

Troop 140

Cold Weather Clothing



Cold Weather Clothing And The Importance Of Layering

Remember:

Your Primary
Shelter Against
Cold Is Always
PROPER Clothing !

Introduction

- **How to dress smart and stay warm when old man winter blows in.**
- ➔ Winter clothing keeps you warm primarily by trapping warm air next to your body (insulation). But when being active in winter and spending multiple days in the same clothes, insulation alone is not enough. It has to stay dry, not just from the outside in, but from the inside out. This is where specialized outdoor clothing is literally a lifesaver.
Wearing cotton or other moisture-retaining fabrics puts you at risk for serious heat loss.

Any Trapped Moisture Is Dangerous!

- Any moisture that **remains** in your clothing quickly conducts body heat straight to the atmosphere.
- This means your active clothing **must not** retain perspiration; instead it must quickly transfer body moisture to your outermost layer, where it can evaporate.
- **The key is to wear layers** made of synthetic, quick-drying materials that helps evaporate your sweat.

Layering

- The advantage of layering, of course, is that when working hard and starting to overheat, you can simply take off an insulating layer (usually a fleece jacket or vest), replace your windproof shell, and you're on your way. When inactive and cooling down, you can replace the insulating layer.

From Bottom to Top, Here Are the Layers You Should Include in Any Cold-weather Travel:

Underlayer:

- Two pairs liner socks (thin, quick-drying)
- Liner gloves
- Synthetic underpants
- Synthetic long underwear tops and bottoms

Insulating Layer 1:

- Thick insulating socks (one pair per day)
- Synthetic pants
- Synthetic shirt

Insulating Layer 2:

- Heavy gloves or mittens (mittens conserve heat better); plus an extra pair in case one is lost
- Fleece pants
- Fleece vest

Outer Layer:

- **Down jacket (with waterproof/breathable outer material)**
- **Shell pants (waterproof/breathable)**
- **Shell jacket with hood (waterproof/breathable)**
- **Neck gaiter or scarf**
- **Shell mittens of waterproof/breathable material**
- **Hat (fleece or wool)**
- **Brimmed cap for warm, sunny days**
- **Boots, waterproof and roomy enough for thick socks and toe-wiggling to prevent frostbite**
- **Gaiters**
- **Goggles (for wind and snow)**
- **Sunglasses, sunscreen and lip balm with sunblock**

General Information:

- Fleece offers more warmth for the weight than wool
- If you have cold feet, cover your head.
- Keep your first layer clothing and socks in Zip Lock Bags. All other clothing should be kept in something waterproof.
- Goose-down is the warmest for the weight, and should be included for rest stops and while hanging around camp. However: Don't break a sweat while wearing it; it dries poorly and won't keep you warm when it's wet the way fleece or other synthetics do.
- With today's synthetic clothing, socks are the only thing you need to change in the backcountry (dry feet are absolutely essential to preventing frostbite). Bring a pair of insulating socks for each day, ideally with a plastic bag for storing each separately.



Remember:

Have Fun,

STAY DRY

And You Will Enjoy!

Cold Weather Clothing Quick Guide

UNDER LAYER



1st INSULATION LAYER



2nd INSULATION LAYER



OUTER LAYER



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Cold Weather Sleeping bags



Sleeping Bags

- Types of Bags – Shape
 - Rectangular – Summer / Indoors
 - Most space to move around
 - Semi rectangular - Cooler Temp
 - Tapers Slightly
 - Mummy - Winter
 - Narrow at feet
 - Wider at Shoulders
 - Tapered to Insulated Hood.
- Good fit allows you to stretch out without too much extra space inside to warm up. Longer bag for Winter, Store Water bottles and boot liners in foot area to keep from freezing.

Sleeping Bags

- Liner and Over bags can increase temperature by 20 degrees.

- Ratings

- Temperature

- How cold it can get outside and still keep you warm.

- Ratings are useful for comparing particular manufacturers line. No standard for ratings.

- Don't account for: Physical State, Quality of Shelter, Quality of sleeping pad, How well dressed, what you've eaten.

