

Guidelines for Exercising in Cold Weather

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Cold exposure can be uncomfortable, impair performance and even become life-threatening. The following guidelines will offer information on the dangers of exercising in extreme temperatures, as well as information on how to prevent cold related injuries.

HOW COLD IS TOO COLD TO ALLOW STUDENTS TO EXERCISE OUTDOORS?

Although temperature is a prime indicator, other factors must be considered, such as wind chill, whether the ground is frozen or the sun is shining, whether the athletes are dressed appropriately, what activity the athletes will be participating in, and the length of time that will be spent outside. **It is ultimately the responsibility of the coach to consider all of this information, as well as the information listed in this fact sheet, when making a decision to exercise outdoors in the cold.**

HEALTH RISKS INVOLVED WITH EXERCISE IN THE COLD...

HYPOTHERMIA

Hypothermia, a situation in which the core temperature in the body becomes dangerously low, is a life-threatening condition. Exercise in the cold has the perfect recipe for developing hypothermia: rapid cooling of the body, exhaustion and energy depletion. When the body and clothing are wet (whether from sweat, rain, snow, etc.), cooling of the body occurs very quickly, thus increasing the risk of hypothermia on a cold day. **NOTE: HYPOTHERMIA CAN OCCUR AT TEMPERATURES ABOVE FREEZING, ESPECIALLY WHEN THE WIND-CHILL MAKES MAINTAINING BODY TEMPERATURE DIFFICULT.**

FROSTBITE:

Frostbite occurs when skin and underlying tissues freeze, and can cause permanent tissue damage. It usually occurs to the face, ears, fingers, and toes. The chart above shows how quickly skin can freeze in various conditions (taking wind-chill into consideration).

OTHER CONDITIONS:

Cold air can trigger an **asthma** attack, so athletes with asthma should take appropriate precautions to warm-up adequately and prevent an attack.

The risk for **musculoskeletal injuries** can increase when exercising in the cold, so appropriate warm-up is recommended to increase body temperature leading into exercise.

		AMBIENT TEMPERATURE (°F)																		
		40°	35°	30°	25°	20°	15°	10°	5°	0°	-5°	-10°	-15°	-20°	-25°	-30°	-35°	-40°	-45°	
WIND SPEED (MPH)	Calm	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-65	-72	-77
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	-81
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	-84
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	-87
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	-89
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	-90
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	-91	
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-85	-93	-93	
50	26	18	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-59	-67	-74	-81	-88	-95	-95	
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-69	-76	-83	-90	-97	-97	
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-70	-77	-84	-91	-98	-98	

Frostbite Times 30 minutes 10 minutes 5 minutes

Courtesy of the National Weather Service

First Aid for Hypothermia

Hypothermia is a medical emergency. If you suspect someone is suffering from hypothermia, get them to a medical facility immediately. Try to make them warm and dry in the meantime (warm blankets are best), and if possible, rehydrate with a warm beverage.

Signs of Hypothermia:

Excessive Shivering
Sluggishness, Poor Judgment, Disorientation
Slow/Slurred Speech

First Aid for Frostbite:

If you suspect you may have frostbite, use warm 100°F-105°F (not hot) water to increase tissue temperature.

Do not rub the affected area.

If warm water is not available, place dry, gloved hands over the area.

Do not walk on frostbitten feet.

If numbness remains, seek medical attention immediately.

Signs of Frostbite:

Lack of sensitivity to touch/Numbness
Sharp/achy pain
Skin becomes hard, pale, cold
White patches may develop on the skin

Learn more about PREVENTING cold injuries on the next page...

PREVENTING INJURIES in the COLD:

If you must exercise in the cold, the following precautions will help you prevent any injuries.

CLOTHING

Dress in layers and try to stay dry. Layers can be added/removed depending on temperature, activity, and wind chill. Remember that moisture, whether from perspiration or precipitation, significantly increases body heat loss. *Fabrics that wick sweat away from the skin and stay dry are preferred as base layers* because they help maintain a dry environment next to the skin. Wool, waterproof, or wind blocking materials are preferred as outer layers to help avoid rain and wind chill. Cotton materials are a poor choice because they hold moisture and cause the body to lose heat when wet. Also, up to 50% of your body heat can be lost through your head and neck, so *the head should be covered in cold weather conditions*. Hand covering should be worn as needed, and mittens are warmer than gloves. A scarf or mask can be used to warm the air for athletes who suffer from asthma.

ENERGY/HYDRATION

Maintain adequate energy levels throughout the day and during exercise. This means to *eat and drink adequately throughout the day*, including while you are exercising. Negative energy balance increases the susceptibility to hypothermia. Stay hydrated. Fluids are as important in the cold as in the heat.

FATIGUE/EXHAUSTION

Fatigue and exhaustion deplete energy reserves and increase the susceptibility to hypothermia.

WARM UP

Warm up thoroughly and keep warm throughout the practice or competition to prevent a drop in muscle or body temperature. Time the warm-up to lead almost immediately to competition. After competition add clothing to avoid rapid cooling.

TRAIN WITH A FRIEND

Train with a friend. An injury such as a sprained ankle can become life threatening when it occurs during a cold-weather workout on an isolated trail.

Resources:

NCAA Sports Medicine Handbook: Guideline 2m - Cold Stress. Jun. 1994, revised June 2002. 21 Jan. 2005
<http://www.ncaa.org/library/sports_sciences/sports_med_handbook/2003-04/2m.pdf>.

Grand Rapid Public Schools. Preventing Weather Related Athletic Injuries. 21 Jan. 2005.
<<http://web.grps.k12.mi.us/athletics/weather.html>>.