

## DUCTAL CARCINOMA IN SITU

*Malignant, non-invasive breast lesions. Applicable to males and females.*

*For Lobular Carcinoma In Situ (LCIS), see “High Risk Lesions of the Breast” case definition. For invasive breast cancer, see “Breast Cancer; Female” and “Breast Cancer; Male” case definitions.*

### Background

This case definition was developed by the Armed Forces Health Surveillance Division (AFHSD) for the purpose of epidemiological surveillance of malignant, non-invasive breast lesions (i.e., ductal carcinoma in situ). The case definition uses the “standard” AFHSD oncology case definition.

### Clinical Description

Ductal carcinoma in situ (DCIS), also called intraductal carcinoma, is the most common type of *non-invasive* breast cancer, comprising approximately 20-25% of all new breast cancer cases in women and 10% of cases in men.<sup>1</sup> Of all in situ breast cancers cases, the vast majority (83%) are DCIS.<sup>2</sup> The lesion is characterized by the proliferation of abnormal epithelial cells contained within the basement membrane of the mammary ducts. Ductal carcinoma in situ is considered early stage (stage 0) breast cancer and a precursor to invasive breast cancer. If left untreated, 40% of these lesions progress to invasive disease.<sup>3</sup> Ninety percent of patients with DCIS present with microcalcifications on mammography, no symptoms, and no palpable mass. Diagnosis is confirmed via biopsy and treatment typically involves surgical excision with radiation to reduce the risk of local recurrence, which ranges from 5% to 15%.<sup>4</sup> Compared to the general population, a diagnosis of DCIS more than doubles an individual’s risk of developing invasive cancer.<sup>5</sup>

#### Case Definition and Incidence Rules (May 2024-present)

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

- *One hospitalization with a case defining diagnosis of DCIS (see ICD9 and ICD10 code lists below) in the first diagnostic position; or*
- *One hospitalization with a procedure code indicating radiotherapy, chemotherapy, or immunotherapy treatment (see ICD9 and ICD10 code lists below) in the first diagnostic position; AND a case defining diagnosis of DCIS (see ICD9 and ICD10 code lists below) in the second diagnostic position; or*

*(continued on next page)*

<sup>1</sup> American Cancer Society. Breast Cancer. <https://www.cancer.org/cancer/types/breast-cancer/about/types-of-breast-cancer/dcis.html>. Accessed February 2025.

<sup>2</sup> Ward, EM, DeSantis, CE, et al. Cancer Statistics: Breast Cancer In Situ. *CA Cancer J Clin* 2015; 65:481-495.

<sup>3</sup> Cowell CF, Weigelt B, Sakr RA, Ng CK, Hicks J, King TA, Reis-Filho JS. Progression from ductal carcinoma in situ to invasive breast cancer: revisited. *Mol Oncol*. 2013 Oct;7(5):859-69. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5528459>. Accessed February 2025.

<sup>4</sup> Solin LJ. Management of Ductal Carcinoma In Situ (DCIS) of the Breast: Present Approaches and Future Directions. *Curr Oncol Rep*. 2019 Mar 5;21(4):33. <https://pubmed.ncbi.nlm.nih.gov/30834994>. Accessed February 2025.

<sup>5</sup> Mannu GS, Wang Z, Broggio J, Charman J et al. Invasive breast cancer and breast cancer mortality after ductal carcinoma in situ in women attending for breast cancer screening in England, 1988-2014: populations based observational cohort study. *BMJ* 2020; 369. <https://www.bmj.com/content/369/bmj.m1570>. Accessed February 2025.



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

- *Three or more outpatient medical encounters, occurring within a 90-day period, with a case defining diagnosis of ductal carcinoma in situ (see ICD9 and ICD10 code lists below) in the first or second diagnostic position.*

#### 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 case defining diagnosis of DCIS.
- An individual is considered an incident case *once per lifetime*.

