North American Association of Central Cancer Registries, Inc. (NAACCR)

Death Clearance Manual

Minimum Requirements and Best Practices for Conducting Death Clearance

Effective January 1, 2015
for Deaths Occurring in 2013
(Appendix I updated April 2020)

NAACCR
North American Association of Central Cancer Registries

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Preface

The North American Association of Central Cancer Registries (NAACCR) Death Clearance Work Group is pleased to present this revised 2014 version of the *Death Clearance Manual* for use as standard practice by NAACCR member registries. This manual is the comprehensive compilation of death clearance process instructions intended to provide all necessary information under one cover to conduct death clearance successfully and consistently. This version of the *Death Clearance Manual* replaces the 2009 version.

What was found in all the years of work on both versions of the *Death Clearance Manual* was that the members of the registry community are very passionate about the subject of death clearance. Some believe no stone should be left unturned while others question the efficacy of the process at all. Reaching consensus in the presence of such polarizing opinions at the organizational level was near impossible.

After the release of the 2009 version, the Work Group remained committed to finding workable solutions to the concerns expressed by the registry community. The real challenge was deciding how to proceed when differing opinions were both valid and presented with great conviction.

In the end, the greatest lesson learned was that sometimes, no matter how hard or how long you try, consensus may not be achieved. The best outcome in this case is to identify and accept viable options. Therefore, in developing this manual, the Work Group included minimum requirements of the death clearance process that every registry should be able to meet. These requirements are based on access to death certificate information and registry resources. Tools and suggestions for automating the process are also provided; use of these should help increase efficiency and reduce resources needed to complete the process.

Death clearance continues to be an important procedure for central registries to identify missed cases and to update records in the registry database with death information. Recognizing benefits beyond a death certificate only (DCO) percentage provides even greater justification of the process.

Through the dedication of the Death Clearance Work Group and the input from central registries that completed the questionnaire, the goal of producing a useful manual reflecting the most practical and efficient approach for performing death clearance was achieved. Thanks go to all who contributed their time and effort.

1 Background

The primary purpose of a central or population-based cancer registry is to collect complete, timely, and high-quality data for use in surveillance, decision-making, cancer control, research, and policy development. One activity designed to assess and improve overall registry quality is death clearance, which uses mortality files and death certificates to increase registry completeness by identifying missed cases and to update records in the registry database with death information.

The death clearance process began receiving increased emphasis when the death certificate only (DCO) percentage was used as a measure of completeness in the North American Association of Central Cancer Registries (NAACCR) registry certification process and in the Centers for Disease Control and Prevention (CDC) National Program of Cancer Registries (NPCR) and National Cancer Institute (NCI) Surveillance, Epidemiology, and End Results (SEER) quality measures. When DCO percentage was first included as a certification criterion and measure of quality, there were no documented national standards, rules, or requirements for conducting death clearance.

Without national standards, registry-specific procedures dictated when a case was classified as a DCO. This lack of directives for death clearance resulted in significant variation among registries in determining what constitutes a DCO case. It also identified a need for documentation to promote consistency and comparability of results.

The first attempt to address the need for death clearance documentation, *Series V: Resolving Death Clearance Issues* (2002), was a best practices document developed by a volunteer group from within the central registry community. This document provided guidance for five specific issues, one of which resulted in strong controversy and, therefore, warranted additional attention. This led to a second document, the *Death Clearance Manual* (2009). The manual included steps in the death clearance process, a response to the controversial issue, and minimum requirements that must be met to complete the death clearance process. The manual succeeded in providing comprehensive instructions; however, more controversy was expressed by the registry community over the extensive list of minimum requirements due to limitations in some registries' resources available for performing death clearance. The third attempt, this document, provides a comprehensive but more realistic combination of minimum requirements and best practices to assist with implementing the more basic requirements while yielding consistent, comparable results among registries.

The following sections provide a summary of each document. The descriptions are included to show how the current *Death Clearance Manual* incorporated lessons learned from previous resources and evolved from a "how to" summary to the current document that presents the death clearance process through basic minimum requirements and best practices for implementation.

