COMBAT CENTER ORDER 6200.3C

From: Commanding General
To: Distribution List

Subj: THE WET-BULB GLOBE TEMPERATURE INDEX (WBGTI) SYSTEM/PREVENTION OF HEAT CASUALTIES

Ref: (a) MCO 6200.1D

Encl: (1) Essential Information Regarding Prevention and First Aid for Heat Casualties
(2) Heat Condition Flag Warning System

1. Purpose. To provide all Marines with information on the types, causes, recognition, and treatment of heat casualties, to promulgate procedures and responsibilities for collection of Wet-Bulb Globe Temperature Index (WBGTI) readings, to set forth limitations on training per the reference, and to establish procedures for the dissemination of heat conditions.

2. Cancellation. CCO 6200.3B.

3. Background. The Combat Center lies in an area of extreme summer heat. Because of the accompanying low humidity, the extent of body water and salt loss may go unnoticed, producing a dangerous health hazard. Personnel must be thoroughly indoctrinated in survival under these climatic conditions prior to the commencement of the summer season. Enclosure (1) of this instruction includes : acclimation requirements for the prevailing climatic conditions; effects of body water and salt loss, and preventive action to be taken; effects of body exposure to direct sun through wearing of appropriate clothing, to include headgear; how to minimize heat effects through wearing of loose clothing; and how to recognize and take first aid action in cases of heat stroke and heat exhaustion. A thorough and proper understanding of the causes of heat stroke/exhaustion will reduce such casualties.

4. Action

a. Commanding Officer, Naval Hospital

(1) Maintain the collection site for Heat Stress Data and maintain the Reuter-Stokes Heat Stress Monitor system.

(2) Collect Heat Stress Data and complete the WBGTI every hour between 0800 and one hour after sunset daily from 1 May to 30 September and as necessary through the remainder of the year. If, at one hour after sunset, the Combat Center is in Heat Condition II or above, continue to collect data, compute, and report data until Heat Condition I is in effect.

(3) Retain and maintain a logbook that records time, date, WBGTI reading, time reported to MCAGCC, and who was contacted for a period of two years, after which it may be destroyed.

(4) Determine from the WBGTI when the following heat conditions are in effect:

(a) Heat Condition I (Green Flag): When the WBGTI reaches 80.0 degrees Fahrenheit.

(b) Heat Condition II (Yellow Flag): When the WBGTI reaches 85.0 degrees Fahrenheit.

(c) Heat Condition III (Red Flag): When the WBGTI reaches 88.0 degrees Fahrenheit.

(d) Heat Condition IV (Black Flag): When the WBGTI reaches 90.0 degrees Fahrenheit.

(5) When Heat Condition II is unusual, the CO, Naval Hospital will advise the Commanding General of the condition. (Unusual heat conditions will be determined by the CO, Naval Hospital. Examples of unusual heat conditions are a heat condition during the winter months of November - April, or a heat condition at night.) The Commanding General will make a determination as to whether or not field training shall continue. If field training is halted, units involved will be notified by BEARMAT or the Director, Operations and Training Directorate (O&T).

(6) During normal working hours, by telephone (extension 6020/6365) report to the Director, O&T, when the following occurs:

(a) Heat Condition I or higher is reached.

(b) Any change of heat condition during the day (increase or decrease).

(7) After normal working hours, on weekends and holidays, notify the Combat Center Command Duty Officer (extension 7200), when the following occurs:

(a) Heat Condition II or higher is reached.

(b) Any change of heat condition during the day (increase or decrease).

(8) Provide, upon request, instructions concerning the prevention, recognition, and emergency treatment of heat casualties.

b. Director, Operations and Training Directorate

(1) Upon notification of a heat condition, display appropriate heat condition flag and upon the establishment of Heat Condition II, III, or IV (to include both increases or decreases), the Director, O&T will inform the sections and units listed below by E-Mail:

(a) Training and Visual Information Support Center (TVISC) TV Channel 6.

(b) MCAGCC Staff Secretary.

(c) Director, Sergeant's Course.

(d) Director, Manpower Directorate.

(e) Director, Installations and Logistics Directorate.

(f) Director, Communication and Data Directorate.

