

Emergency Medical Responder: A Skills Approach

Fifth Canadian Edition



FIFTH CANADIAN EDITION

EMERGENCY MEDICAL RESPONDER

A SKILLS APPROACH

MEETS PARAMEDIC ASSOCIATION OF CANADA'S
NATIONAL OCCUPATIONAL COMPETENCY PROFILE



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Chapter 16

Heat and Cold Emergencies

Objectives (1 of 2)

- Describe three ways the body creates heat and two ways it can conserve heat.
- Describe the five ways the body loses heat.
- Compare the signs and symptoms of mild and of severe hypothermia and explain the care of both.
- Explain under what conditions rewarming of a local cold injury should be done.



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Objectives (2 of 2)

- List five factors that can contribute to a heat emergency.
- Describe how to identify a patient with a heat emergency and explain how to cool a patient with hyperthermia.
- Demonstrate a caring attitude toward the patient and family when dealing with a heat or cold injury, while giving priority to the interests of the patient.

Five Ways the Body Loses Heat



Figure 16-1 Mechanisms of heat loss.

Hypothermia Risk Factors

- Medical condition of patient
- Drugs, alcohol, poisons
- Age of patient

Figure 16–2 Wind Chill Calculation Chart

Wind Chill Calculation Chart

Actual Air Temperature	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
Wind Speed at 10 metres in km/h												
5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
15	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
20	1	-5	-12	-18	-24	-31	-37	-43	-49	-56	-62	-68
25	1	-6	-12	-19	-25	-32	-38	-45	-51	-57	-64	-70
30	0	-7	-12	-19	-25	-33	-38	-45	-52	-59	-64	-70
35	1	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
40	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
45	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-70	-76
50	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-70	-76
55	-2	-9	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
60	-2	-9	-16	-23	-30	-37	-43	-50	-57	-64	-71	-78
65	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
70	-2	-6	-16	-23	-30	-37	-44	-51	-59	-66	-73	-80
75	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
80	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

Thresholds:

- Risk of frostbite in prolonged exposure -25
- Frostbite possible in 10 minutes -35
- Frostbite possible in 2 minutes -60

Warm skin, suddenly exposed. Shorter time if skin is cool at the start.

Environment Canada (2012)

Figure 16–2 Wind chill calculation chart.

Stages of Hypothermia

- Stage 1: **Shivering** is a response by the body to generate heat. It does not occur below a body temperature of 32°C.
- Stage 2: **Apathy and decreased muscle function.** First, fine motor function is affected, then gross motor functions.
- Stage 3: **Decreased level of consciousness** is accompanied by a glassy stare and possible freezing of the extremities.
- Stage 4: **Decreased vital signs**, including slow pulse and slow respiration rate.
- Stage 5: **Death.**



Figure 16-3 Stages of hypothermia.

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Signs and Symptoms of Hypothermia

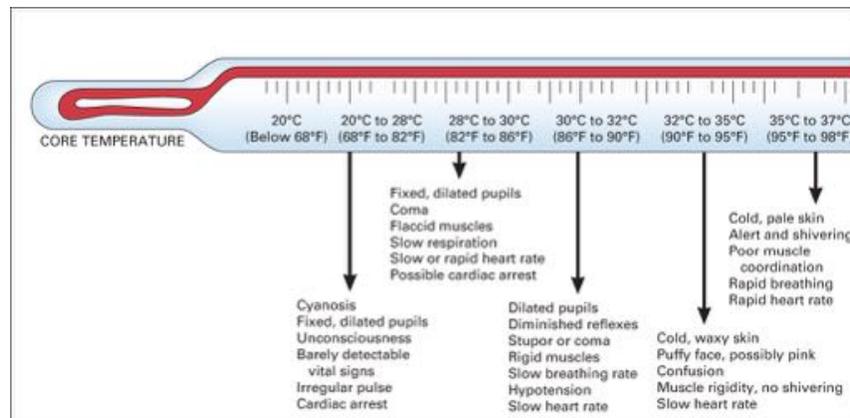


Figure 16-4 Signs and symptoms of hypothermia.

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Mild Hypothermia Signs and Symptoms

- Increased breathing rate
- Increased pulse rate and blood pressure
- Slow, thick speech
- Staggering walk
- Sluggish pupils
- Uncontrollable shivering

Signs and Symptoms of Severe Hypothermia

- Extremely slow breathing rate
- Extremely slow pulse rate
- Unconsciousness
- Fixed and dilated pupils
- Rigid extremities
- Absence of shivering

Emergency Care

- Remove the patient from the cold environment
- Remove all wet clothing and cover patient with a blanket
- Administer oxygen, if allowed
- Handle the patient very gently
- Comfort and reassure the patient

Local Cold Injuries

Figure 16–6a Frostbite, or local cold injury.



