Introduction

Prevention of cold injuries is a Command and Individual Responsibility

ALL COLD WEATHER INJURIES ARE PREVENTABLE!!!
Outline

- Susceptibility Factors
- Cold Weather Injuries
  - description
  - treatment
  - prevention
- Conclusion
Regulation of Body’s Temp

- Body’s heat production
  - metabolism
  - exercise
  - shivering

- Heat loss
  - convection
  - conduction
  - radiation
  - respiration
  - evaporation
Typical Victim of a Cold Weather Injury

- Male
- E-4 or below
- Approximately 20 years old
- From a warm climate
- Less than 18 months time in service
- Uses tobacco, alcohol or medications
- Neglects proper foot care
Susceptibility Factors

- Previous cold weather injury
- Inadequate nutrition
- Alcohol, nicotine use
- Dehydration
- Overactivity (sweating)
- Underactivity
- Long exposure to the cold
- Sick or injured
- Acclimatization
- Ethnic/geographic origin
- Wind, cold, rain
- Age
- Discipline and morale
- Physical stamina
- Inadequate training
- Poor clothing and equipment
Types of Cold Injuries

- Hypothermia
- Frostbite
- Chilblains
- Immersion/Trench Foot
- Dehydration
- Carbon Monoxide Poisoning
- Snow Blindness
- Sunburn
Hypothermia

- MEDICAL EMERGENCY; life threatening condition
- Severe body heat loss - body temp falls below 95°F
- Occurs when:
  - conditions are windy, clothing is wet, and/or the individual is inactive
  - extended water exposure or immersion
    - 1 hour or less when water temp is below 45°F
    - prolonged exposure in slightly cool water (e.g. 60°F)
    - thunderstorms, hail, rain and accompanying winds
Hypothermia

- **Initial Symptoms**
  - shivering
  - dizzy, drowsy
  - withdrawn behavior
  - irritability
  - confusion
  - slowed, slurred speech
  - altered vision
  - stumbling

- **Severe Stages**
  - stops shivering
  - desire to lie down and sleep
  - heartbeat and breathing is faint or undetectable
  - unconsciousness followed by DEATH

The “umbles”-stumbles, mumbles, fumbles, and grumbles
Hypothermia

- Treatment
  - prevent further cold exposure
  - evacuate immediately if severe hypothermia
  - remove wet clothing
  - rewarm in a warmed sleeping bag
  - warm, sweet liquids if conscious
  - minimize handling of the unconscious victim so as to not induce a heart attack.
Hypothermia

Prevention

- eat properly and often
- warm liquids and water
- wear uniform properly (layers worn loosely)
- keep active
- stay dry
- warming tents
- get plenty of rest
- buddy watch/observation/NCO checks
<table>
<thead>
<tr>
<th>BODY TEMP</th>
<th>SYMPTOMS</th>
<th>OBSERVABLE IN OTHERS</th>
<th>FELT BY YOURSELF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(Early Stage)</strong> 98.6 ⇒ 95.0</td>
<td>Intense and uncontrollable shivering; ability to perform complex tasks impaired</td>
<td>Slowing of pace. Intense shivering. Poor coordination.</td>
<td>Fatigue. Uncontrollable fits of shivering. Immobile, fumbling hands.</td>
</tr>
<tr>
<td><strong>(Severe Stages)</strong> 91.4 ⇒ 87.8</td>
<td>Shivering decreases; replaced by muscular rigidity and erratic, jerky movements; thinking not clear but maintains posture.</td>
<td>Irrationality, incoherence. Memory lapses, amnesia. Hallucinations. Loss of contact with environment.</td>
<td>Disorientation. Decrease in shivering. Stiffening of muscles. Exhaustion, inability to get up after a rest.</td>
</tr>
<tr>
<td>87.8 ⇒ 85.2</td>
<td>Victim becomes irrational, loses contact with environment, drifts into stupor; muscular rigidity continues; pulse and respiration slowed.</td>
<td>Blueness of skin. Decreased heart and respiratory rate. Dilation of pupils. Weak or irregular pulse. Stupor.</td>
<td>Blueness of skin. Slow, irregular, or weak pulse. Drowsiness.</td>
</tr>
<tr>
<td>85.2 ⇒ 78.8</td>
<td>Unconsciousness; does not respond to spoken work; most reflexes cease to function; heartbeat becomes erratic.</td>
<td>Unconsciousness.</td>
<td>Unconsciousness.</td>
</tr>
<tr>
<td>78.8 ↓</td>
<td>Failure of cardiac and respiratory control centers in brain; cardiac fibrillation; probable edema and hemorrhage in lungs; apparent death.</td>
<td></td>
<td></td>
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</tbody>
</table>
Frostbite