1.1 *Series V: Resolving Death Clearance Issues* (2002)

In 2002, the NAACCR Death Clearance Best Practices Work Group developed *Series V: Resolving Death Clearance Issues* to document guidelines and suggested operating procedures for the following specific aspects of the death clearance process:

- Objective 1: Develop generic guidelines for addressing ambiguous terminology on death DCO cases.

- Objective 2: Develop best practice guidelines for addressing inconsistencies between the death record and the registry record.

- Objective 3: Determine whether facility ID codes for non-standard and other reporting sources are needed.

- Objective 4: Develop best practice guidelines for addressing cases identified only at death and those that are non-reportable.

- Objective 5: Recommend a best date of diagnosis for DCO cases.

Series V was the first documentation on death clearance to go beyond a general description of "how to perform death clearance" by addressing issues confronting registries as they worked through the process. In many cases, the best practices in this document reflected established practice that provided valuable insight as to how registries handled certain situations. Included with this helpful guidance was one controversial best practice:

> "If sufficient information to determine an actual date or an approximate date of diagnosis is available on the death certificate and/or the follow-back response, it is an MDO (Physician Only) case."

This statement was in conflict with the definition of a DCO, i.e., a reportable case for which the only information the registry has is a death certificate. Therefore, many cancer registry professionals expressed objection. As a result, NAACCR convened the Death Clearance Issues Work Group (hereafter referred to as the "Work Group") to evaluate this practice and to develop a recommendation to resolve this issue.

1.2 *Death Clearance Manual* (2009)

As the Work Group began discussions of the MDO issue, other inconsistencies in determining DCO cases were identified. The Work Group's original charge expanded from providing a recommendation on the MDO issue to developing a comprehensive manual documenting minimum requirements and guidelines to standardize all aspects of the death clearance process and to promote consistency among registries.

In an attempt to standardize death clearance, the Work Group first had to identify methodology, procedures, and decisions that differed among registries when performing death clearance. The

Work Group identified and worked through scenarios encountered when conducting death clearance and reviewed all known sources of information referencing death clearance (see Appendix A: Death Clearance Publications). The Work Group met with representatives from the National Center for Health Statistics (NCHS) and other vital records professionals who provided additional insight into death certificate data collection. Recommendations on controversial issues identified through this process were presented to other committees in the registry community to gain consensus. The information was compiled in a document titled *Death Clearance Manual*.

The NAACCR Board of Directors approved the first version of the *Death Clearance Manual* in February 2009. It was released in July 2009 for implementation by population-based cancer registries for deaths in 2010 to meet death clearance requirements for the NAACCR 2013 Call for Data. However, due to concerns expressed by the membership over additional requirements, the NAACCR Board of Directors requested an assessment be completed prior to the implementation date and implementation was delayed until these concerns were addressed.

1.3 *Death Clearance Manual* (2014)

In June 2009, the Work Group was charged by the NAACCR Board of Directors to assess the impact of changes resulting from the *Death Clearance Manual*. The NAACCR Death Clearance Questionnaire was developed to identify specific impacts and concerns. The Questionnaire was initially sent to NAACCR member registries in March 2011 for completion by September 2011. Due to limited response, the evaluation deadline was extended to December 2011, and eventually April 2012.

A total of 17 NAACCR population-based cancer registries responded to the survey. The participating registries included Alaska, Detroit, Florida, Greater Atlanta, Greater Bay, Idaho, Kentucky, Louisiana, Massachusetts, Montana, North Carolina, New Hampshire, New Mexico, New York, Pennsylvania, Utah, and Texas. Responses from these registries provided helpful insight into current challenges and future direction for the death clearance process and enabled the Work Group to redefine minimum requirements.

For many months after the survey, the Work Group struggled to gain consensus on key issues. Passionate discussions of these issues with Work Group members, death clearance managers, registry managers, and members of national committees in the registry community provided no resolution. The Work Group finally decided the best way to proceed was to use the *Death Clearance Manual* to convey the most basic and reasonable components of the death clearance process that all registries should be able to complete. The *Manual* would also identify additional tasks if registries want to do more or standard-setting organizations require more.

