

HYPOTHERMIA

Whenever you are outdoors in Alaska, a deadly killer is close at hand. It can kill you as surely as falling from a cliff or being mauled by a grizzly bear. Have you ever heard of hypothermia? A surprising number of Alaskans have not. Hypothermia is a major cause of death in Alaska's out of doors, striking down dozens of people every year. Hypothermia has been called "the killer of the unprepared" because it often strikes people who have never heard of it or don't know how to handle it. Hypothermia can happen to anyone, at any time of year. It has killed snowmobilers and skiers in the winter, and has killed swimmers, fishermen, and hikers in the summer. What exactly is hypothermia and what does it do? Hypothermia is a drop in your body's core temperature. It occurs when heat lost from your body exceeds heat gained through food, exercise, and external sources. Hypothermia is a special threat when you are overexerted or when you are wet and exposed to wind. By understanding all aspects of hypothermia, you may save a life—possibly your own.

What This Article Covers

The purpose of this article is to help you identify and prevent hypothermia. More specifically, you should understand the following:

- The danger of hypothermia.
- How to recognize hypothermia.
- How to prevent hypothermia.
- That hypothermia is a threat to anyone—including fishermen, boaters, hunters, hikers, dock workers, and dog mushers.
- How wind increases the risk of hypothermia and how to calculate wind chill.

The Danger of Hypothermia

You are stranded on a windy point of land after surviving a mishap at sea. It is wet and chilly. You and your partner are soaking wet from exertion and from dragging your raft ashore. Within one hour after going ashore you notice something unusual about your partner; his movements seem a bit uncoordinated and his speech sounds strange. Some of the things he says don't make sense. Do you know what this means? Your partner very likely is becoming hypothermic. He is losing body heat, which is lowering his body's core temperature. Hypothermia kills dozens of people in the winter, and it kills people in the summer as well. If you took your clothes off and sat still in a room at 80°F, you would eventually suffer from hypothermia. If that temperature dropped 20 degrees in windy, rainy weather, you would become hypothermic very quickly. The most dangerous thing about hypothermia is that it can sneak up on you without warning.

