



**ORAU TEAM
Dose Reconstruction
Project for NIOSH**

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**Rationale for Matching ICD-9 Codes to
ICD-10 Codes for Predetermined Organ and
IREP Model Selections**

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ACRONYMS AND ABBREVIATIONS

ALK	anaplastic lymphoma kinase
CFR	Code of Federal Regulations
DOL	U.S. Department of Labor
EEOICPA	Energy Employees Occupational Illness Compensation Program Act of 2000
ICD-10-CM	International Classification of Diseases, Tenth Revision, Clinical Modification
ICD-9	International Classification of Diseases, Ninth Revision
IREP	Interactive RadioEpidemiological Program
NCHS	National Center for Health Statistics
NIOSH	National Institute for Occupational Safety and Health
NK/T	natural killer T-cell
NOS	not otherwise specified
ORAU	Oak Ridge Associated Universities
SRDB Ref ID	Site Research Database Reference Identification (number)
WHO	World Health Organization

1.0 INTRODUCTION

The National Center for Health Statistics (NCHS) is responsible for developing the *International Statistical Classification of Diseases and Related Health Problems in the United States*. NCHS has adapted the World Health Organization (WHO) classification to develop the *International Classification of Diseases, Tenth Revision, Clinical Modification* (ICD-10-CM) for use by the U.S. government and its agencies. ICD-10-CM and its codes officially replaced the *International Classification of Diseases, Ninth Revision* (ICD-9, Volumes 1 and 2) on October 1, 2015. NCHS issues updates to ICD-10-CM and its codes each year (NCHS 2018a).

The U.S. Department of Labor (DOL) began sending both ICD-9 and ICD-10 codes for use in Energy Employees Occupational Illness Compensation Program Act of 2000 (EEOICPA) claims in approximately 2014. However, DOL has informed the National Institute for Occupational Safety and Health (NIOSH) that beginning in 2019 they will send only ICD-10 codes for EEOICPA claims. To ensure consistency in organ and Interactive RadioEpidemiological Program (IREP) model selection, it is necessary to conduct a conversion from ICD-9 codes to ICD-10 codes for use in Oak Ridge Associated Universities (ORAU) Team technical information bulletins ORAUT-OTIB-0005, *Internal Dosimetry Organ, External Dosimetry Organ, and IREP Model Selection by ICD-9 Code* (ORAUT 2012) and ORAUT-OTIB-0006, *Dose Reconstruction from Occupational Medical X-Ray Procedures* (ORAUT 2018).

This document provides the rationale for matching ICD-9 codes to ICD-10 codes for predetermined external organ, internal organ, and IREP model selections in preparation for converting other documents to ICD-10 codes for use when DOL begins including only ICD-10 codes in NIOSH Referral Summary Documents. However, since the predetermined external organ is not always appropriate for the X-ray organ selection, additional consideration will need to be made for each ICD-10 code to ensure the appropriate X-ray organ is selected in ORAUT-OTIB-0006.

2.0 DETERMINING ICD-10 CODES

2.1 RESOURCES

To determine the appropriate ICD-10 codes for comparison with the ICD-9 codes presently in ORAUT-OTIB-0005, resources from NCHS were used based on the 2018 version of ICD-10-CM. The 2018 version was selected based on the availability of General Equivalence Maps for conversions from ICD-9 to ICD-10 and conversions from ICD-10 to ICD-9, as well as ICD-10 code descriptions (NCHS 2018b to 2018e).

The ICD-9 coding system currently used in ORAUT-OTIB-0005 has a general range of codes from 140 to 239 to describe cancers. There are some exceptions inside this range, which do not describe cancers and some exceptions outside this range, which do describe cancers. Similarly, the ICD-10 coding system has a general range of codes from C00 to D49 to describe cancers (with similar exceptions inside and outside that range). Because the exceptions are codes that need special consideration to ensure they are not missed, the NCHS conversion from ICD-9 to ICD-10 codes was examined and reduced to those entries that have ICD-9 codes in ORAUT-OTIB-0005. This showed that the majority of the corresponding ICD-10 codes were in the C00 to D49 range as expected, with the exception of codes D68, D74, D75, D89, E31, J91, Q85, and R18. Using the listing of ICD-10 code descriptions from NCHS (2018f), a listing of ICD-9 codes in ORAUT-OTIB-0005 and corresponding ICD-10 codes with descriptions were assembled in ORAUT (2019) for use in this process.

2.2 ICD-10 CODES NOT COVERED BY EEOICPA

The list of all ICD-10 codes with descriptions in ORAUT (2019) was reviewed to determine which codes should be considered under EEOICPA (i.e., codes describing cancer). After ensuring that all ICD-9 codes presently in ORAUT-OTIB-0005 were retained with a corresponding ICD-10 code, the ICD-10 codes outside the expected general range were reviewed. As mentioned earlier, with some small exceptions (i.e., ICD-10 codes D68, D74, D75, D89, E31, J91, Q85, and R18), the overall ICD-10 codes for cancers fell within the C00 to D49 range. To determine if any of these exceptions described a cancer diagnosis, the ICD-10 subcodes for each were examined. With the exclusion of those exceptions that had a direct conversion to an ICD-9 code in ORAUT-OTIB-0005, the rest were determined not to reflect codes for cancer and were removed.

To ensure no ICD-10 cancer codes outside the general range of C00 to D49 were missed, the remaining ICD-10 codes (i.e., A-B and D50-Z) were reviewed. ICD-10 code D77 was determined to correspond to ICD-9 code 289.89 in ORAUT-OTIB-0005 and was kept on the list for consideration. The remaining ICD-10 codes were determined not to reflect codes for cancer and were removed from the list.

The range of codes from C00 to D49 also includes benign cancers, which are not covered under EEOICPA, so these codes were examined to determine which described benign cancers. The following ICD-10 codes were determined to describe benign cancers and were removed from the list: D10.0 to D17.9, D19.0 to D21.9, D23.0 to D24.9, D26.0 to D36.9, and D3A.0 to D3A.8.

In addition, codes within the C00 to D49 range that did not have a corresponding ICD-9 code in ORAUT-OTIB-0005 were examined to determine if they described cancer. Table 2-1 lists ICD-10 codes that were removed because they do not describe cancer.

Table 2-1. ICD-10 codes in the C00 to D49 range not covered by EEOICPA.

ICD-10 code(s)	Disease description	Reason disease is not covered
C80.2	Malignant neoplasm associated with transplanted organ	Condition based on transplanted organ
C96.5 and C96.6	Langerhans-cell histiocytosis	Does not appear to be cancer and no corresponding cases have been received by DOL
D18.0–D18.09	Hemangioma	Non-cancerous blood vessel growth
D18.1	Lymphangioma	Non-malignant
D22.0–D22.9	Melanocytic nevi	Benign growths
D25.0–D25.9	Leiomyoma	Benign growths
D47.2	Monoclonal gammopathy	Benign condition of abnormal plasma cells
D47.Z1	Post-transplant lymphoproliferative disorder	Condition based on transplanted organ

2.3 CORRESPONDING ICD-9 AND ICD-10 CODES

While developing the list of ICD-10 codes covered under EEOICPA, it was determined that many of the ICD-10 codes directly corresponded to ICD-9 codes presently listed in ORAUT-OTIB-0005. However, some ICD-10 codes did not have a clear one-to-one correspondence to an ICD-9 code listed in ORAUT-OTIB-0005. These codes were separated into two groups for further review:

1. Those where an ICD-10 code corresponded to more than one ICD-9 code (duplicate), and
2. Those where the ICD-10 code corresponded to only one ICD-9 code.

A total of 69 ICD-10 codes corresponded to more than one ICD-9 code, resulting in 191 entries needing additional review. These codes were reviewed to determine if there was consistency

between the duplicate codes (i.e., appropriate ICD-9 description, internal organ, external organ, and IREP model) or not.

Out of the remaining 1,321 ICD-10 codes that corresponded to only one ICD-9 code, 948 of these codes did not have a clear one-to-one correspondence to an ICD-9 code listed in ORAUT-OTIB-0005. In addition, there were two ICD-10 codes that had a clear one-to-one correspondence with an ICD-9 code, but in ORAUT-OTIB-0005 those ICD-9 codes were broken down into multiple options for different cancer organs described by the same code. Therefore, all of these codes were reviewed to determine if the ICD-9 code information appeared appropriate, even if only an approximation, or if further review would be necessary to make an accurate determination of the internal organ, external organ, and IREP model that should be used. The remaining 373 ICD-10 codes that were not marked for review were assumed to be acceptable as a one-to-one correspondence to their ICD-9 codes.

As a result of this review process it was determined that 197 ICD-10 codes (i.e., 31 ICD-10 codes with duplicates and 166 ICD-10 codes without duplicates) required additional review to determine the appropriate internal organ, external organ, and IREP model for use in EEOICPA.

Of the 197 total ICD-10 codes requiring additional review, 122 of them were for a type of lymphoma. Because lymphomas were so predominant in the list of ICD-10 codes requiring additional review, the entire list of lymphomas was reviewed, including those already deemed acceptable. The lymphoma ICD-10 codes encompass a range of 363 codes between C81 and C89. This resulted in a total of 438 ICD-10 codes requiring additional review to determine the appropriate corresponding ICD-9 code for organ and IREP model selection.