#### Exclusions:

- *Optional:* Individuals with bilateral mastectomy (see *Case Definition and Incidence Rule Rationale*)

### Codes

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

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Ductal carcinoma in situ (DCIS)	D05.1 (intraductal carcinoma in situ of breast...)	Translated code (ICD9 233.0, carcinoma in situ of breast) is too broad for inclusion.  See Code Set Determination and Rationale below.
	- D05.10 (unspecified breast)	
	- D05.11 (right breast)	
	- D05.12 (left breast)	

Procedures	ICD-10-CM Codes	ICD-9-CM Codes
Related treatment procedures  (Radiotherapy, chemotherapy, immunotherapy)	Z51.0 (encounter for antineoplastic radiation therapy)	V58.0 (radiotherapy)
	Z51.1 (encounter for antineoplastic chemotherapy and immunotherapy)	V58.1 (encounter for chemotherapy and immunotherapy for neoplastic conditions)
	- Z51.11 (encounter for antineoplastic chemotherapy)	- V58.11 (encounter for antineoplastic chemotherapy)
	- Z51.12 (encounter for antineoplastic immunotherapy)	- V58.12 (encounter for antineoplastic immunotherapy)



## Development and Revisions

- This case definition was developed in May 2024 by the Defense Health Agency (DHA) Health Surveillance & Epidemiology (HSE) cancer surveillance Sub Working Group (SubWG). The definition was developed based on reviews of the ICD10 codes, the scientific literature and AFHSD analyses.
- This case definition is designed to capture cases of *malignant, non-invasive*, lesions of the breast, (i.e., DCIS). While lobular carcinoma in situ contains the term “carcinoma in situ,” the lesion is *non-malignant*, non-invasive, and not considered a form of early-stage breast cancer; therefore, it is not included in this case definition. Lobular carcinoma in situ is considered a high-risk lesion of the breast meaning the condition is associated with an increased risk of developing invasive breast cancer in the future (see *High-Risk Lesions of the Breast* case definition).

The National Comprehensive Cancer Network (NCCN) guidelines list management of DCIS under “clinical guidelines for breast cancer,” whereas LCIS is listed under clinical guidelines for “breast cancer screening and diagnosis.”<sup>6</sup> Management of the two in situ carcinomas also differs. “For DCIS, surgical excision is always recommended. Given the relatively low upgrade rates for LCIS compared to DCIS (<3 vs 10-20 %), management of LCIS includes surgical excision or clinical surveillance (depending on histology subtype and imaging concordance) followed by risk reducing agents, (i.e., endocrine therapy).<sup>7,8</sup>

## Standard Oncology Definition

- In 2024, the DHA HSE cancer surveillance SubWG evaluated and expanded the list of cancers in the AFHSD cancer report to include breast (female), bladder, brain, cervical, colorectal, kidney (renal), leukemia, liver (hepatic), lung/bronchial, non-Hodgkin lymphoma, ovarian, pancreatic, prostate, stomach (gastric) and testicular cancer.
- In a 2019 *Medical Surveillance Monthly Report (MSMR)* article, analysis of the AFHSD standard oncology case revealed the definition had a high positive predictive value (PPV) for capturing cases of common cancers, (e.g., breast, prostate, testicular), and a low-to-moderate PPV for rarer cancers, (e.g., gallbladder, intestinal, laryngeal). Analyses also revealed the case definition was less sensitive for identifying cancers of the brain and nervous system, lung and bronchus, bones and joints, and liver (PPV ≤ 50 percent); these cases often represented metastases rather than true incident cases. While the broad application of a single case definition may affect the sensitivity and specificity in varying ways for the individual cancers, the PPV for all the cancers included in the report are >70 percent, and most have a PPV ≥ 90 percent.<sup>9</sup>
- The standard AFHSD oncology case definition was originally developed in 2011 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 for a report on 10 different *invasive* cancers. The case definition was developed based on reviews of the ICD9 codes, the scientific literature and previous AFHSC analyses.

## Case Definition and Incidence Rule Rationale

<sup>6</sup> National Comprehensive Cancer Network (NCCN) Version 2.2023. Clinical Practice Guidelines in Oncology. Breast Cancer screening and diagnosis. [https://www.nccn.org/guidelines/category\\_1](https://www.nccn.org/guidelines/category_1). Accessed February 2025.

<sup>7</sup> Defense Health Agency (DHA) Oncology consultants, March 2024.