HEAT LOSS

HEAT GAIN

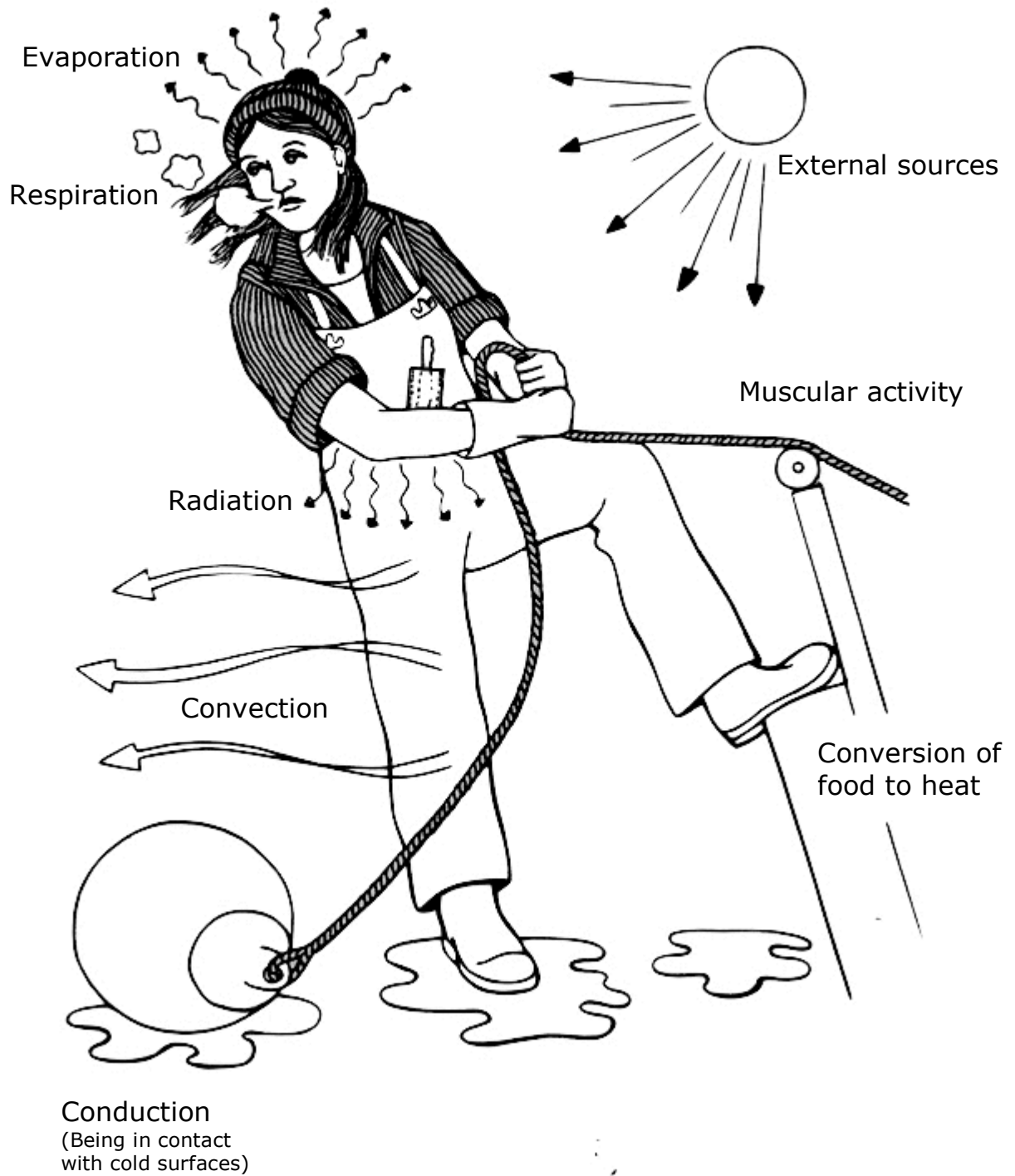


Figure 2: Hypothermia can occur when body heat loss exceeds heat gain.

Late October on Kodiak Island can be cold and damp, but on rare days the island breaks through the rain and fog and sparkles in the sunshine. On these days it is hard to imagine how raw the elements can be.

One sunny day, Wilford Jamieson, a Kodiak school teacher, and his 12-year-old son Robert left their base camp on Zacher Bay to hunt deer. They skipped breakfast so they could get an early start. After crossing a swift stream on a fallen log, they climbed a steep, 1,500-foot ridge on the north side of the valley. It was 10 o'clock when the two hunters, wet from the climb, sat down on a grassy knoll and began glassing for a deer.

Had the Jamiesons not been looking intently for deer, they might have seen a change in the weather. The blue sky disappeared, replaced by an overcast gray sky and a few snowflakes. Soon the snow was coming down heavily—large, wet flakes that accumulated quickly. After finding fresh deer tracks in an alder thicket, the father and son began tracking in the new snow. The tracks led up the valley. The two followed. They jumped a buck an hour later and the elder Jamieson dropped him with a well-placed shot. A seasoned woodsman and hunter, Jamieson quickly dressed the deer and strapped it to his packframe. By that time it was late afternoon. The two hunters, tired and soaked to the skin, started back through the snow-covered alders.

They never made it to camp. When the Jamiesons failed to make their pick-up flight the next day, a search party was flown out. The searchers followed the tracks of the two down the ridge showing that the Jamiesons had wandered aimlessly back and forth through the snow. The tracks crossed the river and then headed upstream—away from the camp.

The rescuers found them nearly five miles upriver. The boy, suffering from hypothermia and frostbite, was quickly flown to a hospital in Kodiak, where he recovered. The elder Jamieson was buried that week.

Anyone familiar with hypothermia would have known what was happening from the tracks in the snow. The two hunters were mentally confused, which is one of the early signs of hypothermia. The wet snow undoubtedly contributed to the hunters' condition. Hypothermia is a greater threat when you are wet and exposed to wind or immersed in water. **Cold water will rob your body of heat about 25 times faster than air of the same temperature.**

Hypothermia Symptoms

Often, the first stage of hypothermia is shivering. Shivering is the body's first attempt to warm itself—to generate enough heat to prevent hypothermia. As the body continues to lose heat, the senses may become numbed. The person may lose physical coordination, speech may be slurred, and mental confusion and drowsiness can occur. At a more serious stage, a person may become weak and unable to walk. This can lead to unconsciousness and coma, and then to an irregular heartbeat and eventually death.

This sequence of events varies from person to person, and may take anywhere from several minutes, to several hours, to even days. A person may not have every symptom. For example, shivering may not occur at all in the very young, the elderly, people who drink alcohol, and people taking certain medications or suffering from particular metabolic disorders.

How do you know you are losing body heat? Often you don't. The onset of hypothermia may be subtle. Hypothermia can cloud your judgment and lead you to believe everything is perfectly normal, when in fact things are very wrong.

The best way to check for hypothermia symptoms is to have a companion watch you. Watch each other. Make sure each other's speech is normal. Watch to see if either of you stumbles. Keep in mind that many victims of hypothermia, if told what is happening to them, refuse to believe it.

Preventing Hypothermia

Your best prevention against hypothermia is to keep your "inner furnace" warm. You can maintain your inner body core temperature by doing mild exercises (but avoid perspiration), by wearing proper clothing, and when possible, by eating high-energy foods and drinking water regularly. Remember to eat only when you have water to drink. Digesting food requires water; eating without water can speed up dehydration of your body.