The current document evolved to provide a comprehensive, but more practical approach to conducting death clearance. This *Manual* includes:

- **Minimum Requirements:** Minimum requirements for conducting death clearance are identified in Chapters 3 and 4. These requirements are the least the registry must do to perform death clearance. Standard setters and registries may require more than the minimum requirements by implementing stricter policies and procedures; however, registries may not do less than a minimum requirement specifies.

- **Best Practices:** Good implementation practices for conducting death clearance are provided with each minimum requirement.

- **Guidelines:** Chapter 5 presents suggestions for getting the most out of the death clearance process and guidelines to consider in using DCO cases. Appendix E provides guidance for performing and automating patient match at the tumor level (tumor comparison).

- **Glossary:** Appendix B includes an alphabetical list of terms, definitions, abbreviations, and acronyms associated with the death clearance process.

2 Understanding Death Clearance

This chapter defines and describes death clearance to promote better understanding of the death clearance process and consistency in referencing any aspect of death clearance. (See also Appendix B: Death Clearance Glossary.)

2.1 Definition of Death Clearance

According to John Lewis Young, Jr., DrPH, CTR, Professor of Epidemiology, Rollins School of Public Health, Emory University, and former Chief of the Demographic Analysis Section, NCI SEER Program, the term "death clearance" originated from the End Results Group, one of the predecessors of the SEER Program. The term referred to the process of linking against mortality files for the purpose of clearing out all of the deaths before beginning the follow-up process and generating accurate survival statistics. The idea of following back on non-reported cancer deaths came much later, when registries expanded to a population base and emphasis was put on complete and accurate incidence as well as survival data.

Death clearance is now defined as the process of matching registered deaths in a population against reportable conditions in the registry database for two purposes: (1) ascertainment of death information for persons in the registry (death clearance match), and (2) identification of all deaths with a reportable condition mentioned as a cause of death that are not found in the registry database (death clearance follow-back but more commonly referred to as death clearance).

2.2 Purpose of Death Clearance

The purpose of death clearance is to improve population-based cancer registration by utilizing information from death certificates to: (1) enhance data quality and usefulness with vital status information and other appropriate death information common to both cancer and death registration systems, and (2) improve completeness by adding previously unreported cancer cases.

Results of the death clearance process provide information to assist registries in assessing the adequacy of reporting from hospital and non-hospital sources. Analysis of these results may identify deficiencies in casefinding that can be used to improve reporting from existing sources or indicate additional sources to include in routine case reporting.

2.3 Death Clearance Process

The death clearance process includes the following two steps:

1. **Death Clearance Match:** Deaths from the official mortality file from the state, territorial, or provincial vital records office (hereafter referred to as mortality file) are linked to the registry database to identify records that match and those that do not match. For each patient match, the registry record is updated with death and other relevant data from the mortality file.

2. **Death Clearance Follow-Back:** For records in the mortality file with a cancer diagnosis that did not match a registry record, the registry investigates to identify potentially missed incidence cases. If follow-back information is obtained, the case may be added as a missed incidence case. If no information other than the death certificate is available, the case is entered in the registry database as a DCO.

Refer to Appendix C: Flow Diagram of the Death Clearance Process.

2.4 Record Linkage of Cancer Registry to Mortality Files

Matching mortality files against records in the registry database is a specific application of general record linkage. Registries use a variety of methods and algorithms. Choice of record linkage method depends on the data items available for linking, the size of files being linked, sensitivity and specificity required, and system capabilities.

Regardless of method, algorithm or software used, the linkage should produce the following three outcomes:

1. **Positive Patient Match:** Person is in both databases, and the match criteria were met. No manual review is required for patient match.

2. **Possible Patient Match:** Match criteria are not completely met. Manual review must be carried out to determine if the records are indeed matches. Review of case files, phone calls to providers, or correspondence with facilities may be required to verify possible matches.

3. **Patient Non-Match:** No record in the registry database meets enough of the match criteria to be considered even a possible match.

