SYMPTOMS:
Exposure to a cold environment: Shivering, mental status changes, loss of shivering, progressive bradycardia, hypotension, and decreased respiratory status.
FROSTBITE: Numbness in affected body part, blanched skin, decreased or loss of sensation, white and waxy appearance to affected tissue.

ASSESSMENT and TREATMENT
ALL LEVELS

1. Perform primary assessment.
2. Assure the patient is moved to a warm environment as quickly as possible.
3. Prevent further heat loss.
    a. Remove wet clothes and dry the skin.
    b. Shelter from wind and wet conditions.
    c. Insulate the patient with dry clothing or wrap in blanket.
    d. Cover the patient with a vapor barrier.
4. Obtain and monitor vital signs (pulse, respirations and blood pressure).
    a. The patient suffering from moderate or severe hypothermia may have severe alterations in vital signs including weak and extremely slow pulses, profound hypotension and decreased respiration.
    b. The rescuer may need to check for vitals longer – 60 seconds.
5. Perform core body temperature measurements if possible and reliable and categorize patient into one of the following four levels of hypothermia.
    a. MILD: 35º-32.1ºC (95º-89.8ºF).
        i. Vital signs not depressed.
        ii. Normal mental status.
        iii. Shivering (Body maintains ability to control temperature).
    b. MODERATE: 32º-28ºC (89.7º-82.5ºF)
        i. Progressive bradycardia, hypotension, and decreased respirations.
        ii. Alterations to mental status.
        iii. General slowing of body functions.
        iv. Shivering will be lost.
    c. SEVERE: 28º-24ºC (82.4º-75.2ºF)
        i. Increase in bradycardia, hypotension and decreased respirations.
        ii. Increased alterations to mental status.
        iii. Body loses the ability to thermo-regulate.
    d. PROFOUND: less than 24ºC (75.2ºF)
        i. Difficult to assess vital signs due to slowed bodily functions.
        ii. Coma.
6. Initiate treatment based on severity of hypothermia – Mild, Moderate or Severe, Frostbite. (See next pages.)

AEMT-R

7. Consider isotonic IV/IO fluid bolus 20ml/kg normal saline.

AEMT-O

8. Consider fluid bolus 20ml/kg lactated Ringer's as appropriate.

INT-R

9. Monitor for arrhythmia and cardiovascular collapse (see appropriate Cardiovascular guideline).

MILD HYPOTHERMIA

ALL LEVELS

1. Assess patient need for oxygen.
    a. Hypothermic patients have decreased oxygen needs and may not require supplemental oxygen.
    b. If oxygen is deemed necessary, it should be warmed to a maximum temperature between 104-108ºF (40-42ºC) and humidified if possible.
2. Fuel the shivering process through caloric replacement.
    a. Vigorous shivering can substantially increase heat production.
    b. Provide beverages or foods containing glucose if feasible and patient is awake and able to manage airway independently.
3. Consider field-rewarming methods such as placement of large heat packs or heat blankets to the anterior chest or wrapped around the patient's thorax if large enough.
4. Monitor vitals frequently. If temperature or level of consciousness decreases refer to Severe Hypothermia.

EMR-O; EMT-R

5. If alterations in mental status, consider measuring blood glucose and see Hyperthermia [M-8] or Hypoglycemia [M-9] guideline.
6. Assess for other causes of alterations of mentation.
7. Transport to hospital capable of rewarming the patient.

EMT-O

8. Place on ECG cardiac monitor.

AEMT-R

9. Consider IV access and IV fluids as indicated.
    a. Normal saline is recommended for volume replacement.
    b. Normal saline bolus therapy 20mg/kg is preferable to continuous drip.
    c. IV fluids ideally should be warmed to 42ºC.

MODERATE or SEVERE HYPOTHERMIA

ALL LEVELS

1. Consider early activation of ALS.
2. Perform ABCs.
    a. Pulse checks should be performed for 60 seconds.
    b. Patient may have severe alterations in vital signs including weak and extremely slow pulses, profound hypotension, and decreased respirations.
    c. Recognize that fixed and dilated pupils, apparent signs of rigor mortis and dependent lividity may not be contraindication for resuscitation in the severely hypothermic patient.
    d. Patients should not be considered deceased until rewarming has been attempted.
    e. In the case of cardiac arrest the patient should be managed with chest compressions (same rate as normothermic patient) and attempts at rewarming.
    f. Consider defibrillation.
        i. If the patient has a shockable rhythm (VF/VT) defibrillation should be attempted.
        ii. If defibrillation is unsuccessful and the patient's core temperature is greater than 86ºF (30ºC) follow guidelines for normothermic patients.
        iii. If asystolic, CPR is the mainstay of therapy.
        iv. If monitoring reveals an organized rhythm (other than VF or VT) and no pulses are detected, do not start CPR. Continue to monitor.
            a) Patient pulse may not be detected but will remain effective due to decreased metabolic needs.

b) In the case of pulseless electrical activity (PEA) the rhythm will deteriorate rapidly to asystole and CPR should be initiated.

3. Manage airway as needed.
    a. **Do not hyperventilate** the patient. A decrease in CO_2 in the blood (hypocarbia) may reduce the threshold for ventricular fibrillation.
    b. Indications and contraindications for advanced airway devices are similar in the hypothermic patient as in the normothermic patient.
4. Obtain core temperature if possible. A rectal thermometer may be used only if in a warm environment.
5. Handle the patient gently.
    a. Attempt to keep the patient in the horizontal position, limiting motion of the extremities to avoid increasing return of cold blood to the heart.
    b. Once in warm environment, clothing should be cut off rather than removed by manipulating the extremities.
    c. Move the patient only when necessary, such as to remove the patient from the elements.
6. Do not allow the patient to stand or exercise as this may cause circulatory collapse.
7. Initiate field-rewarming methods.
    a. Consider placement of large heat packs or heat blankets to the anterior chest or wrapped around the patient's thorax if large enough.
    b. Never apply chemical or electrical heat sources directly to the skin.
    c. Use a barrier between the skin and head source to prevent burns.
    d. Use forced air warming blankets if available.

EMR-O; EMT-R

8. If mental status is altered, consider measuring blood glucose levels. Treat as indicated. Assess for other causes of alterations of mentation.
9. Warm the patient compartment of the ambulance to 75.2ºF (24ºC) during transport.

EMT-O

10. Apply ECG cardiac monitor. Acquire and transmit to receiving facility as trained.

AEMT-R

11. Establish IV and provide warmed NS.
    a. Normal saline is recommended for volume replacement.
    b. Normal saline bolus therapy 20 mg/kg is preferable to continuous drip.
    c. IV fluids ideally should be warmed to 42ºC.

PARA-R

12. Measure core temperature by esophageal probe if one is available, patient's airway is secured, and the provider has been trained in its insertion and use.

FROSTBITE

ALL LEVELS

1. Avoid rewarming the extremities until refreezing is preventable.
    a. Added injury occurs when an area of frostbit is rewarmed and then inadvertently refrozen.
    b. Rewarm frostbitten parts by contact with non-affected body surfaces.
    c. Do not rub or cause physical trauma.
    d. Use circulating warm water 98.6ºF to 102ºF (37ºC to 39ºC) to rewarm the affected body part if available.
2. After rewarming, cover injured parts with loose, sterile dressing.
3. Do to allow injury to refreeze.
4. Treat per Pain Management guideline [M-11].