SECTION 16 – ORTHOPEDICS

Specific Conditions

- Amputation, Deployment-Related
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- Cruciate Ligament Injuries
- Heterotopic Ossification
- Low Back Pain, Mechanical
- Osteoarthritis
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General Conditions

- Injuries, By Anatomic Region
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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. [1] 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.[2]

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 inpatient medical encounter* 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 inpatient or medical encounter that includes a defining diagnosis of amputation.
- An individual may have *one* major limb amputation only.

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[1] 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.
[2] *Theater Medical Data Store* (TMDS). This data source captures outpatient and inpatient medical encounters within theaters of operation.

Case Definition and Incidence Rules (cont.)

- An individual is considered an incident case only once during the surveillance period.

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)** - 887.0 (unilateral, below elbow, without mention of complication) - 887.1 (unilateral, below elbow, complicated) - 887.2 (unilateral, at or above elbow, without mention of complication) - 887.3 (unilateral, at or above elbow, complicated) - 887.4 (unilateral, level not specified, without mention of complication) - 887.5 (unilateral, level not specified, complicated) - 887.6 (bilateral, any level, without mention of complication); one hand and other arm - 887.7 (bilateral, any level, complicated) **896.x (traumatic amputation of foot; complete, partial)** - 896.0 (unilateral, without mention of complication) - 896.1 (unilateral, complicated) - 896.2 (bilateral, without mention of complication) - 896.3 (bilateral, complicated) **897.x (traumatic amputation of leg(s); complete, partial)** - 897.0 (unilateral, below knee, without mention of complication) - 897.1 (unilateral, below knee, complicated)	*(continued on next page)*

	- 897.2 (unilateral, at or above knee, without mention of complication) - 897.3 (unilateral, at or above knee, complicated) - 897.4 (unilateral, level not specified, without mention of complication) - 897.5 (unilateral, level not specified, complicated) - 897.6 (bilateral, any level, without mention of complication); one foot and other leg - 897.7 (bilateral, any level, complicated **V49.6 (upper limb amputation status)** - V49.60 (unspecified level) - V49.63 (hand) - V49.64 (wrist) - V49.65 (below elbow) - V49.66 (above elbow) - V49.67 (shoulder) **V49.7 (lower limb amputation status)** - V49.70 (unspecified level) - V49.73 (foot) - V49.74 (ankle) - V49.75 (below knee) - V49.76 (above knee) - V49.77 (hip)	
Related diagnostic procedures	**84.0 (Amputation of upper limb)** - 84.00 (upper limb amputation, not otherwise specified) - 84.03 (amputation through hand) - 84.04 (disarticulation of wrist) - 84.05 (amputation through forearm) - 84.06 (disarticulation of elbow) - 84.07 (amputation through humerus) - 84.08 (disarticulation of shoulder) - 84.09 (interthoracoscapular amputation) **84.1 (Amputation of lower limb)** - 84.10 (lower limb amputation, not otherwise specified) - 84.12 (amputation through foot) - 84.13 (disarticulation of ankle)	*(continued on next page)*

	- 84.14 (amputation of ankle through malleoli of tibia and fibula) - 84.15 (other amputation below knee) - 84.16 (disarticulation of knee) - 84.17 (amputation above knee) - 84.18 (disarticulation of hip) - 84.19 (abdominopelvic amputation)	

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, finder 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.[3] 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.

[3] 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.

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

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

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

Comments

None

CARPAL TUNNEL SYNDROME

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.

Clinical Description

Carpal Tunnel Syndrome (CTS) is a pathologic condition involving compression of the median nerve as it passes through the wrist. Compression of the median nerve causes symptoms such as pain, numbness, weakness, and paresthesia in the hand and wrist. Pain may radiate up the arm.[1] Causes of CTS involve many factors including congenital predisposition, injury or trauma, specific endocrine conditions, repetitive movements, awkward positioning, and repeated use of vibrating machinery.[2]

Case Definition and Incidence Rules

For surveillance purposes, a case of carpal tunnel syndrome is defined as:

- *Two outpatient medical encounters* with a defining diagnoses of carpal tunnel syndrome (see ICD9 code list below), with the diagnosis appearing at least once in the *primary* diagnostic position.

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first outpatient medical encounter that includes a defining diagnosis of carpal tunnel syndrome.
- An individual is considered an incident case only *once per lifetime*.

Exclusions:

- None

Codes

The following ICD9 code is included in the case definition:

Condition	ICD-9-CM Codes	CPT Codes
Carpal Tunnel Syndrome	354.0 (carpal tunnel syndrome)	NA

[1] National Institute of Neurological Disorders and Stroke. http://www.ninds.nih.gov/disorders/carpal_tunnel/detail_carpal_tunnel.htm#170463049.

[2] Silverstein BA, Fine LJ, Armstrong TJ. Occupational factors and carpal tunnel syndrome. *Am J Ind Med.* 1987; 11:343-58.

Development and Revisions

This case definition was developed in July of 2011 by a preventive medicine resident doing a rotation at AFHSC. The definition was used for a MSMR article on carpal tunnel syndrome.[3]

Reports

None

Review

Sep 2011	Case definition reviewed and adopted by the Surveillance Methods and Standards (SMS) working group.
Jul 2011	Case definition developed and reviewed by AFHSC MSMR staff.

