Inside This Issue:

Causes of medical evacuations from Operations Iraqi Freedom (OIF), New Dawn (OND) and Enduring Freedom (OEF), active and reserve components, U.S. Armed Forces, October 2001-September 2010 ................................................................. 2

Cruciate ligament injuries, active component, U.S. Armed Forces, 2000-2009 ...................... 8

Surveillance snapshot: Acute myocardial infarction, active component, U.S. Armed Forces, 2000-2009 ................................................................. 12

Summary tables and figures

Deployment-related conditions of special surveillance interest ........................................... 13

Read the MSMR online at: http://www.afhsc.mil
There are numerous and varied threats to the health and safety of U.S. military members, regardless of the natures or locations of their assignments. In addition, there are unique health threats inherent to combat-related (e.g., battle injuries, psychological stress) and other deployment operations particularly, in areas with significant endemic disease threats and minimal public health and public safety infrastructures.
Causes of Medical Evacuations from Operations Iraqi Freedom (OIF), New Dawn (OND) and Enduring Freedom (OEF), Active and Reserve Components, U.S. Armed Forces, October 2001- September 2010

There are numerous and varied threats to the health and safety of U.S. military members, regardless of the nature or location of their assignments. In addition, there are unique health threats inherent to combat-related (e.g., battle injuries, psychological stress) and other deployment operations – particularly, in areas with significant endemic disease threats and minimal public health and public safety infrastructures.

Since October 2001, approximately 2 million U.S. service members have served one or more times in support of Operations Iraqi Freedom (OIF), New Dawn (OND) and/or Enduring Freedom (OEF), mainly in Iraq and Afghanistan. In the theaters of operations, most medical care is provided by deployed military medical personnel; however, some injuries and illnesses require medical management outside the operational theater. In such cases, affected individuals are usually transported by air to a fixed military medical facility in Europe or the United States. At the fixed facility, they receive the specialized, technically advanced, and/or prolonged diagnostic, therapeutic, and rehabilitative care required.

Medical air transports ("medical evacuations") are costly and generally indicative of serious medical conditions. Some serious medical conditions are directly related to participation in, or support of, combat operations (e.g., battle wounds); many others are unrelated to combat and may be preventable. The objectives of this report are to compare the natures, numbers, and trends of conditions for which male and female military members were medically evacuated from the OIF/OND and OEF theaters during the past nine years.

Methods:

The surveillance period was 1 October 2001 to 30 September 2010. The surveillance population included all members of the active and reserve components of the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard who were evacuated during the surveillance period from the U.S. Central Command (CENTCOM) area of responsibility (AOR) to a medical treatment facility outside the CENTCOM AOR. Evacuations were included in analyses if the affected service member had at least one inpatient or outpatient medical encounter in a U.S. military medical facility within ten days after the evacuation date. Records of all medical evacuations conducted by the U.S. Transportation Command (TRANSCOM) are routinely provided for health surveillance purposes to the Armed Forces Health Surveillance Center (AFHSC) via the Office of the Assistant Secretary of Defense for Health Affairs.

Medical evacuations included in the analyses were classified by the causes and natures of the precipitating medical conditions (based on information reported in relevant evacuation and medical encounter records). First, all medical conditions that resulted in evacuations were classified as "battle injuries" or "non-battle injuries and illnesses" (based on entries in an indicator field of the TRANSCOM evacuation record). Evacuations due to non-battle injuries and illnesses were sub-classified into 18 illness/injury categories based on International Classification of Diseases (ICD-9-CM) diagnostic codes reported on records of medical encounters after evacuation. For this purpose, all records of hospitalizations and ambulatory visits from five days prior to ten days after the reported date of each medical evacuation were identified. The primary (first-listed) diagnosis for either a hospitalization (if one occurred) or the earliest ambulatory visit was considered indicative of the condition responsible for the evacuation; diagnostic codes that specified illnesses and injuries (ICD-9-CM 001-999) were prioritized over external cause of injury ("E") and other (e.g., observation, medical examination, vaccination ["V"] codes.

