

## HEAT ILLNESS

*Includes Heat Exhaustion and Heat Stroke; Does Not Include Other and Unspecified Effects of Heat and Light*

### Background

This case definition was developed by the Armed Forces Health Surveillance Branch (AFHSB) for the purpose of epidemiological surveillance of heat illness.

### Clinical Description

For the purposes of this case definition heat illness is defined as a diagnosed case of either heat exhaustion (HE) or heat stroke (HS). Heat exhaustion is an acute reaction to excessive heat often accompanied by profuse sweating, dizziness, nausea, headache and fatigue. Heat stroke is a form of hyperthermia, in which the core body temperature is elevated above (>104°F/40 °C), measured immediately following collapse during strenuous activity, and accompanied by central nervous system dysfunction (i.e., disorientation, headache, irrational behavior, irritability, emotional instability, confusion, altered consciousness, or seizure). Heat stroke is considered a medical emergency that can be fatal if not properly treated. Service members carrying out duties in environments with high ambient temperatures and/or engaging in strenuous exercise are at higher risk of developing heat illness.<sup>1</sup>

### Case Definition and Incidence Rules

For surveillance purposes, a case of heat illness is defined as:

- *One hospitalization or outpatient medical encounter* with a case defining diagnosis of heat illness (see ICD9 and ICD10 code lists below) in the *first* or *second* diagnostic position; or
- One record of a reportable medical event (RME) of heat illness.

#### *Incidence rules:*

For individuals who meet the case definition:

- The incidence date is considered the date of the first hospitalization, outpatient medical encounter, or reportable medical event that includes a defining diagnosis of heat illness.
- An individual is considered an incident case only *once per calendar year*.
- For individuals with more than one heat illness diagnosis in a calendar year, heat stroke is prioritized over heat exhaustion.
- Medical encounters for each individual within a calendar year are prioritized: hospitalizations > reportable medical events > ambulatory visits.

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<sup>1</sup> Armed Forces Health Surveillance Branch. Update: Heat Illness, Active Component, U.S. Armed Forces, 2017. *Medical Surveillance Monthly Report (MSMR)*. 2018 March; Vol 25(4): 6-12.



### Case Definition and Incidence Rules *(continued)*

#### Exclusions:

- None

### Codes

The following ICD9 and ICD10 codes are included in the case definition:

#### Heat Illness

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Heat stroke	T67.0 (heatstroke and sunstroke...)	992.0 (heat stroke and sunstroke)
	- T67.0XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
Heat exhaustion	T67.3 (heat exhaustion, anhydrotic...)	992.3 (heat exhaustion, anhydrotic)
	- T67.3XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T67.4 (heat exhaustion due to salt depletion...)	992.4 (heat exhaustion due to salt depletion)
	- T67.4XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T67.5 (heat exhaustion, unspecified...)	992.5 (heat exhaustion, unspecified)
	- T67.5XX [A,D,S] (initial encounter, subsequent encounter, sequela)	

### Development and Revisions

- In March of 2017 the case definition was updated to include ICD10 codes. Terminology was also changed to be consistent with the January 2017 Armed Forces Reportable Medical Events Guidelines and Case Definitions (i.e., heat injuries was changed to heat illness).
- This case definition was originally developed in 2010 by the AFHSC *Medical Surveillance Monthly Report (MSMR)* staff for a *MSMR* article on heat injuries.<sup>2</sup>

#### Case Definition and Incidence Rule Rationale

- Because the intent of this case definition is to determine the annual number of individuals who are incident cases, in March of 2018 the incidence rule for calculating *counts* of heat illnesses in specific categories was removed. The rule specified that individuals were allowed one event in each category (i.e., heat stroke, heat exhaustion, etc.) *once every 60 days*. In future analyses

<sup>2</sup> Armed Forces Health Surveillance Center. Update: Heat Injuries, Active Component, U.S. Armed Forces, 2009. *Medical Surveillance Monthly Report (MSMR)*. 2010 March; Vol 17(3): 6-8.



individuals will be considered an incident case once per calendar year irrespective of heat illness category. Investigators interested in repeat incidence events may want to consider using a 60-day incidence rule).

