



Portage County EMS Patient Care Guidelines



Hypothermia and Frostbite

Note:

- Most cases of accidental hypothermia encountered by EMS involve alcohol and drug abuse.
- In the hypothermic patient, rough handling can precipitate ventricular fibrillation.
- When checking pulses and respiratory rates, check for 60 seconds, as bradycardia and bradypnea are common in moderate to severe hypothermia.
- Look for signs of trauma in all patients with hypothermia.
- Hypothermia may be categorized as mild, moderate and severe. The following table may be used to estimate the degree of hypothermia based on clinical findings.

Severity	Temperature	Clinical Findings
Mild	> 93 °F	Shivering, impaired judgment; Tachycardia and hypertension may be present
Moderate	86 – 93 °F	Consciousness clouded to stuporous; Shivering stops; Blood pressure becomes difficult to obtain.
Severe	< 86 °F	Bradycardia, hypotension and slow respirations; Arrhythmias may develop; Consciousness is lost.

Priorities	Assessment Findings
Chief Complaint	"Person found down in a cold environment"
LOPQRST	What led up to this? Where was the patient found?
AS/PN	Associated trauma and MOI? Drug or alcohol use?
AMPL	Check for medications that could be contributory (beta blockers, psychiatric medications, sedatives, narcotics or barbiturates).
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ If possible, obtain a rectal temperature in the field with a digital thermometer. General Appearance: Shivering, paradoxical undressing, evidence of trauma? Skin: Signs of frostbite (pallor, blisters)? Lungs: Pulmonary edema? Heart: Rate and rhythm? Neuro: Loss of coordination, impaired judgment, ALOC?
Data	Core temperature, SpO ₂ , ET/CO ₂ , Blood glucose, 12-lead EKG (tachycardia, bradycardia, atrial fibrillation, junctional rhythm, ventricular fibrillation?)
Goals of Therapy	<ul style="list-style-type: none"> • Above all, avoid rough handling! • Initiate active and passive external rewarming measures in the field. • Support airway, breathing and circulation. • Do not attempt to thaw frozen limbs in the field.
Monitoring	SpO ₂ , Cardiac monitoring and capnography

EMERGENCY MEDICAL RESPONDER/ EMERGENCY MEDICAL TECHNICIAN

- Attempt to remove the patient from the cold environment if it can be done gently. Rough handling must be avoided.
 - Do not attempt to rewarm frostbitten or frozen parts by rubbing them
- Remove wet clothing and gently dry the skin by patting, not rubbing, with dry towels

- Initiate passive rewarming with blankets on top of and underneath the patient; insulate the patient from the cold ground; shield them from the cold wind or helicopter rotor wash.
- If the patient is shivering, support thermogenesis by giving the patient fluids and calories (e.g. oral glucose).
- Initiate active external rewarming with warm blankets and hot packs in the axillae and groin.
- Administer oxygen 2 – 4 LPM per nasal cannula if SpO₂ < 94%. Increase flow and consider non-rebreather mask to keep SpO₂ > 94%
- Initiate CPR if the patient is pulseless
 - If the chest is frozen solid, or ice blocks the airway, CPR will be futile and should be discontinued (or not even started) in the field.
 - If the patient was submerged for more than an hour, do not initiate CPR.
- Apply an AED and analyze. If shocks are indicated, attempt defibrillation.
 - The shock should be given no matter what the core temperature is.
 - Do not delay defibrillation to measure a core temperature.
- If frozen limbs are fractured and angulated, splint in the position found. Do not attempt to straighten until they are completely thawed.
- Areas affected by frostbite:
 - Remove jewelry
 - If possible, place affected areas against other warm body surface for rewarming
 - Cover with dry, sterile dressings
 - Hands and feet should be elevated to reduce edema

Give a status report to the ambulance crew by radio ASAP.

ADVANCED EMERGENCY MEDICAL TECHNICIAN

- IV normal saline TKO
- If warm saline [1] is available, run at 250 ml/hr.
- Consider a second IV of warm saline.
- Do not delay transport to initiate an IV. Peripheral IVs may be quite difficult to start in a hypothermic patient.

Contact Medical Control for the following:

- Additional fluid orders

INTERMEDIATE/ PARAMEDIC

- Consider intraosseous or external jugular venous access, if an IV has not been established.
- Consider advanced airway management if the patient is unresponsive without a gag reflex
 - Administer warm humidified oxygen[2].
- Refer to *Cardiac Arrest Guidelines* as needed

Contact Medical Control for the following:

- Further orders

FOOTNOTES:

- [1] Technique for warming IV fluids in the field
 - Wrap the IV tubing around a hot pack several times

- [2] Technique for warming and humidifying oxygen
 - Place saline in a nebulizer
 - Wrap a hot pack around the nebulizer
 - Start oxygen flow
 - Administer by mask

REFERENCES:

Salomone, J. (2011). *Prehospital trauma life support*. (7 ed., pp. 500-515). St. Louis: Elsevier.

Vanden Hoek TL, Morrison LJ, Shuster M, Donnino M, Sinz E, Lavonas EJ, Jeejeebhoy FM, Gabrielli A. Part 12: cardiac arrest in special situations: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;122(suppl 3):S829 –S861.

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