Figure 16–6a Frostbite, or local cold injury.

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Figure 16–6b Late or deep frostbite.



Figure 16–6b Late or deep frostbite.

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Local Cold Injuries -Rewarming

- Warm the entire frostbitten area in tepid water (about 37°C to 40°C)
- Be sure to pick a container that permits the entire area to be immersed
- Continue to support the injured limb during rewarming
- Do not allow the injured area to touch the bottom or side of the container
- If the water starts to cool, remove the limb from the water. Then, add more warm water

Hyperthermia Risk Factors

- Heat and humidity
- Exercise and strenuous activity
- Age of patient
- Medical condition of patient
- Certain drugs and medications

Signs and Symptoms of a Heat Emergency

(1 of 2)

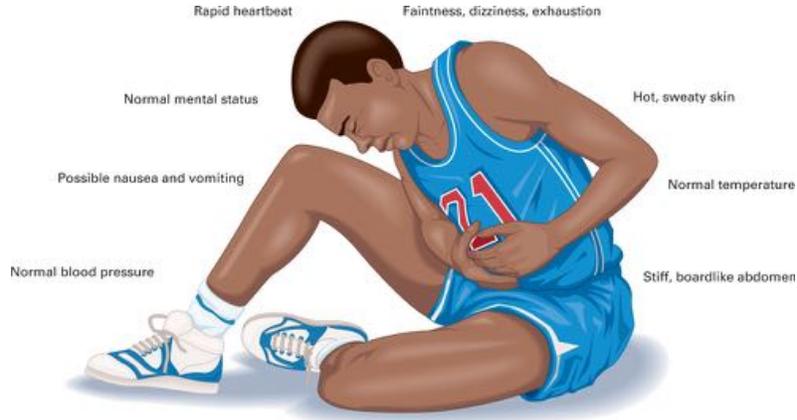
- Muscle cramps
- Weakness, exhaustion
- Dizziness, faintness
- Initially rapid pulse that gives way to a weaker one as damage progresses
- Headache

Signs and Symptoms of a Heat Emergency

(2 of 2)

- Seizures
- Loss of appetite, nausea, vomiting
- Altered mental status, possibly unconsciousness
- Skin that may be moist, pale, and normal to cool in temperature, or hot and dry, or hot and moist

Signs and Symptoms of Heat Cramps or Heat Exhaustion



Severe muscular cramps and pain, especially of the arms, fingers, legs, calves, and abdomen

Figure 16-7 Signs and symptoms of heat cramps.

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Signs and Symptoms of Heat Stroke

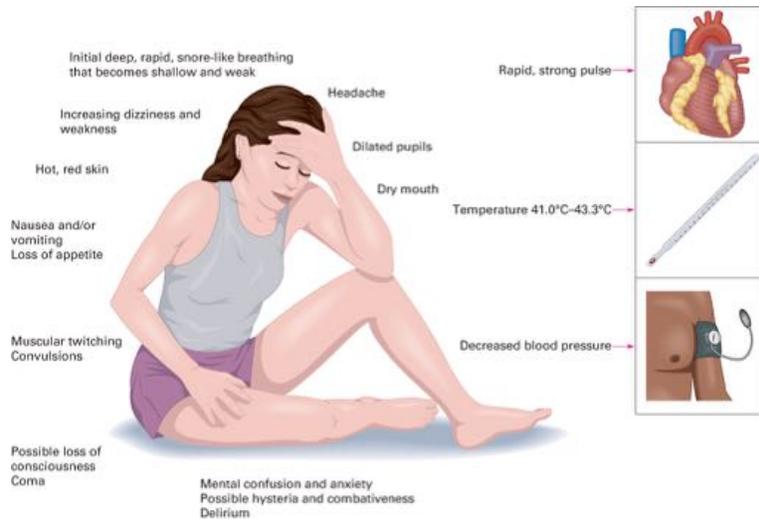


Figure 16-9 Signs and symptoms of heat stroke.

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Emergency Care for Patients with Moist, Pale, and Normal to Cool Skin Temperature

- Remove patient from the hot environment
- Administer oxygen, if allowed
- Cool the patient
- Position the patient
- Monitor the patient

Emergency Care for Patient with Hot Skin

- Loosen or remove clothing
- Apply cold packs to the neck, armpits, and groin
- Keep the skin wet by applying water with wet towels or a sponge
- Fan the patient aggressively
- Continually monitor the patient