HYPOTHERMIA

Prolonged exposure to cold outdoor temperatures and high winds, cold water, or under-heated rooms can lower overall body temperature and produce life-threatening hypothermia. Prolonged exposure can lead to mental confusion, impaired judgment, stroke, heart failure, and death. Predisposing factors may include inadequate clothing and nourishment, thinness, age (worse in very young and old), chronic heart and lung problems, and conditions restricting movement to keep warm (e.g., paralysis, arthritis).

Hypothermia should be suspected in any child with a history of prolonged exposure to a cold environment, but may also occur with severe illness or injury, transport and resuscitation, child abuse, or toxic exposure. Some causes, especially child abuse, may not be readily apparent and must be considered to prevent a missed diagnosis.

The clinical features seen in hypothermia vary by temperature. Severe hypothermia may be less obvious than mild or moderate hypothermia.

Because external rewarming increases the risk of afterdrop (a continued decline in body temperature) in moderate to severe hypothermia, it may potentiate fatal collapse. Children may be at increased risk of afterdrop due to decreased body mass and increased peripheral vasoconstriction. Thus, rewarming (outside of a critical care unit) is not practiced in children with suspected moderate or severe hypothermia.

Initial Management

WISHeS Illness and Injury Protocols:
Hypothermia
Frostnip/ Frost Bite

1. Obtain subjective data: History of exposure to cold, sensation of cold, drowsiness and weakness.

2. Obtain objective data:
    a. Take temperature. Body temperatures below 95° F indicate hypothermia. (Electronic thermometers measure temperatures between 84-108° F). It is a **medical emergency** if temperature is less than 90° F.
    b. Take vital signs. (Pulse and respirations may be very weak).
    c. Observe skin for appearance (pale, bluish, bright pink, or puffy) and presence of shivering (no shivering below 90° F).
    d. Observe for slurred speech, mental confusion, unconsciousness, muscle rigidity, lack of coordination, stumbling, and drowsiness.
    e. Check for signs of frostbite (see frostbite management)

3. Provide or supervise treatment/care:
    a. Take student to warm room. Remove or cut wet clothing.

b. Wrap student in blankets, towels, clothing, or other heavy insulation. Body warmth may also help. Do not rewarm with hot water, heating pad, heat lamp.
c. Offer student any warm, nonalcoholic drink if conscious. Offer in small amounts, frequently due to potential nausea.
d. If indicated, call EMS/911. Refer to electronic student health record for prefered hospital. Notify principal of EMS/911 call.
e. Contact parent about transport to emergency room or need for medical care.
f. Consult / notify school nurse
g. Document in electronic student health record
    i. Subjective Data
        1. Details regarding exposure
        2. Symptoms of hypothermia experienced
    ii. Objective Data
        1. Temperature
        2. Signs of hypothermia observed
        3. Signs of frostbite observed
    iii. Intervention
        1. First aid performed
        2. Referral to further care

Follow-up

1. Provide health education about prevention, signs and symptoms, first aid and self-care of hypothermia.

References

Brown DJ, Brugger H, Boyd J, Paal P. Accidental hypothermia. N Engl J Med 2012; 367:1930. UpToDate, accessed 7/2023

Dow J, Giesbrecht GG, Danzl DF, et al. Wilderness Medical Society Clinical Practice Guidelines for the Out-of-Hospital Evaluation and Treatment of Accidental Hypothermia: 2019 Update. Wilderness Environ Med 2019; 30:S47. UpToDate, accessed 7/2023