3.0 PRIMARY ICD-10 CODES REQUIRING ADDITIONAL REVIEW

The goal of this evaluation was to determine the best matching ICD-9 code for each ICD-10 code so that the predetermined organs and cancer models from ORAUT-OTIB-0005 can be transferred to the new ICD-10 codes. This evaluation assumes ORAUT-OTIB-0005 is correct and complete. It does not reevaluate the organs and models for those codes. In some cases, the corresponding ICD-9 code was chosen based only on the appropriateness of the internal organ, external organ, and IREP model, not the appropriate medical diagnosis.

Due to the number of questionable lymphoma ICD-10 codes between C81 and C89, a review of all of the lymphoma codes was conducted and is discussed separately in Section 3.2.

The following discussion provides the rationale for the selection of the most appropriate ICD-9 code for each ICD-10 code that required additional review. The rationale for each ICD-10 code is presented in the following format:

1. ICD-10 code(s) – Description
 - a. Corresponding ICD-9 code from initial review – Description
 - i. If ICD-10 code corresponds to multiple ICD-9 codes; ICD-9 Code – Description
 - b. Rationale
 - c. ICD-9 code to be used for organ and IREP model selection for ICD-10 code – Description; or other decision

3.1 PRIMARY NONLYMPHOMA ICD-10 CODES

1. C72.20 to C72.59 – Malignant neoplasm of olfactory, optic, acoustic, and unspecified cranial nerves
 - a. 192.0 – Malignant neoplasm of cranial nerves
 - b. ICD-10 code C72 has subcodes for various nerves in the head, whereas ICD-9 has two codes for the nervous system, 191 – brain and 192 – all other parts of nervous system. In ORAUT-OTIB-0005, the internal organ, external organ, and IREP model are identical for all 191 and 192 ICD-9 subcodes.
 - c. 192.0 – Malignant neoplasm of cranial nerves
2. C90.20 to C90.22 – Extramedullary plasmacytoma
 - a. 203.80 to 203.82 – Other immunoproliferative neoplasms
 - b. ICD-10 code C90 refers to multiple myelomas and malignant plasma cell neoplasms, and is broken down into the following subcodes: C90.0 – multiple myeloma, C90.1 – plasma cell leukemia, C90.2 – extramedullary plasmacytoma, and C90.3 – solitary plasmacytoma. This implies that C90.2 and C90.3 are either a form of multiple myeloma or plasma cell leukemia. The corresponding ICD-9 codes for the C90 ICD-10 codes are 203.0 – multiple myeloma, 203.1 – plasma cell leukemia, and 203.8 – other immunoproliferative neoplasms. All three ICD-9 codes use the same internal organ, external organ, and IREP model in ORAUT-OTIB-0005.
 - c. 203.80 to 203.82 – Other immunoproliferative neoplasms
3. C90.30 to C90.32 – Solitary plasmacytoma
 - a. 203.80 to 203.82 – Other immunoproliferative neoplasms
 - b. See discussion for C90.20 to C90.22.
 - c. 203.80 to 203.82 – Other immunoproliferative neoplasms
4. C91.A0 to C91.A2 – Mature B-cell leukemia Burkitt-type
 - a. 204.80 to 204.82 – Other lymphoid leukemia
 - b. ICD-9 code 204.8 is essentially a generic classification for all other lymphoid leukemias not elsewhere classified. ICD-10 coding specified Burkitt-type leukemia instead of grouping it with “all other” types. In addition, Burkitt-type leukemia is a different cancer diagnosis than Burkitt lymphoma (ICD-10 code C83.7, ICD-9 code 200.2).
 - c. 204.80 to 204.82 – Other lymphoid leukemia
5. C92.20 to C92.22 – Atypical chronic myeloid leukemia
 - a. 205.20 to 205.22 – Subacute myeloid leukemia
 - b. An associate professor of medicine, board certified in hematology, stated that he “was not sure what subacute leukemia is” (NIOSH ca. 2005). It appears that WHO simply changed the name of this diagnosis to something more acceptable, indicating it is not quite acute (subacute) and not quite chronic (atypical chronic). The cancer model for this “subacute”

cancer was specified in the technical documentation for IREP, and this name change from “subacute” to “atypical chronic” does not appear to be a good reason to change the organs or IREP model for this cancer.

- c. 205.20 to 205.22 – Subacute myeloid leukemia
6. C93.30 to C93.32 – Juvenile myelomonocytic leukemia
 - a. 206.80 to 206.82 – Other monocytic leukemia
 - b. Although this code appears to be intended for children, there is a history of some energy employees under the age of 18 in EEOICPA. Therefore, this code should remain in the list of cancers in ORAUT-OTIB-0005.
 - c. Retain C93.30 to C93.32 corresponding to 206.8 – Other monocytic leukemia
7. C94.30 to C94.32 – Mast cell leukemia
 - a. 207.80 to 207.82 – Other specified leukemia
 - b. Mast cell leukemia is a different cancer diagnosis than mast cell lymphoma (ICD-10 code to C96.2). In addition, all ICD-9 codes for other leukemia diagnosis in ORAUT-OTIB-0005 use the same internal organ, external organ, and IREP model.
 - c. 207.80 to 207.82 – Other specified leukemia
8. C94.40 to C94.42 – Acute panmyelosis with myelofibrosis
 - a. 238.79 – Neoplasm of uncertain behavior of other lymphatic/hematopoietic tissue
 - b. ICD-9 did not have a code specific to acute panmyelosis with myelofibrosis; however, the 238.7 group of ICD-9 codes includes myelodysplastic syndrome and myelofibrosis with myeloid metaplasia. From the name, C94.4 appears to fall into the 238.7 group of ICD-9 codes and all 238.7 codes use the same external organ, internal organ, and IREP model.
 - c. 238.79 – Neoplasm of uncertain behavior of other lymphatic/hematopoietic tissue
9. C94.6 – Myelodysplastic disease, not classified
 - a. 238.79 – Neoplasm of uncertain behavior of other lymphatic/hematopoietic tissue
 - b. According to the National Cancer Institute (2019) this unclassified version shows features of both myeloproliferative disease and myelodysplastic disease, therefore it is not classified as either. All forms of classified myelodysplastic disease are under ICD-10 code D46. The corresponding ICD-9 codes for D46 are within the 238.7 group and use the same internal organ, external organ, and IREP model as 238.79.
 - c. 238.79 – Neoplasm of uncertain behavior of other lymphatic/hematopoietic tissue
10. C95.90 to C95.92 – Leukemia, unspecified
 - a. Corresponded to multiple ICD-9 codes
 - i. 208.2 – Subacute leukemia

- ii. 208.8 – Other leukemia unspecified
 - iii. 208.9 – Other leukemia not otherwise specified
- b. The corresponding ICD-9 codes use the same internal organ and external organ, but different IREP models. ICD-9 codes 208.2 and 208.8 indicate known types of leukemia that do not have their own specific code, whereas 208.9 is for a leukemia of unknown type. In addition, 208.9 uses all possible IREP models for leukemia and is the most claimant favorable of the three ICD-9 codes.
- c. 208.9 – Other leukemia not otherwise specified
11. C96.20 to C96.29 – Malignant mast cell neoplasms
- a. 202.60 to 202.68 – Malignant mast cell neoplasms of specific locations
 - b. ICD-9 specified various locations for the site of this cancer while ICD-10 does not. The locations described in ICD-9 dictated the appropriate organ to use in ORAUT-OTIB-0005, but all 202.6 ICD-9 subcodes use the same IREP model.
 - c. Require a medical review for internal and external organs using 202.6 lymphoma location scheme and IREP model. If medical review is inconclusive, use organ selection for 202.60, because this is the most claimant-favorable organ and IREP model selection.
12. C96.4 – Sarcoma of dendritic cells (accessory cells)
- a. 202.90 – Other malignant neoplasm of lymphoid and histiocytic tissue of unspecified organ
 - b. In the hierarchy of ICD-10 codes, C81 to C88 specify lymphomas, while C90 to C95 specify leukemias and multiple myeloma (there is no C89 code). C96 specifies “Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissues,” which essentially includes anything not captured in the other codes between C81 and C95. In the hierarchy of ICD-9, 202 specifies “Other malignant neoplasms of lymphatic or hematopoietic tissue,” which appears to be a good match of C96. 202.1 through 202.7 specify specific cell types while 202.8 is for “lymphomas not elsewhere classified” and 202.9 is for “lymphoid and histiocytic tissue.” In ORAUT-OTIB-0005, 202.8 and 202.9 designate the same internal and external organs and cancer model.
 - c. 202.9 – Malignant neoplasm of lymphoid and histiocytic tissue
13. C96.Z – Other specified malignant neoplasm of lymphoid, hematopoietic and related tissues
- a. 202.90 – Other malignant neoplasm of lymphoid and histiocytic tissue of unspecified organ
 - b. See discussion for C96.4.
 - c. 202.9 – Malignant neoplasm of lymphoid and histiocytic tissue
14. D01.1 – Carcinoma in situ of rectosigmoid junction
- a. 230.4 – Carcinoma in situ of rectum
 - b. ICD-9 code 230.4 is for the rectum but not necessarily the rectosigmoid junction. However, ICD-9 codes 230.5 and 230.6 are for “anal canal” and “anus NOS [not otherwise specified],” respectively. All three codes have the same internal organ, external organ, and IREP model. Additionally, ICD-9 code 154.0 is for malignant neoplasms of the

rectosigmoid junction and also uses the same internal organ, external organ, and IREP model.

