

RHABDOMYOLYSIS; EXERTIONAL

Background

This case definition was developed by the Armed Forces Health Surveillance Division (AFHSD) for the purpose of epidemiological surveillance of exertional rhabdomyolysis among healthy service members. The methodology is intended to capture cases that are preventable through established safety measures designed to mitigate heat-related illness associated with strenuous exertion and inadequate hydration in high ambient-temperature environments.¹

Clinical Description

Rhabdomyolysis is a condition characterized by the rapid breakdown of skeletal muscle tissue, which leads to the release of cellular contents—predominantly myoglobin, muscle enzymes, and electrolytes—into the bloodstream. If the concentration of these muscle byproducts becomes too high, it can trigger severe complications across multiple organ systems. Major clinical risks include acute kidney injury (AKI), fluid and electrolyte imbalances, compartment syndrome and disseminated intravascular coagulation (DIC). A hallmark sign of the condition is myoglobinuria—the visible appearance of myoglobin in the urine. In the United States, the overall case fatality rate is less than 5%; however, patient outcomes depend on the underlying cause, the severity of initial symptoms, the individuals baseline health, and any comorbid conditions.²

Case Definition and Incidence Rules *(September 2026 - present)*

For surveillance purposes, a case of exertional rhabdomyolysis is defined as:

- *One hospitalization* with a case-defining diagnosis of exertional rhabdomyolysis in *any* diagnostic position; AND *at least one* “rhabdomyolysis-associated condition” (see ICD9 and ICD10 code list below) in *any* diagnostic position; or
- *One outpatient or Theater Medical Data Store (TMDS) medical encounter* with a case-defining diagnosis of exertional rhabdomyolysis in *any* diagnostic position; AND *at least one* “rhabdomyolysis-associated condition” (see ICD9 and ICD10 code list below) in *any* diagnostic position.

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first hospitalization or outpatient medical encounter that includes a case-defining diagnosis of exertional rhabdomyolysis.
- An individual is considered an incident case *once per calendar year*.

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¹ Armed Forces Health Surveillance Branch. Update: Exertional rhabdomyolysis, active component, U.S. Armed Forces, 2001-2016. *MSMR*. 2017; 24(3): 14-18.

² Armed Forces Health Surveillance Center. Update: Exertional Hyponatremia, Active Component, U.S. Armed Forces, 1999-2010. *MSMR*. 2011; 18(3): 12-15.



Case Definition and Incidence Rules *(continued)*

Exclusions:

- Cases of exertional rhabdomyolysis that include any of the complicating diagnoses (see ICD9 and ICD10 code lists below) in *any* diagnostic position.

Codes

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

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Exertional rhabdomyolysis	M62.82 (rhabdomyolysis)	728.88 (rhabdomyolysis)
	R82.1 (myoglobinuria)	791.3 (myoglobinuria)

Rhabdomyolysis-Associated Conditions

Condition	ICD-10-CM Codes	ICD-9-CM Codes
[A] initial encounter, [D] subsequent encounter, [S] sequela		
Dehydration	<i>E86 (volume depletion)</i>	<i>276.5 (volume depletion)</i>
	E86.0 (dehydration)	- 276.51 (dehydration)
	E86.1 (hypovolemia)	- 276.52 (hypovolemia)
	E86.9 (volume depletion, unspecified)	- 276.50 (volume depletion, unspecified)
Effects of heat and light	<i>T67 (effects of heat and light)</i>	<i>992 (effects of heat and light)</i>
	T67.0 (heatstroke and sunstroke...)	992.0 (heat stroke and sunstroke)
	- T67.0XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T67.1 (heat syncope...)	992.1 (heat syncope)
	- T67.1XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T67.2 (heat cramp...)	992.2 (heat cramps)
	- T67.2XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
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	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)	
	T67.6 (heat fatigue, transient...)	992.6 (heat fatigue, transient)
	- T67.6XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T67.7 (heat edema...)	992.7 (heat edema)
	- T67.7XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	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)
	- T67.9XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
Water deprivation and exhaustion	T73.1 (deprivation of water)	994.3 (effects of thirst; deprivation of water)
	- T73.1XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T73.2 (exhaustion due to exposure)	994.4 (exhaustion due to exposure)
	- T73.2XX [A,D,S] (initial encounter, subsequent encounter, sequela)	
	T73.3 (exhaustion due to excessive exertion)	994.5 (exhaustion due to excessive exertion)
	- T73.3XX [A,D,S] (initial encounter, subsequent encounter, sequela)	

Complicating Diagnoses (Exclusions)

ICD-10-CM Codes (^ = all digits)

S00.^ - T88.^ (injury, poisoning and certain other consequences of external causes)

ICD-9-CM Codes (* = all digits)

800.*- 999.* (injury, poisoning, toxic effects)

