Policies and Procedures

Title: HEAT RELATED ILLNESSES POLICIES AND PROCEDURES

Document Code: TSC- PP-001

No. of Pages: Page 1 of 9

Department: Medical Services Division

Manual: TECHNICAL SUPERVISORY COMMITTEE P&P MANUAL

Issue Number: 1

Issue Date: 20.08.1437

Applies To: All Healthcare Providers During Hajj

Effective Date: 01.09.1437

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1. Policy statement:

1.1. Heat related illnesses are among the leading causes of morbidity and mortality of pilgrims exposed to intense physical exertion, under sustained high temperature and humidity. Mortality correlates with the degree of temperature elevation and time to initiation of cooling measures. This mandates the development of an evidence based policy and safest measures of care to reduce the morbidity and mortality.

1.2. In order to unify the practice and minimize variations, it is recommended to follow clinical guidelines of heat stroke during hajj (CG-001), clinical guidelines of heat exhaustion during hajj (CG-002), clinical guidelines of heat injury during hajj (CG-003), clinical guidelines of heat edema during hajj (CG-004), clinical guidelines of heat syncope during hajj (CG-005), clinical guidelines of heat cramps during hajj (CG-006), clinical guidelines of prickly heat during hajj (CG-007), clinical guidelines of sunburn during hajj (CG-008), Exertion associated hyponatremic encephalopathy can be confused with the heat stroke, and It can result in devastating outcomes if managed in the same way, therefore a clinical guidelines for its prevention, assessment and treatment was considered (CG-009), clinical guidelines of prehospital management of heat illness during hajj (CG-010), clinical guidelines of in-hospital triage for heat illness during hajj (CG-011), and clinical guidelines of heat illnesses cooling during hajj (CG-012).

2. Purpose:

2.1. To facilitate an efficient and effective management of heat related illnesses.

2.2. To save lives, start cooling and maintain at least a minimal level of body functions, until arrival to the hospital.

2.3. To ensure interdepartmental coordination and that all resuscitative measures shall be taken in a professional and appropriate manner to obtain (wherever possible) successful resuscitation.

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3. Definitions:

3.1. “Heat related illnesses” is the term given to a spectrum of disorders due to environmental exposure to heat. It includes:

3.1.1. “Heat stroke” applies to all cases with a core body temperature in excess of 40ºC (104ºF) with associated central nervous system dysfunction in the setting of a large environmental heat load that cannot be dissipated.

3.1.2. “Heat Exhaustion” applies to a condition of moderate to Severe heat-related illness characterized by a core body temperature around 40ºC, loss of salt and water caused by exposure to high environmental heat or strenuous physical exercise.

3.1.3. “Heat injury” applies to a condition with a core body temperature in excess of 40ºC associated with multiorgan failure but the central nervous system is not affected.

3.1.4. “Heat Syncope” applies to a transient loss or near-loss of consciousness due to the indirect effects of high ambient temperature.

3.1.5. “Heat cramps” applies to Exertion-associated painful involuntary muscle contractions during or immediately after exertion due to salt depletion.

3.1.6. "Heat Oedema" applies to a condition with dependent extremity swelling caused by interstitial fluid pooling.

3.1.7. "Prickly heat" applies to a condition manifests as small, red, itchy lesions on the skin as a result of heat related sweat ducts obstruction.

3.1.8. "Sunburn" applies to a condition results from an overexposure to the sun, manifests as redness, pain, edema, itching, peeling skin, rash and syncope.

3.2. Commanders or coordinator:

3.2.1. "Heat illness control and command center" : The HICCC represented by Strategic Commander who Sets the strategic response to an extreme heat event and focus on Strategic support and planning of the whole Hajj season..

3.2.2. "The tactical commanders" are those who supervise a group of hospitals, a group of PHCs or field medical team, they Takes the Strategy and develops action plans, and focus on Tactical support and planning.