Results:

During the nine-year surveillance period, 62,087 medical evacuations of service members from OIF/OND or OEF were followed by at least one medical encounter in a fixed medical facility outside the operational theater. During the period, there were approximately 3.5 times as many evacuations from OIF/OND as from OEF; overall, approximately seven times as many males as females were medically evacuated (Table 1).

Nearly one-fifth (18.9%) of all medical evacuations were considered battle injury-related (Table 1). Not surprisingly, evacuations for battle injuries varied in relation to the number of deployed service members (e.g., before and after troop surges) and the nature, locations, and intensity of ongoing combat operations (Figure 1). For example, there were spikes in battle-related evacuations from OIF in April 2003, April 2004, and November 2004 and a less sharp peak in May 2007; in contrast, numbers of battle injury-related medical evacuations from OEF were relatively low and stable from 2002 through 2006, sporadically higher in 2007 and 2008, and relatively highest following troop increases in 2009 and 2010 (Figure 1).
During each month of the nine year period, in both OIF/OND and OEF, there were more medical evacuations for conditions unrelated to battle than for battle-related injuries; overall during the period, there were approximately four times as many medical evacuations for non-battle as for battle-related conditions (Table 1, Figure 1).

During the surveillance period, four categories of illnesses and injuries accounted for a majority (52.2%) of all evacuations. Musculoskeletal disorders, primarily affecting the back and knee, accounted for approximately one of every six (16.3%) evacuations; non-battle injuries, primarily sprains and fractures of extremities, accounted for approximately one of seven (14.5%) evacuations; mental disorders, most frequently adjustment reactions, mood disorders, and post-traumatic stress disorder (PTSD), accounted for approximately one of nine (11.1%) evacuations; and “signs, symptoms and ill-defined conditions” (more than one-fourth related to the respiratory system) accounted for approximately one of ten (10.2%) evacuations (Table 1).

There were differences in the conditions that resulted in medical evacuations of male and female deployers. Of all medical evacuations of males throughout the period (n=54,501), the most frequent causes were battle injuries (21.1%), musculoskeletal disorders (16.6%), and non-battle injuries (15.3%). In contrast, the most frequent causes of medical evacuations of females during the period (n=7,586) were mental disorders (14.6%), “signs, symptoms, and ill-defined conditions” (14.4%), musculoskeletal disorders (14.3%), and non-battle injuries (9.1%) (Table 1, Figure 2).

Among both males and females, “adjustment reaction” was the most frequent specific diagnosis (3-digit diagnosis code of ICD-9-CM) during initial medical encounters after evacuations. “Adjustment reaction” accounted for relatively more of the total evacuations of females (n=420; 5.5%) than males (n=2,350; 4.3%). Among males, joint and back-related conditions – specifically, “other and unspecified disorders of joint” (e.g., knee problems) (n=1,993; 3.7%), “intervertebral disc disorders” (n=1,897; 3.5%), and “other and unspecified disorders of back” (n=1,504; 2.8%) – were the next most frequent diagnoses among medical evacuees (data not shown).

Among OIF/OND participants, the proportion of medical evacuations attributable to battle injuries declined from approximately 25 percent in 2004, 2006, and 2007 to less than 4 percent in 2010 (through September) (Figure 3). In contrast, among OEF participants, the proportion of
Figure 1. Medical evacuations of U.S. service members from OIF/OND and OEF, by month and operation, October 2001-September 2010

Figure 2. Proportions of medical evacuations, by major categories of illness/injury (ICD-9-CM), by gender, U.S. Armed Forces, October 2001-September 2010
A previous MSMR report estimated that during a 12-month deployment to OIF or OEF, approximately 4 percent of Army, 2 percent of Marine Corps, and 1 percent of the other Services’ members were medically evacuated for any reason. The relatively low likelihood of medical evacuation suggests that most deployers were sufficiently healthy and fit, and received the medical care in theater necessary, to successfully complete their OEF/OIF/OND assignments.

This analysis extends the findings of the previous report. It documents significantly different numbers and underlying causes of medical evacuations from OIF/OND and OEF in relation to the numbers and characteristics of deployed service members and the locations and characteristics of ongoing military operations. The report also documents significantly different predominant causes of medical evacuations, from both OIF/OND and OEF, among male and female deployers.

