

COLD WEATHER INJURIES

Applies to Superficial Frostbite, Frostbite with Tissue Necrosis, Hypothermia, Immersion Hand and Foot, and Other Effects of Reduced Temperature

Background

This case definition was developed by the Armed Forces Health Surveillance Branch (AFHSB) for the purpose of epidemiological surveillance of conditions important to military-associated populations. Prolonged or intense exposures to cold can significantly impact the health, well-being, and operational effectiveness of service members and their units. Because the U.S. military operations are conducted in diverse geographic and weather conditions, the U.S. military has developed extensive countermeasures against threats associated with training and operating in cold environments.¹

Clinical Description

Cold injuries include several abnormal and often serious physical conditions caused by exposure to cold temperatures. Injuries are often divided into two categories, those that occur without the freezing of body tissue (chilblains and immersion foot), and those that occur with the freezing of body tissue (frostbite). In addition, hypothermia, or systemic cold injury, is a clinical condition in which the core body temperature decreases to 35°C (94°F) or lower with multiple end-organ effects. The severity of injury due to cold depends on the temperature, the rate of chilling, and the duration of exposure.

Case Definition and Incidence Rules

For surveillance purposes, a case of cold weather injury is defined as:

- *One hospitalization or outpatient medical encounter* with any of the defining diagnoses of a cold weather injury (see ICD9 and ICD10 code lists below) in the *first* diagnostic position; or
- One record of a reportable medical event (RME) of a cold weather injury

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first reportable medical event, hospitalization, or outpatient medical encounter that includes a defining diagnosis of a cold weather injury.
- An individual is considered an incident case only *once per “cold year”* defined as 1 July thru 30 June, (i.e., one cold weather injury of any type per individual per cold year).
- If data on a specific *type* of cold weather injury is required, an individual is considered an incident case once per type of injury per cold year, (i.e., one of each type of cold injury per individual per cold year).

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¹ Armed Forces Health Surveillance Center. Cold Weather Injuries, U.S. Armed Forces, July 2005-June 2010. *Medical Surveillance Monthly Report (MSMR)*. 2010 October; Vol 17(10): 7-11.



Case Definition and Incidence Rules *(continued)*

Exclusions:

- None

Codes

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

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Superficial frostbite	<i>T33 (superficial frostbite)</i>	<i>991 (effects of cold temperature)</i>
	<i>T33.0 (superficial frostbite of head)</i>	991.0 (frostbite of face)
	T33.01 (superficial frostbite of <u>ear</u>)	
	- T33.011A (superficial frostbite of <i>right</i> ear, initial encounter)	
	- T33.012A (superficial frostbite of <i>left</i> ear, initial encounter)	
	- T33.019A (superficial frostbite of <i>unspecified</i> ear, initial encounter)	
	T33.02 (superficial frostbite of <u>nose</u>)	
	- T33.02XA (superficial frostbite of nose, initial encounter)	
	T33.09 (superficial frostbite of <u>other part of head</u>)	
	- T33.09XA (superficial frostbite of other part of head, initial encounter)	
	<i>T33.1 (superficial frostbite of neck)</i>	991.3 (frostbite of other and unspecified sites)
	- T33.1XXA (superficial frostbite of neck, initial encounter)	
	<i>T33.2 (superficial frostbite of thorax)</i>	
	- T33.2XXA (superficial frostbite of thorax, initial encounter)	
	<i>T33.3 (superficial frostbite of abdominal wall, lower back, pelvis)</i>	
	- T33.3XXA (superficial frostbite of abdominal wall, lower back, pelvis, initial encounter)	
<i>T33.4 (superficial frostbite of arm)</i>		