- c. 230.4 – Carcinoma in situ of rectum

15. D09.3 – Carcinoma in situ of thyroid and other endocrine glands

- a. 234.8 – Carcinoma in situ not elsewhere classified
- b. There is no ICD-9 code for carcinoma in situ of the thyroid or any other endocrine gland. For the purposes of organ and IREP model selection in EEOICPA, there should be no difference between a malignant neoplasm and a carcinoma in situ. Therefore, the organ and IREP model selection for D09.3 should correspond to ICD-9 codes 193 and 194, malignant neoplasm of thyroid and other endocrine glands.
- c. 193 and 194.0 to 194.9 – Malignant neoplasm of thyroid and other endocrine glands, requiring a medical review to determine which location is most appropriate.

16. D37.01 – Neoplasm of uncertain behavior lip

- a. 235.1 – Neoplasm of uncertain behavior oral pharynx
- b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
- c. 140.9 – Malignant neoplasm lip NOS

17. D37.1 – Neoplasm of uncertain behavior stomach

- a. 235.2 – Neoplasm of uncertain behavior stomach, intestine, and rectum
- b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
- c. 151.9 – Malignant neoplasm stomach NOS

18. D37.2 – Neoplasm of uncertain behavior small intestine

- a. 235.2 – Neoplasm of uncertain behavior stomach, intestine, and rectum
- b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
- c. 152.9 – Malignant neoplasm small bowel NOS

19. D37.3 – Neoplasm of uncertain behavior appendix

- a. 235.2 – Neoplasm of uncertain behavior stomach, intestine, and rectum

- b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 153.5 – Malignant neoplasm appendix
20. D37.4 – Neoplasm of uncertain behavior colon
- a. 235.2 – Neoplasm of uncertain behavior stomach, intestine, rectum
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 153.9 – Malignant neoplasm colon NOS
21. D37.5 – Neoplasm of uncertain behavior rectum
- a. 235.2 – Neoplasm of uncertain behavior stomach, intestine, rectum
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 154.1 – Malignant neoplasm rectum
22. D38.3 – Neoplasm of uncertain behavior mediastinum
- a. 235.8 – Neoplasm of uncertain behavior pleura
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 164.9 – Malignant neoplasm mediastinum NOS
23. D38.4 – Neoplasm of uncertain behavior thymus
- a. 235.8 – Neoplasm of uncertain behavior pleura
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 164.0 – Malignant neoplasm thymus
24. D41.3 – Neoplasm of uncertain behavior urethra
- a. 236.99 – Neoplasm of uncertain behavior other and unspecified urinary organs
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.

- c. 189.3 – Malignant neoplasm urethra
25. D43.3 – Neoplasm of uncertain behavior cranial nerves
- a. 237.9 – Neoplasm of uncertain behavior other and unspecified nervous system
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 192.9 – Malignant neoplasm nervous system NOS
26. D44.0 – Neoplasm of uncertain behavior thyroid gland
- a. 237.4 – Neoplasm of uncertain behavior other and unspecified endocrine glands
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 193 – Malignant neoplasm thyroid
27. D44.2 – Neoplasm of uncertain behavior parathyroid gland
- a. 237.4 – Neoplasm of uncertain behavior other and unspecified endocrine glands
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 194.1 – Malignant neoplasm parathyroid
28. D44.6 – Neoplasm of uncertain behavior carotid body
- a. 237.3 – Neoplasm of uncertain behavior paraganglia
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 171.9 – Malignant neoplasm soft tissue NOS
29. D44.7 – Neoplasm of uncertain behavior aortic body and other paraganglia
- a. 237.3 – Neoplasm of uncertain behavior paraganglia
 - b. For the purposes of organ and IREP model selection in EEOICPA, cell behavior is not relevant. Only the location of the cancer is important for determining the organ and IREP model selection. Therefore, the location-specific malignant neoplasm is used.
 - c. 171.9 – Malignant neoplasm soft tissue NOS

30. D45 – Polycythemia vera

- a. Corresponds to multiple ICD-9 codes
 - i. 207.1 – Chronic erythremia
 - ii. 238.4 – Polycythemia
- b. Erythremia is a chronic form of polycythemia. For use in EEOICPA, the only difference is the IREP model used for the two ICD-9 codes (i.e., 207.1 – leukemia, excluding chronic lymphocytic leukemia, and 238.4 – bone). *NIOSH-Interactive RadioEpidemiological Program (NIOSH-IREP) Technical Documentation, Final Report* (NIOSH 2002, Table 4) provides the IREP model for 207.1 but does not list one for 238.4. The IREP model used for 238.4 was provided by a DOL-obtained medical opinion indicating it is a type of bone cancer (DOL 2002) Therefore, ORAUT-OTIB-0005 uses the IREP model for bone for 238.4.
- c. 238.4 – Polycythemia

31. D47.01 – Cutaneous mastocytosis

- a. 238.5 – Mastocytosis NOS
- b. Mast cell neoplasms are assumed to be associated with location (see C96.2) and cutaneous mastocytosis appears to be associated with the skin. The cancer model is specified as the lymphoma model for 238.5 in NIOSH (2002) Table 4, which is the same model used for C96.2. Because there is no skin region in ICD-9 code 202.6, the ICD-9 code used for C96.2, ICD-9 code 202.1 – mycosis fungoides will be used. This might not be a good fit from a medical perspective, but the correct organs and cancer models can be selected from this code.
- c. 202.1 – Mycosis fungoides

32. D47.02 – Systemic mastocytosis

- a. 238.5 – Mastocytosis NOS
- b. This type of mastocytosis involves the entire body and not one specific location. This corresponds to a mastocytosis not elsewhere specified.
- c. 238.5 – Mastocytosis NOS

33. D47.4 – Osteomyelofibrosis

- a. 289.89 – Unspecified diseases of blood and blood-forming organs
- b. The ICD-9 code for myelofibrosis, 289.83, uses the same internal organ, external organ, and IREP model as 289.89.
- c. 289.89 – Unspecified diseases of blood and blood-forming organs

34. D47.Z2 – Castleman disease

- a. 238.79 – Neoplasm of uncertain behavior of other lymphatic/hematopoietic tissue

- b. This cancer did not have its own designation under ICD-9. Therefore, it would have fallen into an “other” category and 238.79 appears to be the correct ICD-9 “other” category.
 - c. 238.79 – Neoplasm of uncertain behavior of other lymphatic/hematopoietic tissue
35. D48.2 – Neoplasm of uncertain behavior of peripheral nerves and autonomic nervous system
- a. 238.1 – Neoplasm of uncertain behavior of soft tissue
 - b. ICD-9 code 238.1 requires a medical review for the internal organ, uses the remainder for the external organ and the connective tissue IREP model, which comes from NIOSH (2002), Table 4. Because ICD-10 specifically separated these nerve cells out of the soft tissue group, a more appropriate ICD-9 code can be found. The ICD-9 code 237.7 – neurofibromatosis is grouped under the neoplasm of uncertain behavior code 237, but uses the nervous system IREP model instead of the connective tissue model.
 - c. 237.7 – Neurofibromatosis
36. D49.2 – Neoplasm of unspecified behavior of bone, soft tissue, and skin
- a. 239.2 – Unspecified neoplasm of bone, soft tissue, and skin NOS
 - b. These ICD-10 and ICD-9 codes are an identical cell type match, so the same method will be used to provide the different organ selections in ORAUT-OTIB-0005, one option for bone and one for skin. Soft tissue neoplasms of unspecified behavior are covered by all other D49 cancers.
 - c. 239.2 – Unspecified neoplasm of bone, soft tissue, and skin NOS
37. D49.511 to D49.519 – Neoplasm of uncertain behavior of kidney
- a. 239.5 – Unspecified neoplasm of genitourinary organs (male and female)
 - b. Because the ICD-10 cancer description specifies the kidney, ICD-9 code 236.91 – neoplasm of uncertain behavior of kidney, is more appropriate. The internal organ, external organ, and IREP model used for ICD-9 code 236.91 are identical to the codes used for 189.0 – malignant neoplasm of kidney.
 - c. 236.91 – Neoplasm of uncertain behavior of kidney
38. D49.59 – Neoplasm of unspecified behavior of other genitourinary organ
- a. 239.5 – Unspecified neoplasm of genitourinary organs (male and female)
 - b. In accordance with Table 4 in NIOSH (2002), ORAUT-OTIB-0005 separates ICD-9 code 239.5 into male and female for organ selection. Therefore, the same should be done for D49.59.
 - c. 239.5 – Unspecified neoplasm of genitourinary organs (male and female)
39. D49.7 – Neoplasm of unspecified behavior of endocrine glands and other parts of nervous system
- a. 239.7 – Unspecified neoplasm of brain, nervous system, and endocrine glands NOS

- b. For ICD-9 code 239.7, multiple organ selections are provided in ORAUT-OTIB-0005 due to the number of specific organs listed in the cancer description. However, ICD-10 code D49.7 does not include the brain in its description. Instead, ICD-10 uses code D49.6 – neoplasm of unspecified behavior of brain. Therefore, the brain will not be included for ICD-10 code D49.7.
- c. 239.7 – Unspecified neoplasm of brain, nervous system, and endocrine glands NOS, excluding an option for the brain.

