

Frostbite

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Frostbite can be a tissue injury that can occur after exposure to extremely low temperatures, usually affecting the face, ears, fingers, and/or feet; frostbite may occur accompanied with or without hypothermia. Mild frostbite is reversible, while severe cases may require removal of the injured part. Non-frostbite cold injuries are usually less severe and include immersion injuries, panniculitis, cold urticaria, and pernio. Introduction Humanity has struggled against injuries caused by extreme environmental conditions. While ancient physicians like Hippocrates and Galen wrote extensively about hypothermia, most reports of cold injuries within the literature come from military history. Hannibal lost 1/2 his army crossing chain in 218 B.C. During Napoleon’s retreat from Moscow within the fall and winter of 1812, as many as 50,000 soldiers died of hypothermia. During the nice World Wars of the primary 1/2 the 20th century, ground troops on the march and within the trenches of Europe succumbed to the severe effects of the cold. High altitude frostbite was described in 1943, accounting for more injuries to heavy bomber crews in warfare II than all other causes combined. and through the war, 10% of the whole US casualties were thanks to the cold.^{1,2}

Frostbite refers to local tissue freezing and injury that may occur with any degree of hypothermia. “Frostnip” refers to

cold-related tingling and numbness that's not related to any tissue damage. The hands and feet are the foremost common sites (almost 90% of the time), followed by the ears, nose, cheeks, and penis. While most texts note that the very young and therefore the elderly are at highest risk, frostbite is most typical in adults from 30-50 years old. In extensive studies from the Scandinavian countries, frostbite has been related to wet and improper clothing, a history of previous hypothermia or frostbite, wound infection, diabetes, and smoking. All of those factors are commonplace among persons fighting homelessness, and clinicians must be vigilant for frostbite during the weather.^{1,2,3}

General features⁴

-Freezing can occur in the presence or absence of hypothermia.

One of the most affected areas can be the face, distal areas such as ears and fingers.

-It can start with paresthesias followed by numbness.

Characteristics by stage

Frostbite has similar classifications to burns, although they are more difficult to stage as they are purely clinical.⁵

Stage		Clinical features	Tissue loss
Simplified	Classic		
Superficial or mild frostbite	1 st degree	<ul style="list-style-type: none"> Erythema, progressing to pale, waxy skin Mild edema Numbness 	<ul style="list-style-type: none"> Typically none or minimal
	2 nd degree	<ul style="list-style-type: none"> Clear fluid-filled blisters Erythema and edema 	
Deep or severe frostbite	3 rd degree	<ul style="list-style-type: none"> Hemorrhagic blisters 	<ul style="list-style-type: none"> Significant
	4 th degree	<ul style="list-style-type: none"> Tissue necrosis extending into the muscle, down to the bone 	

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The main objective is to try to preserve the integrity of the tissues as quickly as possible, thus avoiding the progression of inflammatory mediators. This section describes the three phases of frostbite treatment. Pre-Thaw Phase The goal of this initial phase is to prevent thawing and refreezing, which magnifies tissue damage. Wet clothing should be removed from the affected area. In urban areas with hospital availability, do not try to thaw in the field. The affected area should be wrapped in loose clothing and splinted to prevent trauma. Try to minimize movement of the area. Never rub or massage the area. Do not use heating pads or heat lamps because the frostbitten area is insensitive and severe burns can easily occur.^{6,7}

CONCLUSION

Frostbite is a cold-induced tissue injury due to hypoperfusion of the same tissues, affecting more areas with less vascularization. Frostbite can be superficial or deep depending on the time and intensity to which the tissues have been exposed. Deep frostbite can lead to amputation of multiple limbs of varying extent if left untreated. The best treatment for frostbite is prevention. Wear a hat and gloves in the cold, as well as layer clothing. Remember that frostbite occurs much more quickly on days where the wind is stronger and/or raining.⁶

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