- Air temps below 32°F
  - skin freezes at 28°F
- Superficial frostbite (mild)
  - freezing of skin surface
- Deep frostbite (severe)
  - freezing of skin and flesh, may include bone
- Hands, fingers, feet, toes, ears, chin, nose, groin area
Frostbite

● Symptoms
  – initially redness in light skin or grayish in dark skin
  – tingling, stinging sensation
  – turns numb, yellowish, waxy or gray color
  – feels cold, stiff, woody
  – blisters may develop
Deep Frostbite
Frostbite

- Treatment
  - remove from cold and prevent further heat loss
  - remove constricting clothing and jewelry
  - rewarm affected area evenly with body heat until pain returns
  - when skin thaws it hurts!!
  - do not rewarm a frostbite injury if it could refreeze during evacuation or if victim must walk for medical treatment
- do not massage affected parts or rub with snow
- evacuate for medical treatment
Frostbite
Frostbite

Prevention

- wear uniform properly (layers and loosely)
- keep socks and clothing dry (use poly pro/thermax liner socks and foot powder/ change insoles also)
- protect yourself from wind
- keep face and ears covered and dry
- drink hot fluids and eat often
- keep active
- insulate yourself from the ground (sleeping pad/tree branches etc…)
- “Buddy System”
- caution skin contact with super-cooled metals or fuel
- Use approved gloves to handle POL
- seek medical aid for all suspected cases
Chilblains

- Nonfreezing cold injury
- Cold, wet conditions (between 32-60°F, high humidity)
- Repeated, prolonged exposure of bare skin
- Can develop in only a few hours
- Ears, nose, cheeks, hands and feet
Chilblains

● Symptoms:
  – initially pale and colorless
  – worsens to achy, prickly sensation then numbness
  – red, swollen, hot, itchy, tender skin upon rewarming
  – blistering in severe cases
Chilblains

Treatment

- prevent further exposure
- wash, dry gently
- rewarm (apply body heat)
- don’t massage or rub
- dry sterile dressing
- seek medical aid
Chilblains

- Prevention
  - keep dry and warm
  - cover exposed skin
  - wear uniform properly
  - use the “Buddy System”
Trench/Immersion Foot

- Potentially crippling, nonfreezing injury (temps from 50°F-32°F)
- Prolonged exposure of skin to moisture (12 or more hours)
- High risk during wet weather, in wet areas, or sweat accumulated in boots or gloves
Symptoms

- initially appears wet, soggy, white, shriveled
- sensations of pins and needles, tingling, numbness, and then pain
- skin discoloration - red, bluish, or black
- becomes cold, swollen, and waxy appearance
- may develop blisters, open weeping or bleeding
- in extreme cases, flesh dies
Trench/Immersion Foot
Trench/Immersion Foot

Treatment
- prevent further exposure
- dry carefully
- DO NOT break blisters, apply lotions, massage, expose to heat, or allow to walk on injury
- rewarm by exposing to warm air
- clean and wrap loosely
- elevate feet to reduce swelling
- evacuate for medical treatment
Trench/Immersion Foot