Sleeping Bags

- Materials
 - Shell
 - Ripstop Nylon
 - Strong and wind resistant
 - Nylon Taffeta
 - Not as strong or wind resistant
 - Waterproof Breathable
 - Repel Moisture and wind

Sleeping Bags

- Fill Material

- Down

- Light, Warm, Packable.

- Loses insulating ability when wet

- Synthetic Fill

- Retains insulation when wet.

- Less expensive.

Sleeping Bags

- Take sleeping bag out of stuff sack as soon as then is up.
 - The bag needs to uncompress and be at full loft to be most efficient.
- Sleeping bags can be worn like a cloak prior to bedtime if an extra layer is necessary.
 - Traps in body heat and will be warmer at bedtime.

Sleeping Bags

- Sleeping Warm
 - Eat a hearty dinner, with plenty of fat, and drink lots of fluids. You need the fuel and fluids to burn during the long , cold night.
 - Warm yourself up before you go to sleep. Go for a walk, ski, shovel some snow. Go easy, you don't want to get into bed sweaty, just warm.
 - Wear a hat.

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Cold Weather Nutrition



Importance of Nutrition

- One needs a high calorie diet made up from the following sources for energy
 - Carbohydrates
 - Fats
 - Proteins

Carbohydrates (sugars & starches) are digested quickly as an energy source

- Simple “Carbs”

- (simple sugars both granulated & brown, honey & molasses)
- Break down fast and enter bloodstream quickly giving an energy boost right away but are burned off quickly.

- Complex “Carbs”

- (pasta, grains, fruits and starchy vegetables)
- Break down slowly and provide long term energy and MUST be a part of the menu.

- FATS break down very slowly so more time is needed for them to provide energy.
- (cheese, nuts, peanut butter, meat)

Proteins

- While proteins are important, they are not the primary energy source. Their importance is for the continued upkeep of basic human tissue.
- (meat, milk products, egg, cheese, seeds, nuts, whole grains)

Basic Food Checklist

- Breakfast: oatmeal, cream of wheat, granola, pancake mix, hash brown potatoes
- Lunch: bagels, cheese, nuts & seeds, dried fruit, crackers, energy bars, trail mix
- Dinner: cheese pasta, rice, tortillas, meats

Other items to include to supplement the menu:

- Couscous, hummus, sliced pepperoni, bacon, beef jerky, hot drinks, cocoa, tea, instant soups, powder milk, sugars, spices

Menu Planning

- Have a full breakfast which includes complex “carbs”
 - Plan a full dinner (for ease of prep in the cold, one pot meals work well)
 - It is best to have a high fat snack just about every hour to include a drink to sustain your body’s energy needs
 - A snack right before bed will help keep one warm over night.

- The only other item of importance is drinking a lot of fluids to keep properly hydrated. Water being your best choice. Limit your amount of caffeine

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Cold Weather Shelter



Shelter

- Cabin
 - Heated
 - Fire Place
 - Unheated
- Lean-to
 - Open
 - Enclosed

Shelter

- Tents
- Needs to stand up to strong wind and heavy snow.
 - Expedition
 - Double Walled. Rain Fly goes almost to ground.
Single walled tents collect condensation and never stay dry.
 - Need a Vestibule for gear and a place to cook if necessary.
 - Larger for more gear.
- Stakes for use in snow are wider and longer to be more secure

Shelter

- Tarp – in A frame
- Snow Shelter

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Cold Weather First Aid



HYPOTHERMIA

- Hypothermia, sometimes mistakenly referred to simply as "exposure", is a lowering of the body's core temperature caused by over-exposure to cool or cold air or water.

HYPOOTHERMIA

- One need not be subjected to near zero air temperatures or icy waters to be overcome, in fact, most cases of hypothermia occur during the spring, summer and fall. While the basic effects of air or water induced hypothermia are similar, the speed of occurrence and progression differs.

HYPOTHERMIA

Predisposing Conditions:

- Poor physical condition.
- Inadequate nutrition and water intake.
- Thin build.
- Non protective clothing.
- Getting wet.
- Inadequate protection from wind, rain and snow.
- Exhaustion.

