This protocol is intended to assist in those instances of cold-related injuries involving long evacuation and transport time. When possible, all rewarming treatment should be left for a hospital setting.

A. ACCIDENTAL HYPOTHERMIA

1. Unintentional or accidental hypothermia can occur whenever the ambient temperature is less than the body temperature and the body is not capable of maintaining a normal body temperature. For example, an elderly, debilitated patient sitting overnight in a 66°F room may become hypothermic from that exposure alone. Suspect hypothermia in the injured, elderly, or debilitated patient. Maintain high index of suspicion for neglect and/or abuse.

2. Severe hypothermia (core body temperature <30°C /86°F) is associated with marked depression of critical body functions, which may make the victim appear clinically dead during the initial assessment. Therefore, lifesaving procedures should be initiated unless the victim is obviously dead (e.g., rigor mortis, decomposition, decapitation, etc.)

3. The hypothermic victim in cardiac arrest should be transported to a center where aggressive rewarming during resuscitation is possible.

4. Ventricular dysrhythmias may be difficult to convert without active rewarming. Measures to rewarm should be initiated in any hypothermic patient in cardiac arrest in conjunction with the Cardiac Arrest Protocol. The decision and methods to rewarm should be made in consultation with Medical Control and should consider the following factors:
   a. Method of rewarming available
   b. Time / distance to the hospital
   c. Squad capabilities (BLS vs. ALS)

5. Standard treatment of bradycardia should be avoided in the hypothermic victim.

6. Be careful to prevent / avoid jostling or excessive stimulation of the patient. A cold heart is susceptible to ventricular dysrhythmias.

7. Wet clothing robs heat from the body more than it insulates and should be removed. Attempt to protect the patient from wind and other elements.

B. FROSTBITE

1. Thawing should be done under controlled conditions. It is extremely painful.

2. Complete rewarming requires active heating for a prolonged period. Partial rewarming is worse than none. Therefore, rewarming should rarely be done in the field.
A. ACCIDENTAL HYPOTHERMIA without Cardiac Arrest

1. Assess and manage airway. Apply pulse oximeter and provide oxygen per Pulse Oximeter Procedure; use warm / humidified oxygen if available.
2. Move patient to warm environment; remove any wet clothing, cover with blankets and place hot packs in groins and armpits.
3. Evaluate patient’s general appearance, relevant history of condition and determine OPQRSTI and SAMPLE.
4. Assess vital signs, mental status, temperature of patient and environment, and evidence of any injuries.
5. Do NOT allow conscious patients to ambulate, exercise, or move about.
6. Contact Medical Control and advise of patient condition. Transport

B. ACCIDENTAL HYPOTHERMIA with Cardiac Arrest

1. If the hypothermic patient shows no signs of life, begin CPR with rewarming and transport.
2. Refer to Cardiac Arrest Protocol.

C. FROSTBITE

1. Treat the patient for accidental hypothermia if indicated
2. Protect injured areas from pressure, trauma, and friction. Remove all covering from injured parts. Do NOT rub. Do NOT break blisters.
3. Do not allow patient to ambulate, exercise, or move about.
4. Do not allow frozen limb to thaw if there is a chance that limb may refreeze before evacuation is complete.
5. Maintain core temperature by keeping patient warm with blankets, warm fluids, etc.
6. Contact Medical Control and advise of patient condition. Transport

A. ACCIDENTAL HYPOTHERMIA without Cardiac Arrest

1. During Transport begin IV NS TKO, warmed if available.
2. If patient becomes hypotensive administer IV normal saline fluid bolus:
   a. 250 – 500 ml for adult patient
   b. 20 ml/kg for pediatric patient (to a maximum of 500ml)
   c. Repeat boluses as needed to maintain BP
3. Apply cardiac monitor. Monitor vital signs.

B. ACCIDENTAL HYPOTHERMIA with Cardiac Arrest

1. Refer to Cardiac Arrest Protocol

C. FROSTBITE

1. During Transport begin IV NS TKO, warmed if available
2. Apply cardiac monitor.
A. Recognize that the very old, very young and patients with a history of spinal injury are high-risk for developing heat-related emergencies.

B. Heat emergencies can occur either due to increased environmental temperatures and/or prolonged exercise. Environments with temperatures > 90°F and humidity > 60% present the greatest risk.

C. Types of Heat-Related Illnesses:
   1. **Heat Stroke** – The most serious type of heat exposure illness, usually due to prolonged exposure to heat, inadequate fluid replacement and deficient thermoregulatory function. The two factors that define heat stroke are a core temp => 104°F and/or an altered mental status. Depending on the severity, the patient may become comatose and seizures may also occur. Skin condition is an unreliable indicator of heat stroke. In classic heat stroke, the skin is hot and dry, whereas in heat stroke due to exertion, the skin is hot and moist. Cardiovascular collapse is the usual cause of death.

   2. **Heat Exhaustion** – A more moderate form of heat exposure associated with dehydration combined with overexertion. Patient may experience headaches, nausea, vomiting, fatigue, but mental status is still intact. The skin is warm. The core temperature is below 104°F. The patient may experience syncope with orthostatic hypotension.