3.2.3. "The heat related illnesses operational commander or coordinator" in each hospital, PHC or field team; is a doctor or trained nurse in each shift who liason between each hospital or PHC and the Heat illness control and command center through the tactical commander.

3.3. "Managing team" applies to a Group of personnel who are expert in delivering the necessary care in a professional way to save patient life. And include; field medicine staff, Red Crescent, PHC doctor, PHC nurse, Triage nurse, Emergency Doctors, Emergency Nurse, Heat stroke nurse, ICU Doctors, medical doctor, Respiratory Therapist and Pharmacist.

4. Procedures:

4.1. Prehospital Management of heat illness:

4.1.1. Red Crescent or Field medicine staff :

4.1.1.1. Shall Move the patient to a shaded or air-conditioned area and shall Remove all excess clothing.

4.1.1.2. Shall assess and resuscitate the patient with possible severe heat illness by evaluating and securing the airway and maintaining oxygenation.

4.1.1.3. Shall do Measurements of vital signs.

4.1.1.4. Shall give chilled water or Salt-containing solutions orally if the patient is not nauseated, vomiting, or manifesting a depressed mental status.

4.1.1.5. Shall secure IV line and give IV bolus of NS 500 ml if blood pressure is low and the patient is not tolerating orally;
## 4.1.1. Heat related illnesses

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4.1.1.6. Shall do Measurements of the rectal temperature.

4.1.1.7. Shall suspect heat stroke if temperature ≥ 40°C in the setting of altered mental status, and suspect heat exhaustion if temperature is elevated with normal mental status.

4.1.1.8. If temperature is elevated, staff shall place the patient supine and initiate rapid cooling as soon as possible, with Ice or Ice packs, mainly to the neck, axillae, groins and hairless areas, and shall change the Ice as soon as a moderate degree of melting occurs.

4.1.1.9. Alternative methods; chemical packs, ice/wet towel rotation, Towels shall be replaced as soon as they are no longer cool or every two to three minutes.

4.1.1.10. Field medicine staff shall use Fans for cooling if readily available.

4.1.1.11. Shall Continue cooling until a rectal temperature reaches just below 39°C. or patient starts shivering.

4.1.1.12. Shall continue Cooling during transport to PHC or a hospital till a rectal temperature just below 39°C. or patient starts shivering.

4.1.1.13. Staff shall accompany the patient during transportation and shall Monitor and document vital signs (rectal temperature, heart rate, respiratory rate, blood pressure) and mental status continually and shall continue cooling during transport till the patient begins to shiver.

4.1.1.14. Shall endorse the patient to the receiving caregiver.

### 4.1.2. PHC management for moderate to severe heat illnesses:

#### 4.1.2.1. PHC doctor:

4.1.2.1.1. Shall evaluate the patients.

4.1.2.1.2. Shall Maintain airway, breathing and circulation in accordance with standard life support protocols and maintain adequate oxygenation.

4.1.2.1.3. Shall give order for cooling if the temperature reaches more than 39 c.

4.1.2.1.4. Shall give order to stop cooling when temperature is less than 39c.

4.1.2.1.5. If there is convulsion the doctor Shall control it with Midazolam 0.1-0.2 mg/kg IV, to a maximum dose 4 mg, or Lorazepam 0.1 mg/kg IV, to a maximum dose 4 mg.

4.1.2.1.6. Shall transfer the patient to the hospital if there is other medical illness or convulsions.

#### 4.1.2.2. PHC nurse:

4.1.2.2.1. Shall Keep the patient on a bed with raised bed side rails to maintain safety of patient.

4.1.2.2.2. Shall do Measurements of vital signs, including a rectal temperature.

4.1.2.2.3. If the rectal temperature is more than 39° C the nurse Shall Start Cooling measures.

4.1.2.2.4. For the steps of Evaporative Cooling (Fan and body water spray) and Other cooling methods see (4.4).

4.1.2.2.5. Cooling measures shall continue till a rectal temperature reaches just below 39°C or the patient starts shivering.

