HEAT STRESS

POLICY: To establish guidelines for preventing and monitoring heat stress illness.

DISCUSSION:

It is the **responsibility of the facility medical staff** to provide guidelines to assist the facility administration in the determination of safe and healthful work conditions. Every reasonable effort shall be made in the interest of preventing heat-related injuries in the workplace. Heat stress is best prevented by acclimatizing staff and inmates to working under hot and humid climate conditions, assuring adequate fluid intake and, to a lesser extent, assuring adequate salt intake. Proper treatment of heat stress should begin at the work site, but severe heat stress is a medical emergency which must be treated in a medical facility**. Salt tablets should not be used in the treatment or prevention of heat stress**.

DEFINITIONS:

I. **Heat Stress**: a group of conditions which may occur from overexposure to or overexertion in excess environmental temperature. It includes heat cramps, heat exhaustion and heat stroke.

II. **Heat Cramps**: usually develop following strenuous exercise, in muscles that have been subjected to extensive work. The pain is brief, intermittent and crampy, and may be quite severe. Heat cramps usually occur after several hours of work, and may occur even at low ambient temperatures. The cause is inadequate replacement of electrolytes (sodium and potassium). Cooling efforts should be provided while medical staff is contacted for further treatment. **Prevention** is accomplished by ample fluid intake during and after work, and salting of food during meals if not medically contraindicated. Use of electrolyte replacement drinks or lightly salted fruit drinks at the work site may also be beneficial.

III. **Heat Exhaustion (Heat Prostration)**: the most common form of heat stress, caused by depletion of water and salt. Symptoms include weakness, anxiety, fatigue, thirst, dizziness, headache, nausea and urge to defecate. Signs include profuse perspiration, rapid pulse, incoordination and confusion. Heat prostration may lead to **heat syncope**, a sudden onset of collapse that is usually of brief duration. During heat syncope the patient appears ashen gray and skin is cool and clammy. Failure to treat heat exhaustion may result in progression to heat stroke. Risk factors include failure to maintain adequate fluid intake during exertion, and taking diuretics. Cooling efforts should be provided while medical staff is contacted for further treatment. **Prevention** is accomplished by ample fluid intake during work, proper work-rest cycles, and salting of food during meals if not medically contraindicated.

IV. **Heat Stroke**: is a medical emergency. While it may be preceded by signs of heat exhaustion, the onset is often sudden. In heat stroke the body has lost its ability to dissipate heat and maintain a normal body temperature. Body temperature is often elevated over 106° F. Exertional heat stroke occurs in young, healthy people who maintain inadequate fluid intake during exertion. Signs include headache, chills, gooseflesh, weakness, incoordination, nausea and vomiting, progressing to unconsciousness. Classical heat stroke is seen in the elderly, those with predisposing medical conditions such as congestive heart failure, diabetes and alcoholism, and those on medications which cause fluid depletion, interfere with sweating or interfere with the body's thermoregulatory system. Classical heat stroke has few premonitory signs. Collapse may be among the first symptoms. Skin is hot and dry, and pulse is rapid and weak. Shock and death may occur in either type of heat stroke. Cooling efforts should be provided while medical staff is contacted for further treatment. **Prevention** includes ample fluid intake during work, proper work-rest cycles, excluding people at high risk from working under conditions of extreme

heat and humidity, and maintaining adequate indoor conditions, such as access to cool fluids and use of cooling fans, for persons at increased risk for heat stroke.

V. **Anhidrotics** are drugs that inhibit perspiration**.**

VI. **Poikilothermics** are drugs that disrupt the body's normal temperature regulating mechanisms.

VII. **Potentiators** are drugs which potentiate the effects of anhidrotics or poikilothermics.

PROCEDURES:

I. Using the current temperature, humidity, and heat index, in addition to any other reliable weather information, the warden shall use the Heat and Humidity Index (Attachment B) to assess the risk prior to exposing workers to hot working conditions.

II. **Acclimatization**. Inmates newly assigned to jobs which require work under conditions with an apparent air temperature of 90° F or greater (see Table 1 on page 5) must be acclimatized before assuming a full workload. They should work no more than 3 hours at a time, separated by at least one hour rest in a cooler environment for the first week. After the first week, they may assume a normal work schedule. Acclimatization can be lost in as little as two weeks, so anybody who has been away from a hot work environment for more than two weeks should be reacclimatized. Acclimatization is not necessary for persons assigned to the same job when temperatures vary with seasonal changes.

III. **Fluid Intake**. Inmates and staff working at apparent air temperatures over 90° F should maintain an intake of at least 16 oz of fluids per hour of work. Under extreme conditions, work should be interrupted every 15 - 20 minutes and inmates instructed to drink fluids even if they are not thirsty. Drinking water will always be available to workers in hot weather conditions.

IV. **Work-rest Cycle**. Whenever the apparent temperature (see Table 1 on page 5) is 90 - 95° F, a 5-minute rest break should be given every hour. If the apparent temperature is 96 - 120° F, a 5-minute rest break should be given every 30 minutes, and work intensity be reduced by 1/3. If the apparent temperature is over 120° F, work should be curtailed, or, if work must continue, a 10-minute rest period should follow every 20 minutes of work, and work intensity should be decreased by 1/2 to 2/3.

V. **Newly-assigned workers** who are not acclimatized to the heat should be evaluated by the medical staff before being subjected to significant heat stress, and should be monitored by supervisors for signs of heat stress during the acclimatization period.