Comments

None

[3] Armed Forces Health Surveillance Center. Carpal Tunnel Syndrome, Active Component, U.S. Armed Forces, 2000-2010. *Medical Surveillance Monthly Report (MSMR).* 2011 Jul; Vol 18(7): 12-15.

CRUCIATE LIGAMENT INJURIES

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. In the military, cruciate ligament injuries are occupational and recreational hazards, and can lead to a significant loss of workdays for those affected.

Clinical Description

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. Injuries of these ligaments can occur in the form of sprains, partial tears, and complete tears. The injury is often painful, depending upon the severity of injury experienced. Treatment for cruciate ligament injuries ranges from conservative measures to surgical repair.[1]

Case Definition and Incidence Rules

For surveillance purposes, a cruciate ligament injury case is defined as:

- *One inpatient medical encounter* with any of the defining diagnoses of cruciate ligament injury (see ICD9 code list below) in *any* diagnostic position; or
- *Two outpatient medical encounters*, occurring *within 180 days* of each other, with any of the defining diagnoses of cruciate ligament injury (see ICD9 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 inpatient or outpatient medical encounter that includes a diagnosis of a cruciate ligament injury.
- An individual can be considered an incident case once every 180 days.

Exclusions:

- None

[1] Armed Forces Health Surveillance Center. *Cruciate Ligament Injuiries, Active Component, U.S. Armed Forces, 2000-2009*. Medical Surveillance Monthly Report (MSMR). 2011 February; Vol 18(2): 8-11.

Codes

The following ICD-9 codes are included in the case definition:

Condition	ICD-9-CM codes	CPT Codes
Cruciate Ligament Injuries	717.83 (old disruption of the anterior cruciate ligament) 717.84 (old disruption of the posterior cruciate ligament) 844.2 (sprains and strains; cruciate ligament of knee)	NA

Development and Revisions

The case definition for cruciate ligament injuries was developed based on reviews of the ICD9 codes, the scientific literature, and previous AFHSC analyses. The case definition was developed by MSMR staff for use in a MSMR article for the February 2011 edition.

Case Definition and Incidence Rule Rationale

- The signs of cruciate ligament injuries are non-specific and health care providers may include the condition in the differential diagnosis for an individual prior to making a definitive diagnosis. As such, the case definition requires two outpatient visits to confirm a true case. The diagnosis is permitted in any diagnostic position because of the possibility of co-morbid diagnoses.

- The interval of 180 days between outpatient visits is used because full recovery is usually achieved 6 months post-surgical repair for cases that require surgery, re-opening the possibility of subsequent injury.

Code Set Determination and Rationale

- The ICD9 codes were chosen to use all possible descriptions of cruciate ligament injuries.
- 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 left and right knees in the same 180 day period. For example, if a Service member injures his right anterior cruciate ligament and meets the case definition, a subsequent injury to the left anterior cruciate ligament within 180 days of the right-sided injury would not be recorded as a new occurrence.

Reports

- None

Review

June 2011	Case definition reviewed and adopted by Surveillance Methods and Standards (SMS) working group.
Dec 2010	Case definition developed and reviewed by AFHSC MSMR staff.

Comments

None

HETEROTOPIC OSSIFICATION

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. Heterotopic Ossification (HO) has emerged as a frequent and concerning clinical and rehabilitation problem among service members with severe traumatic injuries sustained in Iraq and Afghanistan. AFHSC designated HO as a deployment-related condition of special surveillance interest because of its incidence among service members wounded in Iraq and Afghanistan and also because of its potential to be an obstacle to an amputation victim's recovery.

Clinical Description

Heterotopic ossification (HO) is the formation of bone tissue outside the skeleton in, or adjacent to, soft tissues that have been injured. It is commonly detected 2 months after injury and is characterized by increasing pain and decreasing range of motion about a joint. [1]

Case Definition and Incidence Rules

For surveillance purposes, a case of heterotopic ossification is defined as:

- *One inpatient medical encounter* with any of the defining diagnoses of heterotopic ossification in *any* diagnostic position (see ICD9 code list below); or
- *Two or more outpatient medical encounters*, at least 7 days apart, with any of the defining diagnoses of heterotopic ossification in *any* diagnostic position (see ICD9 code list below).
- *If analysis requires "deployment-associated" incident case counts*, 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 (see *Development and Revisions* section below).

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first inpatient or outpatient medical encounter that includes a defining diagnosis of heterotopic ossification.
- An individual is considered an incident case only *once per lifetime*.

Exclusions:

- None

[1] Skinner, H.B. 2006. *Current Diagnosis and Treatment in Orthopedics.* 4th ed. United States: McGraw-Hill/Appleton & Lange.

Codes

The following ICD9 codes are included in the case definition:

Condition	ICD-9-CM codes	CPT Codes
Heterotopic Ossification	728.12 (traumatic myositis ossifications; myositis ossificans (circumscripta) 728.13 (postoperative heterotopic calcification) 728.19 (other; polymyositis ossificans)	NA

Development and Revisions

- The case definition was originally developed by the AFHSC Medical Surveillance Monthly Report (MSMR) staff for the MSMR article referenced below. Surveillance of the condition dates back to January 2002.[2]

Case Definition and Incidence Rule Rationale

- In order to increase the specificity and positive predictive value of the case definition, it was agreed upon that there should be some time interval between the two outpatient encounters with a diagnosis of heterotopic ossification. Accordingly, the 7 day period between the two outpatient encounters was chosen for the case definition.

