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Indiana Department of Correction

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3.08A

**HEALTH CARE SERVICES  
DIRECTIVE-ADULT  
Manual of Policies and Procedures**

Title

**MANAGEMENT OF HEAT RELATED ILLNESS**

Legal References

(includes but is not limited to)

IC 11-8-2-5 IC 34-4-12.6

Related Policies/Procedures

(includes but is not limited to)

01-02-101

Other References

(includes but is not limited to)

[www.cdc.gov](http://www.cdc.gov)

I. PURPOSE:

This Health Care Services Directive (HCSD) provides information and direction regarding Heat Related Illness (HRI) and avoiding HRI.

II. GUIDELINES:

A. Introduction

Heat related illness is any illness caused by high temperatures and humidity. HRI is preventable yet each year thousands of people are hospitalized for and according to the Centers for Disease Control and Prevention (CDC) an approximate 700 deaths were recorded where natural heat was a contributing cause of death. Morbidity rates detailing the number of people who incur an injury or illness as result of the heat are estimated at 3-5 times the mortality rate. Incarcerated individuals and staff at Department facilities are at risk for HRI, especially when temperatures and humidity are high and personal risk factors are present.

B. Factors affecting HRI

Body temperature normally is kept within the “normal” range by a balance of internal heat production and heat loss to the environment. Activities or actions that produce heat (general metabolic activity, physical exercise, use of clothes, sun exposure, etc.) must be balanced equally with activities or actions that promote heat loss (radiating heat into a cool environment, sweating with evaporative cooling, panting, etc.). When heat production exceeds heat loss, body temperature rises. If heat loss processes become seriously impaired, heat rises may be precipitous. Body temperatures above 104° F are dangerous, and brain damage will result if temperatures above 105° F are sustained more than briefly. Dehydration or loss of sodium

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balance may cause dysfunction in muscles and nervous tissue even at normal body temperatures.

The spectrum of HRI range from simple heat cramps through heat exhaustion and on to heat stroke. The mechanisms that cause HRI include dehydration, loss of electrolyte, and increased body temperature. Heat stroke is a true medical emergency may rapidly cause death if not emergently treated.

High relative humidity impairs the evaporation of sweat from the skin. (increased air movement increases evaporative cooling). When warm weather is accompanied by high humidity, and especially in still air, a normal body may have difficulty maintaining an acceptable body temperature. The relationship between humidity and evaporative cooling gives rise to the concept of “apparent temperature” (commonly called the “heat index”) often reported with weather forecasts.

There are many individual factors that affect a person’s susceptibility to HRI. Most are included in the following listing:

1. Those at greatest risk for developing HRI include infants and children up to four years of age, people 65 and older, people who are overweight and people who are ill or on certain medications.
2. Acclimation to heat occurs during continuing exposure to hot conditions over seven (7) to ten (10) days. Acclimated individuals are more resistant to HRI. However, acclimation should not be assumed unless all participants are known to be acclimated.
3. Loose clothing that does not completely cover the skin permits more cooling than does thick tight clothing. Multiple layers of clothing or clothing that is resistant to the flow of moisture impede heat loss.
4. Exposure to direct sun increases apparent heat by up to 15 degrees.
5. Different individuals in similar circumstances may exercise at different intensities, producing different amounts of heat that requires dissipation.
6. Certain medications impair the body’s ability to sweat or manage fluid balance. These include over the counter and prescription products, not limited to typical antipsychotic medications, cyclic antidepressant medication, antihistaminic medication, vasodilators, beta blockers, and diuretic medications. Tranquilizing medications

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(including drugs of abuse) may impair an individual's ability to recognize thirst or heat.

7. Certain health conditions may place an individual at increased risk for HRI. These include end stage kidney disease, especially if dialysis is used; congestive heart failure and other cardiac conditions; asthma, chronic obstructive pulmonary disease; poorly controlled diabetes mellitus, decompensated cirrhosis; and schizophrenia.
8. Prolonged exposure to heat, as in a heat wave, may predispose those at risk by reducing the general state of hydration or tiring those who are frail or have multiple risk factors.

Although this is an extensive list and includes the major risks for HRI, it is not a complete listing. It is provided to alert staff to the necessity to consider the entire patient when evaluating the risk for HRI and to underscore that individual HRI risk cannot be quantitated and can change over time.

HRIs are generally divided into four syndromes (descriptions are abstracted from the National Institute for Occupational Safety and Health ):

1. Heat cramps usually affect those who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture levels. Low salt levels in muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion. Heat cramps present as muscle cramps, pain, or spasms in the abdomen, arms, or legs. Heat cramps remit spontaneously with the cessation of exercise. They can be prevented by liberal water intake and eating a snack (carbohydrate or electrolyte replacement). These patients should seek medical treatment if the symptoms do not subside.
2. Heat exhaustion is the body's response to an excessive loss of water and salt, usually through excessive sweating. Patients most susceptible to heat exhaustion are those that are elderly, have high blood pressure, and those working in hot environments. These patients typically present with headaches, nausea, dizziness, weakness, heavy sweating, and extreme thirst. Heat exhaustion can be prevented by adequate intake of water and electrolytes. Patient or staff suffering from heat exhaustion should seek medical attention. Make sure to stay with the patient or staff and offer plenty of liquids.
3. Rhabdomyolysis is a health condition associated with heat stress and prolonged physical exertion, resulting in the rapid breakdown,

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rupture, and death of muscle. These symptoms may include muscle cramps/pain, dark urine (tea colored), exercise intolerance, weakness, and at times totally asymptomatic. This HRI requires medical intervention. Patients should be directed to stop activity immediately and increase water intake. Staff shall not leave the patient's side until medical attention is rendered.

