MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: TRADOC Heat Illness Prevention Program 2018

1. Heat illness remains a significant health risk for TRADOC Soldiers and civilian personnel. In 2017, TRADOC had a 9 percent increase in reported heat incidents compared to the previous year. Avoidance of exertional heat illnesses has long been a challenge in the training environment, and the elevated temperatures across much of the Nation last year especially challenged TRADOC leaders. Inaccurate reporting of such incidents has also impeded analysis to identify trends and prevent reoccurrences. Common reporting gaps include the capturing of the Wet Bulb Globe Temperature (WBGT) at the time of the heat incident and a detailed description of the precipitating activity.

2. We can control hazards and minimize the risks associated with rigorous training during periods of elevated temperature with careful planning, quality training, active leadership, and execution to standard at all levels.

3. The enclosed information paper will assist leaders in familiarizing all Soldiers of the risk factors and mitigation techniques to prevent heat illness. It also provides reporting requirements that contribute to thorough analyses to help prevent future occurrences.

4. TRADOC senior commanders will review and update their installation/unit’s heat injury prevention plans and ensure all leaders and cadre receive heat injury/illness prevention training prior to 15 Apr 18.

5. Victory Starts Here!

Encl

[Signature]

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(see next page)
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1. Purpose: To provide heat illness prevention references and training resources; additional information on heat illness prevention requirements; descriptions of the different heat illness conditions; recovery procedures from heat incidents including iced sheets; and TRADOC heat illness incident reporting requirements.

2. Facts:

   a. References:


      (2) Training Circular (TC) 4-02.1 (First Aid), 1 January 2016 (https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/TC%204-02.1%20WEB.pdf).


b. Heat Illness Prevention Requirements. Heat illnesses range from heat exhaustion to heat stroke. While heat illnesses include milder conditions such as dehydration and heat cramps, if mitigation actions are not immediately taken, these can rapidly lead to conditions that require urgent medical treatment. Commanders should establish standing operating procedures to incorporate requirements/procedures contained in TRADOC Regulation (TR) 350-29 and establish techniques, protocols, and authorities for application of specific controls/mitigation measures such as those identified therein (reference 2a(8)), appendix B.

(1) Training. Conduct seasonal heat illness prevention training for leaders/cadre no later than 15 Apr 18 (using slide deck named TRADOC Heat Illness Prevention Guide for Leaders in reference 2a(10). Include the “Heat Can Kill” video as part of the training material (reference 2a(10)). Additional USAPHC training products (Heat Illness Prevention training video, factsheet, slide deck, brochures, urine monitoring cards) can be used to ensure there is proper awareness of the risk factors that increase Soldiers' susceptibility to heat illness and the prevention techniques to avoid heat illness (reference 2a(11)). All new cadre (i.e., those that arrive after 15 April each year) must receive heat illness prevention training before assuming their duties. Additionally:

(a) Ensure trainees receive heat illness prevention training within the first week of their training cycle so their battle buddies will recognize heat illness and immediately
notify leaders/cadre when signs and symptoms are present. Training will include identifying signs and symptoms, and field treatment of heat stroke, heat exhaustion, heat cramps, and hyponatremia (reference 2a(8)).

(b) Conduct response drills to prepare units for heat illness or heat-related incidents. Initial military training units should conduct “Soldier down” drills with their Soldiers each cycle (reference 2a(10), “Soldier Down – Ice Sheet Procedures” presentation).

(c) Provide heat awareness products (e.g., posters, fliers, pocket cards) throughout the unit and training areas. Several awareness products can be downloaded from the TRADOC Surgeon’s Army Knowledge Online (AKO) files, see reference 2a(10) or USAPHC Web site, reference 2a(11).