Deployment-Associated Incident Cases of Heterotopic Ossification

If an analysis requires "deployment-associated" incident case counts, AFHSC includes the restriction described above under *Case Definition and Incidence Rules.*

As of November 2010, AFHSC includes the following operations associated with deployment in their heterotopic ossification 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 screening and/or medical evaluations that result in the diagnosis of heterotopic ossification. When estimating "deployment-associated" incident cases, it should be noted that a causal association for heterotopic ossification due to an event that occurred during a deployment or direct combat cannot be determined using data available to AFHSC.

Reports

AFHSC reports on heterotopic ossification 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).

[2] Armed Forces Health Surveillance Center. Heterotopic Ossification, U.S. Armed Forces, 2002-2007. *Medical Surveillance Monthly Report (MSMR)*, 2007 Aug; Vol 14(5): 7-9).

Revisions and Review

Feb 2011	Case definition reviewed and adopted by the Surveillance Methods and Standards (SMS) working group.
Aug 2007	Case definition developed and reviewed by AFHSC MSMR staff.

Comments

None

LOW BACK PAIN; MECHANICAL

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. In the U.S. Armed Forces, low back pain is among the most frequent causes of medical visits and lost-duty time. Back problems have also been the leading causes of medical evacuations from Iraq and Afghanistan.[1] This case definition is used to identify cases of *mechanical* low back problems defined as local or radicular pain associated with conditions of the sacrum or lumbar spine and unrelated to major trauma, neoplasms, pregnancy, infectious or inflammatory causes.[2]

Clinical Description

Low back pain is a common musculoskeletal condition affecting up to two-thirds of the population at some time in their lives.[3] The condition can be acute or chronic with pain localized to the spine and paraspinal regions or radiating into the leg suggesting nerve root compression. Low back pain accompanied by spinal nerve root damage is usually associated with neurological signs and symptoms.[4] Risk factors for developing back pain include smoking, obesity, older age, being female, physically strenuous work, sedentary lifestyle, anxiety, and depression. The diagnosis is generally made by clinical history and, if needed, radiographic imaging. Treatment includes pain relievers, muscle relaxants, physical therapy, cortisone injections, and, rarely, surgery. The vast majority of low back pain episodes resolve within two to four weeks of onset. However, 25% of patients have recurrent episodes within one year. [5, 6]

Case Definition and Incidence Rules

For surveillance purposes, a case of low back pain is defined as:

- *One inpatient or outpatient medical encounter* with any of the defining diagnoses of low back pain (see ICD9 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 inpatient or outpatient medical encounter that includes a diagnosis of low back pain.

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[1] Armed Forces Health Surveillance Center. Low Back Pain, Active Component, U.S. Armed Forces, 2000-2009. *Medical Surveillance Monthly Report (MSMR).* 2010 July; Vol 17(7): pp. 2-7.
[2] Cherkin D, Deyo R, Volinn E, et al. Use of the International Classification of Diseases (ICD-9-CM) to identify hospitalizations for mechanical low back problems in administrative databases. *Spine*. 1992; 17(17):817-25.
[3] Andersson GBJ. Epidemiologic features of chronic low-back pain. *Lancet*. 354: 1999; 581.
[4] Last A, et al. Chronic low back pain: Evaluation and management. *American Family Physician*. 2009;79:1067.
[5] Devereaux M. Low back pain. *Medical Clinics of North America*. 2009;93:477.
[6] Stanton TR, Henschke N, Maher CG, et al. After an episode of acute low back pain, recurrence is unpredictable and not as common as previously thought. *Spine*. 2008;33:2923-8.

Case Definition and Incidence Rules (cont.)

- An individual can be considered an incident case *once per surveillance period.*
- For individuals with more than one low back pain diagnosis reported during a single medical encounter, the diagnosis reported in the highest (primary > secondary, etc.) diagnostic position is used.
- *If analysis requires recurrent case counts*, an individual is considered a recurrent case if he or she meets the criteria of an incident case $\geq$ *30 days* after the initial defining encounter.

Exclusions:

- Inpatient and outpatient medical encounters for back pain during which there is also recorded, in *any* diagnostic position, a diagnosis associated with major trauma, pregnanc neoplasms, infections, or other inflammatory causes of back pain are excluded. Specific ICD9 codes that result in exclusion are :
  - Neoplasms (140-239.9)
  - Intraspinal abscess (324.1)
  - Pregnancy (630-676, V22.0-V23.9, V27.0-V27.9)
  - Inflammatory spondyloarthropathies (720.0-720.9)
  - Osteomylelitis (730-730.99)
  - Vertebral fractures (733.13, 805-806.99)
  - Vertebral dislocations (839-839.59)

Codes

The following ICD9 codes are included in the case definition:

Condition	ICD-9-CM Codes[2]	CPT Codes
Nonspecific back pain	724.2 (lumbago) 724.5 (backache, unspecified) 846.xx (sprains and strains of sacroiliac region) 847.2 (sprains and strains, lumbar) 847.3 (sprains and strains, sacrum) 847.9 (sprains and strains, unspecified site of back)	NA *(continued on next page)*

