

FROSTBITE

Iditarod! Jack Frost is nipping at the noses of mushers and dogs on the trail from Anchorage to Nome. When he does more than nip, you need to take care. Frostnip, chilblains, frostbite, or tissue freezing, occurs in temperatures below 32 degrees Fahrenheit. As the skin cools, blood vessels constrict to keep blood away from that cold area to preserve body warmth. Because there's no blood flow, the skin dies. Mild cases are most common but with proper preventive measures, frostbite and other cold related illnesses need not occur at all. Answer the following questions to learn more about frostnip, chilblains and frostbite. Suggested sources: www.webmd.com; www.mayoclinic.com

1. What is frostnip or chilblains?

2. What are the signs and symptoms of frostnip?

3. What is frostbite?

4. What are the signs and symptoms of frostbite?

5. What causes frostnip, chilblains and frostbite?

6. What First Aid should be given for frostbite or chilblains?

What to do –

What not to do –

7. Until medical help becomes available, what First Aid can be given for frostbite?

What to do –

What not to do –

8. How can you prevent frostnip, chilblains and frostbite?

FROSTBITE APPLICATION PROBLEMS

Now that you know a few facts about the cold-related illness of frostbite and how it affects people who work or play in the out-of-doors during cold weather, let's consider two special questions. These questions will require some additional research on your part.

DOUG SWINGLEY

What unusual circumstance required Doug Swingley to withdraw from the 2004 Iditarod? Was this situation related in any way to frostbite? What preventive measures could Doug have taken to avoid having to withdraw from the 2004 Iditarod? How might skiers or snowboarders benefit from Doug's experience?

JACK FROST NIPPING AT YOUR TAIL

During cold weather, human athletes need to protect fingers, toes, noses and ears from frostnip or frostbite by wearing protective clothing when outside yet without wearing hats and mittens and warm socks, canine athletes, wolves and other animals survive in frigid temperatures rarely being affected by frostbite. What factors make animals, especially sled dogs, so capable of surviving in cold conditions that would be extremely dangerous for humans?

How can dogs walk around in snow and subzero weather without getting frostbite on their feet?

In researching this question, I found two very knowledgeable sources. The first was my veterinarian, Rebecca Lee. Dr. Lee lived in Fairbanks, Alaska and served in the veterinary corps for many sprint races as well as the Yukon Quest. She also cared for the dogs in Susan Butcher's Kennel. The second was an article that quoted Stuart Nelson Jr. DVM, the head veterinarian for the Iditarod. Given their experience, I figured if ever a vet knew about dogs and frostbite it would be one or both of these two. They both concurred as to why dogs don't frostbite their feet.

In an article found in the Chicago Reader at straightdope.com, Dr. Nelson says he's seen some frostbitten canine parts but never any feet. He thinks this may result from some peculiarity of the canine circulatory system. When people are exposed to extreme cold, vasoconstriction in the extremities reduces the flow of blood to the area, helping reduce heat loss and maintain the body's core temperature. Maybe this doesn't happen with dogs. Or maybe they just have more blood vessels in their feet. Whatever the case, it's not something peculiar to sled dogs. Nelson says he's never seen frostbitten dog feet in private practice either.

Dr. Lee has seen dogs with frostbitten nipples as well as the tips of their tails and ears. She attributes the rarity of frostbitten feet in dogs to several factors. The dogs have fur on their feet and around their pads. The thick epithelial (leather like) pads protect the bottom of their feet. Dogs have a higher body temperature (100 – 102.5) than humans do and their heart rate (100 – 120) is also higher. Their metabolism is very high and up to 50 percent of their calories come from fat. Dogs and other animals are able to curl their feet next to their bodies when they sleep. For the dogs, this is an adaptation to their environment. It's a survival mechanism – if a dog or other wild animal can't move, it dies. When extremities get cold in animals, circulation doesn't decrease as it does in humans.

Other vets doubt that dogs enjoy any special protection though they concede that frostbitten paws are rare. A 1975 veterinary account of the Iditarod, before Nelson's time, mentions a few cases of frostbite but these occurred because booties intended to protect dogs with paw abrasions were tied too tightly and impeded circulation. This backs the circulation theories presented by both Nelson and Lee.

The explanations offered by Dr. Lee and Dr. Nelson seem to satisfy the question – dogs don't wear warm boots or clothes but they withstand conditions that would most certainly kill a human.