   3. **Heat Cramps** – The mildest form of heat exposure caused by dehydration, overexertion, and electrolyte abnormalities. The skin is moist with painful muscle cramps, usually affecting the large muscle groups.

D. When altered mental status is present consider other causes such as hypoglycemia, substance use, stroke and/or shock.

E. **Hyponatremia** – Usually seen in athletes who are un-acclimatized, smaller, and female, or those who engage in prolonged exertion such as those at the “back of the pack” in a marathon. The longer they run, the more Na+ they sweat out, the worse the hyponatremia becomes. Presents as generalized weakness, confusion, or seizures.

F. **Rhabdomyolysis** – In cases of extreme over-exertion, particularly in non-acclimatized athletes who also have inadequate hydration, they risk kidney failure. Over-exertion leads to muscle breakdown, painful (atraumatic) muscle aches, and myoglobin protein gets into the bloodstream. This in turn can shut down the kidneys and produces a classic brown “Coca Cola”-colored urine.

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**Basic EMT**

A. Assess and manage the airway
   1. Administer oxygen as needed
   2. Apply pulse oximeter and treat per pulse oximeter procedure

B. Move patient to cool environment, remove any tight clothing.
C. Evaluate patient’s general appearance, relevant history of condition and determine **OPQRSTI** and **SAMPLE**.

D. Assess vital signs and mental status every 5 minutes for an unstable patient and every 15 minutes for a stable patient.

E. Contact Medical Control and advise of condition. Transport.

F. If patient has altered LOC:
   1. Apply cold packs to axilla, groin, and neck. Avoid shivering.
   2. Check blood sugar and treat accordingly.

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**Advanced EMT / Paramedic**

A. Begin resuscitation with NS IVFs. The majority of these patients are significantly dehydrated.

B. Administer NS IV fluid bolus, even if the patient isn’t hypotensive:
   1. 500-1000 mL for adult patient
   2. 20 ml/kg for pediatric patient (maximum cumulative dose 60 ml/kg)
   3. Repeat boluses as needed to maintain BP

C. Apply cardiac monitor, especially in cases of heat syncope. Treat **Dysrhythmias** as indicated. Rely on patient’s own subjective impression of feeling lightheaded or pre-syncopal when they stand up, not orthostatic vital signs

D. Treat seizures per **Seizure Protocol**.

E. Monitor patient’s airway and manage it as necessary depending on their mental and respiratory status

F. Heat Cramps, Heat Exhaustion – In addition to rest, cool environment, and IV fluids, consider administering PO electrolyte replacement (e.g. Gatorade), particularly if they have been exercising for > 60 minutes. Do not give a heat stroke patient anything PO as they have an altered mental status and are at risk for aspiration.

G. Heat Stroke – If the patient has an altered mental status or a core temp => 104F that you feel is due to heat stroke and is still protecting their airway, the best treatment is immersion in an ice bath. Ice baths are often available at the first aid tent of athletic events, but not in most EDs. If available, priority should be given to ice water immersion in heat stroke patients and prolonged on-scene times for this purpose are acceptable. Assist event staff in cooling the patient down to 102.2F/39C within 30 minutes. Event staff will be measuring core temperature (usually via rectal thermometer), not oral, tympanic, or axillary as these are unreliable. Transport once patient is cooled and mental status is improving.

H. Hyponatremia – Can often be difficult to distinguish from dehydration/heat-related illness
   - If you are **not** at an event with an i-STAT portable device that can give you a sodium reading, starting with 500-1000 mL NS IV fluids is reasonable.
   - If your event **does** have an i-STAT machine, event staff (NOT EMS) may decide that fluid restriction, oral hypertonic solutions or the administration of 100 mL boluses of 3% saline “hot salts” IV is appropriate. This will depend on sodium level and symptom severity. EMS will not administer 3% saline in the field.
   - Apply cardiac monitor and obtain a 12-lead EKG. Hyponatremia patients can develop arrhythmias.
- Recheck neurological status, airway, and vitals q5 mins. If patient seizes, treat per seizure protocol. High probability of significant deterioration in the field or en-route to hospital.

I. Rhabdomyolysis – If patient is complaining of dark urine, generalized malaise, muscle cramps and heavy physical exertion with poor acclimatization first (fits picture for rhabdo), early IV fluid resuscitation is key.
- Get patient to a cool environment, cool their neck, axillae and groin as you would any patient with heat-related illness
- Monitor vitals q5 mins
- Administer 500-1000 mL NS IV fluid bolus

NEAR DROWNING / DROWNING

A. The key to success is the provision of early, effective pulmonary support.

B. It is essential that the EMT exercise caution and take steps to ensure their own safety while retrieving the victim from the water.

Basic EMT

A. Assess and manage the airway with cervical spine immobilization.
   1. Administer oxygen as needed to treat shock and/or respiratory distress.
   2. Apply pulse oximeter and treat per pulse oximeter procedure.
   3. If patient has agonal respirations or apneic begin ventilations by two-person BVM with oral airway and 100% oxygen, warm and humidified if possible. Refer to Respiratory Distress – Apneic Patient Protocol.