Miscellaneous back problems	722.30 (Schmorl's nodes, unspecified region) 722.32 (Schmorl's nodes, lumbar region) 724.3 (sciatica) 724.4 (thoracic or lumbosacral neuritis or radiculitis, unspecified) 724.8 (other symptoms referable to back) 724.9 (other unspecified back disorders) 737.1x (curvature of spine; kyphosis, acquired) 737.2x (curvature of spine; lordosis, acquired) 737.3x (curvature of spine; kyphoscoliosis and scoliosis) 738.5 (other acquired deformity of back or spine) 739.3 (nonallopathic lesions, not elsewhere classified, lumbar region) 739.4 (nonallopathic lesions, not elsewhere classified, sacral region) 756.10 (anomaly of spine, unspecified) 756.13-756.19 (various congenital anomalies of spine)	
Degenerative changes	721.3 (lumbosacral spondylosis without myelopathy) 721.5 (spondylosis, kissing spine) 721.6 (spondylosis, ankylosing vertebral hyperostosis) 721.7 (spondylosis, traumatic spondylopathy) 721.8 (spondylosis, other allied disorders of spine) 721.90 (spondylosis of unspecified site, without mention of myelopathy) 722.52 (degeneration of lumbar or lumbosacral intervertebral disc) 722.6 (degeneration of intervertebral disc, site unspecified) 722.90 (other and unspecified disc disorder, unspecified region) 722.93 (other and unspecified disc disorder, lumbar region)	
Possible instability	724.6 (other and unspecified disorders of back, sacrum) 738.4 (other acquired deformity, spondylolisthesis) 756.11 (other congenital musculoskeletal anomalies; spondylolysis, lumbosacral region) 756.12 (other congenital musculoskeletal anomalies; spondylolisthesis)	*(continued on next page*

Herniated disc	722.1 (displacement of thoracic or lumbar intervertebral disc without myelopathy) 722.10 (displacement of lumbar intervertebral disc without myelopathy) 722.2 (displacement of intervertebral disc, site unspecified, without myelopathy) 722.70 (intervertebral disc disorder with myelopathy, unspecified region) 722.73 (intervertebral disc disorder with myelopathy, lumbar region)	
Spinal stenosis	721.42 (lumbar spondylosis with myelopathy) 721.91 (spondylosis of unspecified site, with myelopathy) 724.00 (spinal stenosis, other than cervical, unspecified region) 724.02 (spinal stenosis, other than cervical, lumbar region, without neurogenic claudication) 724.09 (spinal stenosis, other than cervical, other)	
Sequelae of previous back surgery	722.80 (postlaminectomy syndrome, unspecified region) 722.83 (postlaminectomy syndrome, lumbar region)	

Development and Revisions

This case definition was developed in July of 2011 by the Medical Surveillance Monthly Report (MSMR) staff for use in a MSMR article on incident and recurrent cases of mechanical low back pain.[1] The definition was developed based on reviews of the ICD9 codes, the scientific literature, and previous AFHSC analyses.

Case Definition and Incidence Rule Rationale

- *Recurrent cases:* To identify recurrent cases, the case definition requires an interval of 30 days or more between episodes of back pain in order to exclude encounters associated with continuing care of the preceding incident event. Given the favorable natural history for acute and subacute LBP, with up to 90% of patients regaining function within 6-12 weeks with or without physician intervention,[7,8] the 30 day interval may be too short and may prematurely classify some incident cases as recurrent cases.

[7] South-Paul, JE, Matheny, SC, Lewis EL. *Current Diagnosis and Treatment in Family Medicine*, 3e, Chapter 24 Low Back Pain in Primary Care: An Evidence-Based Approach. McGraw Hill Companies, Inc. 2011.

[8] Carey TS, Garrett J, Jackman A, McLaughlin C, Fryer J, Smucker DR. The outcomes and costs of care for acute low back pain among patients seen by primary care practitioners, chiropractors, and orthopedic surgeons: the North Carolina Back Pain Project. *N Engl J Med*. 1995; 333(14):913-917.

Code Set Determination and Rationale

- This case definition uses a code set developed in 1992 by Cherkin et al [2] designed to identify patients with mechanical low back pain from administrative databases. The code set was selected after a review of the scientific literature and of the relevant codes in the International Classification of Diseases, 9th Revision.

Reports

None

Review

May 2012	Case definition reviewed and adopted by the AFHSC Surveillance Methods and Standards (SMS) working group.
July 2010	Case definition developed by AFHSC MSMR staff.

Comments

None

OSTEOARTHRITIS

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. In the military, work-related injuries account for significant lost work time, health care costs, and disability compensation.[1]

Clinical Description

Osteoarthritis (OA), the most common form of arthritis, is a non-inflammatory degenerative joint disease characterized by destruction of cartilage and remodeling of bone at the joints. OA is highly prevalent in the United States and is associated with advancing age. Osteoarthritis can cause a range of symptoms from joint pain and stiffness to more disabling impairment. Risk factors for OA may be inherent to an individual, i.e., obesity, family history, hypermobility and abnormalities of the joint, or related to exposure, i.e., trauma, or overuse from physical activity or occupation.[2]

Case Definition and Incidence Rules

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

- *One inpatient medical encounter* with any of the defining diagnoses of osteoarthritis (see ICD9 code list below) in *any* diagnostic position; or
- *Two outpatient medical encounters*, occurring *within two years* of each other, with any of the defining diagnoses of osteoarthritis (see ICD9 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 inpatient or outpatient medical encounter that includes a defining diagnosis of osteoarthritis.
- An individual is considered an incident case only *once per lifetime*.