VI. **Inmates on Medications**. Work assignments for inmates on medications classified as anhidrotics, poikilothermics or potentiators (see Attachment A) should be considered carefully. In general, inmates on antipsychotic drugs should not be allowed to work or recreate in environments where the apparent air temperature is 95° F or higher. This restriction should also be considered for inmates who are on other drugs classified as anhydrotics, poikilothermics, or potentiators if they are on more than one such drug or if they also have an underlying medical condition that places them at increased risk (see Attachment B), particularly at higher dosage
levels of the drugs. Decisions about suitability of work assignments for these inmates will be made by facility medical staff. Documentation shall be made in the Restriction Module in the inmate's electronic health record and will be automatically transmitted to the HSIN screen in the TDCJ Mainframe.

Reports identifying inmates with heat and/or sunlight sensitivity restrictions:

1. Unit count room staff will provide unit security staff with the "Medical Heat Restriction List" which is generated from the Countroom Management System (R050) in mainframe. This report identifies inmates who have a heat restriction for work assignments.
2. The OnBase chain list, "Daily Strength Changes", (ITSS52) produced for individual units and the Transportation Department identifies inmates with a heat and/or sunlight sensitivity restriction who will be moving from one TDCJ unit to another on the following day.
3. Unit medical staff can access the OnBase report, "Inmates with Sunlight and Heat Restriction" (IMS042) any time a list of inmates with a heat and/or sunlight sensitivity restriction who are currently assigned to that unit is needed.

VII. Inmates with Heat Sensitivity Scores

Some inmates are potentially at a heightened risk of heat-related illnesses because of their age, health conditions, or medications. These inmates are identified through an automated heat sensitivity score that uses information from the inmate's EHR.

A. Heat sensitivity scores are updated automatically at least daily and as changes occur to the information in EHR. For newly received inmates, unit health services staff use an intake heat sensitivity form to screen inmates as soon as they arrive. When new inmates receive their physical examination, their score is updated automatically. Inmates who have a heat sensitivity score receive priority placement by classification in a housing area that is air-conditioned. Inmates identified as Pack Unit Class Members shall be managed in accordance with AD-03.05, "Inmates Identified as Pack Unit Class Members."

B. For returning inmates, unit classification intake staff will verify any previous heat sensitivity score(s) prior to placement in a housing area. If an inmate has previously received a heat sensitivity score, the inmate will be housed in a cool bed until the physical examination is completed and their score can be updated.

C. Inmates assigned to the Developmental Disabilities Program (DDP), in an infirmary, or in an inpatient mental health or a specialized mental health program may not refuse air-conditioned housing. These placements are based on physician orders or in the case of DDP, a health care policy. Inmates identified as Pack Unit Class Members shall be managed in accordance with AD-03.05, "Inmates Identified as Pack Unit Class Members."

VIII. **Transportation.** Units are to refrain from transporting psychiatric inpatients to another facility via chain bus. Inmates on the OnBase medication list should be transported during the coolest hours of the day. Outgoing chain screens should be reviewed against the unit OnBase Report to ensure that the inmates on medication are traveling on the appropriate mode of transportation. Please note that the Transportation Department adjusts their schedule during the summer months so that routes are run during the coolest part of the day.

IX. **Training**. Facility medical staff shall provide initial and annual training in the prevention of temperature extreme injury to all supervisory personnel who manage employees and inmates. Documentation of completed training shall be maintained by the Facility Health Administrator/Facility Practice Manager. Training should generally be accomplished in March or April of each year.

X. **Reporting**: The UTMB Senior Director of Quality and Outcomes will generate a monthly report from the electronic health record that summarizes all heat related illness for the period of April 15th through October 31st yearly. The monthly reports will be produced no later than the 5th day of the following months (i.e. May 5th, June 5th, July 5th, August 5th, September 5th, October 5th, and November 5th) and distributed to the Health Services Division Director, the University Medical Directors, and Division Directors for the Correctional Institutions Division, Administrative Review & Risk Management, Private Facility Contract Monitoring/Oversight Division and the Office of General Counsel.

HEAT STRESS

References:

ACA Performance Standard 5-2A-4153 Heating and Cooling

TDCJ Administrative Directive 10.64, Temperature Extremes in the TDCJ-ID Workplace (Cold/Hot)

TDCJ Administrative Directive 03.05, Inmates Identified as Pack Unit Class Members.

Heat Stress, Trainer Guide and Workbook, Association of Farmworker Opportunity Programs, Washington, DC

The Merck Manuals: The Merck Manual for HealthCare Professionals.
http://www.merck.com/mmpe/print/sec10/ch118/ch118e.html. Updated February 2012.

Centers for Disease Control and Prevention, http://www.cdc.gov/

Gerald Fletcher, M.D., professor of medicine at the Mayo Clinic, "Protect Your Heart in the Heat," American Heart Association, December 21, 2011. Accessed via the internet at
http://www.heart.org/HEARTORG/Conditions/More/MyHeartandStrokeNews/Protect-Your-Heart-in-the-Heat_UCM_423817_Article.jsp

NOAA's National Weather Service heat index. Beat the heat weather ready nation campaign. National Weather Service.
http://www.nws.noaa.gov/os/heat/index.shtml#heatindex

OSHA's Campaign to Prevent Heat Illness in Outdoor Workers. Occupational Safety & Health Administration. United States Department of Labor. Available at https://www.osha.gov/SLTC/heatillness/index.html

Table 1: Heat and Humidity Index

Actual Air Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of heat disorders with prolonged exposure or strenuous activity	Heat Index	Risk Level
Yellow = Caution	80 to 90°F	Possible fatigue with prolonged exposure
Gold = Extreme Caution	91°F to 103°F	Heat-related illness possible with long exposure
Orange = Danger	103°F to 115°F	Heat stroke possible and heat-related illness likely
Red = Extreme Danger	Greater than 115°F	High risk of heat stroke