<sup>8</sup> Sue GR, Lannin DR, Killelea B, Tsangaris T, Chagpar AB. Does time to definitive treatment matter in patients with ductal carcinoma in situ? *Am Surg*. 2013 Jun;79(6):561-5. PMID: 23711263.

<sup>9</sup> Webber, B, Rogers, A, Pathak, S, Robbins, A. Positive Predictive Value of an Algorithm Used for Cancer Surveillance in the U.S. Armed Forces. *MSMR* 2019; 26(12):18-23



- In May 2024, the DHA HSE cancer surveillance SubWG, in consultation with oncology experts at the DHA, adopted the standard AFHSD oncology case definition for surveillance of all in situ cancers. The determination was based on the following exploratory analyses and chart reviews of melanoma in situ and ductal carcinoma in situ:
  - The workgroup explored using a *single inpatient or outpatient medical encounter* to define a case. The proposed criteria was based on the following assumptions: (1) in situ cancers are a histologic diagnosis based on a core needle biopsy or an excisional biopsy and specific pathological criteria; (2) most clinicians would not enter a specific in situ diagnosis in the electronic health record (EHR) without pathologic confirmation of a tissue sample; and (3) when a definitive diagnosis is pending or unknown, clinicians document suspicious lesions with ICD10 codes N63.x (unspecified lump in breast) (see *Comments* below).
  - Analyses demonstrated the criteria did identify in situ cases; however, examination of a random sample of 20 cases of intraductal carcinoma situ (ICD10 D05.1) via chart review revealed 8 (40%) cases were actually invasive cancer, 10 (50%) cases had pathologic evidence of both invasive and in situ disease, equating to a total of (18 (90%) of the cases included a diagnosis of invasive cancer. Given in situ cancers are commonly miscategorized using ICD code-based administrative data and to avoid inadvertently capturing invasive cancers, the workgroup adopted the standard oncology case finding criteria of *one hospitalization or three outpatient encounters* to define a case.<sup>10</sup>
  - Analysis of melanoma in situ and ductal carcinoma in situ *using the standard AFHSD oncology definition* showed most cases met the case finding criteria in the first diagnostic position. There were no cases that met the case finding criteria requiring a procedure code in the first diagnostic position and a case defining diagnostic code in the second position. This finding is unlikely to impact case counts and likely indicates the procedures used to identify cases in the standard oncology case definition are not commonly used to treat ductal carcinoma in situ.
  - The workgroup considered adopting the case finding criteria used for non-melanoma skin cancer, (i.e., *one hospitalization in any diagnostic position or two or more outpatient encounters occurring within 90 days*), for in situ cancers. Given chart reviews of in situ cancer frequently showed invasive cancer, the workgroup determined the standard oncology definition would be best suited to identify true cases of disease.
- The case finding criteria of *three or more outpatient medical encounters, within a 90-day period*, is used to identify cases that do not meet the other criteria in the definition. Exploratory analysis of Defense Medical Surveillance System (DMSS) data revealed this criterion yielded optimal specificity.<sup>11</sup>
  - A period of 90 days allows for the likelihood that “true” cases of DCIS will have second and third encounters within that timeframe. The timeframe is based on the following standards of care: (1) following a biopsy of a clinically suspicious breast lesion, the average time to obtain a pathology report and a definitive diagnosis is 1-3 weeks; (2) individuals whose biopsy results are positive for DCIS are likely to have a follow-up visit for surgical treatment within

<sup>10</sup> Detailed information on these analyses is available through AFHSD; reference DMSS Request #R240023. Data was pulled for the active component, Oct 2015 - Dec 2022. A case was defined as a single inpatient or outpatient medical encounter, with a diagnosis of intraductal carcinoma (D05.1\*), in any diagnostic position. Results: 3,492 encounters among 399 individuals. Of these, 128 had a single encounter and most were outpatient encounters.

<sup>11</sup> Detailed information on these analyses is available through AFHSD; reference DMSS Requests #R230308, #R230378 and #R240009.