- T33.40XA (superficial frostbite of <i>unspecified</i> arm, initial encounter)	
- T33.41XA (superficial frostbite of <i>right</i> arm, initial encounter)	
- T33.42XA (superficial frostbite of <i>left</i> arm, initial encounter)	
<i>T33.5 (superficial frostbite of wrist, hand and fingers)</i>	991.1 (frostbite of hand)
T33.51 (superficial frostbite of <u>wrist</u>)	
- T33.511A (superficial frostbite of <i>right</i> wrist, initial encounter)	
- T33.512A (superficial frostbite of <i>left</i> wrist, initial encounter)	
- T33.519A (superficial frostbite of <i>unspecified</i> wrist, initial encounter)	
T33.52 (superficial frostbite of <u>hand</u>)	
- T33.521A (superficial frostbite of <i>right</i> hand, initial encounter)	
- T33.522A (superficial frostbite of <i>left</i> hand, initial encounter)	
- T33.529A (superficial frostbite of <i>unspecified</i> hand, initial encounter)	
T33.53 (superficial frostbite of <u>finger(s)</u>)	
- T33.531A (superficial frostbite of <i>right</i> finger(s), initial encounter)	
- T33.532A (superficial frostbite of <i>left</i> finger(s), initial encounter)	
- T33.539A (superficial frostbite of <i>unspecified</i> finger(s), initial encounter)	
<i>T33.6 (superficial frostbite of hip and thigh)</i>	991.3 (above)
T33.60 (superficial frostbite of unspecified hip and thigh)	
- T33.60XA (superficial frostbite of <i>unspecified</i> hip and thigh, initial encounter)	
- T33.61XA (superficial frostbite of <i>right</i> hip and thigh, initial encounter)	
- T33.62XA (superficial frostbite of <i>left</i> hip and thigh, initial encounter)	
<i>T33.7 (superficial frostbite of knee and lower leg)</i>	

	<p><i>T33.70 (superficial frostbite of unspecified knee and lower leg)</i></p> <ul style="list-style-type: none"> - T33.70XA (superficial frostbite of <i>unspecified</i> knee and lower leg, initial encounter) - T33.71XA (superficial frostbite of <i>right</i> knee and lower leg, initial encounter) - T33.72XA (superficial frostbite of <i>left</i> knee and lower leg, initial encounter) 	
	<p><i>T33.8 (superficial frostbite of ankle, foot, and toe(s))</i></p> <p>T33.81 (superficial frostbite of <u>ankle</u>)</p> <ul style="list-style-type: none"> - T33.811A (superficial frostbite of <i>right</i> ankle, initial encounter) - T33.812A (superficial frostbite of <i>left</i> ankle, initial encounter) - T33.819A (superficial frostbite of <i>unspecified</i> ankle, initial encounter) <p>T33.82 (superficial frostbite of <u>foot</u>)</p> <ul style="list-style-type: none"> - T33.821A (superficial frostbite of <i>right</i> foot initial encounter) - T33.822A (superficial frostbite of <i>left</i> foot, initial encounter) - T33.829A (superficial frostbite of <i>unspecified</i> foot, initial encounter) <p>T33.83 (superficial frostbite of <u>toe(s)</u>)</p> <ul style="list-style-type: none"> - T33.831A (superficial frostbite of <i>right</i> toe(s) initial encounter) - T33.832A (superficial frostbite of <i>left</i> toe(s), initial encounter) - T33.839A (superficial frostbite of <i>unspecified</i> toe(s), initial encounter) 	991.2 (frostbite of foot)
	<p><i>T33.9 (superficial frostbite of other and unspecified sites)</i></p> <p>T33.90 (superficial frostbite of unspecified sites)</p> <ul style="list-style-type: none"> - T33.90XA (superficial frostbite of unspecified sites, initial encounter) <p>T33.99 (superficial frostbite of other sites)</p> <ul style="list-style-type: none"> - T33.99XA (superficial frostbite of other sites, initial encounter) 	991.3 (above)