(2) Wet Bulb Globe Temperature (WBGT). Use WBGT devices at each company-level unit to monitor heat conditions in the local area (references 2a(7) and 2a(8)). Use the WBGT Risk Categories (references 2a(8) and (11)) to determine activity levels. WBGT Risk categories 4 and 5 (red and black) should be avoided for training or any outdoor activities, especially on consecutive days. WBGT should be obtained at the specific location of planned activities, not just at the start of activities, but again during extended activities. This is because the WBGT often changes throughout the day (e.g., there can be notable differences between 0600 hours versus 0900 hours and then especially later in the day). In addition, WBGT can vary notably at different locations (e.g., black top road or open field, versus outside a building or in shade).

(3) Conduct periodic safety inspections. Installation safety personnel or designated unit personnel (i.e., cadre) can conduct these assessments and report the results to battalion commanders or higher as appropriate. The assessment may include checking if the following items are available and serviceable within the unit: manual and/or digital WBGTs, heat mitigation methods (e.g., Arm Immersion Cooling System (AICS)), iced sheets, hydration status markers, leader cards, and current risk assessments.

(4) Identify and monitor risks. Leaders should apply these steps in the “Identify Hazards” step of the risk management process available in the referenced training presentation, “TRADOC Heat Illness Prevention for Leaders 2018” (see reference 2a(10)). Specific risks (hydration status, individual characteristics, environment, and activity) are described below. Additional details and training materials are provided in the USAPHC Heat Illness Prevention Training video and USAPHC Heat Illness Prevention Factsheet (reference 2a(11)).

(a) Hydration status. Use knotted parachute (“550”) cords or other means to identify the amount of water consumed by Soldiers. This identification method assists the Soldier and the leader/cadre to ensure individuals drink sufficient fluids for risk mitigation and may also prevent those individuals from over hydration.
(b) Individual risk characteristics. Key factors that put Soldiers at increased risk to become heat casualties include prior heat illness, not acclimatized, poor fitness, overweight, minor illness, prescriptions, skin rash, and sun exposure. Soldiers who have previously suffered a heat illness and those who are poorly acclimated to the heat or enduring strenuous activity are at the greatest risk. Soldiers who have high risk for heat illness (e.g., Soldiers previously treated for a heat illness) should be marked (i.e., with a colored patch, red beads on boot, or other means understood by the unit). In addition to unit leaders' monitoring of personnel, leaders should ensure the buddy system is used so every Soldier is monitored for heat illness by a designated buddy. The buddy system is especially important since Soldiers who are highly motivated often ignore symptoms or may self-treat by consuming too much water.

(c) Environment. Warmer temperatures especially when combined with high humidity are a key risk to Soldiers conducting rigorous activities. Very importantly, data has shown that risk of heat illness is most strongly associated with the cumulative exposure to heat, combined with strenuous exertion over a 3-day period. Therefore, training plans should minimize the overall exposure to heat and strenuous activity that occurs on consecutive days. Activities can be modified and/or conducted at times like dawn or at night when temperatures are cooler. Consideration can also be given to changing the location of activities – for example, moving from the blacktop to a field, a shady area, or even indoors.

(d) Activity. Most reported heat illnesses occur during road marches (i.e., 8-12 miles) or running events (i.e., 4 miles or greater), especially if the running is part of an evaluation test or competition. Reported heat illnesses have also been associated with other events involving obstacle and land navigation courses. Though less common, cases of muscle injury (i.e., Rhabdomyolysis) from excessive muscle strain have occurred, not just in the hot outdoors, but also during intense indoor training activities such as combative or weightlifting sessions. Leaders should recognize the higher risks and increased motivation levels during these types of high-risk activities and emphasize prevention.

