

HEAT EXHAUSTION AND HEAT STROKE

Does not include other specified and unspecified effects of heat and light.

Background

This case definition was developed by the Armed Forces Health Surveillance Division (AFHSD) for the purpose of epidemiological surveillance of heat exhaustion and heat stroke among active duty service members. Prolonged or intense exposures to heat can significantly impact the health, well-being, and operational readiness of service members and their units. Because military operations are conducted in diverse geographic regions and weather conditions, the U.S. military has established comprehensive countermeasures to mitigate the threats associated with training and operating in high-temperature environments.¹

Clinical Description

Heat illness—an acute reaction to excessive heat—occurs on a continuum of severity. Mild illness can present with symptoms such as cramps, rash, edema and thirst. Moderate illness, or heat exhaustion (HE), is characterized by profuse sweating, dizziness, nausea, headache and fatigue. Core body temperature is typically elevated ($>100.5^{\circ}\text{F}$ [38°C] but $<104^{\circ}\text{F}$ [40°C]). Heat stroke is the most severe form of heat illness, characterized by severe hyperthermia (core body temperature $>104^{\circ}\text{F}$ [40°C]) and significant central nervous system dysfunction. The dysfunction can include changes in mental status such as delirium, stupor, loss of consciousness and coma. Heat stroke is a medical emergency that requires aggressive intervention and rapid cooling to prevent end-organ damage; it can be fatal if not properly treated.²

Case Definition and Incidence Rules (September 2026 - present)

For surveillance purposes, a case of heat exhaustion or heat stroke is defined as:

- *One hospitalization* with a case-defining diagnosis of heat exhaustion or heat stroke (see ICD9 and ICD10 code lists below) in the *first* or *second* diagnostic position; or
- *One outpatient or Theater Medical Data Store (TMDS) medical encounter* with a case-defining diagnosis of heat exhaustion or heat stroke (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 exhaustion or heat stroke.

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first RME, hospitalization, or outpatient medical encounter that includes a case-defining diagnosis of a heat exhaustion or heat stroke.

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¹ Armed Forces Health Surveillance Branch. Update: Heat Illness, Active Component, U.S. Armed Forces, 2017. *MSMR*. 2018; 25(4): 6-12.

² Armed Forces Health Surveillance Division. Update: Heat Exhaustion and Heat Stroke Among U.S. Active Component Service Members, 2021-2025. *MSMR*. 2026; 33(5): 3-9.



Case Definition and Incidence Rules *(continued)*

- An individual is considered an incident case *once per calendar year*.
- For individuals with more than one heat illness diagnosis in a calendar year, the more severe diagnosis (heat stroke) is prioritized over heat exhaustion.
- For individuals with multiple medical encounters in a calendar year, encounters are prioritized as follows: hospitalizations > RME > outpatient and TMDS encounters.

Exclusions:

- Individuals who have an ICD10 code with a “D” (subsequent encounter) or “S” (sequela) in the 7th position, AND no corresponding ICD10 code with an “A” (initial encounter) in the 7th position within the same calendar year (see *Case Definition and Incidence Rule Rationale* below).

Codes

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

Condition	ICD-10-CM Codes	ICD-9-CM Codes
[A] initial encounter, [D] subsequent encounter, [S] sequela		
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

- *Surveillance population:* In April 2024, the *Medical Surveillance Monthly Report (MSMR)* staff added the Coast Guard and Space Force active components to its surveillance populations for heat illness.



- In March 2017 the case definition was updated to include ICD10 codes.
- The case definition was originally developed in 2010 by the Armed Forces Health Surveillance Center (AFHSC) *MSMR* staff for an article on heat injuries.³

Data Sources:

- The data used to determine incident heat stroke and heat exhaustion diagnoses is derived from the following sources: Military Health System (MHS) Management System, MHS Management Analysis and Reporting Tool (M2), Defense Medical Surveillance System (DMSS), Disease Reporting System internet (DRSi) and Theater Medical Data Store (TMDS).²
- In July 2017, a software update to DRSi removed the specific sub-category labels, (i.e., heat stroke" and "heat exhaustion"), from RME records transmitted to the DMSS. As a result, DMSS records only registered a generic “heat illness” event. To distinguish the type of heat illness, analysts manually cross-reference and pull the specific diagnoses directly from the source DRSi database.⁴

Title and Terminology Changes:

- In April 2023, the title of *MSMR*’s annual heat injury report was changed from “Heat Illness” to “Heat Exhaustion and Heat Stroke” to more accurately reflect the reporting categories in the *Armed Forced RME Guidelines and Case Definitions (RME Guidelines)*. No changes to the incidence rules or code set were made at this time.⁴ The title of the AFHSD case definition was updated accordingly in July 2026.
- In January 2017, the *RME Guidelines* removed “Heat Injury” as a reportable medical event leaving “Heat Exhaustion” and “Heat Stroke” as the reportable illness types. Accordingly, they retired the title “Heat Injuries” and adopted the title “Heat Illness” for these reportable medical events. The AFHSD updated the case definition and *MSMR* report titles in March 2017 to match the *RME Guideline* change.

