Winter is here, which means so is the cold weather. The days are getting longer now and with winter comes the cold weather. Everyone has varying opinions of the cold, but what are the effects it has on the body? In this eBook, we will look at how your body responds to the cold, debunk a few cold-weather myths, and offer some ways to help keep you warm!
When the body is cold, goosebumps can appear all over the skin. The skin is sensitive to touch, changes in temperature and air, as well as in reaction to an emotion. Arrector pili are tiny muscles attached to hair follicles. When the muscles contract in response to, say, a change in temperature, it causes the hairs to which they’re attached to stand on end. Goosebumps offer little benefit to humans, but are helpful to animals with fur. Goosebumps allow the fur to puff out, trapping air between the fur and the skin. This air is warmed by the animal’s body, allowing them to retain more heat.
A shiver is another way the body tries to regulate its temperature. Shivering starts when the body’s internal temperature drops to a level below what the body feels comfortable with. When this happens, the muscles tighten and relax rapidly, turning chemical energy (ATP) into kinetic energy that releases heat as a byproduct, warming the body. The temperature when the body starts shivering is different for everyone. Shivering can help warm up the body, but only for a few hours. The muscles eventually run out of energy and relax.
Frostbite is the freezing of the skin and underlying tissues. It is most common in the fingers, toes, nose, ears, cheeks, and chin. The most common cause of frostbite is exposure to cold for too long or direct contact with a cold object.

There are varying degrees of frostbite:

- **Frostnip**: mild frostbite irritates the skin but doesn’t permanently damage it. The epidermis of the skin becomes red, cold, and eventually numb.

- **Superficial frostbite**: the skin feels warm and a fluid-filled blister may appear 24 to 35 hours after rewarming the skin. Effects the epidermis and the dermis.

- **Deep frostbite**: joint or muscles may no longer work and large blisters form 24 to 48 hours after rewarming. After this, the area turns hard and black and the tissues die. Effects all layers of the skin.
Hypothermia occurs when your body loses heat faster than it can produce it. The normal body temperature is 98.6°F (37°C). Hypothermia occurs when the body’s temperature falls below 95°F (35°C). Hypothermia is most commonly caused by exposure to cold weather conditions or cold water. When body temperature drops, the heart, nervous system and other organs can’t work properly. Hypothermia even affects the brain, causing the victim to be unable to think clearly. If left untreated, it can lead to failure of the heart and respiratory system.
Did you know that heart attacks are more common in the winter? This is because the cold causes blood vessels to constrict. As a result, blood moving through the vessels pushes harder against their walls, causing an increase in blood pressure. The risk further increases if you are doing activities in the cold such as shoveling or clearing snow off your car. In addition, your heart is working hard to maintain your body’s temperature.
The immune system works better in warmer temperatures and becomes sluggish in the cold. Why does this happen? One reason could be that less sun exposure in the winter often results in vitamin D deficiency. Vitamin D can be found in the immune system and helps fight off infections. If the immune system’s response is slower, pathogens can more easily multiply within the body.
**Why can you see your breath in the cold?**

The air we exhale is the same temperature as the body and contains moisture. Cold air can’t hold moisture as well as warm air. When the warm, moist air we exhale hits the cold air, the extra moisture turns into a misty cloud we can see.

**Why do we curl up when we want to avoid being cold?**

When we curl our body, we are decreasing its surface area and increasing its volume. This means that the cold has to travel further to reach the center of the body. Some animals curl up with others for the same effect.
**Why do your hands and feet get cold first?**

Some regions of your body are ‘allowed’ to get colder than others. Your core has the organs that need warmth to work properly. As a result, in cold weather you will keep warm blood more in your core than in your limbs.

**“Summer body” might not be the ideal winter body?**

Fat keeps you warm because it adds an additional layer of insulation between the outside world and your inner organs. Fat is not good at transferring thermal energy, which makes it a good insulator. Animals that live in cold environments have a thicker fat layer. For example, the bodies of beluga whales, which are found in arctic waters, are 50% fat, and their fat layers are 6 inches thick!
You lose most of your heat from your head: You lose the most heat wherever your skin is exposed to cold temperatures, and the majority from respiratory membranes.

You do not need sunglasses in the winter: Whenever the sun is out, it still produces UV rays that can damage your eyes. And the UV rays can be even stronger if there is snow, since snow reflects 80% of UV light!

Cold weather makes you SAD (Seasonal Affective Disorder): It is thought that the lack of sunlight and the lack of natural light (from shorter days, more time indoors, and less of the body exposed to the sun) causes SAD more than the cold weather itself.
The cold makes you sick: Again, it’s not the cold weather itself that’s responsible here. More people catch colds and the flu in the colder months because they spend more time inside and in close proximity to one another. This allows viruses to spread more easily.

Alcohol warms you up: Alcohol causes your blood vessels to dilate and can impair your body’s ability to shiver. Instead, you start to sweat, which makes you feel warm even though your body is not actually warming itself up.
BENEFITS OF THE COLD

It helps you burn more calories: The body uses energy to maintain your core temperature.

It improves allergies: No pollen count outside means no outdoor allergies! Unfortunately, allergens like dust and mold can still make us sneeze indoors.

You may sleep better: The body needs to cool itself down before we sleep. The more hot and humid it is, the more difficult this becomes, making falling asleep uncomfortable in the summer. However, there is little to no humidity in the winter!
Wear layers while you’re outside. The inner layer should be a close-fitting base that wicks away sweat. The middle layer should be something looser-fitting, and the outer layer should be windproof and waterproof.

Cover your head and face with a hat, scarf, or mask to protect your skin. Wear sunglasses or goggles to protect your eyes.

Wear warm, waterproof boots with good tread to prevent slips and falls.
A universe of anatomical and physiological visuals and reference texts at your fingertips!
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