HYPOTHERMIA

CAUSES:

Three factors are major causal factors in hypothermia: cold, water, and wind.

- 1) In a cold environment, the body must work harder to regulate heat; contact with cold air, water, snow, ground or clothing will cause heat losses due to conduction.
- 2) If a person is submersed in water, heat will be lost due to conduction and convection. At a water temperature of 32 degrees death occurs in 15 minutes; at 70 degrees survival for as long as 48 hours has been observed. Loss of heat by evaporation is a major contributor also. Wet skin or clothing will cool of the body quickly, especially if it is windy and/or cold.
- 3) Wind will cause heat loss due to convection, and will accelerate heat loss due to evaporation.

HYPOTHERMIA

Hypothermia occurs much more quickly in the elderly and chronically ill.

Hypothermia is insidious. As the body's core temperature drops, more and more body systems suffer from the effects of cold. The presence and severity of hypothermia can be assessed by the signs and symptoms below. A patient is hypothermic at any temperature below 98.6 degrees Fahrenheit. 98-94 degrees is mild hypothermia; 94-84 degrees is moderate hypothermia, and below 84 degrees is severe hypothermia.

HYPOTHERMIA

Symptoms:

- Loss of ability to reason.
- Shivering.
- Slowing, drowsiness, fatigue.
- Stumbling.
- Thickness of speech.
- Amnesia.
- Irrationality, poor judgment.
- Hallucinations.
- Cyanosis (blueness of skin).
- Dilation of pupils of eyes.
- Decreased heart and respiration rate.
- Stupor.

STAGES OF HYPOTHERMIA

- 98 - 95 degrees - Sensation of chilliness, skin numbness; minor impairment in muscular performance, especially in use of hands; shivering begins.
- 95 - 93 degrees - More obvious muscle un-coordination and weakness; slow stumbling pace; mild confusion and apathy. Skin pale and cold to touch.
- 93 - 90 degrees - Gross muscular un-coordination with frequent stumbling and falling and inability to use hands; mental sluggishness with slow thought and speech; retrograde amnesia.
- 90 - 86 degrees - Cessation of shivering; severe muscular un-coordination with stiffness and inability to walk or stand; incoherence, confusion, irrationality.
- 86 - 82 degrees - Severe muscular rigidity; patient barely arousable; dilatation of pupils; in apparent heartbeat and pulse. Skin ice cold.
- 82- 78 degrees and below - Unconsciousness; death due to cessation of heart action.

TREATMENT

- Two situations are possible. One is where a 911 call can be made and evacuation to a medical facility is possible within several hours.
- The other is where evacuation will be delayed or impossible.