40. D74.0 – Congenital methemoglobinemia

- a. 289.7 – Essential thrombocytosis
- b. ICD-10 code D74 contains three subcodes for methemoglobinemia: D74.0 – congenital methemoglobinemia, D74.8 – other methemoglobinemias, and D74.9 – methemoglobinemia, unspecified. Although it is not clear if this disease should be classified as a cancer, it corresponds to a disease that EEOICPA recognizes as a cancer, so it will be retained. However, by separating the congenital form from the other forms of the disease, it is clear that D74.0 is not associated with radiation injury, is thus not applicable to EEOICPA, and should be removed.
- c. Remove D74.0

41. D77 – Other disorders of blood and blood-forming organs in diseases classified elsewhere

- a. 289.89 – Unspecified diseases of blood and blood-forming organs
- b. This ICD-10 code includes a note indicating that the underlying disease should be coded first and then code D77 is used as a manifestation code. This means that D77 describes the manifestation of an underlying disease, not the disease itself. Therefore, it should be removed because it is not applicable to EEOICPA.
- c. Remove D77

3.2 PRIMARY LYMPHOMA ICD-10 CODES

In 2006, after consulting with an associate professor of medicine, board certified in hematology and a member of the International Commission on Radiological Protection Committee 2 responsible for internal dosimetry models, NIOSH developed technical information bulletin OCAS-TIB-0012, *Selection for Internal and External Dosimetry Target Organs for Lymphatic/Hematopoietic Cancers* (NIOSH 2006), to specify the appropriate organs to use for lymphatic and hematopoietic cancers. For lymphatic cancers (ICD-9 codes 200 to 202), NIOSH (2006) used three schemes to designate the applicable internal and external organs:

- Systemic. The scheme uses the same internal and external organs for every region of the body. An example of these is code 200.0 (nodular lymphoma).
- Location specific. The applicable internal and external organ for these is based on the region of the body in which the cancer is located. The regions and the organs are the same for each instance of this type with the fifth digit of the ICD-9 code indicating the applicable region. An example of these is any of the 201 codes (Hodgkin lymphoma).

- Unique. An example of this is code 202.1 (mycosis fungoides). The unique nature of this cancer is that it is a lymphoma that arises in the skin. Therefore, the internal and external target organs were chosen to be the skin.

Reexamining these schemes is beyond the scope of this report. Therefore, this report assumes that the organs and models used in ORAUT-OTIB-0005 are accurate and simply attempts to determine the most appropriate ICD-9 code to correspond to each ICD-10 code. Due to the number of questions associated with lymphoma from the initial review, it was decided to document the rationale for each of the lymphoma cancers rather than just those with questions. Where appropriate and to avoid repetition, the ICD-10 codes for lymphomas are grouped together in this report and discussed as a group.

1. C81 – Hodgkin lymphoma
 - a. 201 – Hodgkin’s disease
 - b. All ICD-10 C81 subcodes represent forms of Hodgkin lymphoma and correspond to ICD-9 201 subcodes, which also represent Hodgkin lymphomas. Under OCAS-TIB-0012, *Selection for Internal and External Dosimetry Target Organs for Lymphatic/Hematopoietic Cancers* (NIOSH 2006), all Hodgkin lymphomas use the location-specific scheme. All of the C81 subcodes include essentially the same location information as the 201 subcodes, so the C81 subcodes will correspond to the 201 subcodes listed in the supporting spreadsheet [ORAUT (2019)]
 - c. 201 – Hodgkin’s disease
2. C82 – Follicular lymphoma
 - a. 202.0 – Nodular lymphoma
 - b. According to WHO (2016), C82 is a category for “Follicular (nodular) non-Hodgkin lymphoma.” All the C82 cancers crosswalk to ICD-9 codes 202.0 – nodular lymphoma and 202.8 – lymphoma not elsewhere specified. All the C82 ICD-10 codes have the word “follicular” in the name, and the WHO category title correlates that with “nodular” lymphoma. In addition, ICD-9 codes 202.0 and 202.8 use the same internal organ, external organ, and IREP model.
 - c. 202.0 – Nodular lymphoma
3. C83.0 – Small cell B-cell lymphoma
 - a. 200.8 – Mixed lymphosarcoma
 - b. ICD-9 code 200.8 uses the location-specific scheme, and small cell lymphoma are found mostly in the lymph nodes and spleen. As such, it appears to be location specific just like lymphosarcoma.
 - c. 200.8 – Mixed lymphosarcoma
4. C83.1 – Mantle cell lymphoma
 - a. 200.4 – Mantle cell lymphoma

- b. The ICD-10 and ICD-9 codes directly correspond and no issue was raised during the initial review.
- c. 200.4 – Mantle cell lymphoma
- 5. C83.30 – Diffuse large B-cell lymphoma, unspecified site
 - a. 200.00 – Reticulosarcoma unspecified extranodal organ
 - b. See discussion for C83.31 to C83.39.
 - c. C83.30 corresponds to 200.00 – Reticulosarcoma unspecified extranodal organ
- 6. C83.31 to C83.39 – Diffuse large B-cell lymphoma, known site
 - a. Corresponds to multiple ICD-9 codes
 - i. 200.0 – Reticulosarcoma
 - ii. 200.5 – Primary central nervous system lymphoma
 - iii. 200.7 – Large cell lymphoma
 - b. ICD-9 codes 200.0 and 200.7 use the location-specific scheme, while 200.5 uses the systemic scheme. The majority of C83.3 subcodes correspond to only 200.0 and/or 200.7, which use the same internal organ, external organ, and IREP model. However, ICD-10 subcode C83.39 (extranodal and solid organ sites) corresponds to 200.5 as well. ICD-9 code 200.5 specifies a location of the central nervous system. Because the possible locations for C83.39 are disseminated throughout the body, ICD-9 code 200.00 or 200.70 for unspecified locations correspond to C83.39. In addition, ICD-10 code C83.30 only corresponds to 200.00, which as stated before uses the same organs and IREP model as 200.7. Therefore, the 200.7 group of codes for “large cell” lymphomas will be used for all ICD-10 codes except C83.30, which corresponds to ICD-9 code 200.00.
 - c. C83.31 to C83.39 correspond to 200.7 – Large cell lymphoma
- 7. C83.5 – Lymphoblastic (diffuse) lymphoma
 - a. 200.1 – Lymphosarcoma
 - b. Lymphosarcoma was specially mentioned in NIOSH (2005) as being location specific. Because C83.5 corresponds to 200.1, it implies a location-specific scheme is appropriate.
 - c. 200.1 – Lymphosarcoma
- 8. C83.7 – Burkitt lymphoma
 - a. 200.2 – Burkitt’s tumor/lymphoma
 - b. The ICD-10 and ICD-9 codes directly correspond, and no issue was raised during the initial review.
 - c. 200.2 – Burkitt’s tumor/lymphoma

9. C83.8 – Other non-follicular lymphoma

a. Corresponds to multiple ICD-9 codes

- i. 200.3 – Marginal zone lymphoma
- ii. 200.5 – Primary central nervous system lymphoma
- iii. 200.8 – Mixed lymphosarcoma

b. ICD-9 codes 200.3 and 200.5 use the systemic scheme, while 200.8 uses the location-specific scheme. The general 200 ICD-9 code category is for lymphosarcoma and reticulosarcoma, which are named specifically by ICD-9 codes 200.0 and 200.1, respectively. Both 200.0 and 200.1 use the location-specific scheme. Because 200.8 is for mixed lymphosarcoma (i.e., other named variants of lymphoma), the location scheme is appropriate.

c. 200.8 – Mixed lymphosarcoma

10. C83.9 – Non-follicular (diffuse) lymphoma

a. 200.8 – Mixed lymphosarcoma

b. ICD-10 code C83.9 is closely related to C83.8, representing other unspecified types and other unnamed types, respectively. Therefore, they will correspond to the same ICD-9 code.

c. 200.8 – Mixed lymphosarcoma

11. C84.0 – Mycosis fungoides

a. 202.1 – Mycosis fungoides

b. These ICD-10 and ICD-9 codes are direct cell type matches.

c. 202.1 – Mycosis fungoides

12. C84.1 – Sezary disease

a. 202.2 – Sezary's disease

b. These ICD-10 and ICD-9 codes are direct cell type matches.

c. 202.2 – Sezary's disease

13. C84.4 – Peripheral T-cell lymphoma

a. 202.7 – Peripheral T-Cell (cutaneous) lymphoma

b. These ICD-10 and ICD-9 codes are direct cell type matches.

c. 202.7 – Peripheral T-Cell (cutaneous) lymphoma

14. C84.6 to C84.7 – Anaplastic large cell lymphoma (ALK [anaplastic lymphoma kinase] positive and negative)

a. 200.6 – Anaplastic large cell lymphomas

b. These ICD-10 and ICD-9 codes are direct cell type matches with the only difference being ALK positive or negative, which has no effect for the purposes of EEOICPA.