4.1.2.2.6. The nurse shall Monitor and document vital signs (rectal temperature, heart rate, respiratory rate, blood pressure) and mental status. Continuously.

### 4.2. In-hospital Triage:

#### 4.2.1. Triage nurse:

4.2.1.1. Shall use only rectal thermometer to measure the temperature in any patient with a suspected heat related illness.
4.2.1.2. Shall shift the patient to the heat stroke resuscitation unit if the rectal temperature is equal to or more than 40°C, with history of exposure to a severe environmental heat.

4.2.1.3. If cooling measures were initiated in a patient with a heat related illness who has an altered mental status or seizure prior to his arrival, the triage nurse shall shift the patient to the heat stroke resuscitation unit.

4.2.1.4. If patient was brought by Field medicine staff or Red Crescent staff or PHC nurse, they shall endorse the documented vital signs to the triage nurse, if temperature was recorded before cooling to be more than 40°C, or had convulsion, The triage nurse shall shift the patient to the heat stroke resuscitation unit.

4.2.1.5. If a rectal temperature is less than 40°C, with normal mental stats and no seizure, the patient shall be shifted to cooling or observation rooms.

4.2.2. For quick guide to the clinical diagnosis of different types of heat illnesses (see Annex #8.1).

4.3. Evaluation and initial management:

4.3.1. Emergency Doctor:

4.3.1.1. Shall evaluate and resuscitate the patient according to the protocol of ABC; Maintain airway, breathing, adequate oxygenation and maintain circulation.

4.3.1.2. Shall give an order to cool the patient if a rectal temperature is more than 39°C.

4.3.1.3. Shall give order to stop cooling when temperature is less than 39°C.

4.3.2. Heat stroke unit nurse and Emergency Nurse:

4.3.2.1. Keep the patient on a bed with raised bed side rails to maintain safety of patient.

4.3.2.2. Maintain airway, breathing, adequate oxygenation and maintain circulation in accordance with standard life support protocols.

4.3.2.3. Measurements of vital signs, including a rectal temperature.

4.3.2.4. If the rectal temperature is more than 39°C Start Cooling measures.

4.3.2.5. Shall stop cooling when temperature is less than 39°C.

4.3.2.6. Shall take overall responsibility for documenting the events. (Who attended during the resuscitation, Time of and end of resuscitation and cooling, Medications given, time dosage and response and Patient's vital signs, etc.).

4.3.3. Heat stroke unit Charge Nurse and Emergency Charge Nurse:

4.3.3.1. Coordinate with the doctor’s order to the nurses and be sure about nurse response.

4.4. Cooling measures:

4.4.1. Keep the patient on a bed with raised bed side rails to maintain safety of patient.

4.4.2. Fully expose the patient with closed curtain to maintain privacy.

4.4.3. Maintain airway, breathing and circulation in accordance with standard life support protocols and maintain adequate oxygenation.

4.4.4. Measurements of vital signs, including a rectal temperature.

4.4.5. If the rectal temperature is more than 39°C Start Cooling measures.

4.4.6. Evaporative Cooling (Fan and body water spray; see Annex #8.2):

4.4.6.1. The nurse shall fill the water container of the fan using plain tab water.

4.4.6.2. Ice or cold water shall not be used in the fan container.

4.4.6.3. The nurse shall direct the fan towards the patient while fully naked.

4.4.6.4. The nurse shall Press the Control button of the mist in the fan (see Annex #8.3) to spray on the whole body of the patient with a mist of lukewarm water.

4.4.6.5. The nurse shall Press the Control button of fan (see Annex #8.3) to blow air over the moist skin.
4.4.6.6. The Evaporative cooling is the method of choice to treat heat stroke.

4.4.6.7. The nurse shall continue Cooling measures till a rectal temperature reaches just below 39°C or the patient starts shivering, at this point stop the mist then air of the fan.

4.4.6.8. The nurse shall monitor and document vital signs (rectal temperature, heart rate, respiratory rate, blood pressure) and mental status. Continuously.