- 4 weeks of a definitive diagnosis; and (3) individuals are likely to have follow-up visits to monitor clinical indicators of disease within the 90-day timeframe.<sup>12</sup>
- Three outpatient encounters with a case defining diagnosis of DCIS within a 90-day period also eliminates individuals who are diagnosed with DCIS on core needle biopsy and later upstaged to invasive breast cancer on excisional biopsy or definitive surgery. Upstaging rates for DCIS have been widely studied and reported in the range of 8-40%.<sup>13</sup> Factors contributing to upstaging include lesion size, palpability, and DCIS grade.
  - The methodology used in this case definition does not try to distinguish laterality; therefore, the diagnoses and associated ICD10 codes for the three or more outpatient medical encounters *are not required to reference the same breast*. While ICD-10-CM does allow investigators to distinguish right and left breast lesions, analyses of the data revealed the requirement was complicated by the frequent use the nonspecific code ICD10 D05.10 (intraductal carcinoma, unspecified breast) making it difficult to assign a tumor to a particular breast. For long term surveillance, attempting to distinguish laterality also makes it more difficult to link data with ICD-9-CM data as ICD9 codes do not distinguish laterality.
  - For outpatient encounters, the incident date is considered the first of the three encounters occurring within the 90-day period, (e.g., if an individual has four DCIS codes on 1-Jan-12, 1-Dec-15, 8-Dec-15, and 15-Dec-15, the incident date would be 1-Dec-15; 1-Jan-12 would be considered a screening encounter and dropped).
  - To maintain consistency with the standard AFHSD methodology for surveillance of invasive cancers, AFHSD uses a *once per lifetime* incidence rule. The workgroup recognizes individuals, may be considered disease free after treatment or after an extended period of time, (e.g., 5 years), with no clinical evidence of disease. Individuals who develop a second primary tumor after being disease free could, theoretically, be counted as a new incident case. However, for surveillance of cancer using administrative, (i.e., billing), data, it is difficult to identify individuals who are disease free after treatment.
  - Individuals who have, or develop over time, a second DCIS lesion in the same, or contralateral breast are only counted once using this definition. While both lesions are considered primary tumors, for surveillance of in situ cancer, AFHSD counts cases (unique individuals), not individual tumors. Investigators interested in capturing the incidence of distinct primary tumors may want to modify the case finding criteria and consider utilizing different data sources such as pathology data or cancer registry data.
  - The case definition does not exclude individuals with bilateral mastectomy; however, there may some benefit to incorporating this exclusion into the methodology. These individuals would contribute to the denominator of the rate, particularly among older age groups. Quantifying the number and percentage of women by age group that have a history of bilateral mastectomy and comparing that group with the population of women with no history could help clarify the accuracy of the rate.
  - Individuals with a prior, case-defining, incident diagnosis of invasive breast cancer are *not* excluded from this definition. The AFHSD counts the “first-ever” occurrence of each cancer type separately. This methodology ensures rates and trends over time accurately reflect the condition of interest by eliminating the potentially confounding effect of disease trends of excluded conditions, (i.e., ensures DCIS rates are not dependent upon invasive breast cancer rates and vice versa).

<sup>12</sup> Breast cancer. National Comprehensive Cancer Network (NCCN) Guidelines Version 2.2023. <https://www.nccn.org/guidelines/recently-published-guidelines>; Accessed February 2025.

<sup>13</sup> Zheng, L, Gökmen-Polar, Y & Badve, S.S. Is conservative management of ductal carcinoma in situ risky? *npj Breast Cancer* 8, 55 (2022). <https://doi.org/10.1038/s41523-022-00420-2>.



### Code Set Determination and Rationale

- The following nonspecific ICD10 codes related to carcinoma in situ of the breast are not included in this case definition. Given more specific codes to define breast lesions exist, (e.g., DCIS, LCIS), the codes are not favored for diagnostic purposes and are infrequently used. Exploratory analysis of administrative data revealed the codes were the incident diagnosis in about 5% of cases: 3.7% for unspecified carcinoma in situ and 1.5% for other specified type of carcinoma in situ). Most of the cases had a more specific diagnosis occurring within a short timeframe. Other cases also had an invasive breast cancer diagnosis occurring prior/post to the in situ carcinoma diagnosis.