(g) Director, Marine Corps Community Services Directorate.

(h) Range Control (BEARMAT).

(i) Head, Tactical Training Exercise Control Group.

(j) OIC, Range Scheduling.

(k) OIC, Reserve Support Unit.

(l) OIC, Marksmanship Training Unit.

(m) Commanding Officer, Light Armored Reconnaissance Battalion

(n) Commanding Officer, Marine Wing Support Squadron-374.

(o) Commanding Officer, Unmanned Aerial Vehicle Squadron 1.

(p) Commanding Officer, 23d Dental Company.

(q) Commanding Officer, Marine Corps Communications-Electronics School (School Ops).

(r) Commanding Officer, Headquarters Battalion (S-3).

(s) Commanding Officer, Combat Service Support Group 1.

(t) Commanding Officer, 7th Marine Regiment.

(2) TVISC. Upon notification of the heat condition, transmit on Channel 6 the following information: date, time and heat condition.

(3) BEARMAT. Inform all units in the field of all changes in heat condition.

(4) Marine Corps Community Services Directorate. Upon notification of the heat condition, display appropriate heat condition flags at all outside athletic locations managed by your Directorate.

c. Command Duty Officer. When posted, upon notification of the establishment of, or change of, the heat condition, notify the Range Control Unit (BEARMAT), extension 6623, and the Officer of the Day of each unit located at Mainside.

d. Directors. Upon notification of a heat condition, ensure that each subordinate unit and section is notified and that those training and working restrictions established in enclosure (2) are observed.

e. Supervisors of Civilian Employees. Upon notification of heat condition, ensure that employees are advised of the following:

(1) Regardless of heat or other climatic conditions, supervisors have a

responsibility to observe their subordinates' appearance, conduct and work, and to take appropriate action to seek medical aid if symptoms of heat stroke, exhaustion or other distress appear.

(2) If the nature of the work is such that a completion point must be reached prior to quitting, every effort will be made to complete the work without jeopardizing the employee's health. Allowing a worker frequent short rest periods, reducing the work pace, and ensuring adequate water intake may be appropriate safety measures. The health of an employee who may become a heat casualty takes precedence over the accomplishment of the job. Work should continue only if employees do not require medical aid.

5. Summary of Revision. Changes the required sections and units to be notified of heat condition changes.

6. Reserve Applicability. This Order is applicable to the Marine Corps Reserve.

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D. T. LENNOX
Chief of Staff

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Essential Information Regarding Prevention and First Aid for Heat Casualties

1. Body Heat and Environment

a. The human body uses energy for all its vital processes and in doing work. This energy becomes heat that, at ordinary temperatures, is transferred from the body to the environment. When the environment becomes as warm as the skin, this is no longer possible. When the temperature of the environment is higher than that of the skin, the process is reversed and the body begins to gain heat.

b. When the body cannot lose heat to the surrounding environment, it begins sweating. As sweat evaporates, transferring heat from the body to the surrounding air, the body is cooled and normal body temperature is maintained.

c. Sweating causes loss of body water and salt. This loss upsets the heat regulating mechanisms of the body. Improper heat regulation in the body can cause an individual to become a heat casualty.

2. Types, Causes, Symptoms, and First Aid for Heat Casualties

a. There are three basic types of heat casualties:

(1) Heat cramps

(2) Heat exhaustion

(3) Heat stroke

b. Heat exhaustion may progress into heat stroke. Heat stroke is the most serious of the heat conditions and, unless promptly treated, may result in death or permanent brain damage. Heat stroke is a true medical emergency.

c. Heat cramps may occur as an isolated condition with normal body temperature or along with heat exhaustion. Heat cramps may occur in a small area of the body or involve a large area when major muscle groups have been stressed. Most frequently involved are muscles of the arms, legs, or abdomen.

d. The symptoms of the two most serious conditions, heat exhaustion and heat stroke, are different and easy to recognize. The major differences are in the condition of the skin. Heat exhaustion causes the skin to be sweaty, cool, and pale. Heat stroke causes the skin to be unusually dry, hot, and flushed.

e. The types, causes, symptoms, and first aid treatment for the most serious types of heat casualties are as follows:

(1) Heat Exhaustion

(a) Cause. Exposure to high temperatures and humidity. Solar heat is also an important factor, as are prolonged work, recent arrival in hot climate, and too much clothing.