c. 200.6 – Anaplastic large cell lymphomas

15. C84.9 – Mature NK/T [natural killer T-cell] lymphomas, unspecified

- a. 202.8 – Other lymphomas not elsewhere classified
- b. ICD-9 use of “not elsewhere classified” corresponds to ICD-10 use of “unspecified.”
- c. 202.8 – Other lymphomas not elsewhere classified

16. C84.A – Cutaneous T-cell lymphoma, unspecified

- a. 202.8 – Other lymphomas not elsewhere classified
- b. This is a lymphoma arising in the skin. From a medical perspective, a crosswalk to the generic 202.8 might make sense, but for the purposes of EEOICPA it would appear the appropriate surrogate organ would be the skin. Therefore, for EEOICPA, this code will correspond to 202.1 – mycosis fungoides to provide the appropriate target organs rather than important medical information.
- c. 202.1 – Mycosis fungoides

17. C84.Z – Other mature T/NK-cell lymphomas

- a. 202.8 – Other lymphomas not elsewhere classified
- b. This code is very similar to ICD-10 code C84.9. The only difference is that the actual cell type is known but not listed instead of unspecified. Therefore, both ICD-10 codes correspond to the same ICD-9 codes.
- c. 202.8 – Other lymphomas not elsewhere classified

18. C85.1 – Unspecified B-cell lymphoma

- a. 202.8 – Other lymphomas not elsewhere classified
- b. ICD-9 use of “not elsewhere classified” corresponds to ICD-10 “unspecified.”
- c. 202.8 – Other lymphomas not elsewhere classified

19. C85.2 – Mediastinal (thymic) large B-cell lymphoma

- a. Correspond to multiple ICD-9 codes
 - i. 200.7 – Large cell lymphomas
 - ii. 202.8 – Other lymphomas not elsewhere classified
- b. As stated before, 202.8 is a generic classification for unspecified or other lymphomas. However, 200.7 appears to correspond better, as it specifies large cell lymphoma. Additionally, ICD-10 code C83.3 – large B-cell lymphoma is similar to this code (though this one is more specific) and corresponds to 200.7.
- c. 200.7 – Large cell lymphomas

20. C85.8 – Other specified types of non-Hodgkin lymphoma

- a. 202.8 – Other lymphomas not elsewhere classified
- b. ICD-9 use of “not elsewhere classified” corresponds to ICD-10 “other specified.”
- c. 202.8 – Other lymphomas not elsewhere classified

21. C85.9 – Non-Hodgkin lymphoma, unspecified

- a. 202.8 – Other lymphomas not elsewhere classified
- b. ICD-9 use of “not elsewhere classified” corresponds to ICD-10 “unspecified.”
- c. 202.8 – Other lymphomas not elsewhere classified

22. C86.0 – Extranodal NK/T-cell lymphoma, nasal type

- a. 202.81 – Other lymphomas not elsewhere classified, head
- b. All of the 202.8 ICD-9 subcodes identify specific areas of the body; however; all 202.8 subcodes use the same internal organ, external organ, and IREP model. Therefore, the specific location identified in C86.0 does not affect the internal organ, external organ, and IREP selection.
- c. 202.81 – Other lymphomas not elsewhere classified, head

23. C86.1 – Hepatosplenic T-cell lymphoma

- a. 202.87 – Other lymphomas not elsewhere classified, spleen
- b. All of the 202.8 ICD-9 subcodes identify specific areas of the body; however; all 202.8 subcodes use the same internal organ, external organ, and IREP model. Therefore, the specific location identified in C86.1 does not affect the internal organ, external organ, and IREP selection.
- c. 202.87 – Other lymphomas not elsewhere classified, spleen

24. C86.2 – Enteropathy-type (intestinal) T-cell lymphoma

- a. 202.83 – Other lymphomas not elsewhere classified, abdominal
- b. All of the 202.8 ICD-9 subcodes identify specific areas of the body; however; all 202.8 subcodes use the same internal organ, external organ, and IREP model. Therefore, the specific location identified in C86.2 does not affect the internal organ, external organ, and IREP selection.
- c. 202.83 – Other lymphomas not elsewhere classified, abdominal

25. C86.3 – Subcutaneous panniculitis-like T-cell lymphoma

- a. 202.83 – Other lymphomas not elsewhere classified, abdominal
- b. All of the 202.8 ICD-9 subcodes identify specific areas of the body; however; all 202.8 subcodes use the same internal organ, external organ, and IREP model. Therefore, the specific location identified in C86.3 does not affect the internal organ, external organ, and IREP selection.
- c. 202.80 – Other lymphomas not elsewhere classified, unspecified extranodal organ

26. C86.4 – Blastic NK-cell lymphoma

- a. 202.80 – Other lymphomas not elsewhere classified, unspecified extranodal organ

- b. All of the 202.8 ICD-9 subcodes identify specific areas of the body; however; all 202.8 subcodes use the same internal organ, external organ, and IREP model. Therefore, the specific location identified in C86.4 does not affect the internal organ, external organ, and IREP selection.
- c. 202.80 – Other lymphomas not elsewhere classified, unspecified extranodal organ

27. C86.5 – Angioimmunoblastic T-cell lymphoma

- a. 200.80 – Other variants of mixed lymphosarcoma of unspecified extranodal and solid organs
- b. Although the corresponding ICD-9 code follows the location specific scheme, it is also a general code for unspecified sites. In addition, the internal organ, external organ, and IREP model are the most claimant-favorable location. The only difference between the claimant-favorable location scheme and the systemic scheme is the external organ, thyroid and thymus, respectively. This difference does not warrant changing the corresponding ICD-9 code.
- c. 200.80 – Other variants of mixed lymphosarcoma of unspecified extranodal and solid organs

28. C86.6 – Primary cutaneous CD30-positive T-cell proliferations

- a. 200.80 – Other variants of mixed lymphosarcoma of unspecified extranodal and solid organs
- b. This cancer appears to originate in the skin; as such, the appropriate surrogate organ would be the skin. Therefore, for EEOICPA, this code will correspond to 202.1 – mycosis fungoides to provide the appropriate target organs rather than important medical information.
- c. 202.1 – Mycosis fungoides

29. C88.0 – Waldenstrom macroglobulinemia

- a. 273.3 – Waldenstrom macroglobulinemia
- b. These ICD-10 and ICD-9 codes are direct cell type matches.
- c. 273.3 – Waldenstrom macroglobulinemia

30. C88.2 – Heavy chain disease

- a. Corresponds to multiple ICD-9 codes
 - i. 203.80 – Other immunoproliferative neoplasms, without remission
 - ii. 203.81 – Other immunoproliferative neoplasms, with remission
- b. The only difference between ICD-9 codes 203.80 and 203.81 is with or without remission. This does not affect the organ and IREP model selection for EEOICPA.
- c. 203.80 – Other immunoproliferative neoplasms without remission

31. C88.3 – Immunoproliferative small intestinal disease

- a. 203.80 – Other immunoproliferative neoplasms without remission
- b. This is the only ICD-9 code for immunoproliferative disease.
- c. 203.80 – Other immunoproliferative neoplasms without remission

32. C88.4 – Extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue (MALT-lymphoma)

- a. 200.30 – Marginal zone lymphoma, unspecified
- b. This is the only ICD-9 code for marginal zone lymphoma.
- c. 200.30 – Marginal zone lymphoma, unspecified

33. C88.8 – Other malignant immunoproliferative diseases

- a. Corresponds to multiple ICD-9 codes
 - i. 203.80 – Other immunoproliferative neoplasms without remission
 - ii. 238.79 – Other lymphatic and hematopoietic tissue disease
- b. The only difference between these two ICD-9 codes is the IREP model selection. ICD-9 code 238.79 includes the bone model while 203.80 does not. The bone model was included for 238.79 because myelodysplastic syndrome was considered an “other lymphatic and hematopoietic tissue disease”. Since myelodysplastic syndrome has a specific ICD-10 code, 203.80 IREP model selection corresponds better to C88.8.
- c. 203.80 – Other immunoproliferative neoplasms without remission

34. C88.9 – Malignant immunoproliferative disease, unspecified

- a. 203.80 – Other immunoproliferative neoplasms without remission
- b. See discussion for C88.8.
- c. 203.80 – Other immunoproliferative neoplasms without remission

A complete list of all corresponding ICD-9 and ICD-10 codes can be found in ORAUT (2019).

4.0 SECONDARY CANCER ICD-10 CODES

The ICD-9 coding system currently used in ORAUT-OTIB-0005 has a general range of codes from 196 to 198 to describe only secondary cancers, with two exceptions, 511.81 and 789.51. These two ICD-9 codes are outside the general range for secondary cancers and were determined to correspond with ICD-9 codes 197.2 and 197.6, respectively, and therefore have the same likely primaries. Similarly, the ICD-10 coding system has a general range of codes from C77 to C79, including C7B, to describe secondary cancers, again with two exceptions, J91.0 and R18.0. When evaluating secondary cancers for EEOICPA all likely primary cancers must be assessed, so the list of likely primary cancers in NIOSH (2002) must be converted to ICD-10 codes.

