



Winter Camping Skills: *Clothing and Footwear*

How Heat is Lost: Understanding how heat you generate is lost and how to prevent it.

Evaporation (stay dry) / Convection (stay out of wind) / Conduction (don't sit in a snow bank).

STAY DRY

Evaporation – active /strenuous activity creates excessive heat - body perspires to keep core temp. down – as water evaporates it cools you – in winter conditions this can be dangerous – if clothing retains perspiration and you rest , no longer producing excessive heat, evaporation still continues... you start shivering.....

You Must - minimize perspiration by regulating activity (i.e. pace of hike), adjusting clothing (layering) reduce evaporative cooling by wearing right clothes next to skin (synthetics).

Evaporation – breathing in cold air – breathing passages must warm air before it reaches lungs – warming air lowers its relative humidity causing body to re-humidify air to 100% saturation, losing heat by evaporation in the process - colder the air greater the loss -

You Must - wear scarf mask - this warms air a little before it enters breathing passages.

STAY OUT OF WIND

Convection - Layer of warm air carried away by air currents - cooling is instantaneous - efforts by body to reheat surrounding area result in rapid & drastic heat loss. - Wind a major dangerous source of heat loss in winter (wind chill factor vs. outside temperature reading). Small increase in wind speed causes large increase in heat loss & colder the temperature the more dangerous is any amount of wind.

You Must - Pay attention to outer layer in wet snow or rain - waterproof, breaths/vents, insulates & roomy

Convection - movement of your body through the air (sledding, skiing) - small movements made inside clothing sends heat drifting away through openings warm air rises e.g. Lose heat from open shin while loose pant cuffs draw in cold air... chimney effect.

You Must - "button up"

DON'T SIT IN A SNOWBANK

Conduction - direct contact with cold surface (lie or sit in snow) will rob you of heat.

You Must - Pay particular attention to protecting hands (holding cold objects) and feet (always standing in the snow).

Mountaineers saying, "If your feet are cold, put on your hat."

Clothing

Layering -applies to all parts of the body - more a principal than a specific set of garments

- control of body temp begins with your intelligence rather than with your equipment
- four types combine to meet body's need for insulation & protection against convective & evaporative heat loss (inner /active middle / shell / sedentary middle).
- activity level & heat generation increases...take it off - encourage evaporation when we exercise decreases... put it on - conserve heat when activity stops
- over heating and chilling are serious problems that lead to dehydration, exhaustion and hypothermia

Inner Layer

- chief function is to deal with moisture generated by the body (perspiration & evaporation) use synthetics such as polypropylene, chlorofibre, polyester fibres do not absorb moisture can wick perspiration from the skin to outer layers of clothing or directly to the air
- secondary function, provide a sheath of insulation next to the skin - garment must hug body closely or will not wick or insulate properly - thinner fabrics ventilate better, hollow core thin fibres trap air for better insulation.

Active Middle Layer

- chief function to insulate during activity generating heat (i.e. hiking or digging a snow quinzee)
- should also transport moisture wicked by inner layer through to outside air
- need for insulation will vary with temperature/activity level & metabolism so insulating garments must be adjustable i.e., two or three thin sweaters
- fuzzy, furry, pile, fleece or loose knit fabric trap air better than silky smooth ones
- wool loose-knit sweaters good choice

Shell Layer

- chief function to protect against convective heat loss from wind
- in wet snow & rain must keep inner layers dry
- must breathe avoiding perspiration soaking cloths from within and vents when you overheat, roomy to accommodate more insulation underneath
- GORE-TEX® - waterproof, breathable, windproof, warm.... However there are cheaper alternatives.

Sedentary Middle and or Outer Layer

- chief function is to provide insulation when body stops moving and production of heat drops of rapidly
- need to trap large amounts of air to preserve every bit of warmth body manages to generate
- synthetic fibres such as Polarguard, Rollofil, Quallofil compete with down as super insulators and are less affected by moisture - Goose down is warmest, lightest, compressible, most expensive ,for sedentary insulation only.

Materials and Fabrics to Avoid

- **cotton** as in blue jeans, t-shirts, sweat shirts, corduroy
- wet cotton no insulating properties, promotes heat loss from body
- silk "perdy, luxurious feel".....but, like wool and cotton absorbs moisture

Head and Neck

- important areas that regulate body temp.
- tightly knit fabric for wind protection or toque, ideal for cold day when working hard & sweating / bulky loose knit for more insulation trap the air (little wind protection)
- should protect ears for extreme cold and as much of face, chin and neck as possible
- Balaclavas, fleece neck tube, neoprene face mask, coupled with hood on parka good
- Head band over ears and forehead keeps hair and sweat from eyes, holds glasses in place and doesn't contribute much warmth

Upper Body

- major layering adjustments made here - inner/middle/sedentary/shell
- thermal underwear/assortment of long sleeve flannel shirts with tails or sweaters synthetic or wool / down, cloth, synthetic Parkas with hoods / lightweight nylon jackets / down vests / hooded sweatshirt

Lower Body

- thermal underwear (separate pants preferable to one-piece long johns...especially at 4am -30c in the KYBO) - elastic waist bands & exposed flies "better for guys" than buttons and zippers
- wool pants especially tweed, are warm, shed snow, allow full mobility , windproof.... and hard to find - fleece or pile pants coupled with a wind shell splash pants / thermal underwear and track pants for sleeping
- shell pants, snow pants , bib , crotch zipper or waist length or one piece snow suite... however, remember KYBO .. separate snow pants waist level may be better

Hands

- first area to suffer - gloves and mittens take up little place... pack a lot of 'em.
- Liner gloves important, to manipulate small objects and wear heavy synthetic pile, Thinsulate™, or wool mitts over them
- Contact with snow requires a waterproof/resistant breathable shell or windproof nylon type

Feet

- lose heat through conduction to the snow and from poor circulation (lowering of body core temp/tight boots/and socks.. ..as you add layers of socks, go up a size / layers of trapped air insulate.
- sweaty feet and wet boots or socks lead to evaporative heat loss - wet skin blisters easily.
- Use synthetic or cotton for liner socks then wool or synthetic insulating socks
- Down or synthetic fill booties for sleeping
- Gaiters, designed to keep snow off socks and out of boots

Footwear

- insulated with leather/nylon or rubber uppers (ice or slush) with wool felt liners (bring extra liners) draw string top warmest and keeps snow out of boots
- extra liners replace wet, sweaty ones used during the day. Pull them out when going to bed, turn boots upside down and open as wide as possible because boots will freeze overnight makes puffing in new liners more difficult.
- **Avoid** running shoes, mukluks, leather boots especially steel toe (attracts cold) with no insulation or waterproofed, RUBBER BOOTS, low cut non-winter hiking boots.

