

## AMPUTATION, DEPLOYMENT-RELATED

*Includes Major Limb Amputations Only*

### Background

This case definition was developed by the Armed Forces Health Surveillance Center (AFHSC) for the purpose of epidemiological surveillance of a condition important to military-associated populations. Amputations are designated by AFHSC as a condition of “special surveillance interest” due to their association with combat operations, primarily in Afghanistan and Iraq. Improvements in force protection equipment, medical evacuation procedures, and life saving medical care, have resulted in many severely injured service members, who may have died in earlier wars, surviving their severe injuries with significant disabilities, including amputations.<sup>1</sup> This case definition is designed to capture incident cases of deployment-related, major limb, amputations in the Defense Medical Surveillance System (DMSS). DMSS does not currently include data for healthcare encounters that take place in operational theaters.<sup>2</sup>

### Clinical Description

Limb amputation refers to the loss of all or part of an arm or leg (an extremity). Most amputations are done by surgeons because an extremity is severely diseased, injured, or otherwise not functional. Some amputations are the direct result of a severe traumatic injury and the surgeon’s role is to save as much of the remaining portion of limb as possible.

### Case Definition and Incidence Rules

For surveillance purposes, a case of amputation is defined as:

- *One hospitalization* with any of the defining diagnoses of, or procedure codes for, amputation (see ICD9 code list below) in *any* diagnostic position; AND
- The initial defining encounter must have occurred while the individual was deployed to, or within 365 days of returning from, a theater of operations of interest and the deployment must have been for 30 days or longer.

#### *Incidence rules:*

For individuals who meet the case definition:

- The incidence date is considered the first hospitalization that includes a defining diagnosis of amputation.
- An individual may have *one* major limb amputation only.

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<sup>1</sup> Army Medical Surveillance Activity. Amputations of Lower and Upper Extremities, US Armed Forces, 1990-2004. *Medical Surveillance Monthly Report (MSMR)*. 2005 January; 11(1): 2-9.

<sup>2</sup> Theater Medical Data Store (TMDS). This data source captures outpatient and inpatient medical encounters within theaters of operation.



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

- An individual is considered an incident case only *once per lifetime*.

**Exclusions:**

- None

**Codes**

The following ICD9 codes are included in the case definition:

Condition	ICD-9-CM Codes	CPT Codes
Amputation	887.x (traumatic amputation of arm and hand; complete, partial) <ul style="list-style-type: none"> <li>- 887.0 (unilateral, below elbow, without mention of complication)</li> <li>- 887.1 (unilateral, below elbow, complicated)</li> <li>- 887.2 (unilateral, at or above elbow, without mention of complication)</li> <li>- 887.3 (unilateral, at or above elbow, complicated)</li> <li>- 887.4 (unilateral, level not specified, without mention of complication)</li> <li>- 887.5 (unilateral, level not specified, complicated)</li> <li>- 887.6 (bilateral, any level, without mention of complication); one hand and other arm</li> <li>- 887.7 (bilateral, any level, complicated)</li> </ul> 896.x (traumatic amputation of foot; complete, partial) <ul style="list-style-type: none"> <li>- 896.0 (unilateral, without mention of complication)</li> <li>- 896.1 (unilateral, complicated)</li> <li>- 896.2 (bilateral, without mention of complication)</li> <li>- 896.3 (bilateral, complicated)</li> </ul> 897.x (traumatic amputation of leg(s); complete, partial) <ul style="list-style-type: none"> <li>- 897.0 (unilateral, below knee, without mention of complication)</li> <li>- 897.1 (unilateral, below knee, complicated)</li> <li>- 897.2 (unilateral, at or above knee, without mention of complication)</li> <li>- 897.3 (unilateral, at or above knee, complicated)</li> </ul>	<i>(continued on next page)</i>



	<ul style="list-style-type: none"> <li>- 897.4 (unilateral, level not specified, without mention of complication)</li> <li>- 897.5 (unilateral, level not specified, complicated)</li> <li>- 897.6 (bilateral, any level, without mention of complication); one foot and other leg</li> <li>- 897.7 (bilateral, any level, complicated)</li> </ul> <p>V49.6 (upper limb amputation status)</p> <ul style="list-style-type: none"> <li>- V49.60 (unspecified level)</li> <li>- V49.63 (hand)</li> <li>- V49.64 (wrist)</li> <li>- V49.65 (below elbow)</li> <li>- V49.66 (above elbow)</li> <li>- V49.67 (shoulder)</li> </ul> <p>V49.7 (lower limb amputation status)</p> <ul style="list-style-type: none"> <li>- V49.70 (unspecified level)</li> <li>- V49.73 (foot)</li> <li>- V49.74 (ankle)</li> <li>- V49.75 (below knee)</li> <li>- V49.76 (above knee)</li> <li>- V49.77 (hip)</li> </ul>	
<p>Related diagnostic procedures</p>	<p>84.0 (Amputation of upper limb)</p> <ul style="list-style-type: none"> <li>- 84.00 (upper limb amputation, not otherwise specified)</li> <li>- 84.03 (amputation through hand)</li> <li>- 84.04 (disarticulation of wrist)</li> <li>- 84.05 (amputation through forearm)</li> <li>- 84.06 (disarticulation of elbow)</li> <li>- 84.07 (amputation through humerus)</li> <li>- 84.08 (disarticulation of shoulder)</li> <li>- 84.09 (interthoracoscaphular amputation)</li> </ul> <p>84.1 (Amputation of lower limb)</p> <ul style="list-style-type: none"> <li>- 84.10 (lower limb amputation, not otherwise specified)</li> <li>- 84.12 (amputation through foot)</li> <li>- 84.13 (disarticulation of ankle)</li> <li>- 84.14 (amputation of ankle through malleoli of tibia and fibula)</li> <li>- 84.15 (other amputation below knee)</li> </ul>	<p style="text-align: right;"><i>(continued on next page)</i></p>