Case Definition and Incidence Rule Rationale

- Historically, the case definition distinguished general incident cases—counted once per calendar year—from specific heat-related injury events (e.g., heat exhaustion, heat stroke, and other heat-related injury). The definition used a 60-day incidence rule to capture multiple distinct events per individual per category, particularly deployment-related heat injuries. By 2017, *MSMR* staff phased out the 60-day incidence rule across both general surveillance and deployment-specific tracking, to standardize reporting across all categories to a single incident case per calendar year.⁵
- Exclusions
 - *ICD10 codes with 7th position characters:* In April 2024, the *MSMR* staff determined that individuals who have an ICD10 code with a “D” (subsequent encounter) or “S” (sequela) in the 7th position, AND no corresponding ICD10 code with an “A” (initial encounter) in the 7th position within the same calendar year should be excluded from the total case counts. The

³ Armed Forces Health Surveillance Center. Heat Injuries, Active Component, U.S. Armed Forces, 2009. *MSMR*. 2010; 17(3): 6-8.

⁴ Armed Forces Health Surveillance Division. Heat Exhaustion and Heat Stroke Among Active Component Members of the U.S. Armed Forces, 2018-2022. *MSMR*. 2023; 30(4): 3-7.

⁵ Armed Forces Health Surveillance Branch. Heat Illness, Active Component, U.S. Armed Forces, 2016. *MSMR*. 2017; 24(3): 9-13.



change was instituted in the April 2024 *MSMR* report, which published for surveillance period 2019-2023.⁶

Analyses of cases over a five-year period revealed that approximately 100-200 individuals per year had a “D” or “S” code without an initial “A” encounter code. Because some heat illnesses require long-term follow-up care, the exclusion ensures follow-up medical encounters are not misclassified as new cases, which would artificially inflate incidence rates.

- Prior to the April 2024 *MSMR* report, which was published for surveillance period 2019-2023, the case definition included any individual with an ICD10 code containing an “A,” “D,” or “S” in the 7th position. While the *MSMR* staff noted including these codes might increase case-finding sensitivity, they concluded that combinations of these codes were unlikely to result in duplicate event counts because the incidence rule allowed an individual to be counted as an incident case *only once per calendar year*.
- *Probable and confirmed cases*: The *RME Guidelines* define distinct clinical criteria for “probable” and “confirmed” cases of heat exhaustion and heat stroke. This case definition does not distinguish between probable and confirmed cases.

Code Set Determination and Rationale

Incidence rates and trends over time reported in the *MSMR*’s annual Heat Exhaustion and Heat Stroke report will reflect the following methodology and code set changes.

- *Nonspecific and unspecified codes associated with the effects of heat and light*.
 - In April 2018, the *MSMR* staff removed ICD10/9 codes T67.8*/ 992.8 (other specified effects of heat and light) and T67.9*/ 992.9 (effects of heat and light, unspecified) from the code set to align its reporting methodology with the January 2017 update to the *RME Guidelines* (see below).
 - *RME Guidelines update*: In January 2017, the *RME Guidelines* were revised to eliminate the broad “other heat illness” category and its two associated nonspecific codes (ICD10/9 T67.8*/ 992.8 and T67.9*/ 992.9). Heat exhaustion (T67.[3-5s / 992.[3-5]], also grouped under the discontinued “other heat illness” category, was retained as an active, stand-alone surveillance category. Heat stroke (ICD10/9 T67.0 / 992.0), tracked and reported separately, was also retained.
 - *Impact on historical comparisons*: The removal of ICD10/9 codes T67.8*/ 992.8 and T67.9*/ 992.9 and the change in reporting categories limits the direct comparison of heat illness case counts and incident rates numbers reported in *MSMR* updates prior to 2017.
- To maintain consistency with the *RME Guidelines*, the following heat-related conditions are *not* included in the code set.

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)	
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⁶ Armed Forces Health Surveillance Division. Heat Exhaustion and Heat Stroke Among Active Component Members of the U.S. Armed Forces, 2019-2023. *MSMR*. 2024; 31 (4): 3-8.



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 <i>(Removed April 2018)</i>	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 excluded from the code set because they are caused by direct exposure to solar or ultraviolet radiation, rather than total body heat stress. Also, they generally do not produce systemic adverse effects.

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

The AFHSD reports on heat exhaustion and heat stroke in the following reports:

- Annual *MSMR* update.
- The Defense Centers for Public Health-Aberdeen (DCPH-A) publishes a monthly RME Report which can be obtained by sending an email to: dha.apg.Pub-Health-A.mbx.disease-epidemiologyprogram13@health.mil. A link to this email is also available on the Defense Health Agency (DHA) website; <https://www.health.mil/Military-Health-Topics/Health-Readiness/Public->



[Health/AFHSD/Reports-and-Publications/Armed-Forces-Reportable-Medical-Events](#). Accessed September 2026.

Review

Sep 2026	Case definition updated by <i>MSMR</i> staff; approved by the AFHSD Surveillance Methods and Standards (SMS) working group.
Mar 2018	Case definition reviewed and updated by the Armed Forces Health Surveillance Branch (AFHSB) SMS working group.
Mar 2017	Case definition reviewed and updated by the AFHSB SMS working group.
Mar 2010	Case definition developed by the Armed Forces Health Surveillance Center (AFHSC) <i>MSMR</i> staff; reviewed and adopted by the AFHSC SMS working group (Dec 2010).

Comments

- Heat exhaustion and heat stroke are reportable medical events in the *Armed Forces Reportable Medical Events* surveillance system.