The findings enforce the need to tailor force health protection policies, training, supplies, equipment, and practices based on characteristics of the deployed force (e.g., combat versus support; male versus female) and operational theater

---

**Figure 3.** Proportions of medical evacuations from Operation Iraqi Freedom (OIF)/Operation New Dawn (OND) (n=48,121) attributed to major categories of illness/injury, U.S. Armed Forces, January 2003-September 2010

**Figure 4.** Proportions of medical evacuations from Operation Enduring Freedom (OEF) (n=13,966) attributed to major categories of illness/injury, U.S. Armed Forces, January 2003-September 2010

---

A previous MSMR report estimated that during a 12-month deployment to OIF or OEF, approximately 4 percent of Army, 2 percent of Marine Corps, and 1 percent of the other Services’ members were medically evacuated for any reason. The relatively low likelihood of medical evacuation suggests that most deployers were sufficiently healthy and fit, and received the medical care in theater necessary, to successfully complete their OEF/OIF/OND assignments.

This analysis extends the findings of the previous report. It documents significantly different numbers and underlying causes of medical evacuations from OIF/OND and OEF in relation to the numbers and characteristics of deployed service members and the locations and characteristics of ongoing military operations. The report also documents significantly different predominant causes of medical evacuations, from both OIF/OND and OEF, among male and female deployers.

The findings enforce the need to tailor force health protection policies, training, supplies, equipment, and practices based on characteristics of the deployed force (e.g., combat versus support; male versus female) and operational theater.
Figure 5. Proportions of medical evacuations by selected diagnostic categories among males, U.S. Armed Forces, January 2003-September 2010

(a) OIF/OND (n=42,141)

(b) OEF (n=12,360)

(e.g., endemic disease threats) and the nature of the military operations (e.g., combat versus humanitarian assistance).

There are limitations to the analysis reported here that should be considered when interpreting the results. For example, assessments of trends were based on numbers of medical evacuations per month or year; as such, variations in the numbers of deployed troops (i.e., the population at risk of medical evacuation) over time were not accounted for. Because the numbers of service members deployed to OIF/OND and OEF significantly varied during the period, trends of numbers of medical evacuations do not directly reflect changes in medical evacuation risk over time.

Also, direct comparisons of numbers and proportions of medical evacuations by cause, as between operational theaters or between males and females, can be misleading; for example, such comparisons do not account for differences between the groups in characteristics (e.g., age, grade, military occupation, locations and activities while deployed) that are significant determinants of medical evacuation risk. Also, for this report, most “causes” of medical evacuations were estimated from primary (first-listed) diagnoses that were recorded at the time of hospitalization discharge or initial outpatient encounters after evacuation. In some cases, clinical evaluations in fixed medical treatment facilities after medical evacuations may have “ruled out” serious conditions that were clinically suspected in the theater. For this analysis, the “causes” of such evacuations reflect diagnoses that were determined after evaluations outside of the theater rather than diagnoses – perhaps of severe disease – that were clinically suspected in the theater. To the extent that this occurred, the “causes” of some medical evacuations may seem surprisingly minor.

This report documents that, throughout OIF/OND and OEF (even during periods of the most intensive combat), most medical evacuations were not directly related to battle injuries. Overall, approximately four of every five medical evacuations were due to illnesses and non-battle injuries; and of these, more than one-half were due to musculoskeletal disorders (16.3%), non-battle injuries (14.5%), mental disorders (11.1%), and signs, symptoms, and ill-defined conditions (10.2%).

In addition, this report documents that the proportions of medical evacuations due to mental disorders and battle injuries were not closely temporally related. For example, since 2007 among OEF participants, the proportion of medical evacuations due to battle injuries sharply increased while the proportion due to mental disorders remained stable (Figure 4). Conversely, since 2007 among OIF/OND participants, the proportion of medical evacuations due to battle injuries sharply decreased while the proportion due to mental disorders increased (Figure 3). The recent increase in mental disorder-related evacuations from Iraq may reflect at least in
part increased awareness of, concern regarding, and health care resources dedicated to detecting and clinically managing psychological and stress-related disorders (e.g., PTSD, depression, suicide ideation) among deployers.