(5) Risk Assessment and Mitigation. Assess heat illness risks associated with land navigation courses and foot marches in a field environment. Implement appropriate control measures:

(a) Hydrate prior to, during, and after an event, and ensure maximum drinking consumption rates are not exceeded;

(b) Use work/rest and continuous work tables (Commanders, Senior NCOs, and Instructors’ Guide to Risk Management of Heat Casualties, reference 2a(10);

(c) Introduce heat mitigation methods (modify uniforms - use of rolled up pants legs, T-shirt only, wear of Army Physical Fitness Training (APFT) uniform instead of Army Combat Uniform (ACU);
(d) Use sunblock for ultraviolet (UV) long waves (A) or UV short waves (B) with
30 sun protection factor (SPF) or greater; apply each hour on highly exposed areas
(face, nose, and ears);

(e) Reduce road march distances, if appropriate;

(f) Make iced sheets available on support vehicles;

(g) Use the buddy system and effective internal and external communications;

(h) The Heat Illness Risk Management Matrix is an objective tool that should be
used as a part of the risk management process prior to training activities (Heat Illness
Risk Management Matrix, see reference 2a(10)). This tool quantifiably identifies risks
and provides leaders effective information.

c. Conditions associated with heat illnesses. Heat illnesses are most likely to
occur in hot and humid conditions, but can occur in more moderate environments when
exercise intensity is high or heavy equipment is worn. Body temperature rises during
exercise that causes the body to produce sweat in an attempt to cool off. When a lot of
sweating occurs, the body becomes dehydrated and body temperature continues to
rise. Under these conditions, heat illnesses such as exhaustion or even heat stroke
are most likely to occur.

(1) Heat stroke - Heat stroke, the most severe of heat illnesses, is a medical
emergency. This condition can cause brain damage, damage to other essential organs,
and can be fatal. Symptoms include profuse sweating, convulsions and chills, vomiting,
confusion, combativeness, and loss of consciousness. Individuals will likely feel hot to
touch. IMMEDIATE COOLING and RAPID EVACUATION is critical to improving chance
of survival.

(a) Recognize and use mental status changes as a quick and reliable means to
determine if a Soldier has a heat stroke. Ask the victim a few simple questions that any
conscious person should be able to answer easily (for example, “What is your name?”
“What month is it?” “What year is it?” “Where are you?” “What were you doing before
you became ill?”).

(b) Failing this simple field test is often an indication of heat stroke and should
be treated as a heat stroke. It is also critical to determine the individual’s water
consumption prior to the incident – as in some cases mental confusion could result from
over hydration. Information regarding the individual’s fluid consumption rates should be
passed along to medical transporters and to the treating facility.

(2) Heat exhaustion - A milder form of heat illness often presents symptoms that
include dizziness, headache, nausea, weakness, unsteady walk, and muscle cramps,
with a normal mental status and may have core temperature elevation up to 103°F.
Early detection and treatment is vital to prevent the progression of heat exhaustion to
heat stroke. Treatment involves resting the Soldier in the shade, loosening clothing and removing head gear, and drinking adequate amounts of water. Evacuate the Soldier if there is no improvement in 15 minutes or the condition worsens.

(3) Rhabdomyolysis – Rhabdomyolysis (Rhabdo) is a severe exercise-induced injury of muscle fibers that the release of creatine kinase and myoglobin into the bloodstream. Myoglobin is harmful to the kidneys and frequently results in kidney damage. Other symptoms include abnormal urine color (dark, red, or tea colored); muscle pain, stiffness, or weakness; fatigue; nausea or vomiting; and confusion. Risk factors for rhabdomyolysis include hot weather, improper hydration, inadequate recovery between workouts, intense training, and insufficient fitness level. Implementation of the risk management process to ensure proper hydration and reduction of risks throughout the training period can prevent rhabdomyolysis. If this condition is suspected, promptly evacuate the Soldier to a medical facility for further evaluation.