Exclusions:

- None

[1] Feuerstein M, Berkowitz SM, Peck CA. Musculoskeletal-related disability in US Army personnel: prevalence, gender and military occupational specialties. *J Occup Environ Med*. 1997 Jan;39(1):68-78.
[2] Armed Forces Health Surveillance Center. Osteoarthritis and Spondylosis, Active Component, U.S. Armed Forces, 2000-2009. *Medical Surveillance Monthly Report (MSMR).* 2010 December; Vol.17 (12): 6-11.

Codes

The following ICD9 codes are included in the case definition:

Condition	ICD-9-CM Codes	CPT Codes
Osteoarthritis	715.0 (osteoarthrosis, generalized [0,4,9]) 715.1 (osteoarthrosis, localized, primary [0-8]) 715.2 (osteoarthrosis, localized, secondary [0-8]) 715.3 (osteoarthrosis, localized, not specified whether primary or secondary [0-8]) 715.8 (osteoarthrosis involving, or with mention of more than one site, but not specified as generalized [0,9]) 715.9 (osteoarthrosis, unspecified whether generalized or localized [0-8]) *Fifth-digit subclassification for use with category 715:* 0 site unspecified 1 shoulder region 2 upper arm 3 forearm 4 hand 5 pelvic region and thigh 6 lower leg 7 ankle and foot 8 other specified sites 9 multiple sites	NA

Development and Revisions

The case definition was developed by Medical Surveillance Monthly Report (MSMR) staff for use in the MSMR article referenced above.[2] The case definition was developed based on reviews of the ICD9 codes, the scientific literature, and previous AFHSC report requests.

Case Definition and Incidence Rule Rationale

- The symptoms of osteoarthritis present over time and health care providers may include the condition in the differential diagnosis for an individual prior to making a definitive diagnosis. As such, the case definition requires two outpatient visits to confirm a true case.

Code Set Determination and Rationale

- The ICD9 codes 715.xx were included to use all possible descriptions and sequelae unique to osteoarthritis.

Reports

- None

Review

Mar 2011	Case definition reviewed and adopted by AFHSC Surveillance Methods and Standards (SMS) working group.
Dec 2010	Case definition developed and reviewed by MSMR staff.

Comments

None

SPONDYLOSIS

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. In the military, work-related injuries account for significant lost work time, health care costs, and disability compensation.[1]

Clinical Description

Spondylosis, sometimes referred to as degenerative osteoarthritis, or osteoarthritic spine disease, typically occurs in later life and primarily involves the cervical and lumbosacral spine. Patients often complain of back pain that is increased by motion and associated with stiffness or limitation of motion. Pain may be prominent when x-ray findings are minimal; alternatively, large osteophytes may be seen in asymptomatic patients. If severe, the condition may cause pressure on nerve roots and spinal stenosis.[2]

Case Definition and Incidence Rules

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

- *One inpatient medical encounter* with any of the defining diagnoses of spondylosis (see ICD9 code list below) in *any* diagnostic position; or
- *Two outpatient medical encounters*, occurring *within two years* of each other, with any of the defining diagnoses of spondylosis (see ICD9 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 inpatient or outpatient medical encounter that includes a defining diagnosis of spondylosis.
- An individual is considered an incident case only *once per lifetime*.

Exclusions:

- None

[1] Feuerstein M, Berkowitz SM, Peck CA. Musculoskeletal-related disability in US Army personnel: prevalence, gender and military occupational specialties. *J Occup Environ Med*. 1997 Jan;39(1):68-78.
[2] Braunwald, E., Fauci, A., Longo, D. et al. 2008. *Harrison's Principles of Internal Medicine.* 17th ed. United States: McGraw-Hill Professional.

Codes

The following ICD9 codes are included in the case definition:

Condition	ICD-9-CM codes	CPT Codes
Spondylosis	721.0 (cervical spondylosis without myelopathy) 721.1 (cervical spondylosis with myelopathy) 721.2 (thoracic spondylosis without myelopathy) 721.3 (lumbosacral spondylosis without myelopathy) 721.4 (thoracic or lumbar spondylosis with myelopathy) - 721.41(thoracic region) - 721.42 (lumbar region) 721.5 (kissing spine) 721.6 (ankylosing vertebral hyperostosis) 721.7 (traumatic spondylopathy) 721.8 (other allied disorders of spine) 721.9 (spondylosis of unspecified site) - 721.90 (without mention of myelopathy) - 721.91 (with myelopathy)	NA

Development and Revisions

The case definition was developed by Medical Surveillance Monthly Report (MSMR) staff for use in a MSMR article.[3] The case definition was developed based on reviews of the ICD9 codes, the scientific literature, and previous AFHSC report requests.

Case Definition and Incidence Rule Rationale

- The symptoms of spondylosis present over time and health care providers may include the condition in the differential diagnosis for an individual prior to making a definitive diagnosis. As such, the case definition requires two outpatient visits to confirm a true case.

Code Set Determination and Rationale

- The ICD9 codes 721.xx were included to use all possible descriptions and sequelae unique to spondylosis.

Reports

- None

[3] Armed Forces Health Surveillance Center. Osteoarthritis and Spondylosis, Active Component, U.S. Armed Forces, 2000-2009. *Medical Surveillance Monthly Report (MSMR).* 2010 December; Vol 17 (12): 6-11.