4.4.7. The nurse shall use other effective cooling methods in patients with heat exhaustion or stroke if fans are over utilized:

4.4.7.1. Applying cold compresses to the smooth, hairless skin surfaces of the cheeks, palms, and soles.

4.4.7.2. Applying ice packs to the axillae, neck, and groin (areas adjacent to major blood vessels, but may be poorly tolerated by the awake patient.

4.4.8. The doctor or the nurse shall not use antipyretic agents such as acetaminophen or aspirin in the management of heat stroke.

4.4.9. The doctor shall know that Dantrolene is ineffective in patients with severe temperature elevation not caused by malignant hyperthermia.

4.5. Coordination and patient tracking:

4.5.1. The heat related illnesses operational commander and/or coordinator in each hospital or PHC shall track every patient from triage and inform admission officer about the diagnosis.

4.5.2. The admission officer shall code the patient according to ICD 10 and coordinate with The Statistic officer to feed the information to the dashboard.

4.5.3. The heat related illnesses coordinator shall collect the data according to (Form # 6.1) and send the copy of the form to Heat illnesses control centre by 08:00, 11:00, 14:00, 17:00 and 20:00 daily each day to the tactical commander.

4.5.4. Tactical commander shall forward it to HICCC as soon as he receive it.

4.5.5. Hospitals or PHC personnels or the heat related illnesses coordinator shall not forward collated data directly to any other agency or organization.

4.6. Discharge from emergency:

4.6.1. The doctor shall order a discharge for the patient who recover completely within two hours of presentation provided that the patient fulfill the following discharge criteria:

4.6.1.1. Normal vital signs.

4.6.1.2. Well hydrated.

4.6.1.3. No other symptom or sign of heat illness.

4.6.1.4. Fully conscious.

4.6.1.5. Normal investigations.

4.6.1.6. Free of complications.

4.6.2. The nurse shall carry the order of discharge if there is a responsible person to take the patient.

4.6.3. The Patient Relations Officer shall arrange with the Motawef to fasten the process of discharge.

4.7. Admission for in hospital care:

4.7.1. The Patient who fail to improve after two hours, despite the described procedures, the Emergency doctor shall admit the patient according to his condition to ICU or ward.

4.7.2. Admission officer shall process all administrative regulations related to admission starting from opening new file till patient discharge.

4.7.3. ICU Doctor:

4.7.3.1. Shall be responsible for cases admitted to ICU including heat stroke and heat injury cases.

4.7.3.2. Shall reassess the cases and investigate them to prevent, early detect and treat the complications in timely manner.
4.7.4. Medical doctor:

4.7.4.1. Shall take care of cases admitted to the ward for observation, diagnostic testing and further care, and for the transfered improved patients from ICU.

4.7.4.2. Shall reassess the cases and investigate them to prevent, early detect and treat the complications in timely manner.

4.7.4.3. Any patient in the ward require ICU care, the medical doctor shall coordinate with ICU Doctor.

4.7.5. Respiratory Therapist:

4.7.5.1. Shall attend all serious patients and assume the responsibility of respiratory support until the emergency doctor is available at the scene. Thereafter, he/she shall assist the Emergency doctor.

4.7.6. Pharmacist:

4.7.6.1. Shall prepare and Refill the crash cart continuously.

4.7.7. Security Guard shall:

4.7.7.1. Shall report immediately outside the resuscitation area and ensure that visitors are not permitted into the area and to Take custody of valuables in the possession of the patient being resuscitated.

4.7.8. Patient Relations Officer shall:

4.7.8.1. Shall Ensure the interest of the family who attended.

4.7.8.2. Shall coordinate with Motawefeen and facilitate the turnover of beds for the most effective utilization of heat unit and hospital beds.

5. Monitoring:

5.1.1. Total cases of heat stroke.

5.1.2. Total cases of heat exhaustion.

5.1.3. % of mortality of heat stroke.

5.1.4. % of mortality of heat exhaustion.