TREATMENT

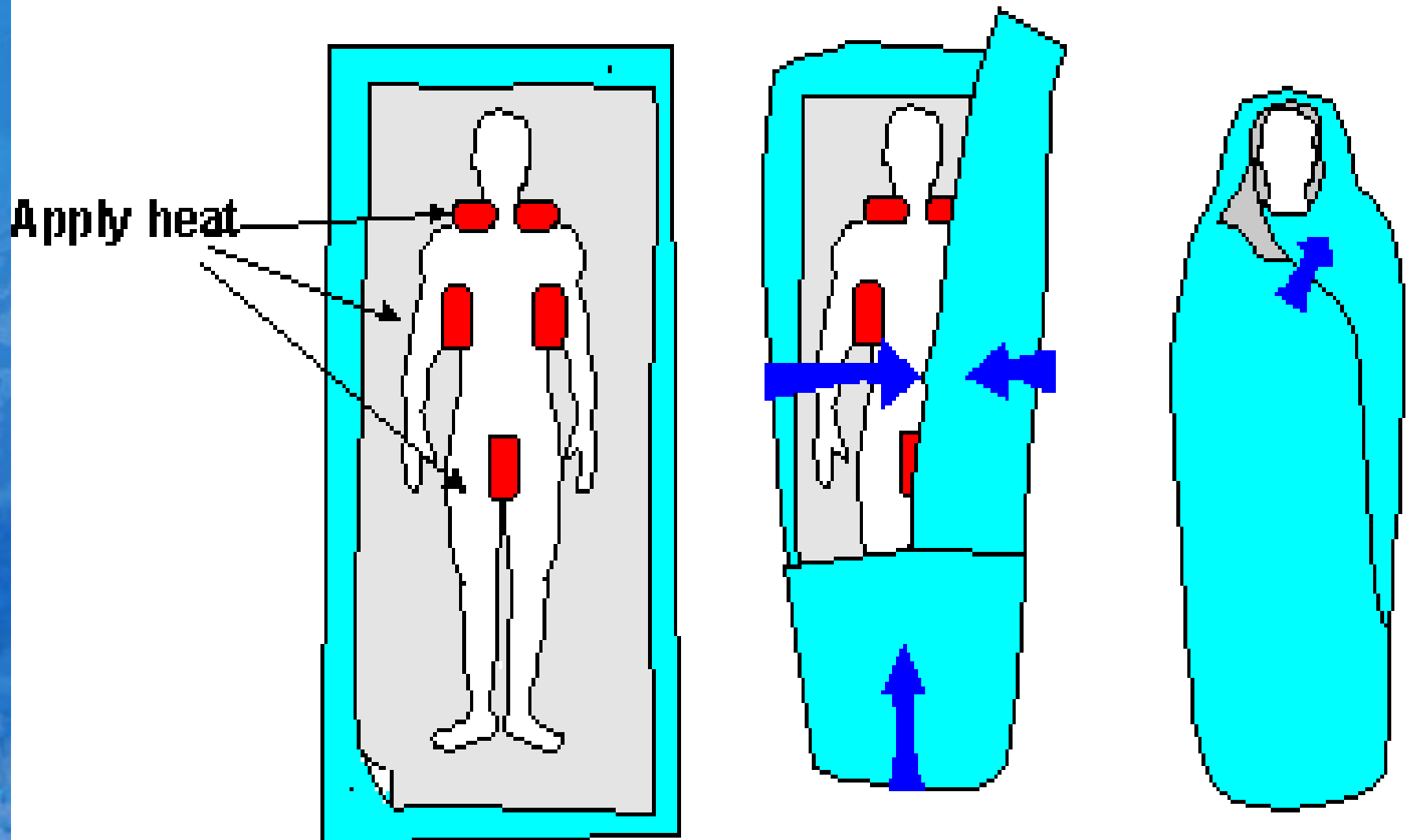
Moderate hypothermia

- Get the patient as sheltered as possible (tent, snow cave, etc.)
- Remove wet clothing and replace with dry clothing. Keep patient laying down. Place patient in a sleeping bag with a second rescuer of normal body temperature. Direct skin to skin contact is preferable.

TREATMENT

- Warm stones or bottles can also be placed in the bag (be careful not to burn patient). Make sure all extremities and exposed areas (e.g. face, nose, ears) are protected. If patient is conscious and able to swallow without danger to his/her airway, give sugar and sweet, warm (not hot) fluids by mouth. **DO NOT GIVE ALCOHOL.** If evacuation is **IMPOSSIBLE** and facilities permit, immerse patient in tub of water at 105 degrees Fahrenheit. Monitor patient's temperature rectally with thermometer if possible. Continue rewarming efforts until patient's core temperature is restored to normal. Always evacuate a hypothermic patient as quickly and gently as possible, including rewarmed patients.

Hypothermia Wrap



TREATMENT

Severe hypothermia

- Patients in severe hypothermia are often erroneously thought to be dead. Neither pulse, nor heart sounds, nor respiration may be apparent. Handle a severely hypothermic patient with great care - **VERY GENTLE HANDLING**. Cut away wet clothing and replace with dry clothing.

