



# Clinical Update

## For Telephone Triage Nurses

Quarter 1, 2014

### Key Points

Frostbite and hypothermia are two different problems.

**Frostbite** is a cold injury to the skin. It occurs when nerves, blood vessels and skin are frozen for a short time. It happens most often to the ears, nose, penis, fingers and toes. A person with frostbite may have a normal core body temperature.

**Hypothermia** means there is a large drop in the body's core temperature. A person can have hypothermia without having frostbite. Hypothermia happens when the body temperature drops below 95°F (35°C), measured rectally. Hypothermia is a medical emergency. It can be deadly if it is not treated right away.

### The Polar Vortex and Frostbite

The polar vortex is a body of extremely cold air that hovers over the pole year round. The winds in the polar vortex exceed 100 mph and they keep the frigid air locked inside. When the winds slow down, some of cold air can come spilling down over North America. The 2014 polar vortex has given us the coldest winter in two decades. The middle of the country has been plunged into a deep freeze. Humans and animals are at risk of frostbite and hypothermia. We thought that a quick review of frostbite might be helpful.

#### Types of Frostbite

- *Frostnip*: This is mild frostbite. It may cause cold, tingling, or painful skin
- *First Degree*: Skin will be white and hard while frozen. There may be mild swelling after re-warming.
- *Second Degree*: Same as first degree. There will be blisters after 24 hours.
- *Third Degree*: Blue blisters that turn into dead skin.

#### Risk Factors

- *Alcohol, Mental Illness*: These impair a person's judgment. They can lead to poor decision-making, such as not wearing proper clothing for cold weather.
- *Medical Conditions*: These may make a person more prone to frostbite. People with diabetes, congestive heart failure, poor circulation, and Raynaud's disease are all at risk. People who have had frostbite in the past are more likely to get it again.
- *Type of Contact*: Frostbite is much worse if skin and clothing are wet. Touching bare hands to cold metal can cause frostbite right away. Touching bare hands to products that are stored outside in the cold can also cause frostbite. An example is gasoline.
- *Length of Contact*: The longer the exposure, the greater the heat loss and chance of frostbite. The wind-chill index on a cold day plays a part in how quickly frostbite happens.

#### Prevention

- Change wet gloves or socks right away.
- Limit time spent outdoors when the wind-chill temperature falls below zero.
- Know the first warnings of frostbite. Pain, tingling, numbness are early signs to go indoors.
- *Clothing*: Dress in layers for cold weather. The first layer should be long underwear. This should be made of polypropylene or polyester, which takes moisture away from skin. The middle layer(s) should be fleece or wool. The outer layer serves as a windbreaker. It also needs to be waterproof. The layers should be loose, not tight.
- *Hand Protection*: Mittens are warmer than gloves. Wear a thin glove under the mitten for extra protection.
- *Headwear*: Wear a hat. Over 50% of heat loss comes from the head.

# Clinical Update

## For Telephone Triage Nurses

Page 2 of 2



- **Footwear:** Do not wear shoes that are too tight. They can decrease circulation. Wear 1-2 pairs of socks made from wool or a wool blend. Wear a thin liner sock under the wool socks for extra protection. This should be made from polyester or polypropylene, which takes moisture away from skin.

### Treatment

#### 1. Frostbite Treatment - Re-warming:

- Re-warm the area rapidly with wet heat.
- Move into a warm room.
- *For Frostbite of Fingers and Toes:* Put the body part in very warm water. A bathtub or sink is often the quickest option. The water should be very warm (104° to 108°F, or 40° to 42°C). It should not be hot enough to burn you. You should keep soaking in this warm water for about 30 minutes. A pink flush means blood flow has returned to the body part. At this point, the numbness should be gone.
- *For Frostbite of the Face:* Put a warm wet washcloth on the area. You should keep doing this for about 30 minutes.
- With more severe frostbite, the last 10 minutes of re-warming can be quite painful.
- If you are not using a tub, keep the rest of your body warm. Cover yourself with plenty of blankets.

#### 2. Frostbite Treatment - Common Mistakes:

- Do not put snow on the frostbitten area. This can cause damage to thawing tissues.
- Do not re-warm with dry heat. This includes a heat lamp or electric heater. You could burn yourself, but not feel it.
- Do not re-warm if it could freeze again in the next couple hours. Freezing-warming-freezing causes more damage than freezing-warming.

#### 3. Drink Warm Liquids:

Drink warm liquids, such as hot chocolate.

#### 4. Aloe Vera Ointment:

Put aloe vera on the area 2 times a day for 5 days.

#### 5. Ibuprofen:

For true frostbite, use ibuprofen for pain relief.

#### 6. Tetanus Shot for Frostbite:

If your last tetanus shot was more than 10 years ago, you need a booster.



### References

Centers for Disease Control and Prevention. ACIP. Diphtheria, tetanus, and pertussis: recommendations for vaccine use and other preventive measures. MMWR. 1991;40: RR-10, 1-28. [PMID-1865873](#)

Heggors JP, et.al. Experimental and clinical observations on frostbite. Ann Emerg Med. 1987;16:1056. [PMID-3631670](#)

Markenson D, Ferguson JD, Chameides L, Cassan P, Chung KL, Epstein J, Gonzales L, Herrington RA, Pellegrino JL, Ratcliff N, Singer A. Part 17: First Aid - 2010 American Heart Association and American Red Cross Guidelines for First Aid [http://circ.ahajournals.org/content/122/18\\_suppl\\_3/S934.full.pdf+html](http://circ.ahajournals.org/content/122/18_suppl_3/S934.full.pdf+html) [PMID-20956233](#)

Patel NN, Patel DN. Frostbite. Am J Med. 2008 Sep;121(9):765-6. [PMID-18724962](#)

Copyright 2014.  
Barton Schmitt, MD  
David Thompson, MD  
[www.stcc-triage.com](http://www.stcc-triage.com)