(4) Hyponatremia – Hyponatremia is also called water intoxication and is a condition that occurs when the level of sodium (salt) in the blood is abnormally low. This can occur from loss of sodium in sweat or more commonly from the dilution effect of drinking too much fluid without adequate nutrition. This is a medical emergency and requires immediate evacuation. This can appear very similar to heat stroke and sometimes occurs in a Soldier who has recently consumed large amounts of water (no more than 1.5 quarts per hour). Symptoms include nausea or vomiting, confusion, clear colored urine, and abdominal swelling that are similar to heat stroke and exhaustion symptoms. A key factor differentiating hyponatremia from heat stroke is core (rectal) temperature, and any person with confusion and mental status changes should have a rectal temperature measured by a combat medic specialist (MOS 68W) or emergency medical services (EMS). This is the only method for measuring core body temperature. Medical personnel should utilize a rectal temperature technique prior to initiating iced sheets to differentiate between hyponatremia and heat stroke. In addition, if a transportable method for measuring serum sodium is available, trained personnel (on-site 68Ws or EMS) should use prior to transporting. Treatment involves fluid restriction and immediate evacuation to a medical facility for further evaluation and care. High-risk situations for hyponatremia include: over-drinking (beyond water intake doctrine), hot weather combined with prolonged exertion, early heat season (non-acclimatized), and inadequate food and electrolyte consumption.

d. First Response and Treatment. Soldiers who collapsed should be directed to rest in the shade, loosen their clothing, and rid their body of any excess heat as soon as possible. Be prepared to treat all personnel who collapse as a heat casualty with immediate cooling techniques (i.e., iced sheets). Soldiers should be placed flat on their back with both legs elevated 12 to 24 inches above the heart. Army medics (68Ws) possess training and scope of practice that qualify them to provide acute care to heat casualties. If a medic is available, they should begin treatment while contacting EMS. If not readily available, first aid treatment should be rendered by those (cadre and/or combat lifesaver) on the scene until EMS arrives. For casualties with suspected heat
stroke, timely activation of 911 and application of iced sheets significantly improves survivability. EMS will determine where to take a victim. Local policy determines evacuation protocols. Specific field treatment steps include:

(1) If available, rapid cooling with cold water immersion (ice baths) are the most effective method for reduction of core temperature. Otherwise, iced sheets should be applied anytime a Soldier exhibits signs or symptoms of heatstroke. For planning purposes, the minimum number of sheets maintained in ice cooler-type chests should be four sheets per potential heat casualty.

(2) Remove the Soldier’s outer clothing down to underwear. Note: make every effort to ensure a same-gender Soldier is present during removal of the Soldier’s clothing, ideally a noncommissioned (NCO) or the Soldier’s battle buddy to protect the Soldier’s privacy and modesty; however, DO NOT hinder treatment waiting for a same-gender Soldier. If there are privacy concerns, not removing the undershirt is acceptable.

(3) Place iced sheets over the casualty’s chest, in the armpits, and in the groin.

(4) Except for the face, cover as much exposed skin as possible with an iced sheet.

(5) Also cover the top of the casualty’s head.

(6) Use of commercial iced sheets/cooling packs can be used in lieu of traditional iced sheets to help eliminate linen laundering, reduce cooling requirements (i.e., use of ice), and transporting ease.

(7) Iced sheets should be re-iced and reapplied (or completely replaced) whenever the iced sheets become warm (because the sheets are no longer delivering cooling therapy). Cooling should be continued until EMS personnel arrive. Do not disrupt cooling on the basis of a temperature measurement (for example, with ear or skin thermometer).

(8) Discontinue iced sheets if the casualty is shivering.

e. Proper nutrition measures to assist in mitigating and/or reducing heat illnesses. A proper nutrition plan is essential for eating and hydrating before, during, and after physical training.

(1) Pre-activity. Always eat prior to any physical activity.

(a) Eat snacks or small meals 2-4 hours before exercise.
(b) Drink water (32-48 oz.) approximately 2-3 hours prior to exercise. One quart canteen holds 32 oz. A hydration pack reservoir’s capacity is 100 oz./approximately 3 quarts/3.0 liters (no more than 1.5 quarts per hour).

(c) Drink another 4 to 8 oz. of water right before starting an activity.

(d) For early morning exercise workouts: drink 8-16 oz. of sports beverage (see paragraph 2g) eat fruit, toast, or other light snacks.

(2) During activity.

(a) Drink water, as needed, for physical activity less than an hour.