In summary, in the past nine years, more than 60,000 U.S. service members were medically evacuated from Iraq and Afghanistan. Throughout the period, there were many more medical evacuations for illnesses and non-battle injuries than for battle injuries; also, the major causes of medical evacuations differed among male and female deployers. Previous reports have documented that relatively large proportions of service members who are evacuated for illnesses (including musculoskeletal and mental disorders) during deployments had medical encounters for the same or closely related conditions shortly before deploying. Further analyses should identify conditions among male and female service members that are most likely to recur or worsen during, and require medical evacuation from, combat-related deployments.

References:

Cruciate Ligament Injuries, Active Component, U.S. Armed Forces, 2000-2009

The anterior and posterior cruciate ligaments of the knee are short, fibrous cords that restrict forward and backward movements of the tibia with respect to the femur. When a cruciate ligament is torn, the knee loses stability. Cruciate ligament (CL) injuries are frequently repaired surgically. Some strenuous activities can resume after 6-8 weeks of recovery and rehabilitation.

Cruciate ligament tears are typically sustained during activities that require abrupt changes of direction, rapid deceleration, or jumping. As such, U.S. military members are at risk during physically rigorous operational, training, and leisure-time activities (e.g., basketball, skiing, soccer). In civilian populations, CL injury risk is associated with older age, increasing weight, female gender, and white race/ethnicity.1-6

This report summarizes numbers, incident rates, trends, and causes of CL injuries among active component U.S. military members from 2000 through 2009.

Methods:

The surveillance period was 1 January 2000 to 31 December 2009. The surveillance population included all individuals who served in an active component of the Army, Navy, Air Force or Marine Corps any time during the surveillance period.

Cases were identified from standardized records of all hospitalizations and outpatient medical encounters of active component members during the surveillance period in fixed (e.g., not deployed, at sea) military and nonmilitary (purchased care) medical facilities. CL injury-related medical encounters were considered those with diagnostic codes indicative of a CL injury (ICD-9-CM codes: 717.83, 717.84, 844.2) in any diagnostic position. For surveillance purposes, a case of CL injury was defined as an active component member with two or more CL injury-related medical encounters on separate days within any 180-day period.

For each case, the date of the first case-defining CL injury-related medical encounter was considered the incident date; each individual could be considered an incident case only once during the surveillance period. Rates were calculated as incident CL injuries per 1,000 person-years (p-yrs) of active component service.

For each case, the record of the first CL-injury-related medical encounter that included an ICD-9-CM external cause of injury code (E codes) or NATO Standard Agreement (STANAG) code was considered informative regarding the cause of the respective CL injury.

Results:

During the 10-year surveillance period, there were 42,176 incident diagnoses of CL injuries among active component military members; the overall incidence rate during the period

Table 1. Incident diagnoses and incidence rates of cruciate ligament injuries, active component, U.S. Armed Forces, 2000-2009

<table>
<thead>
<tr>
<th>Service</th>
<th>No.</th>
<th>Rate per 1,000 p-yrs</th>
<th>Incidence rate ratioa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army</td>
<td>16,629</td>
<td>3.42</td>
<td>referent</td>
</tr>
<tr>
<td>Navy</td>
<td>9,379</td>
<td>2.69</td>
<td>0.79</td>
</tr>
<tr>
<td>Air Force</td>
<td>9,645</td>
<td>2.83</td>
<td>0.83</td>
</tr>
<tr>
<td>Marine Corps</td>
<td>6,523</td>
<td>3.68</td>
<td>1.08</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>37,338</td>
<td>3.24</td>
<td>referent</td>
</tr>
<tr>
<td>Female</td>
<td>4,838</td>
<td>2.43</td>
<td>0.75</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>26,305</td>
<td>3.09</td>
<td>referent</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>7,824</td>
<td>3.21</td>
<td>1.04</td>
</tr>
<tr>
<td>Other</td>
<td>8,047</td>
<td>3.132</td>
<td>1.01</td>
</tr>
<tr>
<td>Military occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combat</td>
<td>8,995</td>
<td>3.25</td>
<td>referent</td>
</tr>
<tr>
<td>Health care</td>
<td>3,423</td>
<td>3.04</td>
<td>0.94</td>
</tr>
<tr>
<td>Other</td>
<td>29,785</td>
<td>3.09</td>
<td>0.95</td>
</tr>
</tbody>
</table>