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Other specified carcinoma in situ of breast	D05.8 (other specified type of carcinoma in situ of breast...)	233.0 (carcinoma in situ of breast)  ICD9 coding system does not distinguish pathologic subtype of in situ breast carcinoma, (e.g., DCIS, LCIS, other carcinoma in situ and unspecified carcinoma in situ all translate to 233.0).
	- D05.80 ( <i>unspecified</i> breast)	
	- D05.81 ( <i>right</i> breast)	
	- D05.82 ( <i>left</i> breast)	
Unspecified carcinoma in situ of breast	D05.9 (unspecified type of carcinoma in situ of breast...)	
	- D05.90 ( <i>unspecified</i> breast)	
	- D05.91 ( <i>right</i> breast)	
	- D05.92 ( <i>left</i> breast)	

- Procedure codes (ICD10 and CPT) indicating surgical treatment of individual cancers such as hysterectomy, mastectomy, prostatectomy, and other procedures unique to certain types of cancers are not included in the code set. While procedure codes may increase the specificity of case finding criteria in select circumstances, analyses can be labor intensive and the effort does not necessarily guarantee a better case definition, (i.e., the definition may still identify false positive cases).
- Screening for disease* codes ICD10 Z12.xx / ICD9 V76.xx (encounter for screening for malignant neoplasms) are not included in the code set. Screening codes are used for “testing for disease or disease precursors in seemingly well individuals so that early detection and treatment can be provided for those who test positive for the disease, (e.g., screening mammogram).”<sup>14</sup> They would not be used for follow-up medical encounters of a specific disease.
- Personal history of malignant neoplasms* (ICD10 Z85.xx) codes are not included in the code set. While these codes may be beneficial for identifying individuals with a history of cancer, analysis of administrative data reveal these codes lack the specificity to count incident cancer cases and are inconsistently used by providers.<sup>15</sup> Given these findings, the AFHSD does not use personal

<sup>14</sup> ICD-10-CM Official Guidelines for Coding and Reporting. FY 2022–Updated April 1, 2022. (October 1, 2021–September 30, 2022. <https://stacks.cdc.gov/view/cdc/126426>. Accessed February 2025.

<sup>15</sup> Analysis performed by the Defense Centers of Public Health–Dayton. Encounters with at least one Z85.x code in any diagnostic position (dx1- dx20) were pulled from Comprehensive Ambulatory Professional Encounter Records (CAPER) and Standard Inpatient Data Records (SIDR) for all Tri-Service beneficiaries between October 2016 and March 2024. A total of 546,962 encounters were identified. Of these, 68,395 (13%) had at least one neoplasm diagnosis (ICD10 C00-D49). With administrative data, there is no way to determine if the neoplasm codes refer to a resolved malignancy or a new cancer diagnosis. Records with conjunction codes for follow-up (Z08), aftercare



history codes to exclude prevalent cases, (i.e., individuals with a history of cancer), nor to identify individuals who are disease free after treatment.

Personal history codes are intended to be used by providers for individuals who have a history of cancer *and* documented evidence in the medical record that the malignancy has been “excised or eradicated and all treatment is complete.” They are not used for a “self-reported” history of malignancy, and they should be used in conjunction with ICD10 codes for follow-up visits (Z08- encounter for follow-up examination after completed treatment for a malignant neoplasm), aftercare visits (Z51.0 - encounter for antineoplastic radiation therapy; Z51.1- encounter for antineoplastic chemotherapy and immunotherapy), and screening visits (Z12 - encounter for screening for malignant neoplasms).<sup>16</sup>

## Reports

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The AFHSD reports on DCIS in the following reports:

- Periodic *MSMR* articles.

## Review

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Feb 2025	Case definition reviewed and adopted by the AFHSD Surveillance Methods and Standards (SMS) working group.
May 2024	Case definition developed by the DHA HSE cancer surveillance SubWG at the AFHSD.

## Comments

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None

(Z51.[0.1] and screening (Z12) were queried: 420,236 (77%) had no conjunction codes in any diagnostic position suggesting providers use personal history codes independent of the purpose of the visit and potentially inconsistently.

<sup>16</sup> Bredehoeft, Emily. Clear Up Confusion as to When Cancer Becomes “History Of.” American Academy of Professional Coders (AAPC). <https://www.aapc.com/blog/40016-clear-up-confusion-as-to-when-cancer-becomes-history-of/>. Accessed February 2025.