(b) Symptoms. Shortness of breath, feeling of illness, headache, weakness, dizziness, blurred vision, nausea, and muscle cramps may occur. After

onset, the casualty will generally have a pale, cool, wet skin.

(c) First Aid

1 Send for medical aid.

2 Place casualty in a cool shady place with circulating air.

3 Lay casualty down with head level or lower than feet.

4 Loosen clothing and equipment.

5 If casualty is conscious, give liberal quantities of water in small sips.

(2) Heat Stroke

(a) Cause. Exposure to high temperature and humidity coupled with the body's inability to sweat. Solar heat is also an important contributing factor, as are prolonged work, recent arrival in hot climate, and too much clothing. When sweating stops, the temperature of the body rapidly builds to dangerous levels.

(b) Symptoms. Lack of sweating, weakness, headache, dizziness, loss of appetite, nausea, shortness of breath, faintness or even collapse may occur. ONSET IS SUDDEN, and will be recognized by convulsion, delirium, or loss of consciousness. The skin will appear flushed, hot, and dry. Death or brain damage may occur if the body temperature is not lowered.

(c) First Aid

1 Send for medical aid.

2 The individual's body temperature should be lowered as quickly as possible.

3 Move casualty to a cool shady place with circulating air. Do not attempt to make the casualty drink.

4 Loosen clothing and equipment.

5 Apply cool water or ice water to entire body. Be careful to avoid the nose and mouth.

6 Fan patient constantly to promote body coolness by evaporation of applied water.

3. How to Avoid Becoming a Heat Casualty. The human body contains a large amount of water and considerable salt. Sweating causes the body to lose these items and they must be replaced. The body cannot be "weaned" away from water or trained to do without salt.

4. Prevention. Follow these rules to avoid heat exhaustion and heat stroke during hot weather:

a. Encourage Marines to drink water frequently and to drink as much as they need. Infrequent large intakes may lead to stomach distention, vomiting, or cardiac problems. When working on their own, individuals should drink water when they need it and drink all they desire. Needs may range from two quarts to three gallons a day in a garrison situation, but may increase to five gallons a day when consuming field rations and performing heavy work in hot weather. In fact, the need for water may exceed the desire. Ideally, personnel should drink until their urine becomes clear or a very pale yellow.

b. Avoid cold drinks while still sweating.

c. The average diet provides the necessary daily salt requirements. Salt tablets should be avoided, unless prescribed and under the supervision of the medical personnel.

d. Marines should wear headgear in the sun and remember that light, loose clothing will actually deflect the sun's heat.

e. A Marine who gets sick or dizzy in hot weather should rest. Don't overdo.

f. If a Marine stops sweating, get prompt medical aid.

g. Poor physical condition, lack of muscle tone, obesity, alcoholic indulgence, and lack of sleep increase susceptibility to heat illnesses.

5. Controlling Heat Casualties

a. Personnel who are not accustomed to physical activity under conditions of high temperature are particularly susceptible to heat injury. This is especially true of individuals who are 10 pounds or more overweight, or in whom a circulatory or sweating deficiency is noted. Conditions of high humidity and solar heat increase the possibility of heat injury.

b. Training programs for personnel who are climatically or physically deficient should be limited in intensity and time. A breaking-in period of, two to three weeks with progressive degrees of physical exertion and heat exposure will suffice for achieving acclimatization. During this period, the workload should be increased gradually but not to the point of exhaustion or to the point where personnel will be unduly fatigued the following day. Until acclimatized, personnel will lose greater than normal quantities of water or salt. These losses must be replaced.

c. Although acclimatization increases tolerance for heat, it does not make an individual immune to becoming a heat casualty. Overexertion can lead to heat illness even in mild weather.

d. Special provisions must be made for individuals who are overweight or who have difficulty with sweating or poor blood circulation.