*For each characteristic, the referent rate is specified.
was 3.12 injuries per 1,000 p-yrs (Table 1). Annual incidence rates declined slightly from 2000 through 2003 and then were stable through 2009 (Figure 1). In each year of the period, crude (unadjusted) incidence rates were higher in the Marine Corps and Army than the Air Force and Navy. In all of the Services, annual rates have been stable since at least 2005 (Figure 2).

**Demographic characteristics**

During the period, CL injury rates were higher among males 25-29 years old and in the Marine Corps than in any other demographic or military subgroups (Figure 3). The crude overall incidence rate was one-third (33%) higher among males than females; rates were markedly higher among males than females in every age group except the youngest (<20 years). Among males, rates were lowest among the youngest (1.96 per 1000 p-yrs) and highest among the 25-29 year olds (3.72 per 1000 p-yrs); among females, rates were similar across all age groups (Figure 3). Also, crude overall rates were similar across racial/ethnic subgroups (Table 1).

**Basic trainees**

Basic trainees accounted for a very small proportion (n=622; 1.4%) of all military members with CL injuries. The overall incidence rate of CL injuries among trainees (2.21 per 1,000 p-yrs) was similar to that among teenaged service members overall (Table 2, Figure 3). Of the trainees in the various Services, those in the Army (2.94 per 1,000 p-yrs) and Air Force (0.70 per 1,000 p-yrs) had the highest and lowest CL injury rates, respectively. Among trainees overall, the CL injury rate was 26 percent higher among females than males and 13 percent higher among white, non-Hispanic than black, non-Hispanic individuals (Table 2).

**Causes of injury**

Accidental slips and falls (n=1,215; 42.8%) and sports-related injuries (n=913; 32.2%) accounted for three-fourths of all CL injuries that were documented (n=2,839) with hospitalization records with cause of injury codes (per NATO Standard Agreement [STANAG] 2050). The most frequent specific causes of CL injuries reported on hospitalization records were twisting, turning, slipping, on land (n=356, 12.5%), late complications or late effects of old injuries (n=342, 12.1%), basketball (n=288, 10.1%), other causes, on land (n=239, 8.4%), and American football (n=161, 5.7%) (Table 3).

**Table 2.** Cruciate ligament injuries among basic trainees, active component, U.S. Armed Forces, 2000-2009

<table>
<thead>
<tr>
<th>Service</th>
<th>No.</th>
<th>Rate per 1,000 p-yrs</th>
<th>Incidence rate ratioa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total trainees</td>
<td>622</td>
<td>2.21</td>
<td></td>
</tr>
<tr>
<td>Army</td>
<td>317</td>
<td>2.94</td>
<td>referent</td>
</tr>
<tr>
<td>Navy</td>
<td>76</td>
<td>1.35</td>
<td>0.46</td>
</tr>
<tr>
<td>Air Force</td>
<td>33</td>
<td>0.70</td>
<td>0.24</td>
</tr>
<tr>
<td>Marine Corps</td>
<td>196</td>
<td>2.82</td>
<td>0.96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>No.</th>
<th>Rate per 1,000 p-yrs</th>
<th>Incidence rate ratioa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>504</td>
<td>2.13</td>
<td>referent</td>
</tr>
<tr>
<td>Female</td>
<td>118</td>
<td>2.68</td>
<td>1.26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>No.</th>
<th>Rate per 1,000 p-yrs</th>
<th>Incidence rate ratioa</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, non-Hispanic</td>
<td>438</td>
<td>2.39</td>
<td>referent</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>86</td>
<td>2.12</td>
<td>0.89</td>
</tr>
<tr>
<td>Other</td>
<td>98</td>
<td>1.71</td>
<td>0.72</td>
</tr>
</tbody>
</table>

aFor each characteristic, the referent rate is specified.
Of 5,590 CL injuries with causes documented with ICD-9-CM E ("external cause of injury") codes (predominately ambulatory visit records), the most frequently reported causes were "overexertion and strenuous and repetitive movements or loads" (n=1,960, 35.1%), "other and unspecified accidental causes" (n=1,002, 17.9%), sports-related accidents (n=931, 16.7%), accidental falls (n=741, 13.3%) and motor vehicle/land transportation accidents (n=264, 4.7%) (data not shown).

