### Accidental Hypothermia: An Evidence-Based Approach

This issue of Emergency Medicine Practice reviews the evidence and current understanding of the pathophysiology, clinical assessment, and treatment options for maximizing outcomes in accidental hypothermia.

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<th>Key Points</th>
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<td>Accidental hypothermia can occur in mild climates, and even indoors, especially among high risk populations such as the elderly, the homeless, or in the setting of acute intoxication or trauma.</td>
<td>1,2</td>
<td>Hypothermia occurs in a wide variety of environmental settings and is complicated by multiple patient comorbidities.</td>
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<td>Standard thermometers do not read below 34°C (93.2°F). Diagnosis of hypothermia (temperature &lt; 35°C (95°F) taken with a rectal, bladder, or esophageal probe) requires a low-reading thermometer.</td>
<td>12</td>
<td>The International Commission for Mountain Emergency Medicine recommends tympanic or esophageal field measurements to maximize accuracy.</td>
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<td>The initial focus in a very cold patient is to prevent additional heat loss by removing wet clothing and insulating the patient from further exposure.</td>
<td>8</td>
<td>Generally, BLS and ACLS protocols should be followed, although there is some controversy surrounding BLS interventions in the severely hypothermic patient.</td>
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<td>Active external rewarming, such as a forced air rewarming device, warmed humidified air, and warm IV fluids is sufficient for most hypothermic patients.</td>
<td>96</td>
<td>The American Society of Anesthesiologists recommends the use of forced air rewarming devices to treat hypothermia and maintain normothermia in post-operative patients during emergence and recovery.</td>
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<td>If a hypothermic patient has been rewarmed to &gt; 32°C (89.6°F) but continues to have an altered mental status, look for other underlying etiologies such as infection or toxic ingestion.</td>
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<td>Do not wait until the patient has been fully rewarmed to reassess and consider other underlying illnesses.</td>
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<td>If a patient is resistant to rewarming techniques, consider other causes such as hypoglycemia, infection, myxedema coma, or adrenal insufficiency.</td>
<td>125</td>
<td>In addition to rewarming the patient, other general treatment principles must be considered, with a focus on detecting and treating underlying illness.</td>
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<td>“A patient is not dead until they are warm and dead.” Continue resuscitation until the patient is rewarmed to 30°C (86°F) to 32°C (89.6°F).</td>
<td>3,4</td>
<td>The lowest initial temperature recorded in a child who survived from hypothermia was 14.2°C (57.6°F), and the lowest recorded temperature in an adult was 13.7°C (56.7°F).</td>
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<td>Resuscitation may be withheld only if the patient is frozen solid, there is an ice-occluded airway, there is a clear “Do Not Resuscitate” order, there are other obvious lethal injuries, or the patient was documented to be submerged for over an hour.</td>
<td>31, 76, 142</td>
<td>Except in these instances, a hypothermic patient should be fully resuscitated, even if they do not have any clear signs of life, until their core temperature has been elevated to &gt; 30°C.</td>
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<td>Even if an unresponsive patient does not have a pulse, consider holding CPR if the patient has an organized rhythm on cardiac monitor.</td>
<td>32</td>
<td>There is controversy surrounding CPR and other BLS interventions in the severely hypothermic patient. Some case reports indicate that CPR may convert the rhythm into fibrillation under these circumstances.</td>
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<td>If a patient in asystole or ventricular fibrillation does not respond to initial vasoadrenergic medication or defibrillation, respectively, hold further rounds and actively rewarm the patient, considering more invasive active rewarming such as cardiopulmonary bypass.</td>
<td>32</td>
<td>It is well documented that ventricular fibrillation in the setting of hypothermia can be refractory to defibrillation attempts.</td>
</tr>
</tbody>
</table>

* See reverse side for reference citations.
REFERENCES

11. Delaney KA, Vassallo SU, Larkin GL, Goldfrank LR. Rewarming rates in urban patients with hypothermia: prediction of underlying infection. Acad Emerg Med. Sep 2006;13(9):913-921. (Prospective observational study; 96 patients)

CLINICAL RECOMMENDATIONS

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