B. If patient is pulseless begin chest compressions as soon as the victim is removed from the water and onto a hard surface. If defibrillation is required, make sure to dry the patient’s chest before any shock is delivered. Refer to Cardiac Arrest Protocol.

C. Patient may show signs of hypothermia. Warm patient by removing wet clothes and cover with blankets. Refer to Environmental Emergencies – Cold-Related Emergencies Protocol.

D. Contact Medical Control and advise of patient condition. Transport patient to a center where aggressive rewarming during resuscitation is possible.

Advanced EMT / Paramedic

A. During Transport begin IV NS TKO, warmed if available.

B. Apply cardiac monitor. Monitor vital signs.
A. Although rare, lightning strikes account for several hundred injuries or deaths in the United States per year. Priority for responders is safety of scene prior to administering any treatment.

B. Victims of lightning strikes have the potential for sustaining serious injuries including significant burns and possibly cardiac arrest. If a victim of a lightning strike is found in cardiac arrest, treatment of the patient should be focused on current advanced life support protocols. Refer to Cardiac Arrest Protocol – Use traditional AHA CPR for these patients, not CCR. If the victim still has a pulse, apply a cardiac monitor and obtain a 12-lead EKG.

C. When encountering a scene of a lightning strike with multiple victims, the patients in respiratory and cardiac arrest should be given the highest priority.
COLD EMERGENCIES
ACCIDENTAL HYPOTHERMIA

- ASSESS AND MANAGE AIRWAY
- MAINTAIN O2 SATS >95% - USE WARM / HUMIDIFIED O2 IF AVAILABLE
- MOVE PATIENT TO WARM ENVIRONMENT; REMOVE WET CLOTHING, KEEP WARM
- EVALUATE PATIENT CONDITION
- MONITOR VITAL SIGNS
- OBTAIN MEDICAL HISTORY
- REASSURE PATIENT
- DO NOT ALLOW PATIENT TO AMBULATE, EXERCISE OR MOVE ABOUT
- TRANSPORT IN POSITION OF COMFORT

IF HYPOTHERMIC PATIENT SHOWS NO SIGNS OF LIFE, BEGIN CPR WITH REWARMING MEASURES AND REFER TO CARDIAC ARREST PROTOCOL

- IV NS (RUN TO MAINTAIN PERFUSION)
- MONITOR ECG

KEY
- BASIC EMT
- ADVANCED EMT
- PARAMEDIC
- MED CONTROL
COLD EMERGENCIES
FROSTBITE

- Assess and manage airway
- Maintain O2 SATS >95% - use warm / humidified O2 if available
- Move patient to warm environment; remove wet clothing, keep warm
- Evaluate patient condition
- Monitor vital signs
- Obtain medical history
- Reassure patient
- Remove all clothing from injured areas and protect from pressure, trauma, and friction.
- Do not break blisters or rub injured areas
- Do not allow patient to ambulate, exercise or move about
- Transport in position of comfort

- IV NS (run to maintain perfusion)
- Monitor ECG
- Consider pain management protocol
ABDOMINAL PAIN / NAUSEA VOMITING

- ASSESS AND MANAGE AIRWAY
- MAINTAIN O2 SATS >95%
- MOVE PATIENT TO COOL ENVIRONMENT; REMOVE TIGHT CLOTHING
- EVALUATE PATIENT CONDITION
- MONITOR VITAL SIGNS
- OBTAIN MEDICAL HISTORY
- REASSURE PATIENT
- TRANSPORT IN POSITION OF COMFORT
- IF PATIENT HAS ALTERED LOC
  - APPLY ICE PACKS TO AXILLA, GROIN, AND NECK. AVOID SHIVERING.
  - CHECK BLOOD SUGAR AND TREAT ACCORDINGLY

- IV NS (RUN TO MAINTAIN PERFUSION)
- MONITOR ECG
- CONSIDER PAIN MANAGEMENT PROTOCOL

KEY
- BASIC EMT
- ADVANCED EMT
- PARAMEDIC
- MED CONTROL

LARGE OUTDOOR EVENTS

Heat Cramps, Heat Exhaustion – Consider administering PO electrolyte replacement (e.g. Gatorade), particularly if they have been exercising for > 60 minutes.

Heat Stroke – The best treatment is immersion in an ice bath. If available, priority should be given to ice water immersion in heat stroke patients and prolonged on-scene times for this purpose are acceptable. Assist event staff in cooling the patient. Transport once patient is cooled and mental status is improving.

Hyponatremia – event staff (NOT EMS) may decide that fluid restriction, oral hypertonic solutions or the administration of 100 mL boluses of 3% saline “hot salts” IV is appropriate.
**NEAR DROWNING / DROWNING**

- Assess and manage airway: consider C-spine control.
- Maintain O2 Sats >95% - use warm / humidified O2 if available.
- Move patient to warm environment; remove wet clothing, keep warm.
- Evaluate patient condition.
- Monitor vital signs.
- Obtain medical history.
- Reassure patient.
- Transport.

If patient shows no signs of life, begin CPR with rewarming measures and refer to cardiac arrest protocol.

- IV NS (run to maintain perfusion)
- Monitor ECG.