## Three Layers of Comfort: How to Dress for Cold Weather Success



(Mah, 2016)











## Learning Outcomes Upon completion, participants will be able to:

•Understand why proper clothing is important when exercising outdoors in winter.

•Identify what fabrics are appropriate for outdoor activities.

•Identify the three kinds of clothing layers for outdoor activities.



(Mah, 2019)







# **Challenges While Exercising Outside During Winter**

Canadian weathers can bring low temperatures, snow, winds, grey skies, and sunny skies.

As the weather can fluctuate throughout the day, folks must prepare for changing conditions. In terms of clothing, this is why adding or removing layers can be beneficial.

Our own body temperature will change from the time we stand still, to our peak exertion as we exercise, and again when we rest.











# **Challenges While Exercising Outside During Winter**

When we exercise, we sweat; how much we sweat depends on each individual person. Sweat management will impact your body's ability to stay warm and dry.

"During exercise, liquid water accumulates on the skin and starts to wet the clothing layer(s) above the skin. Some of the sweat evaporates from both the skin and the clothing and moves out through the clothing...the water vapor either leaves the clothing or condenses and freezes somewhere in the outer layers" (Crow & Osczevski, 1998).



(Sutherland, 2018)







### Staying warm & dry during outdoor winter activities - The Quick Guide -

# Wear the right kinds of clothes made from the right kinds of materials!

- Clothes made from synthetic fibers like polyester & nylon
- Clothes made from wool
- NO COTTON! Check your clothing labels
- Clothing: long underwear, proper pants/shirts, socks, waterproof/windproof jackets, and pants
- Toque/winter headband, mitts/gloves, scarves or head/neck tubes

### Dress in layers that you can take off/ put on as you get warm/cool down!

Base Layers - Worn next to skin

 Ex: Long underwear tops & bottoms, socks

Mid-Layers – Insulator worn over base layers

• Ex: Fleece jacket, synthetic hoodie, Light jacket

Outer Layers – worn over mid-layers; will guard you from the elements of the weather

Ex: Rain jacket & pants, wind jacket & pants, winter jacket & snow pants





### **Natural Fibers**

#### Cotton (plant-sourced) NOT a great choice!

Cotton fibers are hydrophilic (water-loving), which means cotton-based clothing will hold onto any sweat or moisture (rain, snow) it comes in contact with.

Why this matters: wet clothes are uncomfortable, are unable to retain heat, and when combined with friction can cause blisters.

Common cotton clothing: jeans, socks, t-shirts, hoodies.

#### Wool (animal-sourced) Great choice!

Wool fibers are also hydrophilic, BUT it's structure is different from cotton's and will hold onto heat until fully saturated.

Why this matters: wool fibers have an open-cell core and are covered with scaled cuticles. As sweat is pulled into the core, heat will continue to be released and retained by the scales.

Common wool clothing: long or short-sleeved shirts, leggings, sweaters, socks.



(Hatch, 1993)



### **Synthetic Fibers**

(man-made)

#### Polyester Great choice!

Polyester: hydrophobic (dislikes water) and when woven, the fabric construction and fibers work together to transport moisture and promote evaporation.

Why this matters: polyester helps pull sweat away from your skin which helps keep you dry.

Common polyester clothing: athletic wear like the Augustana Viking's uniforms, base layers, mid-layers, outer layers!

### Nylon Great choice!

Nylon: hydrophobic (dislikes water) and strong. Nylon is also blended with polyester for base layers and everyday clothing

Why this matters: nylon helps to protect wearers against weather-related elements (rain, snow, wind).

Common nylon clothing: nylon is often lined on the inside with a waterproof membrane and coated with a durable water repellent coating on the outside. This makes effective rain or snow jackets, running jackets, rain pants, snow pants.





### How will I know what my clothes are made of?

Clothing/care labels sewn into garments will indicate what clothes are made of and to what percentage that fiber exists within the garment.







(Mah, 2019)



### **Base Layers**

Your base layer is extremely important to help keep you dry and warm.

Base layers are in direct contact with your skin and are responsible for actively pulling sweat away from your body and forcing it through the clothes for evaporation.

Examples include: synthetic or wool long underwear bottoms and tops, underwear, bras, socks.

("Layering basics," n. d., para. 1, "Clothing layers: How to stay warm," n. d., para. 2, "L. L. Bean guide to layering," n. d., para. 2).









### **Mid-layer**

Your mid-layer is roomy enough to fit over your base layer. They are designed to hold in your body heat. They also work with your base layer to push moisture away from your body.

This layer can help to moderate your body heat and retain the right amount in the event you need to remove your outer layer.

Examples include: fleece or fleece-lined tops/bottoms, lightly insulated jackets/pants, hoodies.

("Layering basics," n. d., para. 2,"Clothing layers: How to stay warm," n. d., para. 3, "L. L. Bean guide to layering," n. d., para 3.)









### **Outer Layer**

This "shell" layer should be roomy enough to be worn over your base and mid-layers, but not so roomy that they are too baggy or loose; this could be uncomfortable to move in, as well as could result in heat loss.

Most importantly, this layer is designed to protect against environmental elements (rain, snow, wind) and allow moisture to escape from the base and mid-layers; sweat vapour can be pushed out, yet outside precipitation cannot penetrate.

("Layering basics," n. d., para. 3, "Clothing layers: How to stay warm," n. d., para. 4, "L. L. Bean guide to layering," n. d., para. 4, Chaudhari et al., 2007.).







**UNIVERSITY OF ALBERTA** LIBRARY Examples include: Rain jacket, windbreaker, snow jacket, rain/snow/or wind pants.



### **Other Important Items To Bring**

Protect your head, neck, face, and hands from frostbite and chill!

•Toque, gloves/mitts, and a scarf or head/neck tube are cold weather **MUSTS** 

Additional:

- •Headlamp for those peaceful night-time adventures
- •Sunglasses to protect your eyes on bright days
- •Cell phone with a good charge (keep it warm)

•Small snack for those longer adventures









### Ready, set, GO!!!



(Chan, 2012)

Other helpful hints: make sure you are well-rested, hydrated, and have eaten a good snack before you go. Check the weather conditions and bring a buddy (who else is going to take that epic Instagram photo of you)! ③







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# **Questions?**

(Mah, 2008)

Created on behalf of the University of Alberta's Augustana Vikings Athletics Department and the University of Alberta Library by:

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