Review

Mar 2011	Case definition reviewed and adopted by AFHSC Surveillance Methods and Standards (SMS) working group.
Dec 2010	Case definition developed and reviewed by MSMR staff.

Comments

None

TENDON RUPTURE

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. Studies have shown that spontaneous tendon ruptures have a disproportionately large impact on military operational effectiveness and the military health system. [1,2]

Clinical Description

Tendon ruptures are tears in the fibrous tissue that attaches muscle to bone. Tendon ruptures may occur without significant trauma (i.e., spontaneous rupture) and are commonly associated with strenuous activities. For example, running, sudden stops and starts, and jumping are often associated with Achilles tendon tears. Other risk factors include increasing age, male gender, use of certain medications (e.g., fluoroquinolone antibiotics, anabolic steroids), and degenerative changes in tendon tissue. In addition, there may be a genetic predisposition. Tendon ruptures can be chronically painful and disabling depending on the nature and location of the affected tendon. Most ruptured tendons can be repaired surgically or with immobilization; however, regardless of the therapeutic approach, there are often long periods of rehabilitation. [3]

Case Definition and Incidence Rules

For surveillance purposes, a case of tendon rupture is defined as:

- *One inpatient or outpatient medical encounter* with any of the defining diagnoses of tendon rupture (see ICD9 code list below) in the *primary* diagnostic position.

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first inpatient or outpatient medical encounter that includes a diagnosis of tendon rupture.
- For analyses of all tendon ruptures in *any* location, an individual is considered an incident case once during the surveillance period. For analyses of ruptures of a specific tendon, an individual is considered an incident case once per specific tendon per surveillance period.

Exclusions:

- None

[1] Jarvinen TAH, Kannus P, Maffulli N, Khan KH. Achilles tendon disorders: etiology and epidemiology. *Foot Ankle Clin N Amer*. 2005; 10:255-266.
[2] White DW, Wenke JC, Mosely DS, Mountcastle SB, Basamania CJ. Incidence of major tendon ruptures and anterior cruciate ligament tears in US Army soldiers. *Am J Sports Med*. 2007 Aug; 35(8):1308-14.
[3] Armed Forces Health Surveillance Center. Tendon Rupture, U.S. Armed Forces, 2000-2009. *Medical Surveillance Monthly Report (MSMR).* 2010 July; Vol 17(7): pp. 14-19.

Codes

The following ICD9 codes are included in the case definition:

Condition	ICD-9-CM Codes	CPT Codes
Tendon rupture	**727.60-727.69 Rupture of tendon, nontraumatic** - 727.60 (nontraumatic rupture of unspecified tendon) - 727.61 (complete rupture of rotator cuff) - 727.62 (tendons of biceps; long head) - 727.63 (extensor tendons of hand and wrist) - 727.64 (flexor tendons of hand and wrist) - 727.65 (quadriceps tendon) - 727.66 (patellar tendon) - 727.67 (Achilles tendon) - 727.68 (other tendons of foot and ankle) - 727.69 (other)	NA

Development and Revisions

This case definition was developed in July of 2010 by Armed Forces Health Surveillance Center staff for use in a MSMR article on tendon ruptures.[3] The case definition was developed in consultation with external experts on tendon ruptures from the U.S. Military Academy and is also based on reviews of ICD9 codes, the scientific literature, and previous AFHSC analyses.

Case Definition and Incidence Rule Rationale

- Incident cases are restricted to tendon ruptures reported in the primary diagnostic position in inpatient and outpatient records in an effort to increase the specificity of cases identified.

Code Set Determination and Rationale

- The code set was selected after a review of the scientific literature and of the relevant codes in the International Classification of Diseases, 9th Revision.

- The code set includes all codes pertaining to tendon rupture in the ICD-9-CM, 9th Revision. There are no codes specific for partial or incomplete tendon ruptures or tears.

Reports

None

Review

Mar 2012	Case definition reviewed and adopted by the AFHSC Surveillance Methods and Standards (SMS) working group.
July 2010	Case definition developed by AFHSC MSMR staff.

Comments

None

INJURIES, BY ANATOMIC REGION

Case Definition for AFHSC Installation Injury Report

Background

This case definition was developed in June of 2001 by a working group from the Army Medical Surveillance Activity (AMSA), now the Armed Forces Health Surveillance Center, in collaboration with representatives from the Injury Prevention Program at the Army Institute of Public Health (AIPH), formerly the US Army Center for Health Promotion and Preventive Medicine (CHPPM), and with input from the Department of Defense Military Injury Metrics Working Group. The group developed this definition for a monthly installation-specific injury surveillance report designed to give installation commanders and their staffs insight into the natures and relative impacts of injuries at their installations.[1]

Clinical Description

Injuries and musculoskeletal conditions are the single leading cause of deaths, disabilities, hospitalizations, outpatient visits, and manpower losses among military service members. They adversely affect the health of service members and troop readiness more than any other single diagnosis.[2] The leading types of injury for the Army include ankle fractures, intracranial injury, fracture of face bones, sprains and strains of the knee, dislocation of the knee, fracture of the radius and ulna, fracture of one or more fingers, and open wounds of the fingers.