6. Water and Salt Intake

a. Water intake must be sufficient to replace that lost by sweating. During field exercises in hot weather, this will require an allowance of up to one pint of

water per individual per hour if heat exhaustion is to be avoided. Individuals should be encouraged to drink water in small, frequent amounts.

b. Salt replacement for acclimatized troops is normally adequate through their regular meals unless eating is curtailed. Supplementary salt intake, for unacclimatized troops, or for any Marine doing heavy work in the heat, must be carefully supervised by medical personnel. Extreme caution must be taken not to exceed two grams (roughly equivalent to three salt tablets) of supplemental salt per day. Supplementary salt is not required when subsisting on field rations.

c. If water is not available, salt should not be taken. Salt in concentrated form is not absorbed into the system readily and may upset normal body chemistry and cause gastric irritation or nausea.

7. Rest, Sleep, and Recreation during Acclimatization Periods

a. Schedules will call for a 10-minute break every hour. The hour immediately after the noon and evening meals should be devoted to relaxation or nonstrenuous training. Seven hours of sleep per 24-hour period is the minimum required for general efficiency.

b. Sleeping, messing, and recreation quarters should be screened and well ventilated by either natural or mechanical means. Artificial cooling should be provided in buildings if the WBGTI is more then 80 degrees during the night.

8. Treatment Stations. Field dispensaries will be prepared to treat cases of heat illness. Artificial cooling devices should be employed at treatment stations and in ambulances, whenever possible.

9. Previous and Intercurrent Illness. Susceptibility to heat injury is greatly enhanced by illness or infections, including reactions to immunizations. A previous history of heat stroke, vascular disease, or skin trauma such as heat rash, acute sunburn, or any condition affecting sweat secretion or evaporation increases the risk of heat injury. These cases call for special consideration by a medical officer.

Heat Condition Flag Warning System

1. Heat conditions, which are determined by the WBGTI, are used in implementing a flag warning system to help prevent heat casualties during hot weather. The flags used in the system are green, yellow, red, and black with the green flag indicating the least severe heat condition and increasing in severity until a black flag is reached. These flags will be prominently displayed by all commands so that every Marine can see them particularly in areas where physical training takes place.

a. Instruction for Use of Heat Condition Flag Warning System. When the WBGTI reaches the temperature indicated below, the corresponding flag will be raised. Procedures for ordering the flags can be found in enclosure (2), paragraph 1c of the reference.

(1) Heat Condition I, Green Flag. When the WBGTI is between 80.0 degrees Fahrenheit and 84.9 degrees Fahrenheit, exercises such as marching at standard cadence should be conducted with moderation and under constant supervision. Unless otherwise announced, Heat Condition I is normally in effect during the summer months (1 May through 30 Sep) in the high desert. Heavy or strenuous physical work for exposed unacclimated personnel, both military and civilian, must be conducted with caution and under close supervision.

(2) Heat Condition II, Yellow Flag. When the WBGTI is between 85.0 degrees Fahrenheit and 87.9 degrees Fahrenheit, strenuous exercise, such as marching at standard cadence, will be suspended for unacclimatized personnel, both military and civilian, during their first two or three weeks in the high desert. Outdoor classes in the sun are to be avoided.

(3) Heat Condition III, Red Flag. When the WBGTI is between 88.0 degrees Fahrenheit and 89.9 degrees Fahrenheit, all physical training will be halted for those personnel, both military and civilian, who have not become thoroughly acclimatized by at least 12 weeks of living and working in the area. Those personnel who are thoroughly acclimatized may carry on limited activity not to exceed six hours per day during the heat of the day.

(4) Heat Condition IV, Black Flag. When the WBGTI is 90.0 degrees Fahrenheit or higher, strenuous nonessential outdoor physical activity will be halted for all units. Essential activities are defined as those activities associated with scheduled exercises or other major training evolutions where the disruption would cause undue burden on personnel or resources, be excessively expensive, or significantly reduce a unit's combat readiness. Essential outdoor physical activity will be conducted at a level that is commensurate with personnel acclimatization as determined by the unit's Commanding Officer in coordination with the unit's medical officer or medical personnel. All efforts should be made to reschedule these activities during cooler periods of the day.

b. Wearing of body armor or NBC warfare protective uniforms in effect adds 10 degrees Fahrenheit to the measured WBGTI. Heat conditions will be adjusted appropriately.