Types of Clothing

Wearing warm clothes is one of the best ways to prevent hypothermia. Wool and polypropylene are some of the best materials because they retain their insulating properties even when they are wet.

Dressing in layers helps. For example, your clothing might include long underwear, wool pants, polypropylene shirt, fleece sweater, light nylon coat with fleece liner, rain gear, gloves, wool socks, and a wool cap. As you heat up or cool down, you can remove or add layers. Loose-fitting layers with air pockets will provide more warmth than tight ones.

A warm hat is absolutely necessary when you are outdoors in bad weather. **You can lose about 50 percent of your body heat from your head and neck alone.** A wool cap or scarf will prevent much of this heat loss.

The danger of hypothermia is much greater when you are immersed in cold water, though the tale of people freezing to death in Alaska's waters within minutes is not true. The water may be cold enough to make it impossible to swim any distance, but it won't kill you immediately. Shipwreck survivors have lived in Alaska waters for one or two days wearing an insulated immersion suit, and up to a few hours with only a life vest.

Wind Chill

As mentioned earlier, hypothermia is a greater threat when you are wet and exposed to wind or immersed in water. The effective lowering of the air temperature by wind is called wind chill. It is important to understand the effect that moving air can have in increasing body heat loss. Even though the actual air temperature as measured by a thermometer may not be dangerously low, as wind speed increases, the danger due to heat loss can be greatly increased, especially for a person who is not properly dressed.

U.S. Customary Wind Chill Chart												
Estimated Wind Speed in MPH	Actual Thermometer Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER* (for properly clothed person)				INCREASED DANGER* (for properly clothed person)				GREAT DANGER*			
	*DANGER FROM FREEZING OF EXPOSED FLESH											

Figure 2

To use the wind chill chart (Figure 2), find the temperature at the top of the table and find the wind speed on the left side of the table. Follow the temperature column and the wind speed row to where they meet on the table to determine the wind chill. **For example, if the actual temperature is 10°F and the wind speed is 20 mph, the wind chill would be -25°F (Figure 3).**

U.S. Customary Wind Chill Chart												
Estimated Wind Speed in MPH	Actual Thermometer Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER* (for properly clothed person)				INCREASED DANGER* (for properly clothed person)				GREAT DANGER*			
	*DANGER FROM FREEZING OF EXPOSED FLESH											

Figure 3

If there is no wind or the wind is calm, the wind chill is the same as the actual air temperature. For example, if the actual air temperature is 30°F and the wind is calm, the wind chill is 30°F (Figure 4).

U.S. Customary Wind Chill Chart												
Estimated Wind Speed in MPH	Actual Thermometer Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER* (for properly clothed person)			INCREASED DANGER* (for properly clothed person)				GREAT DANGER*				
*DANGER FROM FREEZING OF EXPOSED FLESH												

Figure 4

However, if the wind speed is greater than 40 mph, use the 40 mph wind speed row to determine the wind chill, as wind speeds greater than 40 mph have little additional effect. For example, if the actual air temperature is 20°F and the wind speed is 50 mph, the wind chill is -21°F (Figure 5).

U.S. Customary Wind Chill Chart												
Estimated Wind Speed in MPH	Actual Thermometer Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER* (for properly clothed person)			INCREASED DANGER* (for properly clothed person)				GREAT DANGER*				
*DANGER FROM FREEZING OF EXPOSED FLESH												

Figure 5

If the actual air temperature falls between two temperatures, find the wind chill for the two temperatures the actual air temperature is between, and then estimate what the wind chill would be between those two numbers. **For example, if the actual air temperature is 5°F and the wind speed is 15 mph, the wind chill is approximately half way between -18°F and -36°F, or about -27°F (Figure 6).**

U.S. Customary Wind Chill Chart												
Estimated Wind Speed in MPH	Actual Thermometer Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER* (for properly clothed person)			INCREASED DANGER* (for properly clothed person)				GREAT DANGER*				
	*DANGER FROM FREEZING OF EXPOSED FLESH											

Figure 6

If the actual wind speed falls between two wind speeds, find the wind chill for the two wind speeds the actual wind speed is between, and then estimate what the wind chill would be between those two numbers. **For example, if the actual air temperature is 0°F and the wind speed is 28 mph, the wind chill is a little more than half way between -44°F and -48°F, or about -47°F (Figure 7).**

U.S. Customary Wind Chill Chart												
Estimated Wind Speed in MPH	Actual Thermometer Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER* (for properly clothed person)			INCREASED DANGER* (for properly clothed person)				GREAT DANGER*				
	*DANGER FROM FREEZING OF EXPOSED FLESH											

Figure 7