Case Definition and Incidence Rules

For surveillance purposes, an injury is defined as:

- *One inpatient medical encounter* with any of the defining diagnoses of injury (see ICD9 code list below) in *any* diagnostic position.
- *One outpatient medical encounter* with any of the defining diagnoses of injury (see ICD9 code list below) in *any* diagnostic position.

Incidence rules:

For individuals who meet the case definition:

- An individual can have *one injury per anatomic region every 60 days* (see Code table below for specific anatomic regions).
- The incidence date is considered the date of the first inpatient or outpatient medical encounter that includes one of the defining diagnoses of injury.

Exclusions:

- None

[1] Army Medical Surveillance Activity. Monthly Installation Injury Surveillance Reports: Surveillance of Injuries and their Impacts at the Installation Level, US Armed Forces. *Medical Surveillance Monthly Report (MSMR).* 2001September/October ; 7(8): 7-10.
[2] Jones, BH, Perotta, DM, Canham-Chervak, ML, Nee, MA, and Brundage, JF. *Injuries in the military: A review and commentary focused on prevention.* Am J Prev Med. 2000 April; 18(3 Suppl): 71-84.

Codes

The following ICD9 codes are included in the case definition[3]:

Anatomic Regions	ICD-9-CM codes
Head and Neck Injuries	363.61, 363.63, 364.04, 364.41, 364.76, 364.77, 365.65, 366.20, 379.32, 379.33, 379.34, 525.11, 722.0, 722.71, 723.1, 723.4, 800, 801, 802, 803, 804, 805.0, 805.1, 806.0, 806.1, 807.5, 807.6, 830, 839.0, 839.1, 847.0, 848.0, 848.1, 848.2, 850, 851, 852, 853, 854, 870, 871, 872, 873, 874, 900, 910.0, 910.1, 910.2, 910.3, 910.6, 910.7, 910.8, 910.9, 918, 920, 921, 925, 930, 931, 932, 933, 935.0, 940, 941, 947.0, 950, 951, 952.0, 953.0, 954.0, 957.0, 959.0
Shoulder and Arm Injuries	354.1, 354.2, 354.3, 716.11, 716.12, 716.13, 718.01, 718.02, 718.03, 718.11, 718.12, 718.13, 718.31, 718.32, 718.33, 718.81, 718.82, 718.83, 718.91, 718.92, 718.93, 719.01, 719.02, 719.03, 719.11, 719.12, 719.13, 719.41, 719.42, 719.43, 726.0, 726.1, 726.2, 726.3, 727.61, 727.62, 733.11, 810, 811, 812, 813, 818, 831, 832, 840, 841, 880, 881.00, 881.01, 881.10, 881.11, 881.20, 881.21, 887, 903.0, 903.1, 912.0, 912.1, 912.2, 912.3, 912.6, 912.7, 912.8, 912.9, 923.0, 923.1, 927.0, 927.1, 943, 953.4, 955.0, 955.1, 955.2, 955.3, 955.4, 955.5, 955.7, 955.8, 955.9, 959.2
Hand and Wrist Injuries	354.0, 716.14, 718.04, 718.14, 718.34, 718.84, 718.94, 719.04, 719.14, 719.44, 726.4, 727.63, 727.64, 733.12, 814, 815, 816, 817, 833, 834, 842, 881.02, 881.12, 881.22, 882, 883, 885, 886, 903.4, 903.5, 914.0, 914.1, 914.2, 914.3, 914.6, 914.7, 914.8, 914.9, 915.0, 915.1, 915.2, 915.3, 915.6, 915.7, 915.8, 915.9, 923.2, 923.3, 927.2, 927.3, 944, 955.6, 959.4, 959.5
Leg Injuries	716.15, 716.16, 718.05, 718.15, 718.35, 718.85, 718.95, 719.05, 719.15, 719.45, 726.5, 727.65, 733.14, 733.15, 733.93, 808.0, 808.1, 820, 821, 823, 835, 843, 844.3, 890, 897, 904.0, 904.1, 904.2, 904.3, 904.5, 924.0, 924.10, 928.0, 928.10, 945.00, 945.04, 945.06, 945.09, 945.10, 945.14, 945.16, 945.19, 945.20, 945.24, 945.26, 945.29, 945.30, 945.34, 945.36, 945.39, 945.40, 945.44, 945.46, 945.49, 945.50, 945.54, 945.56, 945.59, 956, 959.6
Knee Injuries	717, 718.36, 718.86, 719.06, 719.16, 719.46, 726.6, 727.66, 822, 836, 844.0, 844.1, 844.2, 924.11, 928.11, 945.05, 945.15, 945.25, 945.35, 945.45, 945.55
Ankle and Foot Injuries	716.17, 718.07, 718.17, 718.37, 718.87, 718.97, 719.07, 719.17, 719.47, 726.7, 727.67, 727.68, 728.71, 733.94, 734, 824, 825, 826, 837, 838, 845, 892, 893, 895, 896, 904.6, 917.0, 917.1, 917.2, 917.3, 917.6, 917.7, 917.8, 917.9, 924.2, 924.3, 928.2, 928.3, 945.01, 945.02, 945.03, 945.11, 945.12, 945.13, 945.21, 945.22, 945.23, 945.31, 945.32, 945.33, 945.41, 945.42, 945.43, 945.51, 945.52, 945.53 *(continued on next page)*

[3] A one page summary of the ICD9 codes used for the Installation Injury Report is available on the AFHSC website at: http://www.afhsc.mil/viewInjury?file=Online_documentation_20041022.pdf. As of May 2011, the codes listed in the online code set are consistent with the codes in this case definition.

