**An Evidence-Based Approach To Hyperthermia And Other Heat-Related Emergencies**
Lin, J, Losey, R, Prendergast, H. April 2009, Volume 6; Number 4

*This issue of Pediatric Emergency Medicine Practice offers an evidence-based approach to treating hyperthermia and other heat-related illnesses in the emergency department. Here, we outline key recommendations for practice based on valid research evidence within the journal issue. For a more detailed and systematic look at the latest evidence on hyperthermia as well as other considerations such as the physical examination, clinical pathways, and other laboratory tests not noted here, see the full text article.*

---

### EVIDENCE-BASED CLINICAL RECOMMENDATIONS FOR PRACTICE

<table>
<thead>
<tr>
<th>Key Points</th>
<th>References*</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiologic and behavioral or developmental differences may place children at higher risk of hyperthermic insults.</td>
<td>2</td>
<td>Children are more susceptible to extremes of temperature because of a greater surface area-to-body mass ratio, higher metabolic heat per mass unit, and a diminished ability to dissipate body heat by evaporation.</td>
</tr>
<tr>
<td>Environmental heat illness represents several different disease entities. They can be relatively minor (ie, heat rash, heat edema, or heat cramps) or they can be more serious (ie, heat exhaustion and heatstroke).</td>
<td>29</td>
<td>Of these, only heatstroke is directly related to an elevation of body temperature. Heat cramps and heat exhaustion are induced by a hot environment.</td>
</tr>
<tr>
<td>Of all the heat-related illnesses, the most important to identify is heatstroke because it is a condition of true thermoregulatory failure.</td>
<td>1</td>
<td>Heatstroke is the most severe form of hyperthermia, with reported mortality between 17% and 80% percent.</td>
</tr>
<tr>
<td>There are 4 categories for treatment of hyperthermia: chemical, conductive, evaporative, and radiation.</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>
- **Chemical** - Treatment includes acetaminophen or ibuprofen to disrupt the heat generating inflammatory process.  
- **Conductive** - Treatment includes direct contact between 2 substances or objects that will cause the transmission of heat from one to the other lowering the temperature of one and raising the temperature of the other. Placing a child in a tepid bath will lower the child’s temperature by conducting heat from the warm child to the cooler water.  
- **Evaporative** – Treatment includes water on a child’s skin that extracts heat energy from the skin as it changes into water vapor via evaporation. This process of changing from a liquid to a vapor state is endothermic. Alcohol baths should never be used in children or adults.  
- **Radiation** – Treatment includes the act of an object, or in this case a child, that is warmer than its surrounding environment dissipating heat by radiation. Disrobing the child will enhance this process. |
| In a true hyperthermic emergency, rapid cooling must be performed to minimize morbidity and mortality amongst any patient population, especially in the pediatric population given their unique physiological differences. | 3 | While many of the cooling strategies are not difficult to utilize and do not require special equipment, it is essential that they are readily available and accessible in the emergency department. |
| With the increase in availability of various drugs and the advent of polypharmacy, we as physicians must also consider the myriad of drug-induced hyperthermia illnesses as these may impact the management of patients. | 57, 64, 71, 79, 88 | Five different drug-induced causes of hyperthermia are well documented in literature: malignant hyperthermia, neuroleptic malignant syndrome, psychostimulants, anticholinergic toxicity, and serotonin syndrome. |
| Initial treatment of drug-induced hyperthermia is the same as with environment-related hyperthermia. |  | Many patients with drug ingestions may require other specific medication treatment to correct the underlying problem. |

*See reverse side for reference citations.*
REFERENCES

These references are excerpted from the original manuscript. For additional references and information on this topic, see the full text article at ebmedicine.net.


CLINICAL RECOMMENDATIONS

Use The Evidence-Based Clinical Recommendations On The Reverse Side For:

- Discussions with colleagues
- Developing hospital guidelines
- Posting on your bulletin board
- Preparing for the boards
- Storing in your hospital’s library
- Teaching residents and medical students

Emergency Medicine Practice subscribers:
Are you taking advantage of all your subscription benefits? Visit your free online account at ebmedicine.net to search archives, browse clinical resources, take free CME tests, and more.

Not a subscriber to Emergency Medicine Practice?
As a subscriber, you’ll benefit from evidence-based, clinically relevant, eminently useable diagnostic and treatment recommendations for every-day practice. Plus, you’ll receive up to 192 AMA/ACEP Category 1 credits and full online access to our one-of-a-kind online database. Visit ebmedicine.net/subscribe or call 1-800-249-5770 to learn more today.