- Probable and confirmed cases of heat illness are not distinguishable using this case definition.

#### *Code Set Determination and Rationale*

- The case definition includes codes with 7<sup>th</sup> digits “A” (initial encounter), “D” (subsequent encounter) and “S” (sequela). Analyses using these codes might increase the sensitivity of case-finding in health care records. Because the incidence rules permit an individual to be considered an incident case *only once per calendar year* it would be unlikely for combinations of diagnoses with A, D, and S 7<sup>th</sup> digits in a patient’s record to be counted as repeat events.
- In March of 2018, to be consistent with the RME guidelines codes ICD9 992.8 / ICD10 T67.8 (other effects of heat and light) and codes ICD9 992.9 / ICD10 T67.9 (effect of heat and light, unspecified) were removed from the heat illness code set and added to the list of heat related conditions not included in the code set below.
- To maintain consistency with the Armed Forces Reportable Medical Events Guidelines, the following heat-related conditions are *not* included in the code set for this case definition.

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Heat syncope	T67.1 (heat syncope...)	992.1 (heat syncope)
	- T67.1XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
Heat cramps	T67.2 (heat cramp...)	992.2 (heat cramps)
	- T67.2XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
Heat fatigue	T67.6 (heat fatigue, transient...)	992.6 (heat fatigue, transient)
	- T67.6XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
Heat edema	T67.7 (heat edema...)	992.7 (heat edema)
	- T67.7XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
Other and unspecified effects of heat and light	T67.8 (other effects of heat and light...)	992.8 (other specified heat effects)
	- T67.8XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T67.9 (effect of heat and light, unspecified...)	992.9 (unspecified effects of heat)
	T67.8 (other effects of heat and light...)	992.8 (other specified heat effects)

- The following conditions are attributable to exposure to the direct effects of solar or other ultraviolet radiation and are not dependent upon the occurrence of total body heat stress. Because these conditions are not generally associated with systemic adverse effects, they are not included in the code set for this case definition.



Condition	ICD-10-CM Codes	ICD-9-CM Codes
Photokeratitis	H16.13[1,2,3,9] photokeratitis	370.24 (photokeratitis)
Solar retinopathy	H31.02[1,2,3,9] (solar retinopathy)	363.31 (solar retinopathy)
Solar urticaria	L56.3 (solar urticaria)	692.72 (acute dermatitis due to solar radiation)
Miliaria,	L74.3 (miliaria, unspecified)	705.1 (prickly heat)
Sunburn	L55.[0,1,2,9] (sunburn, first degree, second degree third degree, unspecified)	692.7x (contact dermatitis and other eczema due to solar radiation; includes sunburn)
	L56.8 (other specified acute skin changes due to ultraviolet radiation)	

## Reports

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AFHSB reports on heat illness in the following reports:

- Annual *MSMR* update; published in March.
- AFHSB Reportable Events Monthly Report. Available on the Defense Health Agency (DHA) website at: <https://health.mil/Military-Health-Topics/Health-Readiness/Armed-Forces-Health-Surveillance-Branch/Reports-and-Publications>.

## Review

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Mar 2018	Case definition reviewed and updated by the AFHSB Surveillance Methods and Standards (SMS) working group.
Mar 2017	Case definition reviewed and updated by the AFHSB Surveillance Methods and Standards (SMS) working group.
Dec 2010	Case definition reviewed and adopted by Surveillance Methods and Standards (SMS) working group.
Mar 2010	Case definition developed and reviewed by AFHSC <i>MSMR</i> staff.

## Comments

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- Heat illness, which includes heat stroke and heat exhaustion, is a reportable medical event in the Armed Forces Reportable Events surveillance system.<sup>3</sup>

<sup>3</sup> Armed Forces Reportable Medical Events Guidelines and Case Definitions, Armed Forces Health Surveillance Branch, 1 January 2017.