Patient matches are used in the death match process. (See Chapter 3, Death Clearance Match for details.) Non-matches are used in the death clearance follow-back process. (See Chapter 4, Death Clearance Follow-back for details.)

2.5 Timing for Conducting Death Clearance

The timing for performing the final death clearance match and death clearance follow-back is based on when the mortality file is complete and when the registry database is complete for the diagnosis year corresponding to the year of deaths. Careful timing of the process to make sure all registry and mortality records are available before final death clearance procedures begin will maximize use of staff time by minimizing the number of non-matched cases requiring follow-back and missed updates to vital status.

For the mortality file to be complete, all filed death certificates must be incorporated into the mortality file, and the death certificate cause-of-death coding must be complete.

For the registry database to be complete, casefinding, abstracting, and reporting from all sources must be complete. These sources include hospitals, freestanding pathology laboratories, non-hospital reporting sources, and data exchange with other registries. Editing and consolidation should also be complete.

Registries may find it beneficial to conduct death match and/or death clearance follow-back on a monthly or quarterly basis. Updating vital status more frequently than annually may reduce the number of follow-back requests. An interim mortality file may be used for this purpose; however, records on these files may undergo correction by vital records offices when the complete yearly file is edited. It is important to be able to identify and make corresponding changes to records linked prior to the annual process that uses the final, complete files.

2.6 Cause-of-Death Section of the Death Certificate

Causes of death recorded on the death certificate play a critical role in death clearance. This section provides information on the Cause-of-Death Section of the U.S. Standard Certificate of Death. Refer to the following NCHS publications for additional information:

- *Instruction for Completing the Cause-of-Death Section of the Death Certificate*. Issued: August 2004. 04-377 (8/04)

- Handbooks for Death Certification:
  - Physicians Handbook on Medical Certification of Death (2003 revision)
  - *Medical Examiners* (2003 Revision)
  - *Funeral Directors' Handbook on Death Registration and Fetal Death Reporting* (2003 Revision)
  - U.S. Standard Certificate of Death (11/2013)

The medical-legal officer's primary responsibility in death registration is to complete the medical part of the death certificate. The medical certification includes information on the causes and manner of death and related factors, such as the place of death and the date and time of the legal pronouncement of death. The proper completion of this section is of utmost importance to a medical-legal investigative system.

A cause of death is a disease, abnormality, injury, or poisoning that contributed directly or indirectly to death. The cause(s) of death entered on the death certificate are all diseases, morbid conditions, or injuries that either resulted in or contributed to death and the circumstances of the accident or violence that produced any such injuries.

The cause-of-death section of the death certificate is designed to elicit the opinion of the medical certifier as to the immediate cause, the antecedent causes, and the underlying cause, as well as the contributing causes of death. It consists of the following two parts:

Part I (chain of events leading directly to death from the immediate cause to the underlying cause)

a. Line (a) is used to report the immediate cause of death. This is the final disease, injury, or complication leading directly to death. It may be the only entry in the cause-of-death section if only one condition was present at death.

b. Lines (b), (c), and (d) are used to sequentially list conditions, if any, leading to the immediate cause of death. If the condition is believed to have prepared the way for the immediate cause, it can be considered an antecedent to the immediate cause even though a long interval of time has elapsed since its onset. The underlying cause of death is the disease or injury that initiated the chain of morbid events which led directly to death or the circumstance of the accident or violence which produced the fatal injury. The underlying cause of death is recorded as the last cause in this section.

Note: Although the position for underlying cause of death is specified on the death certificate, it may be entered in a different position. The most accurate method to identify the underlying cause is to refer to the Underlying Cause of Death field in the electronic mortality file.

c. The approximate interval between onset and death at the end of lines (a), (b), (c), and (d) is used to record the interval between the presumed onset and the date of death. This should be entered for all causes—immediate cause, antecedent conditions, and the underlying cause. These intervals usually are established by the medical examiner or coroner on the basis of available information. In some cases the interval is estimated. The time of onset may be obscure or entirely unknown, in which case the medical-legal officer can state that the interval is "Unknown."

