged periods becomes nauseated
- Wearing 50 SPF when outside and still can affected by UV radiation
- Wears a cover up all the time, bathing suit now “covers me up like a granny”
What were you thinking when you did not turn on the air conditioner when your grandmother was visiting?

- Hyperthermia in the elderly
• **Heat Edema:** swelling of feet and ankles in non-acclimated individuals
  – Self limiting and resolves in a few days

• **Heat Cramps:** severe, brief and intermittent, usually in shoulders, thighs and abd. wall. Core temp is normal or slightly elevated. Key factor is Na+ depletion.
  – Treat with electrolytes-oral or IV rehydration, rest, removal from heat source
  – Discharge Teaching: use sports drinks when outdoors, drink lots of fluids but not ETOH
Heat Exhaustion

- Syndrome caused by prolonged heat exposure, over hours or days
  - Excessive perspiration and inadequate fluids and electrolyte replacement leads to fluid loss, dehydration, electrolyte loss
- S/S rapid onset of extreme thirst, malaise, muscle cramps, headache, N/V, anxiety, tachycardia which causes syncope and collapse
  - Core temperature: 98.6-105° F [37-40.6°C]
  - Untreated progresses to heat stroke

- Treatment:
  - Move to cool environment
  - Undress
  - Evaporative cooling with moist cloths and air
  - Fluid replacement with NSS and electrolytes
  - Monitor cardiac status
  - Treat hypotension with fluid bolus
  - Monitor core temperature
  - Admit in no improvement in 3-4 hours in ED
Heat Stroke

- Core temperature exceeds 105° F
  - Mortality up to 70%
- Exposure to severe heat destroys thermoregulation
- **Classic:** prolonged exposure to sustained high ambient temps, usually elderly and infants
- **Exertional:** young athletes and military recruits
Heat Stroke

- The Body has Cooked - literally
- Management aimed at reduction of temperature and management of complications
  - ABCs
  - Removal of all clothing
  - Removal from heat source
  - Aggressive cooling but do not want them to shiver!
    - Ice packs
    - Tepid water with fans
    - Thorazine for shivers
- Multiple complications secondary to end organ destruction and failure
Questions?