TREATMENT

- Maintain an airway, but use no adjuncts (e.g. oral airway). Once you start CPR, **DON'T GIVE UP**. Get help. Do not attempt to rewarm patient unless evacuation is **IMPOSSIBLE**. Keep patient supine, in a 10 degree head-down tilt.
- Handle every hypothermic patient very gentle. Rough handling can cause cardiac arrest and death. Get every patient into shelter, replace wet clothes with dry ones. Apply external heat if condition dictates. And give warm, sugary food and drink if patient's condition allows. Get help. If possible, have rescuers bring a heated oxygen unit, and administer to patient. Perhaps equipment can be air-dropped. Keep calm and do not become a victim yourself.
- **THE HYPOTHERMIC PATIENT ISN'T DEAD UNTIL HE'S WARM AND DEAD.**

HYPOTHERMIA PREVENTION

- Dress properly for current and possible conditions. Be prepared for sudden weather changes especially at elevations. Have at least one wool garment for the upper and lower parts of your body. Wool is the only material with any insulating value when wet. Carry or wear a windproof, waterproof garment. Always have a wool hat and wool mittens. Have extra clothing available especially mittens and hats. A large proportion of body heat is lost through the head. Wear suitable boots, insulated if necessary; wear wool socks, and always carry extra wool socks. Avoid getting overheated and perspiring, this cools you down - fast. Wear layers and remove clothing as necessary. Better having extra than too little. Dress sensibly and expect the worst.

HYPOTHERMIA PREVENTION

- Sit out bad weather. Better waiting than be overtaken by a blizzard or thunderstorm. Do not push on through the night. Make camp early and rest thoroughly. You can continue tomorrow with a much greater safety margin.
- Do not get exhausted. Exhaustion promotes heat loss, and thus hypothermia. Besides, if your exhausted, you are probably drenched.

HYPOTHERMIA PREVENTION

- Do not get in over your head. If your experience is limited to day hikes on moderate trails, do not try to go out and tackle Mt. Washington in February. Be smart. Learn to use a map and compass. Learn fire starting techniques. Learn first-aid. Be calm. Be prepared.
- Lastly, learn about hypothermia. Know the causes, warning signs, and treatment. Learn how not to get cold.

DEHYDRATION

- Excessive loss of body water.
Impairs the ability to reason, so
the victim may not react properly.



DEHYDRATION

Prevention:

- Drink at least 2 quarts of water a day.
- Avoid dehydrating foods (high protein) and fluids (coffee, caffeine).
- Increase fluid intake at first signs of darker yellow urine.

DEHYDRATION

Symptoms:

1 to 5 % deficiency

- Increased pulse rate
- Nausea and loss of appetite
- Dark urine or constipation
- Irritability, fatigue
- Thirst

DEHYDRATION

Symptoms:

6 to 10 % deficiency

- Headache, dizziness
- Labored breathing
- Tingling
- Absence of salivation
- Inability to walk
- Cyanosis (bluish or grayish skin color)

DEHYDRATION

Symptoms:

11 to 20 % deficiency

- Swollen tongue, inability to swallow
- Dim vision, deafness
- Shriveled, numb skin
- Painful urination
- Delirium, unconsciousness and death

DEHYDRATION

Treatment:

- Mild cases - drink liquids, keep warm.
- More severe cases require professional medical treatment.

FROSTBITE

- Tissue injury involving the actual freezing of the skin and underlying tissues. Recovery is slow, severe frostbite can lead to gangrene. Once exposed the victim will be predisposed toward frostbite in the future.

FROSTBITE

Predisposing Conditions:

- Prolonged exposure to temperatures 32° F or below.
- Brief exposure at extremely low temperatures, -25° F and below.
- Exposed body parts
- Restriction of circulation.
- Fatigue, poor nutrition, low liquid intake, poor physical condition.
- Previous case of frostbite or other cold injury.

FROSTBITE

Symptoms:

First Degree (Frostnip)

- Redness, pain, burning, stinging or prickly sensation.
- Pain disappears and there is a sudden blanching of the skin.
- The skin may look mottled.
- Skin is firm to the touch, but resilient underneath.
- On thawing, there is aching pain or brownness. The skin may peel off, and the part may remain cold for some time.