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Frostbite with tissue necrosis	<i>T34 (frostbite with tissue necrosis)</i>	991 (above)
	<i>T34.0 (frostbite with tissue necrosis of head)</i>	991.0 (above)
	T34.01 (frostbite with tissue necrosis of <u>ear</u>)	
	- T34.011A (frostbite with tissue necrosis of <i>right</i> ear, initial encounter)	
	- T34.012A (frostbite with tissue necrosis of <i>left</i> ear, initial encounter)	
	- T34.019A (frostbite with tissue necrosis of <i>unspecified</i> ear, initial encounter)	
	T34.02 (frostbite with tissue necrosis of <u>nose</u>)	
	- T34.02XA (frostbite with tissue necrosis of nose, initial encounter)	
	T34.09 (frostbite with tissue necrosis of <u>other part of head</u>)	
	- T34.09XA (frostbite with tissue necrosis of other part of head, initial encounter)	
	<i>T34.1 (frostbite with tissue necrosis of neck)</i>	
	- T34.1XXA (frostbite with tissue necrosis of neck, initial encounter)	
	<i>T34.2 (frostbite with tissue necrosis of thorax)</i>	991.3 (above)
	- T34.2XXA (frostbite with tissue necrosis of thorax, initial encounter)	
	<i>T34.3 (frostbite with tissue necrosis of abdominal wall, lower back, pelvis)</i>	
	- T34.3XXA (frostbite with tissue necrosis of abdominal wall, lower back, pelvis, initial encounter)	
	<i>T34.4 (frostbite with tissue necrosis of arm)</i>	
	- T34.40XA (frostbite with tissue necrosis of <i>unspecified</i> arm, initial encounter)	
	- T34.41XA (frostbite with tissue necrosis of <i>right</i> arm, initial encounter)	
	- T34.42XA (frostbite with tissue necrosis of <i>left</i> arm, initial encounter)	
<i>T34.5 (frostbite with tissue necrosis of wrist, hand and fingers)</i>	991.1 (above)	



T34.51 (frostbite with tissue necrosis of <u>wrist</u>)	
- T34.511A (frostbite with tissue necrosis of <i>right</i> wrist, initial encounter)	
- T34.512A (frostbite with tissue necrosis of <i>left</i> wrist, initial encounter)	
- T34.519A (frostbite with tissue necrosis of <i>unspecified</i> wrist, initial encounter)	
T34.52 (frostbite with tissue necrosis of <u>hand</u>)	
- T34.521A (frostbite with tissue necrosis of <i>right</i> hand, initial encounter)	
- T34.522A (frostbite with tissue necrosis of <i>left</i> hand, initial encounter)	
- T34.529A (frostbite with tissue necrosis of <i>unspecified</i> hand, initial encounter)	
T34.53 (frostbite with tissue necrosis of <u>finger(s)</u>)	
- T34.531A (frostbite with tissue necrosis of <i>right</i> finger(s), initial encounter)	
- T34.532A (frostbite with tissue necrosis of <i>left</i> finger(s), initial encounter)	
- T34.539A (frostbite with tissue necrosis of <i>unspecified</i> finger(s), initial encounter)	
<i>T34.6 (frostbite with tissue necrosis of hip and thigh)</i>	991.3 (above)
<i>T34.60 (frostbite with tissue necrosis of unspecified hip and thigh)</i>	
- T34.60XA (frostbite with tissue necrosis of <i>unspecified</i> hip and thigh, initial encounter)	
- T34.61XA (frostbite with tissue necrosis of <i>right</i> hip and thigh, initial encounter)	
- T34.62XA (frostbite with tissue necrosis of <i>left</i> hip and thigh, initial encounter)	
<i>T34.7 (frostbite with tissue necrosis of knee and lower leg)</i>	
<i>T34.70 (frostbite with tissue necrosis of unspecified knee and lower leg)</i>	
- T34.70XA (frostbite with tissue necrosis of <i>unspecified</i> knee and lower leg, initial encounter)	

