WHAT IS FROSTBITE?
Frostbite is the freezing of the skin and/or the tissues under the skin. A person with frostbite on the extremities may also be subject to hypothermia (lowered body temperature). Check for hypothermia and treat those symptoms first.

WHAT DOES FROSTBITE ACTUALLY DO TO THE TISSUES?
The fluids in the body tissues freeze and crystallize. This can cause damage to the blood vessels and result in blood clotting and lack of oxygen to the affected area.

IS FROSTBITE A SERIOUS CONDITION?
It can be. Serious cases of frostbite have been known to kill and damage tissue to the extent that amputation is necessary. The extent of frostbite is best evaluated by a qualified medical professional.

WHAT PARTS OF THE BODY ARE MOST COMMONLY AFFECTED?
The exposed areas and areas with less blood flow such as hands, feet, ears, nose, and face most often suffer frostbite.

WHAT CAUSES FROSTBITE TO OCCUR?
Frostbite is caused by exposure of the body to cold. Several factors can contribute to its development including:
- length of exposure to cold
- temperature
- wind chill factor
- humidity in the air
- wetness of clothing, shoes, skin and hair
- ingestion of alcohol and other drugs
- high altitude

IS IT TRUE THAT FROSTBITE CAN OCCUR IN JUST A FEW MINUTES?
If the conditions are bitterly cold and/or with a severe wind-chill factor, exposure of uncovered body parts (for example, the ears) can actually result in frostbite in just minutes.

ARE THERE CERTAIN MEDICAL CONDITIONS THAT MAY PUT A PERSON AT GREATER RISK FOR FROSTBITE?
The elderly and children are particularly susceptible. In addition, persons with circulation problems (such as those with diabetes, peripheral neuropathy, peripheral vascular disease, and Raynaud’s syndrome/phenomenon); history of previous cold injuries; those who ingest particular drugs (such as alcohol, tobacco, marijuana, and beta-blockers) are at higher risk. Although there is no medical reason, it seems that persons from southern or tropical climates may also be more at risk.

CAN I PREVENT FROSTBITE?
- Proper clothing for winter weather insulates from the cold, lets perspiration evaporate, and provides protection against wind, rain, and snow. Wear several layers of light, loose clothing that will trap air, yet provide adequate ventilation. This is better protection than one bulky or heavy covering. Best fabrics for the cold are wool, polyester or polypropylene, and water-repellent materials (not waterproof, which holds in perspiration). Down coats and vests are warm; however, if down gets wet it loses its insulating properties.
- Coverings for the head and neck are important. Hats, hoods, scarves, earmuffs, and facemasks are good protection.
- Protect your feet and toes. Wear two pairs of socks - wool is best, or cotton socks with a pair of wool on top. Wear well-fitted boots that are high enough to cover the ankles.
• Hand coverings are vital. Mittens are warmer than gloves, but may limit what you can do with your fingers. Wear lightweight gloves under mittens so you'll still have protection if you need to take off your mittens to use your fingers.
• Be sure your clothing and boots are not tight. A decrease in blood flow makes it harder to keep the body parts warm and increases the risk of frostbite.
• When in frostbite-causing conditions, dress appropriately, stay near adequate shelter, avoid alcohol and tobacco, and avoid remaining in the same position for long periods.

WHAT ARE THE SIGNS AND SYMPTOMS OF FROSTBITE?
• Mild frostbite (frostnip) affects the outer skin layers and appears as a blanching or whitening of the skin. The first symptom is a “pins and needles” sensation. Other symptoms include swelling, itching, burning, and deep pain as the area is warmed. Usually, these symptoms disappear as warming occurs, but the skin may appear red for several hours.
• In more severe cases, the frostbitten skin will appear waxy looking with a white, grayish-yellow or grayish-blue color. The affected part(s) will be numb. The tissue will feel frozen or “wooden” to touch. More severe frostbite will result in blisters filled with clear or milky fluid. This indicates a very serious condition.
• Very severe frostbite may cause gangrene (blackened, dead tissue), and damage to deep structures such as tendons, muscles, nerves, and bone, with resultant loss of tissue.

CAN I TREAT THE FROSTBITE MYSELF?
If you think you may have frostbite, even if it seems like a mild case, it is strongly recommended that you consult a medical professional. The following guidelines will decrease the chance of further injury:

DO
• Have your injury re-warmed under medical supervision, if possible.
• Get to a warm place where you can stay warm after thawing.
• Rest the injured areas (avoid walking on frostbitten feet, etc.).
• Use water 100°F - 38°C (should be warm to the touch - not hot) for 30 to 45 minutes until a good color (flush) has returned to the entire area. This process may be painful, especially the final ten minutes.
• Leave the blisters intact. Cover with a sterile or clean covering if protection is needed to prevent rupturing.
• Keep the affected part(s) as clean as possible to reduce the risk of infection.
• Elevate the area above the level of the heart.
• Make sure your tetanus booster is within 10 years.

DO NOT
• Don't allow your injury to thaw then refreeze. This is very dangerous and can cause serious or permanent injury. It is better to delay warming. For example, keep walking to a permanent shelter rather than warm frozen toes at a temporary shelter and then expose them to more cold on the rest of the trip.
• Don't use dry heat (sunlamp, radiator, heating pad, etc.) to thaw the injured area.
• Don't thaw the injury in melted ice.
• Don't rub the area with snow.
• Don't use alcohol, nicotine, marijuana, or other drugs that may affect blood flow.

SUMMARY
Frostbite can be a serious, disabling condition. Use your head! Keep safety in mind when traveling in cold weather, during winter sports participation, and when outside during the frigid winter months.

References
Mayo Clinic website, http://www.mayoclinic.com, search for frostbite

If you are a registered University of Illinois student and you have questions or concerns, or need to make an appointment, please call: Dial-A-Nurse at 333-2700

If you are concerned about any difference in your treatment plan and the information in this handout, you are advised to contact your health care provider.

Visit the McKinley Health Center Web site at: http://www.mckinley.illinois.edu

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