

Foot and Ankle Update

Casper Orthopedic Associates



"Lower Extremity Cold Injuries"

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Background *January 2010*

Most cases of frostbite have occurred in military conflicts. Dr. Baron Larrey, Napoleon's surgeon in the 1800s, recommended gradual rewarming based on experiences on the Russian front. As a result of experiences in World War II, rapid rewarming has emerged as the standard of care. Since hypothermia often accompanies frostbite, core body temperature measurement is an integral part of the treatment of frostbite. Frostbite can be classified as superficial or deep.

Superficial frostbite manifests as either "whitish" skin or clear or cloudy blisters. Deep frostbite is marked by blood filled blisters and dark dead skin (eschars) with tissue necrosis. The influence of race on frostbite is controversial. Some resistance to frostbite has been recorded in Northern Eskimos and African-Americans may be more susceptible. Smoking and alcohol can predispose to cold related injuries as well as vascular disease.

Treatment

The treatment of frostbite should not begin until core body temperature is at least 95 degrees. Increasing core body temperature can be passive (blankets, warm room) or active (warmed IV fluids, blood). Furthermore, the warming and refreezing of extremity injuries is to be avoided. This can cause further irreparable damage to the extremity. Rewarming of an extremity should not occur until the victim can be assured of a warm environment.

The following is a treatment algorithm:

- 1. Immobilize extremity and prevent further injury. Avoid warm and refreeze cycles**
- 2. Correct hypothermia**
- 3. Rapid rewarming in 104-107.6 F water for 15-30 minutes; tetanus prophylaxis; analgesics**
- 4. After rewarming the victim should be treated with wound care, antibiotics, and vigilance for compartment syndrome (swelling in limb)**

Conclusion

Prevention of frostbite includes attention to temperature and wind. Body surfaces should be covered and avoidance of extreme conditions is recommended. Rapid rewarming of extremities is recommended following treatment of core body temperature. Medical and surgical care may be needed depending on severity.



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