NIOSH (2002) Table 7 lists the likely primary cancers and their ICD-9 codes for EEOICPA (reproduced as Table 4-1 below). This list was generated by determining which primary cancers produced approximately 75% of each secondary cancer in the U.S. population (males and females were considered separately). In NIOSH (2002) Table 7, the ICD-9 secondary cancer codes are divided into four digit codes (i.e., one decimal place), while the primary codes are listed as three-digit codes (i.e., no decimal point). The likely primary cancer listings created for the corresponding ICD-10

codes attempts to retain this level of detail, rather than subdivide further, in order to remain accurate in relation to the original statistics.

Table 4-1. NIOSH (2002) Table 7.

Secondary cancer location (ICD-9 code)	ICD-9 code of likely primary cancers
Lymph nodes of head, face, and neck (196.0)	141,142(M), 146(M), 149(F), 161(M), 162, 172, 173, 174(F), 193(F)
Intrathoracic lymph nodes (196.1)	150(M), 162, 174(F)
Intra-abdominal lymph nodes (196.2)	150(M), 151(M), 153, 157(F), 162, 174(F), 180(F), 185(M), 189, 202(F)
Lymph nodes of axilla and upper limb (196.3)	162, 172, 174(F)
Inguinal and lower limb lymph nodes (196.5)	154(M), 162, 172, 173(F), 187(M)
Intrapelvic lymph nodes (196.6)	153(M), 154(F), 162(M), 180(F), 182(F), 185(M), 188
Lymph nodes of multiple sites (196.8)	150(M), 151(M), 153(M), 162, 174(F)
Lymph nodes, site unspecified (196.9)	150(M), 151, 153, 162, 172, 174(F), 185(M)
Lung (197.0)	153, 162, 172(M), 17 (F), 185(M), 188(M), 189
Mediastinum (197.1)	150(M), 162, 174(F)
Pleura (197.2)	150(M), 153(M), 162, 174(F), 183(F), 185(M), 189(M)
Other respiratory organs (197.3)	150, 153(M), 161, 162, 173(M), 174(F), 185(M), 193(F)
Small intestine, including duodenum (197.4)	152, 153, 157, 162, 171, 172(M), 174(F), 183(F), 189(M)
Large intestine and rectum (197.5)	153, 154, 162, 174(F), 183(F), 185(M)
Retroperitoneum and peritoneum (197.6)	151, 153, 154(M), 157, 162(M), 171, 174(F), 182(F), 183(F)
Liver, specified as secondary (197.7)	151 (M), 153, 154(M), 157, 162, 174(F)
Other digestive organs (197.8)	150 (M), 151, 153, 157, 162, 174 (F), 185 (M)
Kidney (198.0)	153, 162, 174 (F), 180 (F), 185 (M), 188, 189, 202 (F)
Other urinary organs (198.1)	153, 174 (F), 180 (F), 183 (F), 185 (M), 188, 189 (F)
Skin (198.2)	153, 162, 171 (M), 172, 173 (M), 174 (F), 189 (M)
Brain and spinal cord (198.3)	162, 172 (M), 174 (F)
Other parts of nervous system (198.4)	162, 172 (M), 17 4 (F), 185 (M), 202
Bone and bone marrow (198.5)	162, 174 (F), 1 85 (M)
Ovary (198.6)	153 (F), 174 (F), 183 (F)
Suprarenal gland (198.7)	153 (F), 162, 174 (F)
Other specified sites (198.8)	153, 162, 172 (M), 174 (F), 183 (F), 185 (M), 188 (M)

In addition, it is not clear if the secondary cancers evaluated in NIOSH (2002) were based on ICD-9 codes or simply based on the location of the secondary cancer for each grouping. With the 75% criteria mentioned above, it is clear that the listings are based on the predominant cancers in the group rather than the more unusual types of cancer belonging to a group. Therefore, the NIOSH (2002) Table 7 was converted based the predominant form(s) of cancer in a particular group.

4.1 CORRESPONDING ICD-9 AND ICD-10 SECONDARY CANCER CODES

To convert NIOSH (2002) Table 7 from ICD-9 codes to ICD-10 codes, all ICD-10 codes describing secondary cancers and their corresponding ICD-9 codes were determined first. In ORAUT (2019), when an ICD-10 code has a clear one-to-one correspondence to an ICD-9 code, no explanation is provided. However, for the ICD-10 codes where the corresponding ICD-9 code is not obvious, the rationale is provided below:

1. C78.7 – Secondary malignant neoplasm of liver and intrahepatic bile duct
 - a. Corresponds to multiple ICD-9 codes
 - i. 197.7 – Secondary malignant neoplasm of liver
 - ii. 197.8 – Secondary malignant neoplasm of other digestive organs

- b. Primary ICD-9 code 155 is for the liver and intrahepatic ducts while the extrahepatic ducts are covered under ICD-9 code 156. Following this logic, 197.7 is the appropriate ICD-9 code for the liver and intrahepatic bile duct.
 - c. 197.7 – Secondary malignant neoplasm of liver
2. C79.31 – Secondary malignant neoplasm of the brain
- a. 198.3 – Secondary malignant neoplasm of the brain and spinal cord
 - b. In the ICD-9 coding system the spinal cord was grouped with the brain (i.e., ICD-9 code 198.3) and cerebral meninges was grouped with other parts of the nervous system (i.e., ICD-9 code 198.4). However, in the ICD-10 coding system, secondary malignant neoplasm of cerebral meninges was given its own ICD-10 code (see C79.32) and the spinal cord was grouped with other parts of the nervous system. To determine which ICD-9 code best corresponds with ICD-10 codes C79.31 and C79.32, the claim statistics in the NIOSH-Division of Compensation Analysis and Support Claims Tracking System were reviewed. These statistics showed that 101 secondary brain cancers, 3 secondary spinal cord cancers, 3 secondary cancers of the brain and spinal cord, and 2 secondary cerebral meninges cancers have been evaluated under EEOICPA. It is clear that secondary brain cancers likely drove the statistics used to create Table 7 in NIOSH (2002). Therefore, ICD-9 code 198.3 will be used for both C79.31 and C79.32, to stay true to the original statistics used to determine the likely primary cancers.
 - c. 198.3 – Secondary neoplasm of the brain and spinal cord
3. C79.32 – Secondary malignant neoplasm of cerebral meninges
- a. 198.4 – Secondary malignant neoplasm of other parts of the nervous system
 - b. See C79.31.
 - c. 198.3 – Secondary malignant neoplasm of the brain and spinal cord

The following ICD-10 codes are all subcodes of the C7B group, which corresponds to ICD-9 code group 209.7. However, the ICD-9 code group 209.7 was added to the ICD-9 coding system in 2009 and corresponded to ICD-9 codes between 196.0 and 199.1. Therefore, for ICD-9 codes 209.7 the corresponding ICD-9 code between 196.0 and 199.1 was used for organ and IREP model selection in ORAUT-OTIB-0005. To maintain consistency, C7B ICD-10 subcodes used the coding system from DHHS (2009) to determine the corresponding ICD-9 code, as described below.

4. C7B.00 – Secondary carcinoid tumor of unspecified sites
- a. 209.70 – Secondary neuroendocrine tumor, unspecified site
 - b. Use ICD-9 code from DHHS (2009)
 - c. 199.1 – Malignant neoplasm NOS
5. C7B.01 – Secondary carcinoid tumor of distant lymph nodes
- a. 196.0 to 196.9 – Malignant neoplasm of lymph nodes (various locations)
 - b. Because ICD-10 code C7B.01 does not describe a distinct location, the ICD-9 code for unspecified locations will be used.
 - c. 196.9 – Malignant neoplasm of lymph nodes NOS

6. C7B.02 – Secondary carcinoid tumor of liver
 - a. 209.72 – Secondary neuroendocrine tumor of liver
 - b. Use ICD-9 code from DHHS (2009).
 - c. 197.7 – Secondary malignant neoplasm of liver
7. C7B.03 – Secondary carcinoid tumors of bone
 - a. 209.73 – Secondary neuroendocrine tumor of bone
 - b. Use ICD-9 code from DHHS (2009).
 - c. 198.5 – Secondary malignant neoplasm bone
8. C7B.04 – Secondary carcinoid tumors of peritoneum
 - a. 209.74 – Secondary neuroendocrine tumor of peritoneum
 - b. Use ICD-9 code from DHHS (2009).
 - c. 197.6 – Secondary malignant neoplasm peritoneum
9. C7B.09 – Secondary carcinoid tumors of other sites
 - a. 209.79 – Secondary neuroendocrine tumor of other sites
 - b. Use ICD-9 code from DHHS (2009).
 - c. 199.0 – Malignant neoplasm disseminated
10. C7B.1 – Secondary Merkel cell carcinoma
 - a. 209.75 – Secondary Merkel cell carcinoma
 - b. ICD-9 code 209.75 corresponds to ICD-9 code 199, which is the code used when nothing is known about the cancer. However, Merkel cell carcinoma is associated with cancer of the skin. Therefore, it corresponds better with the ICD-9 code for secondary skin cancer because the location is known.
 - c. 198.2 – Secondary malignant neoplasm skin
11. C7B.8 – Other secondary neuroendocrine tumors
 - a. 209.79 – Secondary neuroendocrine tumor of other sites
 - b. Use ICD-9 code from DHHS (2009).
 - c. 199.0 – Malignant neoplasm disseminated

Some of the ICD-10 codes above correspond to ICD-9 code 199, which can be either a primary or secondary. As such, there are no likely primary cancers listed in Table 7 of NIOSH (2002) for these cancers (i.e., C7B.00, C7B.09, and C7B.8), so none will be listed in the ICD-10 version.