- Prevention
  - keep feet clean and dry
  - change socks at least every 8 hours or whenever wet and apply foot powder
  - bring extra boots to field - alternate boots from day to day to allow boots to dry
  - no blousing bands
  - report all suspected cases to leadership
Dehydration

- A loss of body fluids to the point of slowing or preventing normal body functions
- Increases chance of becoming a cold weather casualty (especially hypothermia)
Dehydration

- **Symptoms**
  - dark urine
  - headache
  - dizziness, nausea
  - weakness
  - dry mouth, tongue, throat, lips
  - lack of appetite
  - stomach cramps or vomiting
  - irritability
  - decreased amount of urine being produced
  - mental sluggishness
  - increased or rapid heartbeat
  - lethargic
  - unconsciousness
Dehydration

- Treatment
  - drink WATER or other warm liquids
  - water should be sipped, not gulped
  - do not eat snow
  - Rest
  - get medical treatment
Dehydration

● Prevention
  – drink minimum of 3 canteens of water daily for inactivity and 5-6 quarts for activity
  – monitor urine color
  – do not wait until you are thirsty
  – drink hot liquids for warmth
Carbon Monoxide Poisoning

- When oxygen in the body is replaced by carbon monoxide
  - colorless, odorless, tasteless gas resulting from incomplete combustion

- Inadequate ventilation from engines, stoves, heaters
Carbon Monoxide Poisoning

- Symptoms
  - headache
  - dizziness
  - weakness
  - excessive yawning
  - ringing in ears
  - confusion
  - nausea
  - bright red lips, eyelids
  - grayish tint in dark-skinned people
  - drowsiness
  - unconsciousness
  - possibly death
Carbon Monoxide Poisoning

- Treatment
  - move to fresh air immediately
  - seek medical aid promptly
  - provide mouth-to-mouth resuscitation if victim is not breathing
Carbon Monoxide Poisoning

- Prevention
  - ensure proper ventilation
  - don’t use unvented heaters or engines
  - ensure heaters are regularly serviced
  - turn heaters off when not needed (during sleep)
  - if heater kept on during sleep, post a fire guard
  - never sleep in vehicle with engine running
  - never wrap poncho around vehicle exhaust to collect heat
Snow Blindness

- Inflammation and sensitivity of the eyes caused by ultraviolet rays of the sun reflected by the snow or ice

- Symptoms
  - gritty feeling in eyes
  - redness and tearing
  - eye movement will cause pain
  - headache
Snow Blindness

**Treatment**
- remove from sunlight
- blindfold both eyes or cover with cool, wet bandages
- seek medical attention
- recovery may take 2-3 days

**Prevention**
- eye protection
  - dark, UV protective glasses
  - field expedient-cut narrow slits in MRE cardboard and tie around head
- do not wait for discomfort to begin

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Sunburn

- Burning of the skin due to overexposure to the sun and UV light
- Contributing factors
  - fair skin, light hair
  - exposed skin
  - reflective qualities of the snow
  - high altitudes

- Symptoms
  - redness of skin, slight swelling (1st deg)
  - prolonged exposure (2nd deg)
    - pain and blistering
    - chills, fever, headache
Sunburn

● Treatment
  – soothing skin creams in mild cases
  – in severe cases, seek medical attention
  – ibuprofen for pain

● Prevention
  – cover exposed skin with clothing
  – sunscreen, lip balm
  – limit exposure of skin to the environment
Conclusion

- Dress properly
- Drink plenty of fluids
- Eat right
- Keep in shape
- Get plenty of rest
- Minimize periods of inactivity
- Maintain a positive attitude
Reference Materials

- TC 21-3 - *Soldier’s Handbook for Individual Operations and Survival in Cold-Weather Areas*, March 1986
- FM 21-10 - *Field Hygiene and Sanitation*, 21 June 2000
- FM 4-25.11 - *First Aid*, December 2002
- TB MED 508 – *Prevention and Management of Cold Weather Injuries*, April 2005
QUESTIONS?