

Information for Health Care Providers on Heat-Related Morbidity and Mortality

Health care providers should:

- Know the risk factors for heat-related morbidity and mortality.
- Advise at-risk patients to use air conditioning or go to an air conditioned place during hot weather.
- Be alert that extreme heat can exacerbate chronic medical conditions, such as heart or lung disease.
- Recognize the signs and symptoms of heat stroke – a medical emergency – and other heat-related illnesses.
- Initiate treatment and transfer for emergency care as appropriate.

Background

- Heat waves kill more Americans than all other natural disasters combined. In NYC during a 2006 heat wave, there were 40 heat stroke deaths and approximately 100 additional deaths related to underlying medical conditions.
- Heat-related illnesses include heat cramps, heat syncope, heat exhaustion, and heat stroke, and result from the body's failure to thermoregulate and maintain normal core body temperature. Thermoregulation can be impeded by chronic diseases, medications, behavioral and environmental factors.
- Heat exposure can also exacerbate underlying medical conditions, such as heart or lung disease, without causing increased body temperature.
- For NYC, the National Weather Service issues a Heat Advisory, Warning, or Watch based on a measure called the heat index. The heat index is a measure of how hot it feels based on temperature and humidity. A Heat Advisory is issued when the maximum heat index is forecast to be at least 100°F or when the nighttime low is forecast to be above 80°F. However, hot and humid weather can increase the risk of illness or death under less severe conditions depending on a person's risk factors and exposure to heat.

Risk factors for heat-related morbidity and mortality

1. Adults aged 65 and older and children aged 4 and younger
2. Lack of air conditioning at home
3. Use of medications that impede thermoregulation (see following page for a list)
4. Limited mobility or confinement to bed
5. Social isolation
6. One or more chronic medical or mental health condition, such as:

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> • Congestive heart failure and other cardiovascular diseases • Diabetes and other endocrine diseases | <ul style="list-style-type: none"> • Emphysema and other respiratory diseases • Liver disease • Renal failure | <ul style="list-style-type: none"> • Cognitive and psychiatric disorders • Cerebrovascular diseases and sequelae • Obesity • Hypertension |
|---|--|---|

Some signs and symptoms of heat exhaustion and heat stroke

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • Dizziness or fainting • Muscle cramps • Cool, moist skin or dry, hot skin | <ul style="list-style-type: none"> • Nausea or vomiting • Headache • Rapid, shallow breathing | <ul style="list-style-type: none"> • Impaired judgment, bizarre behavior, hallucinations, altered mental status, confusion, disorientation, and coma. |
|---|--|--|
- Key features of heat stroke are hyperthermia above >104°F (>40°C) and central nervous system dysfunction.

Drugs that impair response to heat

Drug effect	Drug
Impaired sweating	<ul style="list-style-type: none">• Anticholinergic drugs• Antidepressants• Antihistamines• Antiparkinsonian drugs• Antipsychotic drugs• Tranquilizers
Hypovolemia	<ul style="list-style-type: none">• Diuretics
Impaired cardiovascular responsiveness	<ul style="list-style-type: none">• Beta-blockers
Increased metabolic rate	<ul style="list-style-type: none">• Amphetamines• Sympathomimetic drugs
Impaired consciousness	<ul style="list-style-type: none">• Ethanol• Opioids• Sedative-hypnotics

Source: *The Merck Manual of Geriatrics*, 3rd Edition, edited by Mark H. Beers, and Robert Berkow. Copyright 2000 by Merck & Co., Inc., Whitehouse Station. Available at www.merck.com/mkgr/mmg/tables/67t1.jsp. Accessed on April 30, 2008.

Treatment for heat exhaustion and heat stroke

- The mainstays of treatment for heat-related illness are:
 - Cooling of core body temperature
 - Fluid replacement
- Heat stroke is a medical emergency and patients require hospitalization.

Preventing heat stroke and heat-related mortality

Health care providers should advise patients to:

- **Use an air conditioner or go to an air conditioned place**
 - Encourage at-risk patients who have air conditioners to use them during hot weather.
 - Encourage at-risk patients who do not have air conditioners to go to a neighbor's house, library, shopping mall, or Cooling Center. Call 311 (TTY: 212-504-4115) or visit www.nyc.gov/oem to find a Cooling Center.
 - Advise at-risk patients to use a fan only when the air conditioner is on or the windows are open.
- **Stay out of the sun**
 - Limit outdoor activity to early morning and evening
 - Wear light-colored and light-weight clothing
 - Wear sunscreen
- **Drink more fluids and avoid foods high in salt**
 - Avoid drinks with caffeine, sugar, or alcohol
- **Call a doctor** if they or someone else experiences early signs of heat-related illness
- **Call 911** if they or someone else experiences signs of heat stroke

Resources

- **NYC DOHMH Heat Illness Fact Sheet:** www.nyc.gov/html/doh/html/cd/cdheat.shtml
- **NYC DOHMH Vital Signs Report:** www.nyc.gov/html/doh/downloads/pdf/survey/survey-2006heatdeaths.pdf
- **CDC Extreme Heat Information:** www.bt.cdc.gov/disasters/extremeheat/