4.2 CORRESPONDING ICD-9 AND ICD-10 LIKELY PRIMARY CANCER CODES

Many of the likely primary cancers in NIOSH (2002) Table 7 are a likely primary cancer for more than one secondary cancer. Table 4-2 lists all of the likely primary cancers with their ICD-9 code, cancer descriptions, and corresponding ICD-10 codes as determined in Section 2.0.

4.3 ICD-10 VERSION OF NIOSH (2002) TABLE 7

Using the information in NIOSH (2002) Table 7 and ORAUT (2019), Table 7 can be converted to ICD-10 codes for secondary cancers and likely primary cancers, as shown in Table 4-3.

Table 4-3 is considered the official list of likely primary cancers, and is listed as such in 42 CFR Part 81. However, in some cases, more than one likely primary cancer code points to identical internal organs, external organs, and IREP models. Therefore, for ease of use in EEOICPA, some of

Table 4-2. Corresponding ICD-9 and ICD-10 likely primary cancer codes.

ICD-9 code	Cancer description	Corresponding ICD-10 code(s)
141	Tongue	C01, C02
142	Major salivary glands	C07, C08
146	Oropharynx	C09, C10
149	Other and ill-defined sites within the lip, oral cavity, and pharynx	C14
150	Esophagus	C15
151	Stomach	C16
152	Small intestine	C17
153	Colon	C18
154	Rectum	C19, C20, C21
157	Pancreas	C25
161	Larynx	C32
162	Trachea, bronchus and lung	C33, C34
171	Connective and other soft tissue	C49
172	Malignant melanoma	C43, D03
173	Non-melanoma skin	C44
174	Breast	C50
180	Cervix uteri	C53
182	Uterus	C54
183	Ovary and other uterine adnexa	C56, C57
185	Prostate	C61
187	Male genital organs	C60, C63
188	Bladder	C67
189	Kidney	C64, C65, C66, C68
193	Thyroid	C73
202	Other malignant neoplasms of lymphoid and histiocytic tissue	C82, C84 (excluding C84.6, C84.7), C85 (excluding C85.2), C86 (excluding C86.5), C91.4 C96

Table 4-3. ICD-10 version of IREP Technical Documentation Table 7.

ICD-10 code	Secondary cancer description	ICD-10 codes of likely primary cancers
C77.0	Lymph nodes of head, face and neck	C01, C02, C07(M), C08(M), C09(M), C10(M), C14(F), C32(M), C33, C34, C43, C44, C50(F), C73(F), D03
C77.1	Intrathoracic lymph nodes	C15(M), C33, C34, C50(F)
C77.2	Intra-abdominal lymph nodes	C15(M), C16(M), C18, C25(F), C33, C34, C50(F), C53(F), C61(M), C64, C65, C66, C68, C82(F), C84(F)(excluding C84.6, C84.7), C85(F) (excluding C85.2), C86(F) (excluding C86.5), C91.4(F), C96(F)
C77.3	Axilla and upper limb lymph nodes	C33, C34, C43, C50(F), D03
C77.4	Inguinal and lower limb lymph nodes	C19(M), C20(M), C21(M), C33, C34, C43, C44(F), C60(M), C63(M), D03
C77.5	Intrapelvic lymph nodes	C18(M), C19(F), C20(F), C21(F), C33(M), C34(M), C53(F), C54(F), C61(M), C67

ICD-10 code	Secondary cancer description	ICD-10 codes of likely primary cancers
C77.8	Lymph nodes of multiple regions	C15(M), C16(M), C18(M), C33, C34, C50(F)
C77.9	Lymph nodes, unspecified	C15(M), C16, C18, C33, C34, C43, C50(F), C61(M), D03
C78.0	Lung	C18, C33, C34, C43(M), C50(F), C61(M), C67(M), C64, C65, C66, C68, D03(M)
C78.1	Mediastinum	C15(M), C33, C34, C50(F)
C78.2	Pleura	C15(M), C18(M), C33, C34, C50(F), C56(F), C57(F), C61(M), C64(M), C65(M), C66(M), C68(M)
C78.3	Other and unspecified respiratory organs	C15, C18(M), C32, C33, C34, C44(M), C50(F), C61(M), C73(F)
C78.4	Small intestine	C17, C18, C25, C33, C34, C49, C43(M), C50(F), C56(F), C57(F), C64(M), C65(M), C66(M), C68(M), D03(M)
C78.5	Large intestine and rectum	C18, C19, C20, C21, C33, C34, C50(F), C56(F), C57(F), C61(M)
C78.6	Retroperitoneum and peritoneum	C16, C18, C19(M), C20(M), C21(M), C25, C33(M), C34(M), C49, C50(F), C54(F), C56(F), C57(F)
C78.7	Liver and intrahepatic bile duct	C16(M), C18, C19(M), C20(M), C21(M), C25, C33, C34, C50(F)
C78.8	Other and unspecified digestive organs	C15(M), C16, C18, C25, C33, C34, C50(F), C61(M)
C79.0	Kidney	C18, C33, C34, C50(F), C53(F), C61(M), C67, C64, C65, C66, C68, C82(F), C84(F) (excluding C84.6, C84.7), C85(F) (excluding C85.2), C86(F) (excluding C86.5), C91.4(F), C96(F)
C79.1	Bladder and urinary organs	C18, C50(F), C53(F), C56(F), C57(F), C61(M), C67, C64(F), C65(F), C66(F), C68(F)
C79.2	Skin	C18, C33, C34, C49(M), C43, C44(M), C50(F), C64(M), C65(M), C66(M), C68(M), D03
C79.3	Brain	C33, C34, C43(M), C50(F), D03(M)
C79.4	Other and unspecified parts of nervous system	C33, C34, C43(M), C50(F), C61(M), C82, C84 (excluding C84.6, C84.7), C85 (excluding C85.2), C86 (excluding C86.5), C91.4, C96, D03(M)
C79.5	Bone and bone marrow	C33, C34, C50(F), C61(M)
C79.6	Ovary	C18(F), C50(F), C56(F), C57(F)
C79.7	Adrenal gland	C18(F), C33, C34, C50(F)
C79.8	Other sites	C18, C33, C34, C43(M), C50(F), C56(F), C57(F), C61(M), C67(M), D03(M)
C79.9	Unspecified sites	C18, C33, C34, C43(M), C50(F), C56(F), C57(F), C61(M), C67(M), D03(M)
C7B.01	Carcinoid tumor of distant lymph nodes	C15(M), C16, C18, C33, C34, C43, C50(F), C61(M), D03
C7B.02	Carcinoid tumor of liver	C16(M), C18, C19(M), C20(M), C21(M), C25, C33, C34, C50(F)
C7B.03	Carcinoid tumor of bone	C33, C34, C50(F), C61(M)
C7B.04	Carcinoid tumor of peritoneum	C16, C18, C19(M), C20(M), C21(M), C25, C33(M), C34(M), C49, C50(F), C54(F), C56(F), C57(F)
C7B.1	Merkel cell carcinoma	C18, C33, C34, C49(M), C43, C44(M), C50(F), C64(M), C65(M), C66(M), C68(M), D03
J91.0	Malignant pleural effusion	C15(M), C18(M), C33, C34, C50(F), C56(F), C57(F), C61(M), C64(M), C65(M), C66(M), C68(M)
R18.0	Malignant ascites	C16, C18, C19(M), C20(M), C21(M), C25, C33(M), C34(M), C49, C50(F), C54(F), C56(F), C57(F)

the codes in the table can be consolidated into a single code. This consolidation does not accurately reflect the likely primary cancers but would result in the appropriate assessment being performed.

Table 4-4 shows the organs and cancer models for each of the likely primary ICD-10 codes. The bolded ICD-10 codes represent the likely primary cancer code that will be used for EEOICPA dose reconstructions.

Table 4-5 shows the likely primary ICD-10 codes that can be combined due to the use of the same internal organ, external organ, and IREP model.

Table 4-4. Organ and IREP model selection for likely primary ICD-10 codes.