Part II (other significant conditions)

Part II is used to record any other important disease or condition present at the time of death, and that may have contributed to death but did not result in the underlying cause of death listed in Part I.

The World Health Organization (WHO) recommends that its signatory nations use the underlying cause of death for basic mortality statistics. Information on the other diseases or conditions that led to death and the other significant conditions that contributed to death is also important. The cause-of-death section reflects information used to examine the frequency of certain diseases or conditions being reported on the death certificate, whether or not they are the underlying cause. Analysis of all conditions reported on the death certificate is especially important in studying diseases or conditions that are rarely the underlying cause of death, but often contribute to death (e.g., pneumonia or diabetes).

2.7 Working With Vital Records Offices

When establishing access to mortality files, registries should ask the following questions:

- **Does a formal agreement need to be established with the vital records office?**
  If an agreement is required, it should cover access to computer records, paper files, and any other documentation of death record information; information that may be accessed; subsequent use or release of death record information; and costs.

- **Are costs associated with accessing mortality files?**
  Vital records offices may charge to release their mortality files, to produce hardcopies of death certificates, or for other related activities. It is important for registries to be aware of all potential charges so that they can be included in the registry's annual budget.

- **What death certificates do the computerized mortality files include?**
  The file must include death certificates of residents in the registry catchment area who die in the registry catchment area. It may also include death certificates of residents in the registry catchment area who die in another catchment area and death certificates of residents from another catchment area who die in the registry catchment area.

  In the United States, many vital records offices have case-sharing agreements in which deaths of out-of-state residents are provided back to the state of residence. There is, however, significant variation in re-release stipulations for each state. It is important to know which states permit access by the registry and use of the death data according to the Inter- Jurisdictional Exchange Agreement for Vital Records, http://www.naphsis.org/Pages/InterJurisdictionalExchangeVitalRecords.aspx.

  In Canada, the provincial and territorial vital statistics registries capture all deaths occurring in their jurisdiction, irrespective of the usual place of residence of the decedent. The Canadian Vital Statistics Death Database collects information on all deaths occurring in Canada from the provincial and territorial vital statistics registries. Dependent on agreements among the provincial and territorial vital statistics registries and the Canadian Vital Statistics Death Database, out of province or territory deaths may be provided to the jurisdiction of residence.

- **What are the timelines for completion of mortality files?**
  In the United States, vital records offices are required to report deaths to the NCHS on a monthly or more frequent basis and are supposed to have their mortality files complete and resolved (e.g., edit errors corrected) 6 months from the end of the death year. It is common to finalize the file much later for resident data due to the long delays in receipt of out-of-state deaths for residents received from other states. In Canada, each province and territorial vital statistics agency is governed by specific legislation, and the number of days within which a death must be registered following an event varies. Caution should be taken when using the mortality file prior to completion, especially the coding of underlying cause of death. The registry needs to be aware of the status of the mortality file before beginning the death clearance process.

In addition, some death certificates for a given year may be received after submission to the NCHS. The registry needs to ask the vital records office how late submissions are handled and ensure that the file they receive contains these death records.

- **What type of death record media can be accessed?**
  Examples of death record media include electronic files (including processing files such as SuperMICAR files) and hardcopies of death certificates. Although computerized mortality files are needed to conduct record linkage, the ability to review actual diagnoses and other uncoded information on the death certificate is essential to resolve linkage questions as well as to determine reportability. If the registry is unable to obtain access to electronic files containing uncoded information, additional information may be obtained by review of microfiche or hardcopy death certificates.

- **What causes of death are coded?**
  It is important to find out what causes of death on the death certificate are coded, because only coded information can be electronically linked with registry files. Across jurisdictions, the number of coded causes of death may differ. At a minimum, the International Classification of Diseases (ICD) code for the underlying cause of death will be available. Some agencies maintain a multiple cause-of-death file that includes ICD codes for some or all of the other causes of death recorded on the death certificate.