FROSTBITE

Second Degree (Superficial Frostbite, Frostbite)

- No pain, the part may feel dead.
- Numbness, hard to move the part.
- Tissue and layers underneath are hard to the touch.
- After thawing (takes 3 to 20 days) pain, large blisters, sweating.
- Black or discolored skin sloughs off, leaving tender new skin.

FROSTBITE

Third degree (Severe Frostbite)

- Full thickness of the skin is involved.
- After thawing, pain continues for 2 to 5 weeks.
- Fourth degree (Severe Frostbite)
- Skin and bone are frozen.
- Swelling and sweating occur.
- Gangrene may develop, amputation may be necessary.

FROSTBITE

Fourth degree (Severe Frostbite)

- Skin and bone are frozen.
- Swelling and sweating occur.
- Gangrene may develop, amputation may be necessary.

FROSTBITE

Treatment:

- Do not rub affected area with snow. Hold it over fire, or use cold water to thaw it.
- Exercise the affected area to promote blood circulation.
- Use any warmth available to thaw area.
- Do not attempt to thaw frostbitten limbs in the field. It is less harmful for the victim to walk out on a frostbitten limb than to thaw it in the field. Thawing only risks additional injury and the victim will be in too much pain to walk.
- Check for hypothermia.

FROSTBITE

Prevention:

- Proper clothing.
- Good nutrition, drink water, maintain core temperature.
- Use buddy system to check face, nose, and ears.
- Immediate treatment of minor symptoms.

CHILBLAINS

- An extreme reaction to cold, in which superficial blood vessels contract excessively causing skin to go pale and numb, then red, swollen, and itchy; eventually skin may break; most common on hands and feet. Cold causes constriction of the small arteries and veins in the skin and rewarming results in leakage of blood into the tissues and swelling of the skin.
- Each chilblain comes up over a few hours as an itchy red swelling and subsides over the next 7-14 days. In severe cases blistering, scabs, and ulceration can occur. Occasionally the lesions may be ring-shaped. They may become thickened and persist for months.

CHILBLAINS

Common sites for chilblains are:

- Hands
- Feet
- Lower legs
- Thighs
- Nose
- Ears

CHILBLAINS

Treatment

- Unfortunately chilblains respond poorly to treatment. The following may be useful:
- Keep affected parts as warm and as dry as possible
- See a doctor
- A topical anti-itch cream applied accurately for a few days may relieve itch and swelling.
- Antibiotic ointment or oral antibiotics may be necessary for secondary infection.

CHILBLAINS

Prevention

- Warm clothing especially gloves, thick woolen socks and comfortable protective footwear. Keep the head and neck warm with hat and scarf.

LOSS OF BODY HEAT

- The body's process for maintaining an even temperature is called **Homeostasis**. The arms and legs are used as a radiator to remove excess heat from the body. This process dilates the blood vessels, allowing more blood to flow to the skin surfaces. When the body temperature drops, these blood vessels constrict, decreasing blood flow, and thereby, heat loss. This is why hands and feet get numb when cold, and why they're particularly vulnerable to frostbite.

LOSS OF BODY HEAT

- Since your brain needs oxygen to function, your body can't cut off the flow of blood to your head in order to conserve heat. Consequently, much of your body heat can be lost through an uncovered head and neck.

LOSS OF BODY HEAT

Radiation. (55%)

A major source of heat loss. Heat is lost directly from exposed skin and the head. The head may lose up to one-half of the body's total heat production at 40 degrees F, and up to three-quarters at 5 degrees F.

LOSS OF BODY HEAT

Conduction. (15% w/convection)

Heat is lost through skin contact with cold objects, primarily the hands, and wet or tight clothing. Handling gasoline, and other super-cooled liquids, at low temperatures is especially dangerous.

Convection

Heat is lost from the wind carrying away heat from the surface of the skin. This includes wind-chill effects.

LOSS OF BODY HEAT

Evaporation (21%)

Loss from evaporation of sweat, moisture from the skin and lungs produces substantial heat loss. There is little that can be done about this. We need to allow for this by using breathable fabrics to allow this moisture to pass out freely.

Respiration (2-9%)

Heat lost from inhaling cold air and exhaling warm air.