ICD-9 code	ICD-10 code	Internal organ	External organ	IREP model
141	C01 ^a	Highest non-met org/tissue	Thyroid/remainder	Oral cavity and pharynx
141	C02	Highest non-met org/tissue	Thyroid/remainder	Oral cavity and pharynx
141	C02	LNET	Thyroid/remainder	Oral cavity and pharynx
142	C07 ^a	Highest non-met org/tissue	Thyroid/remainder	Oral cavity and pharynx
142	C08	Highest non-met org/tissue	Thyroid/remainder	Oral cavity and pharynx
146	C09	LNET	Esophagus	Oral cavity and pharynx
146	C010	ET2	Esophagus	Oral cavity and pharynx
149	C14	ET2	Esophagus	Oral cavity and pharynx
149	C14	LNET	Esophagus	Oral cavity and pharynx
150	C15	Esophagus/stomach	Esophagus/stomach	Esophagus/stomach
151	C16	Stomach	Stomach	Stomach
152	C17	SI	Stomach	All digestive
153	C18	LLI	Colon	Colon
153	C18	ULI	Colon	Colon
153	C18	Colon	Colon	Colon
154	C19 ^a	LLI	Colon	Rectum
154	C20 ^a	LLI	Colon	Rectum
154	C21	LLI	Colon	Rectum
157	C25	Pancreas	Stomach	Pancreas
161	C32	ET2	Esophagus	Other respiratory
162	C33 ^a	Lung	Lung	Lung
162	C34	Lung	Lung	Lung
171	C49	Highest non-met org/tissue	Thyroid/remainder	Connective tissue
172	C43	Skin	Skin	Malignant melanoma
172	D03 ^a	Skin	Skin	Malignant melanoma
173	C44	Skin	Skin	Non-melanoma skin-basal cell
173	C44	Skin	Skin	Non-melanoma skin-squamous cell
174	C50	Breast	Breast	Breast
180	C53	Uterus	Uterus	Female genitalia less ovary
182	C54	Uterus	Uterus	Female genitalia less ovary
183	C56 ^a	Ovaries	Ovaries	Ovary
183	C57	Uterus	Ovaries	Ovary
183	C57	Ovaries	Ovaries	Ovary
183	C57	Uterus	Uterus	Female genitalia less ovary
185	C61	Highest non-met org/tissue	Bladder	All male genitalia
187	C60	Skin	Testes	All male genitalia
187	C60	Testes	Testes	All male genitalia
187	C63 ^a	Testes	Testes	All male genitalia

ICD-9 code	ICD-10 code	Internal organ	External organ	IREF model
188	C67	Bladder	Bladder	Bladder
189	C64	Kidney	Liver	Urinary organs less bladder
189	C65 ^a	Kidney	Liver	Urinary organs less bladder
189	C66 ^a	Highest non-met org/tissue	Liver	Urinary organs less bladder
189	C68	Highest non-met org/tissue	Liver	Urinary organs less bladder
189	C68	Bladder	Liver	Urinary organs less bladder
193	C73	Thyroid	Thyroid	Thyroid
202	C82 ^a	LN(TH)	Thymus/lung	Lymphoma and multiple myeloma
202	C84.0-C84.4, C84.A	Skin	Skin	Lymphoma and multiple myeloma
200	C84.6-C84.7 ^a	Not Included as likely primary	Not applicable	Not applicable
202	C84.9, C84.Z	LN(TH)	Thymus/lung	Lymphoma and multiple myeloma
202	C85.1 ^a	LN(TH)	Thymus/lung	Lymphoma and multiple myeloma
200	C85.2 ^a	Not Included as likely primary	Not applicable	Not applicable
202	C85.8-C85.9 ^a	LN(TH)	Thymus/lung	Lymphoma and multiple myeloma
202	C86.0-C86.4 ^a	LN(TH)	Thymus/lung	Lymphoma and multiple myeloma
200	C86.5 ^a	Not Included as likely primary	Not applicable	Not applicable
202	C86.6 ^a	Skin	Skin	Lymphoma and multiple myeloma
204	C91.0-C91.3 ^a	Not Included as likely primary	Not applicable	Not applicable
202	C91.4	Red bone marrow	Red bone marrow	Lymphoma and multiple myeloma
204	C91.5-C91.Z ^a	Not Included as likely primary	Not applicable	Not applicable
202	C96.0	LN(TH)	Skin	Lymphoma and multiple myeloma
202	C96.2, C96.A	LN(TH)	Thyroid	Lymphoma and multiple myeloma
202	C96.4, C96.9, C96.Z	LN(TH)	Thymus/lung	Lymphoma and multiple myeloma

a. Code represents ICD-10 primary cancer codes that will not be used for EEOICPA dose reconstructions because they are duplicates of ICD-10 codes that will be used for each specified ICD-9 code.

Table 4-5. ICD-10 codes with identical organ and IREP model selection.

ICD-10 code included as likely primary	ICD-10 code(s) that can be removed from likely primary evaluation
C02	C01 and/or C08
C21	C19 and/or C20
C34	C33
C43	D03
C54	C53
C57	C53 and/or C54 and/or C56
C60	C63
C64	C65
C68	C66
C84	C82 and/or C85 and/or C86

The consolidated ICD-10 version of NIOSH (2002) Table 7 for use in EEOICPA is shown in Table 4-6. In the future, if any revisions are made to the organs or models for any ICD-10 codes listed as a likely primary cancer, the consolidated table must be reviewed.

5.0 CONCLUSION

Beginning in 2019, DOL will report only ICD-10 codes to describe covered illnesses under EEOICPA to NIOSH. Therefore, to maintain consistency in the organ and IREP model selection used in EEOICPA, the information in this report and ORAUT (2019) will be used to update ORAUT-OTIB-0005 and ORAUT-OTIB-0006 from ICD-9 to ICD-10 codes.

Table 4-6. ICD-10 version of IREP Technical Documentation Table 7 for use in EEOICPA.

ICD-10 code	Secondary cancer description	ICD-10 codes of likely primary cancers
C77.0	Lymph nodes of head, face and neck	C02, C09(M), C10(M), C14(F), C32(M), C34, C43, C44, C50(F), C73(F)
C77.1	Intrathoracic lymph nodes	C15(M), C34, C50(F)
C77.2	Intra-abdominal lymph nodes	C15(M), C16(M), C18, C25(F), C34, C50(F), C53(F), C61(M), C64, C68, C84(F)(excluding C84.6, C84.7), C91.4(F), C96(F)
C77.3	Axilla and upper limb lymph nodes	C34, C43, C50(F)
C77.4	Inguinal and lower limb lymph nodes	C21(M), C34, C43, C44(F), C60(M)
C77.5	Intrapelvic lymph nodes	C18(M), C21(F), C34(M), C54(F), C61(M), C67
C77.8	Lymph nodes of multiple regions	C15(M), C16(M), C18(M), C34, C50(F)
C77.9	Lymph nodes, unspecified	C15(M), C16, C18, C34, C43, C50(F), C61(M)
C78.0	Lung	C18, C34, C43(M), C50(F), C61(M), C67(M), C64, C68
C78.1	Mediastinum	C15(M), C34, C50(F)
C78.2	Pleura	C15(M), C18(M), C34, C50(F), C57(F), C61(M), C64(M), C68(M)
C78.3	Other and unspecified respiratory organs	C15, C18(M), C32, C34, C44(M), C50(F), C61(M), C73(F)
C78.4	Small intestine	C17, C18, C25, C34, C49, C43(M), C50(F), C57(F), C64(M), C68(M)
C78.5	Large intestine and rectum	C18, C21, C34, C50(F), C57(F), C61(M)
C78.6	Retroperitoneum and peritoneum	C16, C18, C21(M), C25, C34(M), C49, C50(F), C57(F)
C78.7	Liver and intrahepatic bile duct	C16(M), C18, C21(M), C25, C34, C50(F)
C78.8	Other and unspecified digestive organs	C15(M), C16, C18, C25, C34, C50(F), C61(M)
C79.0	Kidney	C18, C34, C50(F), C53(F), C61(M), C67, C64, C68, C84(F)(excluding C84.6, C84.7), C91.4(F), C96(F)
C79.1	Bladder and urinary organs	C18, C50(F), C57(F), C61(M), C67, C64(F), C68(F)
C79.2	Skin	C18, C34, C49(M), C43, C44(M), C50(F), C64(M), C68(M)
C79.3	Brain	C34, C43(M), C50(F)
C79.4	Other and unspecified parts of nervous system	C34, C43(M), C50(F), C61(M), C84(excluding C84.6, C84.7), C91.4, C96
C79.5	Bone and bone marrow	C34, C50(F), C61(M)
C79.6	Ovary	C18(F), C50(F), C57(F)
C79.7	Adrenal gland	C18(F), C34, C50(F)
C79.8	Other sites	C18, C34, C43(M), C50(F), C57(F), C61(M), C67(M)
C79.9	Unspecified sites	C18, C34, C43(M), C50(F), C57(F), C61(M), C67(M)
C7B.01	Carcinoid tumor of distant lymph nodes	C15(M), C16, C18, C34, C43, C50(F), C61(M)
C7B.02	Carcinoid tumor of liver	C16(M), C18, C21(M), C25, C34, C50(F)
C7B.03	Carcinoid tumor of bone	C34, C50(F), C61(M)
C7B.04	Carcinoid tumor of peritoneum	C16, C18, C21(M), C25, C34(M), C49, C50(F), C57(F)
C7B.1	Merkel cell carcinoma	C18, C34, C49(M), C43, C44(M), C50(F), C64(M), C68(M)
J91.0	Malignant pleural effusion	C15(M), C18(M), C34, C50(F), C57(F), C61(M), C64(M), C68(M)
R18.0	Malignant ascites	C16, C18, C21(M), C25, C34(M), C49, C50(F), C57(F)

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