(b) Consume 10-20 grams of carbohydrates (e.g., sports drinks, banana, pretzels, sports gels) at the 20-minute mark for physical activity lasting 60 minutes or more. Note: Energy drinks are not the same as sports drinks and should never be used for hydration. They contain large amounts of caffeine that can be a diuretic and worsen dehydration.

(3) Post activity.

(a) Timing is crucial for optimum growth and recovery from your workout.

(b) Refuel and rehydrate within 30-60 minutes after strenuous activity with a 4:1 carbohydrate-to-protein ratio recovery beverage or adequate consumption of proteins and carbohydrates. These may include 100-percent fruit juice (8 oz.), whole-grain bread with peanut butter, a banana, scrambled eggs, bowl of oatmeal, 16 oz. chocolate milk, or a granola bar.

f. Dietary and Performance Supplements. Soldiers have become ill from using dietary and performance supplements. This highlights the potential danger of these products. These products contain stimulants that may result in an adverse effect such as nervousness, headache, irregular heartbeat, and high blood pressure, which may increase the risk of dehydration and heat illness.

(1) Leaders should be aware of alerts for recalls, market withdrawals, and safety bulletins, as well as links to additional reliable information on supplements (reference 2a(9)).

(2) The Food and Drug Administration does not test or approve dietary supplements before they are marketed to the public. Leaders should be aware that there is no proven evidence of the safety and effectiveness of most of these products. Individuals should consult with a health care provider regarding use of any dietary or performance supplements. Further information for leaders is available from the USAPHC per reference 2a(11).
g. Sports/Electrolyte Drinks. Use the following guidance to help determine reasonable use of sports/electrolyte drinks for your Soldiers:

(1) Sports/electrolyte drinks are unnecessary for Soldiers who are consuming meals regularly and drinking enough water; these provide all the electrolytes and fluid needed for normal activities.

(2) Consider integrating sports/electrolyte drinks with standard water consumption before, during, and/or after activity in the following circumstances:

(a) To increase compliance with fluid intake, for Soldiers who are unaccustomed to hydrating with water and may lack the discipline needed to drink enough water.

(b) If the training event is strenuous and takes place outside the normal span of time between meals (4 hours), e.g., before breakfast or at night.

(c) If personnel are not acclimatized to the environment, they may require a sports/electrolyte drink until acclimatized.

(d) The following criteria should be used when using carbohydrate-electrolyte beverages (reference 2(a)1):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount per 8 oz. (as served)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>82-163 milligrams (mg)</td>
</tr>
<tr>
<td>Potassium</td>
<td>18-46 mg</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>12-24 grams (carbohydrate per 237ml)</td>
</tr>
</tbody>
</table>

h. Heat Mitigation Techniques and Devices.

(1) The use of designated rest areas called “cool zones” are becoming more popular to help reduce the heat effects of Soldiers in training. Cool zones provide a break area for those who are exposed to the debilitating effects of the heat during physical activity. These break areas are specially designed to provide shade from the sun and include devices or items to assist in mitigating and preventing heat illnesses. Such devices include camouflage cover/solar shades, water buffaloes/tanks, coolers containing water and sports drinks, power breezers/fans and misters, and arm immersion cooling system (AICS) units.

(2) The AICS concept is recognized as a method of heat illness mitigation in the military medical community and within TRADOC. It is designed to prevent the early signs and symptoms of heat illness.

(a) The AICS is a simple, efficient method for reducing body (core and skin) temperature, and mitigating the risk of serious heat illness. AICS takes advantage of the rapid rate of heat transfer from the skin directly into cool water using the large
surface area-to-mass ratio of the forearms. Some organizations are using existing AICS prototypes or large ice chest/coolers. The water temperature should be within a temperature range of 10 to 20°C or 50 to 68°F. Ice is provided with its use to keep temperatures within that range.

(b) Because of the limited inventory of the AICS prototype devices at certain locations, it is recommended that AICS be used for those personnel who may be more vulnerable to the heat conditions during a training activity (e.g., previous heat illness, poor fitness, overweight, minor illness (such as a cold)).