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<i>EXCEPT</i> - T67.0-T67.9 (effects of heat and light) - T73.1^ (deprivation of water) - T73.2^ (exhaustion due to exposure) - T73.3^ (exhaustion due to excessive exertion)	<i>EXCEPT</i> - 992.0-992.9 (effects of heat and light) - 994.3 (effects of thirst) - 994.4 (exhaustion due to exposure) - 994.5 (exhaustion due to excessive exertion)
<i>EXCEPT</i> - S03.4^ (sprain of jaw) - S03.8^ (sprain of joints and ligaments of other parts of head) - S03.9^ (sprain of joints and ligaments of unspecified parts of head) ----- S09.11^ (strain of muscle and tendon head)	<i>EXCEPT</i> 840.* - 848.* (sprains and strains of joints and adjacent muscles)
----- S13.4^ (sprain of ligaments of cervical spine) S13.8^ (sprain of joints and ligaments of other parts of neck) S13.9^ (sprain of joints and ligaments of unspecified parts of neck) ----- S16.1^ (strain of muscle, fascia and tendon at neck level) ----- S23.3^ (sprain of ligaments of thoracic spine) S23.4^ (sprain of ribs and sternum) S23.8^ (sprain of other specified parts of thorax) S23.9^ (sprain of unspecified parts of thorax) ----- S29.01^ (strain of muscle and tendon of thorax) ----- S33.5^ (sprains of ligaments of lumbar spine) S33.6^ (sprain of sacroiliac joint) S33.8^ (sprain of other parts of lumbar spine and pelvis) S33.9^ (sprain of unspecified parts of lumbar spine and pelvis) ----- S39.01^ (strain of muscle, fascia and tendon of abdomen, lower back and pelvis) ----- S43.4^ (sprain of shoulder joint) S43.5 (sprain of acromioclavicular joint) S43.6 (sprain of sternoclavicular joint) S43.8 (sprain of other specified parts of shoulder girdle) S43.9 (sprain of unspecified parts of shoulder girdle)	(continued on next page)



----- S46.01^ (strain of muscle(s) and tendon(s) of the rotator cuff and shoulder) S46.11^ (strain of muscle, fascia and tendon of long head of biceps) S46.21^ (strain of muscle, fascia and tendon of other parts of biceps) S46.31^ (strain of muscle, fascia and tendon of triceps) S46.81^ (strain of muscle, fascia and tendons at shoulder and upper arm level) S46.91^ (strain of unspecified muscle, fascia and tendons at shoulder and upper arm level) ----- S53.4^ (sprain of the elbow) S63.5^ (other and unspecified sprain of wrist) S63.6^ (other and unspecified sprain of finger(s)) S63.8^ (sprain of other part of wrist of hand) S63.9^ (sprain of unspecified part of wrist and hand) ----- S73.1^ (sprain of hip) ----- S76.01^ (strain of muscle, fascia and tendon of hip) S76.11^ (strain of quadriceps muscle, fascia and tendon) S76.21^ (strain of adductor muscle, fascia and tendon of thigh) S76.31^ (strain of muscle, fascia and tendon of the posterior muscle group at thigh level) S76.81^ (strain of other specified muscles, fascia and tendons at thigh level) S76.91^ (strain of unspecified muscles, fascia and tendons at thigh level) ----- S83.4^ (sprain of collateral ligament of knee) S83.5^ (sprain of cruciate ligament of knee) S83.6^ (sprain of the superior tibiofibular joint and ligament) S83.8^ (sprain of other specified parts of knee) S83.9^ (sprain of unspecified site of knee) ----- S93.4^ (sprain of ankle) S93.5^ (sprain of toe) S93.6^ (sprain of foot) ----- S96.01^ (strain of muscle and tendon of long flexor muscle of toe at ankle and foot level)	(continued on next page)
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S96.11^ (strain of muscle and tendon of long extensor muscle of toe at ankle and foot level) S96.21^ (strain of intrinsic muscle and tendon at ankle and foot level) S96.81^ (strain of other specified muscles and tendons at ankle and foot level) S96.91^ (strain of unspecified muscles and tendons at ankle and foot level)	
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Development and Revisions

- In March of 2017 the case definition was updated to include ICD10 codes.
- This case definition was developed in 2008 for by the Armed Forces Health Surveillance Center (AFHSC) *Medical Surveillance Monthly Report (MSMR)* staff for an article on exertional rhabdomyolysis.²

Case Definition and Incidence Rule Rationale

- *Case finding criteria:* A standalone diagnosis of rhabdomyolysis lacks the specificity required to determine etiology. In an attempt to isolate cases that have an exertional or thermal etiology, the case definition requires the primary diagnosis of rhabdomyolysis be accompanied by a secondary, qualifying, condition associated with volume depletion (dehydration) or heat-related illness.
- *Exclusions:* Cases of rhabdomyolysis associated with trauma, musculoskeletal injury or substance abuse are excluded from the definition. These etiologies fall outside the intended scope of the definition and are less preventable through standard safety protocols. To ensure comprehensiveness, the exclusion criteria for the case definition were expanded in 2011.

Code Set Determination and Rationale

- An ICD9 code specific for rhabdomyolysis (728.88) was added to the ICD-9-CM in 2004. Consequently, identifying historical cases prior to this date may be challenging.
- *ICD10 7th position character codes:* To maximize case-finding sensitivity, the case definition includes codes with “A” (initial encounter), “D” (subsequent encounter) and “S” (sequela) in the 7th position. While including subsequent encounter and sequela codes could overestimate incident cases by counting follow-up care as new events, the risk is mitigated by the *once per calendar year* incidence rule.

Reports

The AFHSD reports on hyponatremia in the following reports:

- Periodic *MSMR* articles.

Review

Sep 2026 Case definition reviewed and updated by *MSMR* staff; approved by the AFHSD Surveillance Methods and Standards (SMS) working group.



Mar 2017	Case definition reviewed and updated by the Armed Forces Health Surveillance Branch (AFHSB) Surveillance Methods and Standards (SMS) working group.
Jul 2011	Case definition reviewed and adopted by the AFHSC Surveillance Methods and Standards (SMS) working group.
Mar 2011	Case definition developed and reviewed by the AFHSC <i>MSMR</i> staff.

Comments

None