5.1.5. Average transportation time.

5.1.6. Average cooling time.

5.1.7. No. of heat stroke cases remained in ICU after day 13 thulhejjah.

6. Forms

6.1. Data collection form for Heat related activity (for hospitals and PHCs), to be collected by the coordinator in each hospital or PHC, and sent to Heat illnesses control centre by 08:00, 11:00, 14:00, 17:00 and 20:00 each day.
HEAT RELATED HOSPITAL and PHC ACTIVITY – DATA COLLECTION

Date: ……………………………………………… time: …………………

To be collected by the coordinator in each hospital or PHC, and sent to Heat Illnesses
control centre by 08:00, 11:00, 14:00, 17:00 and 20:00 each day.

Hospitals or PHCs should not forward collected data directly to any other agency or organization.

7. References

7.1. Care of the Wilderness and Adventure Athlete, Riana R. Pryor, PhD, ATC, Department of Kinesiology, California State University, published by Wilderness & Environmental Medicine. 26, S69-S75 (2015).


7.5. Heatstroke, Robert S Helman, MD; Chief Editor: Joe Alcock, MD, MS, Updated: May 01, 2015.


8. Annex

8.1. Table of the clinical diagnosis and management of different types of heat illnesses with ICD 10 CODE.

8.2. The Evaporating Fan.

8.3. Control buttons of the Evaporating Fan.
# Heat related illnesses

**Applies To:** All Healthcare Providers During Hajj

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## Heat illnesses Clinical Features and management

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<th>ILLNESS</th>
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<th>HEAT INJURY</th>
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<tr>
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<td>T 67.6</td>
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<td>L 74.0</td>
<td>L 55.9</td>
<td>T 67.2</td>
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### Clinical Features

**Severe heat related illness characterized by:**
- Core temp. (rectal) more than 40°C.
- CNS abnormalities such as altered mental status, seizures or coma.

**Resulting from:**
- Passive exposure to environmental heat.
- Strenuous exertion.

**Other features:**
- Tachycardia, Hypertension, Tachypnea.
- And may have: Dehydration and aspiration pneumonia.

**Exertional Heat Injury**
- Defined as a progressive multisystem disorder with hyperthermia less than 40°C, following vigorous activity that is associated with end-organ damage (eg. kidney, liver, musculature) in the absence of significant neurologic injury.

**Mild-to-moderate heat-related illness due to loss of salt and water caused by:**
- Exposure to high environmental heat or strenuous physical exercise.
- Intense thirst, weakness, disorientation, anxiety, dizziness, syncope.
- Core temp. may be normal or 38°C.
- Sweating, Pertussis hypotension.

**Heat Induced peripheral vasodilatation and pooling of blood with transient loss of consciousness followed by spontaneous return to normal mentation.**

**Dependent extremity swelling caused by intravascular fluid pooling.**

**Mild swelling of feet.**

**Heat rash caused by obstruction of the sweat ducts.**
- Small, red, itchy lesions on the skin.
- Result from exposure to the sun.

**Typically, there is initial redness (erythema) followed by varying degrees of pain, proportional in severity to both the duration and intensity of exposure.**

**Other symptoms can include edema, itching, peeling skin, rash, nausea, fever, chills, and syncope.**

**Exercise associated pathologic involuntary muscle contractions during or immediately after exertion due to salt depletion.**

**Complications involving large muscle groups (legs).**

**Mottled skin,**

**Normal body temperature,**

**Minimal distress.**

**Serum sodium below normal.**

**Signs of cerebral edema.**

**Low serum cortisol.**

**Low urine sodium and osmolality.**

## Initial Care

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<td>Mild</td>
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Source: Pocket guide for clinicians during Hajj – MOH 1437-2016 / ICD 10 code

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Table of the clinical diagnosis and management of different types of heat illnesses with ICD 10 CODE (Annex # 8.1).
The Evaporating Fan (Annex # 8.2)

Control buttons of the Evaporating Fan (Annex # 8.3)