4. Heat Stroke: This is the most severe HRI. It occurs when the body becomes unable to control its temperature; the body's temperature rises rapidly, sweating mechanisms fail, and the body is unable to cool down. When heat stroke occurs the body's temperature can reach 106° Fahrenheit or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if not treated emergently. Although initial symptoms may be similar to those of exertional heat injury, heat stroke may present suddenly with loss of consciousness. Heat stroke is accompanied by disturbances of the clotting cascade, rhabdomyolysis, shock, and other abnormalities. Treatment must be immediate. Removal of clothing and spraying with cool water while ice is applied to the head, neck, armpits and groin will help lower core temperature. A fan aimed directly at the body will assist evaporative cooling and convective heat loss. Emergency services (911) shall be called for continued treatment.

In general, HRI can be avoided if individuals drink adequate fluid prior to hard or prolonged exercise, especially in hot environments, continue to drink fluid periodically while exercising (or while in extremely hot conditions even if not exercising), and take breaks (rest) on a regular basis. When extreme risks for HRI are present, additional measures may be required to promote cooling, including environmental fans, air conditioning, and presentation of cool water on a scheduled, periodic basis. Individuals whose health conditions place them at special increased risk may require more preventive measures, instituted at cooler temperatures. It is impossible to provide simple rules for individual persons.

The National Weather Service generally advises that a "Heat Advisory" should be issued when the daytime heat index is 105° F or greater and the night time minimum is 80° F or greater for a period of 48 hours or longer (A heat advisory indicates that there is increased risk for HRI). These criteria are not applied universally, and heat advisory declaration criteria vary around the country.

C. Actions:

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Each facility must devise a site specific HRI prevention facility directive based upon the information provided in this HCSD and the characteristics of the facility and its population. The plans should include, at a minimum:

1. Appointment of the Safety Hazard Manager (SHM) as the responsible person for design and implementation of the HRI prevention plan;
2. Establishment of a process for measuring heat and humidity (so that heat index can be calculated) in living spaces and the outdoor recreation and work areas;
3. Identification of those at special risk for HRI ;
4. Identification of activities likely to increase the likelihood of HRI during hot weather and of assignments on which risk is increased;
5. Identification of year-round hot work environments (e.g., laundries, kitchens) in which preventive measures may be necessary during all working hours;
6. Establishment of a process to educate staff and the incarcerated population about the risks of HRI and how to reduce them;
7. Establishment of a trigger temperature for organized and documented monitoring of the heat index;
8. Establishment of a process for declaring and establishing action levels (see below).
9. Establishing site and activity specific interventions to be implemented for each action level;
10. Establish heat index and temperatures for termination of organized and documented monitoring of the heat index;
11. Require notification of Central Office Operations staff when a level III heat action level is declared; and,
12. Develop measures for monitoring the process and report on them to the Safety Hazard Committee.

D. HRI prevention action levels are suggested as follows:

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1. Level I:

When the heat index is 85° or higher, prolonged exercise (whether recreational or work) should be undertaken with caution, especially by those who are not yet acclimated to heat. Cool water must be available as requested to those who are exercising, and they should be encouraged to drink before thirst is present. Prolonged time in direct sunlight should be avoided, as the relative temperature in sunshine is much higher. Rest periods of at least 10 minutes for every 30 minutes of activity (longer rest periods if the exercise is extremely hard) should be mandatory.

Those individuals at increased risk (described above) should be managed as if a Level II situation is present.

2. Level II:

When the heat index is 90°F or higher, prolonged exercise should be avoided by all except those who are already acclimated to heat. Cool water must be available at all times and those exercising must be encouraged every fifteen (15) minutes to drink water. Prolonged time in direct sunlight should be avoided. Rest periods equal to or longer than exercise periods must be mandatory.

Those at increased risk should not be permitted to exercise and should be managed as if a Level III situation is present.

3. Level III:

When the heat index is 95°F or higher prolonged exercise must be avoided. Brief periods of exercise may be permitted only if water is immediately available and encouraged. Prolonged exposure to direct sunlight should be avoided. Water breaks and water lines may be required in some settings.

Some patients may be at risk for water intoxication. Water intoxication is a potentially fatal syndrome characterized by obsessive water drinking and resulting in central nervous system dysfunction. Implementation of water lines in behavioral health settings may require that certain individuals have the specific gravity of their urine monitored in order to assure that electrolytes are not being washed out. Similarly, patients whose treatment requires mild dehydration (dialysis patients, congestive heart failure patients, and so on) may require similar monitoring (urinary specific

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gravity, blood pressure, weight, and so on) to ensure that adequate hydration is maintained.

IV. APPLICABILITY:

This HCSD is applicable to all facilities housing incarcerated adults.

signature on file

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Kristen Dauss , MD  
Chief Medical Officer

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Date