3. Heat Illness Reporting. If a reportable heat incident occurs (i.e., heat stroke, heat exhaustion, hyponatremia, or rhabdomyolysis), units should coordinate with both the Preventive Medicine personnel of their supporting local military treatment facility (MTF) and their safety office (i.e., DA Form 285-AB, U.S. Army Abbreviated Ground Accident Report [AGAR]). During the reporting process, it’s imperative to include as much information as possible about the heat incident to support a heat illness incident trend analysis and reevaluate prevention strategies. Common reporting gaps include the capturing of the WBGT at the time of the heat incident and a description of the precipitating activity (i.e., in the Serious Incident Report (SIR) (TRADOC Reg 1-8, para B-2, item 26 (Weather Conditions)). WBGT and activity information are required comments for the MTF to enter the heat incident into the Disease Reporting System internet (DRSi). Because there continues to be two to three heat-related fatalities in the Army each year and hundreds of serious heat illnesses, these serious and preventable conditions are high-visibility concerns that have several reporting mechanisms:

a. Serious Incident Report (SIR). Units are required to report immediately to the TRADOC Emergency Operations Center (EOC) IAW TRADOC Regulation 1-8, (Ref. 2a(13)), ensuring the WBGT at the time of the heat incident and a description of the precipitating activity are included in the SIR (para B-2, item 26 (Weather Conditions)). Any significant environmental injuries to TRADOC personnel such as heat stroke, rhabdomyolysis, heat exhaustion, and any other reportable medical events IAW AR 40-5, paragraph 2-18d (2a(13)).

b. DRSi. For consistent, timely Department of Defense (DOD) reporting of critical medical conditions and supporting critical elements, specific heat illness conditions (heat stroke, heat exhaustion, as well as heat and exertion-related hyponatremia and rhabdomyolysis) are included as Armed Forces Reportable Medical Events (reference 2a(13)). This should include conditions treated at military or civilian medical facilities. DRSi is used for the collection and timely reporting of information on cases of reportable medical events (RMEs) and is the system of record by the TRADOC Surgeon’s Office tracking and monitoring heat incident cases. MTF (preventive medicine staff) is required to report EHI treated at their local military or civilian medical facility into DRSi during the week of their occurrence. The DRSi RME documentation should include the specific activity preceding the event (PT, run) and specific location/time and WBGT/heat category. This information must be provided to the preventive medicine staff by the units and or safety office.
c. Risk Management Information System (RMIS)/Army Safety Management Information System (ASMIS) database. It is also important to document heat illness incidents through safety reporting mechanisms to capture details regarding the nature of the incident that led to the heat injury so that a determination can be made regarding the effectiveness of heat illness training, heat mitigation devices, etc. This documentation should be coordinated through safety channels/ASMIS within 72 hours of the incident. In addition, all heat illness incidents that require medical intervention or result in lost duty time will be reported in accordance with AR 385-10.

d. Soldiers Electronic Health Records (EHR) (i.e., Armed Forces Health Longitudinal Technology Application - AHLTA/Military Health System - MHS). If a Soldier is treated at an MTF for a heat illness, the individual's diagnosis and treatment procedures will be captured in their official medical record, and the master problem list will be updated accordingly.

(1) This information is used for DOD and Armywide medical surveillance reporting and is also useful for identifying and tracking at-risk individuals. While this is the most accurate system for capturing Army heat illness cases treated by Army medical providers, it is not a timely source for tracking and also does not capture the cases of those Soldiers who are treated at civilian medical facilities.

(2) Where EMS is not available due to the reduction of services at supporting MTFs, Soldiers requiring emergency medical treatment for heat illness are taken to civilian facilities. In these cases, preventive medicine offices should coordinate with patients to ensure civilian medical treatment records are provided to their military healthcare provider for documentation in their electronic health record. Also, Soldiers seen in civilian facilities must report to their military healthcare providers for follow-up, fitness for duty determinations, and duty-limiting profiles, reference 2a(15).

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