Chest, Back, and Abdomen Injuries	720.2, 721.7, 722.1, 722.72, 722.73, 724.2, 724.3, 724.4, 724.5, 724.9 , 733.13, 805.2, 805.3, 805.4, 805.5, 805.6, 805.7, 806.2, 806.3, 806.4, 806.5, 806.6, 806.7, 807.0, 807.1, 807.2, 807.3, 807.4, 808.2, 808.3, 808.4, 808.5, 808.8, 808.9, 809, 839.2, 839.3, 839.41, 839.42, 839.51, 839.52, 839.61, 839.71, 846, 847.1, 847.2, 847.3, 847.4, 847.9, 848.3, 848.4, 848.5, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 875, 876, 877, 878, 879.0, 879.1, 879.2, 879.3, 879.4, 879.5, 879.6, 879.7, 901, 902, 911.0, 911.1, 911.2, 911.3, 911.6, 911.7, 911.8, 911.9, 922, 926, 934, 935.1, 935.2, 936, 937, 938, 939, 942, 947.1, 947.2, 947.3, 947.4, 952.1, 952.2, 952.3, 952.4, 953.1, 953.2, 953.3, 953.5, 954.1, 954.8, 954.9, 959.1, 959.11, 959.12, 959.19
Environmental Injuries	363.31, 370.24, 388.10, 388.11, 388.12, 692.71, 692.76, 692.77, 910.4, 910.5, 911.4, 911.5, 912.4, 912.5, 913.4, 913.5, 914.4, 914.5, 915.4, 915.5, 916.4, 916.5, 917.4, 917.5, 919.4, 919.5, 990, 991, 992, 993, 994
Unspecified Injuries	716.10, 716.18, 716.19, 718.00, 718.08, 718.09, 718.10, 718.18, 718.19, 718.30, 718.38, 718.39, 718.80, 718.88, 718.89, 718.90, 718.98, 718.99, 719.00, 719.08, 719.09, 719.10, 719.18, 719.19, 719.40, 719.48, 719.49, 722.2, 722.70, 726.8, 726.9, 727.2, 727.3, 727.60, 727.69, 728.83, 729.1, 729.2, 733.10, 733.16, 733.19, 733.95, 805.8, 805.9, 806.8, 806.9, 819, 827, 828, 829, 839.40, 839.49, 839.50, 839.59, 839.69, 839.79, 839.8, 839.9, 844.8, 844.9, 848.8, 848.9, 879.8, 879.9, 884, 891, 894, 903.2, 903.3, 903.8, 903.9, 904.4, 904.7, 904.8, 904.9, 913.0, 913.1, 913.2, 913.3, 913.6, 913.7, 913.8, 913.9, 916.0, 916.1, 916.2, 916.3, 916.6, 916.7 , 916.8, 916.9, 919.0, 919.1, 919.2, 919.3, 919.6, 919.7, 919.8, 919.9, 923.8, 923.9, 924.4, 924.5, 924.8, 924.9, 927.8, 927.9, 928.8, 928.9, 929, 946, 947.8, 947.9, 948, 949 , 952.8, 952.9, 953.8, 953.9, 957.1, 957.8, 957.9, 959.13, 959.14, 959.3, 959.7, 959.8, 959.9, 995.81, 995.83, 995.85

Development and Revisions

- In 2004 the case definition was reviewed by AMSA and the ICD9 code list updated to be consistent with changes to the ICD9 code manual.
- The original case definition was developed in June of 2001 by an AMSA working group in collaboration with representatives from the Injury Prevention Program at CHPPM and with input from a DoD Military Injury Metrics Working Group. The case definition was developed based on results of Army injury field investigations, reviews of the ICD9 codes and the scientific literature.

Case Definition and Incidence Rule Rationale

- The incidence rule of one injury per category per 60 days is used because recovery from most injuries is usually achieved within this time frame. In addition, the DoD Military Injury Metrics Working Group conducted analyses of medical ambulatory data and found that, of all follow-up visits that occurred within 90 days after an injury, only 2.25% took place after 60 days.[4]

[4] DoD Military Injury Metrics Working Group White Paper, November 2002; Appendix G: Justification Data for 30 Day Threshold. Available online at: http://www.ergoworkinggroup.org/ewgweb/SubPages/ProgramTools/Metrics/Metrics.htm

Code Set Determination and Rationale

- For the purpose of this report, ICD9 codes were selected to indicate "acute traumatic, repetitive stress, or environmental injuries or their direct sequelae.[1]

- 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 in the same 60 day period. For example, if a Service member injures his right knee and meets the case definition, a subsequent injury to the left knee within 60 days of the right sided injury would not be recorded as a new occurrence.

Reports

Using the above case definition, AFHSC reports on injuries in the following reports:

- Monthly: AFHSC Installation Injury Report; reports total incident injuries by anatomic region.
- Annually: U.S. Army Annual Injury Epidemiology Report; reports total incident injuries by anatomic region. Report case definition uses diagnoses in the *primary* diagnostic position only.

Review

June 2011	Case definition reviewed and adopted by Surveillance Methods and Standards (SMS) working group.

Comments

- None