This report documents that numbers and rates of CL injuries among active component service members have been remarkably stable since 2002. Each year since 2002, there have been from 3,980 to 4,331 incident cases of CL injuries among military members; annual incidence rates during the period were consistently in the narrow range between 2.88 and 3.17 per 1,000 service members per year.

Studies among civilian athletes often document higher rates of cruciate ligament injuries among females than males. However, in this analysis, incidence rates of CL injuries were higher among males than females in every age group except those younger than 20 years; of note, CL injury rates were higher among female than male basic combat trainees/recruits.

Throughout the period, CL injury rates were consistently higher among Marine Corps and Army than Air Force and Navy members. The findings may reflect differences in the natures, intensities, durations, and timing of both military occupation-specific and leisure time activities among male and female service members and across the military services. For example, when stresses on knee ligaments are similar among males and females (e.g., recruit training), injury rates may be higher among females than males (as among civilian athletes). However, when stresses on knees vary because of different military occupational activities (e.g., ground combat, aviation, administration) or off-duty activities (e.g., basketball, skiing, weight training), CL injury rates by gender may reflect the differences.

The findings of this report should be interpreted cautiously due to several limitations. For example, the surveillance case definition was designed to be conservative; i.e., the case definition required CL injury-specific diagnoses during at least two medical encounters on different days in a 180 day period. If an affected military member left service after receiving a CL injury-specific diagnosis (e.g., retirement examination), the individual would not have been included as a "case" for this report. In addition, for temporal trend analyses, the date of the first CL injury-specific medical encounter was considered the date of the injury; however, because CL injuries are not always incapacitating, some diagnoses may have been delayed from the times when the injuries occurred. Also, in this analysis, the causes of CL injuries were assessed based on codes that were reported on hospitalization and ambulatory visit records. Of CL injuries that were documented with relevant information, the most frequent causes were falls/accidents and sports activities. However, the causes of many CL injuries were not specified; and even among those with relevant information, it is difficult to determine specific causes because of the numerous acceptable coding options in two different reporting systems (STANAG and ICD-9-CM E codes). Thus, for example, an injury that occurred during an athletic event could reasonably be reported as an injury from twisting on land. Finally, this analysis only considered CL injuries among members of the active component. Undoubtedly, there were many CL injuries
among reserve component members; thus, the findings in this report may not be generalizable to U.S. military members overall.

Because they require relatively long convalescence and rehabilitation periods, CL injuries significantly degrade the health, fitness, readiness, and operational capabilities of affected service members and their units. Over the past ten years, there have been more than 42,000 incident diagnoses of cruciate ligament injuries among active component members and many more than 20,000 surgical repairs of CL injuries in U.S. military medical facilities (and likely more in non-military facilities through purchased care) (data not shown). Clearly, CL injuries demand considerable health care resources for diagnosis, treatment, and rehabilitation. Researchers are investigating interventions, e.g., core proprioception and neuromuscular control training, to reduce CL injury risk in female athletes. The findings may be informative and useful in relation to prevention of such injuries in young, healthy, and physically active U.S. military populations.

Reported by: Jennifer A. Cockrill, MS, MPH, Jr. Epidemiologist, Armed Forces Health Surveillance Center.