- T34.71XA (frostbite with tissue necrosis of <i>right</i> knee and lower leg, initial encounter)	
- T34.72XA (frostbite with tissue necrosis of <i>left</i> knee and lower leg, initial encounter)	
<i>T34.8 (frostbite with tissue necrosis of ankle, foot, and toe(s))</i>	991.2 (above)
T34.81 (frostbite with tissue necrosis of ankle)	
- T34.811A (frostbite with tissue necrosis of <i>right</i> ankle, initial encounter)	
- T34.812A (frostbite with tissue necrosis of <i>left</i> ankle, initial encounter)	
- T34.819A (frostbite with tissue necrosis of <i>unspecified</i> ankle, initial encounter)	
T34.82 (frostbite with tissue necrosis of <u>foot</u>)	
- T34.821A (frostbite with tissue necrosis of <i>right</i> foot, initial encounter)	
- T34.822A (frostbite with tissue necrosis of <i>left</i> foot, initial encounter)	
- T34.829A (frostbite with tissue necrosis of <i>unspecified</i> foot, initial encounter)	
T34.83 (frostbite with tissue necrosis of <u>toe(s)</u>)	
- T34.831A (frostbite with tissue necrosis of <i>right</i> toe(s), initial encounter)	
- T34.832A (frostbite with tissue necrosis of <i>left</i> toe(s), initial encounter)	
- T34.839A (frostbite with tissue necrosis of <i>unspecified</i> toe(s), initial encounter)	
<i>T34.9 (frostbite with tissue necrosis of other and unspecified sites)</i>	991.3 (above)
T34.90 (frostbite with tissue necrosis of unspecified sites)	
- T34.90XA (frostbite with tissue necrosis of unspecified sites, initial encounter)	
T34.99 (frostbite with tissue necrosis of other sites)	
- T34.99XA (frostbite with tissue necrosis of other sites, initial encounter)	

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Other effects of reduced temperature	<i>T68 (hypothermia)</i>	991.6 (hypothermia)
	- T68.XXXA (hypothermia, initial encounter)	
	<i>T69 (other effects of reduced temperature)</i>	991.8 (other specified effects of reduced temperature)
	<i>T69.0 (immersion hand and foot)</i>	
	T69.01 (immersion hand)	
	- T69.011A (immersion hand, <i>right</i> hand)	
	- T69.012A (immersion hand, <i>left</i> hand)	
	- T69.019A (immersion hand, <i>unspecified</i> hand)	
	T69.02 (immersion foot)	
	- T69.021A (immersion foot, <i>right</i> foot)	
	- T69.022A (immersion foot, <i>left</i> foot)	
	- T69.029A (immersion foot, <i>unspecified</i> foot)	
	<i>T69.8 (other specified effects of reduced temperature)</i>	991.8 (above)
	- T69.8XXA (other specified effects of reduced temperature, initial encounter)	
	<i>T69.9 (effect of reduced temperature, unspecified)</i>	991.9 (other unspecified effects of reduced temperature)
	- T69.9XXA (effects of reduced temperature, initial encounter)	

Development and Revisions

- In December of 2016 the case definition was updated to include ICD10 codes.
- This case definition was originally developed in 2000 by the Army Medical Surveillance Activity (AMSA) staff for a *Medical Surveillance Monthly Report (MSMR)* article on cold weather injuries in active duty soldiers.²

Code Set Determination and Rationale

- In 2004 chilblains (ICD9 991.5/ ICD10 69.1) was deleted from the case definition because the condition is common, infrequently diagnosed as an illness or injury, usually mild in severity, and thought to have minimal medical, public health, or military impact.

² Army Medical Surveillance Activity (AMSA). Cold Weather Injuries, Active Duty Soldiers, 1997-2000. *Medical Surveillance Monthly Report (MSMR)*. 2000 December; Vol 6(10): 2-3.



- The Tri-Service Reportable Events system case definition for cold weather injuries does not include ICD9 codes 991.5 (chilblains), 991.8 (other specified effects of reduced temperature) or 991.9 (other unspecified effects of reduced temperature).

Reports

AFHSB reports on cold weather injuries in the following reports:

- Annual *MSMR* update. Most recent update Oct 2016.³
- Monthly: Armed Forces Health Surveillance Branch. *Sentinel reportable events among service members and beneficiaries at U.S. Army, Navy, and Air Force medical facilities*. Includes only reportable medical events (does not include IDC9 codes 991.5, 991.8-991.9).

Review

Dec 2016	Case definition reviewed and updated by the AFHSB Surveillance Methods and Standards (SMS) working group.
Feb 2011	Case definition reviewed and adopted by Surveillance Methods and Standards (SMS) working group.
Dec 2000	Case definition originally developed and reviewed by AMSA <i>MSMR</i> staff.

Comments

None

³ Armed Forces Health Surveillance Branch. Update: Cold Weather Injuries, Active and Reserve Components, U.S. Armed Forces, July 2011-June 2016. *Medical Surveillance Monthly Report (MSMR)*. 2016 October; Vol 623(10): 12-20.