	<ul style="list-style-type: none"> <li>- 84.16 (disarticulation of knee)</li> <li>- 84.17 (amputation above knee)</li> <li>- 84.18 (disarticulation of hip)</li> <li>- 84.19 (abdominopelvic amputation)</li> </ul>	
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### Development and Revisions

- Jan 2012: AFHSC is currently conducting additional epidemiologic analyses looking at improving the amputation definition. The feasibility of using stump revisions and alternative inpatient and outpatient ICD9 and procedures codes from TMDS and TRAC2ES cohorts are being examined.
- March 2009: The specification of “within 365 days of returning” from a theater of operations was added to the case definition. See “Deployment Associated Incident Cases of Amputation” below.
- May 2005: In response to conflicts in OEF and OIF, amputations were designated by AMSA as a deployment-related condition of “special surveillance interest.” In an effort to identify *major limb amputation cases related to deployment*, the case definition was modified to: 1) include a specification of service in OEF and OIF, and 2) remove from the code set the following ICD9 codes related to thumb, finger and toe amputations: ICD9 84.01 (amputation and disarticulation of finger), ICD9 84.02 (amputation and disarticulation of thumb), ICD9 84.11 (amputation of toe), V49.61 (upper limb amputation status, thumb), V49.62 (upper limb amputation status, other fingers), V49.71 (lower limb amputation status, great toe), V49.72 (lower limb amputation status other toes), PR 84.01 (amputation and disarticulation of finger), PR 84.02 (amputation and disarticulation of thumb), and PR 84.11 (amputation of toe).
- January 2005: The original case definition was developed by the Army Medical Surveillance Activity (AMSA) staff for a MSMR article on lower and upper amputations.<sup>3</sup> The case definition was *not* limited to individuals whose amputations occurred during or after deployment and the code set included amputations of the thumb, finger, and toe.

### Case Definition and Incidence Rule Rationale

- An individual is allowed one major limb amputation only because this case definition is used to count individuals with an amputation, not amputations.
- The ICD9 codes do not specify laterality (right or left side) of the injury. Therefore, there is a potential for underreporting if a Service member sustains separate injuries to the same body part on the left and right side during the same surveillance period. For example, if a Service member injures his right knee and meets the case definition, a subsequent injury to the left knee within the same training period as the right-sided injury would not be recorded as a new occurrence.

### Code Set Determination and Rationale

- The ICD9 code set used in this definition includes codes for major limb amputation only. Codes for thumb, finger, and toe amputation are not included.

<sup>3</sup> Army Medical Surveillance Activity. Amputations of Lower and Upper Extremities, U.S. Armed Forces, 1990-2004. *Medical Surveillance Monthly Report (MSMR)*. 2005 January; 11(1): 2-9.



### *Deployment-Associated Incident Cases of Amputation*

If an analysis requires “deployment-associated” incident case counts, AFHSC includes the restriction described above in the case definition. As of November 2010, AFHSC includes the following operations associated with deployment in their amputations analyses: Enduring Freedom (OEF), Iraqi Freedom (OIF), and New Dawn (OND).

The specification of “within 365 days of returning” represents the best judgment of a reasonable time frame to allow for post-deployment medical evaluations and follow-up that result from an amputation. When estimating “deployment-associated” incident cases, it should be noted that a causal association for amputation due to an event that occurred during a deployment or direct combat cannot be determined using data available to AFHSC.

### **Reports**

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AFHSC reports on amputations in the following reports:

- Monthly: Armed Forces Health Surveillance Center. Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service. *Medical Surveillance Monthly Report (MSMR)*.

### **Review**

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Jan 2012	Case definition reviewed and adopted by Surveillance Methods and Standards (SMS) working group.
Jan 2005	Case definition developed and reviewed by AMSA MSMR staff.

### **Comments**

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None