References:


 Notice to Readers:

Sentinel reportable medical events, active component, U.S. Armed Forces, cumulative numbers through December 2009 and December 2010

Annual summaries of reportable medical events in CY 2010 will be published in a future MSMR issue.
Surveillance Snapshot:
Acute Myocardial Infarction, Active Component, U.S. Armed Forces, 2000-2009

Acute myocardial infarctions (AMIs), or "heart attacks", occur when there is partial or complete occlusion of coronary arteries and deprivation of oxygen to the heart muscle, resulting in cell death. The most common cause of blockage is atherosclerosis, the deposition of cholesterol plaques over time, which is exacerbated by high blood pressure, elevated cholesterol, diabetes mellitus, and cigarette smoking.

During the 10-year surveillance period, there were 3,448 incident hospitalizations for AMI among active component U.S. military members. The numbers of AMIs per year decreased from 2002 (n=226) to 2006 (n=143) and remained relatively stable from 2007 (n=162) through 2009 (n=159). AMIs were highly correlated with age, with the highest rates among service members older than 40 years.
Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - January 2011 (data as of 01 March 2011)

Traumatic brain injury (ICD-9: 310.2, 800-801, 803-804, 850-854, 907.0, 950.1-950.3, 959.01, V15.5_1-9, V15.5_A-F, V15.59_1-9, V15.59_A-F)


Indication diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from OEF/OIF. (Includes in-theater medical encounters from the Theater Medical Data Store [TMDS] and excludes 2,749 deployers who had at least one TBI-related medical encounter any time prior to OEF/OIF).


One diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 90 days of returning from OEF/OIF.
Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - January 2011 (data as of 01 March 2011)

Amputations (ICD-9: 887, 896, 897, V49.6 except V49.61-V49.62, V49.7 except V49.71-V49.72, PR 84.0-PR 84.1, except PR 84.01-PR 84.02 and PR 84.11)a


Heterotopic ossification (ICD-9: 728.12, 728.13, 728.19)b


aIndicator diagnosis (one per individual) during a hospitalization while deployed to/within 365 days of returning from OEF/OIF.

bOne diagnosis during a hospitalization or two or more ambulatory visits at least 7 days apart (one case per individual) while deployed to/within 365 days of returning from OEF/OIF.
Deployment-related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003 - January 2011 (data as of 01 March 2011)

Severe acute pneumonia (ICD-9: 518.81, 518.82, 480-487, 786.09)\(^a\)

![Graph showing number of cases of severe acute pneumonia by month and service from January 2003 to January 2011.]

Leishmaniasis (ICD-9: 085.0 to 085.9)\(^b\)

![Graph showing number of cases of leishmaniasis by month and service from January 2003 to January 2011.]


\(^a\)Indicator diagnosis (one per individual) during a hospitalization, ambulatory visit, and/or from a notifiable medical event during/after service in OEF/OIF.

\(^b\)Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.
The Medical Surveillance Monthly Report (MSMR), in continuous publication since 1995, is produced by the Armed Forces Health Surveillance Center (AFHSC). The MSMR provides evidence-based estimates of the incidence, distribution, impact and trends of illness and injuries among United States military members and associated populations. Most reports in the MSMR are based on summaries of medical administrative data that are routinely provided to the AFHSC and integrated into the Defense Medical Surveillance System for health surveillance purposes.

All previous issues of the MSMR are available online at www.afhsc.mil. Subscriptions (electronic and hard copy) may be requested online at www.afhsc.mil/msmr or by contacting the Armed Forces Health Surveillance Center at (301) 319-3240. E-mail: msmr.afhsc@amedd.army.mil

Submissions: Suitable reports include surveillance summaries, outbreak reports and cases series. Prospective authors should contact the Editor at msmr.afhsc@amedd.army.mil

All material in the MSMR is in the public domain and may be used and reprinted without permission. When citing MSMR articles from April 2007 to current please use the following format: Armed Forces Health Surveillance Center. Title. Medical Surveillance Monthly Report (MSMR). Year Month;Volume(No):pages. For citations before April 2007: Army Medical Surveillance Activity. Title. Medical Surveillance Monthly Report (MSMR). Year Month;Volume(No):pages.

Opinions and assertions expressed in the MSMR should not be construed as reflecting official views, policies, or positions of the Department of Defense or the United States Government.

ISSN 2158-0111 (print)
ISSN 2152-8217 (online)
Printed on acid-free paper