

LEUKEMIA

Includes Acute Lymphocytic Leukemia (ALL), Chronic Lymphocytic Leukemia (CLL), Acute Myeloid Leukemia (AML) and (Chronic Myeloid Leukemia (CML)

Background

This case definition was developed in 2010 by the Armed Forces Health Surveillance Center (AFHSC) in collaboration with a working group of subject matter experts from the Office of the Assistant Secretary of Defense for Health Affairs (ASDHA), the United States Army Public Health Command (USAPHC) and the United States Military Cancer Institute. The definition was developed for the purpose of epidemiological surveillance of invasive cancers and was used in a June 2012 Medical Surveillance Monthly Report (MSMR) article on incident diagnoses of cancers.¹

Clinical Description

Leukemia is a cancer of the bone marrow and blood and is classified into four main groups according to cell type and rate of growth: acute lymphocytic (ALL), chronic lymphocytic (CLL), acute myeloid (AML), and chronic myeloid (CML). Almost 90% of cases are diagnosed in adults 20 years of age and older, with the most common types being AML and CML. In children, ALL is the most common type. Symptoms include lymphadenopathy, night sweats and recurrent infections. The cause of leukemia is unknown; however, risk factors for developing the condition include exposure to ionizing radiation, benzene exposure (particularly with AML), and heredity for CLL. Treatment varies depending on the type and stage of disease. Leukemia is estimated to be the cause of about 3% of new cancer cases and 4% of all cancer deaths in the United States for 2012.²

Case Definition and Incidence Rules

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

- *One hospitalization* with any of the defining diagnoses of leukemia (see ICD9 code list below) in the *primary* diagnostic position; or
- *One hospitalization with a V-code* indicating a radiotherapy, chemotherapy, or immunotherapy treatment procedure (see ICD9 code list below) in the *primary* diagnostic position; AND any of the defining diagnoses of leukemia (see ICD9 code list below) in the *secondary* diagnostic position; or
- *Three or more outpatient medical encounters*, occurring *within a 90-day period*, with any of the defining diagnoses of leukemia (see ICD9 code list below) in the *primary or secondary* diagnostic position.

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¹ Armed Forces Health Surveillance Center. Incident Diagnoses of Cancers and Cancer-related Deaths, Active Component, U.S. Armed Forces, 2000-2011. *Medical Surveillance Monthly Report (MSMR)*. 2012 June; 19(6): 18-22.

² American Cancer Society. *Cancer Facts & Figures 2012*. Atlanta: American Cancer Society; 2012.



Case Definition and Incidence Rules *(continued)*

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first hospitalization or outpatient medical encounter that includes a defining diagnosis of leukemia.
- 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
Leukemia	<p><i>Fifth-digit subclassification for use with categories 204-208:</i></p> <p>0 without mention of having achieved remission or failed remission</p> <p>1 in remission</p> <p>2 in relapse</p> <p>204 Lymphoid leukemia</p> <ul style="list-style-type: none"> - 204.0x (acute) [0-2] - 204.1x (chronic) [0-2] - 204.2x (subacute) [0-2] - 204.8x (other lymphoid leukemia) [0-2] - 204.9x (unspecified lymphoid leukemia) [0-2] <p>205 Myeloid leukemia</p> <ul style="list-style-type: none"> - 205.0x (acute) [0-2] - 205.1x (chronic) [0-2] - 205.2x (subacute) [0-2] - 205.3x (myeloid sarcoma) [0-2] - 205.8x (other myeloid leukemia) [0-2] - 205.9x (unspecified myeloid leukemia) [0-2] 	<p>NA</p> <p><i>(continued on next page)</i></p>



	<p>206 Monocytic leukemia</p> <ul style="list-style-type: none"> - 206.0x (acute) [0-2] - 206.1x (chronic) [0-2] - 206.2x (subacute) [0-2] - 206.8x (other monocytic leukemia) [0-2] - 206.9x (unspecified monocytic leukemia) [0-2] <p>207 Other specified leukemia</p> <ul style="list-style-type: none"> - 207.0x (acute erythremia and erythroleukemia) [0-2] - 207.1x (chronic erythremia) [0-2] - 207.2x (megakaryocytic leukemia) [0-2] - 207.8x (other specified leukemia) [0-2] <p>208 Leukemia of unspecified cell type</p> <ul style="list-style-type: none"> - 208.0x (acute) [0-2] - 208.1x (chronic) [0-2] - 208.2x (subacute) [0-2] - 208.8x (other leukemia of unspecified cell type) [0-2] - 208.9x (unspecified leukemia) [0-2] 	
Related treatment procedures	<p>Radiotherapy, chemotherapy, immunotherapy treatment</p> <ul style="list-style-type: none"> - V58.0 (radiotherapy) - V58.1 (encounter for chemotherapy and immunotherapy for neoplastic conditions) - V58.11 (encounter for antineoplastic chemotherapy) - V58.12 (encounter for antineoplastic immunotherapy) 	

Development and Revisions

- This case definition was developed in 2010 by the Armed Forces Health Surveillance Center (AFHSC) in collaboration with a working group of subject matter experts. The definition was developed based on expert consensus opinion, reviews of the ICD9 codes, the scientific literature, and previous AFHSC analyses.

Case Definition and Incidence Rule Rationale

- Case finding criteria for this definition require one case-defining ICD9 code for leukemia in the *primary* diagnostic position *unless* a code for a related treatment procedure is in the primary diagnostic position; then the case-defining ICD9 code for leukemia is allowed in the *secondary* diagnostic position.



- The case finding criterion of *three or more outpatient medical encounters, within a 90-day period*, with a defining diagnosis of leukemia is used to identify cases that do not meet the other criteria in the definition. Exploratory analysis of the Defense Medical Surveillance System (DMSS) data revealed that this criterion yielded optimal specificity.³ The period of 90 days was established to allow for the likelihood that “true” cases of leukemia would have second and third encounters within that interval.
- This case definition was developed for a global report on ten different invasive cancers. As such, the same case finding criteria are used for all types of cancer in the report. This broad application of a single case definition may affect the sensitivity and specificity in varying ways for the individual cancers. Furthermore, surgical treatment procedures such as hysterectomy, mastectomy, prostatectomy, and other procedures unique to certain types of cancer are not included in the code set for individual cancers.

Reports

AFHSC reports on leukemia in the following reports:

- Periodic MSMR articles on cancers and cancer-related deaths.

Review

Apr 2013	Case definition reviewed and adopted by the AFHSC Surveillance Methods and Standards (SMS) working group.
Jun 2012	Case definition reviewed and adopted by the AFHSC MSMR staff.

Comments

None

³ Detailed information on this analysis is available through AFHSC MSMR staff; reference DMSS Requests #R080127, #R080159, #R090184, #R090302, #R090341, #R100181, and #R100303 (DoD Cancer Incidence), 2008-2009.