- **What death certificates and data items on the mortality file may be accessed by the registry?**
  To effectively perform death clearance match and death clearance follow-back, registries should have access to as many death certificates and data items on the death certificate as possible. At a minimum, registries should have access to all resident deaths, including residents who expire in another state/territory/province. Registries should request data items as available from the mortality file that will facilitate linkage, describe the cancer, and provide death information. Such data items include name, address, date of birth, birth place, sex, race, ethnicity, U.S. Social Security number or Canadian heath card number, all causes of death, date of death, place of death, death certificate file number, duration or interval between onset and death, occupation, and industry.

- **How are data items on the mortality file coded?**
  Registries must know what version of ICD is used to code causes of death and what coding systems are used by vital records offices to code data items such as race, ethnicity, birthplace, county, minor civil division, marital status, occupation, and industry. It is important for registries to have access to the vital records coding manual so that a conversion program can be written if coding systems differ.

- **To whom may registries re-disclose death information incorporated into the registry through the death clearance process?**
  The agreement between registries and vital records offices should delineate permissible re-disclosures. Examples of potential sources for re-disclosure include hospital registries, other registries (e.g., AIDS), other health department programs, researchers, NAACCR, SEER, and NPCR.

3 Death Clearance Match (Death Match)

This chapter documents minimum requirements and best practices for performing death clearance match, a process in which records in the registry database are linked to mortality files for the purpose of updating death and other available information on previously-reported cases in the registry database. This process is commonly referred to as death match.

The primary source of mortality files for death match is the state/provincial/territorial vital records office. Death match may also be conducted using the National Death Index (NDI)/Vital Statistics/Statistics Canada (STC). The benefit of using the NDI/STC in addition to vital records mortality files for death match is to obtain death information on patients who no longer reside in the registry catchment area and for patients who resided in the registry catchment at the time of death but expired in another state/province/territory for which death certificates are not available to the registry.

The requirements described in this chapter are the least the registry must do to perform death match. Standard setters and registries may require more than what is called for in the minimum requirements by implementing stricter policies and procedures; however, registries may not do less than each minimum requirement. Before implementing a stricter version of the requirement, standard setters and/or registries should assess its impact on the registry's workload.

3.1 At-A-Glance List of Minimum Requirements for Conducting Death Match

The following list is an at-a-glance list of the three minimum requirements that must be included in death clearance match for the process to be considered complete. Each requirement is discussed in detail in the following sections of this chapter:

1. Death clearance match must be completed at least once per year.

2. The official mortality file from the state, territorial, or provincial vital records office containing deaths for the specified year for the catchment area must be used to match against the registry database.

3. The registry record must be updated with death and other relevant data from the mortality file for each patient match.

3.2 Detailed Description of Minimum Requirements and Best Practices for Conducting Death Match

The following detailed description of minimum requirements and best practices is provided to assist in implementing each requirement.

3.2.1 Death clearance match must be completed at least once per year.

Death match must be conducted at least once per year but may be performed more frequently to provide more current information on vital status. The year of deaths corresponds to the cancer

incidence year being completed or later if death match for the incidence year has been completed and more current vital status information is needed and available.

Best Practices for Determining Frequency for Death Match

Registries may find it beneficial to conduct death match more frequently than once per year to be able to provide more current information on vital status. If death match is performed before the mortality file is complete, registries must implement a procedure to make sure all matches are identified and all changes made to the final mortality file are incorporated into the registry database. In addition to linking the most recent year of deaths, at least once each year, registries should consider re-linking previous years to identify any deaths that may have occurred in cases added after the linkage was completed or any changes made to death information.

3.2.2 The official mortality file from the state, territorial, or provincial vital records office containing all deaths for the specified year must be used to match against the registry database.

The official mortality file must include all death certificates of residents in the registry catchment area who die in the registry catchment area. To complete death match, either the underlying cause of death file (contains only underlying cause of death) or the multiple cause of death file (contains underlying and all contributing causes of death) may be used.

Best Practices for Identifying Death Certificates to be Included in Death Match

Three types of death certificates may be included in the mortality files: (1) death certificates of residents in the registry catchment area who die in the registry catchment area, (2) death certificates of residents in the registry catchment area who die in another catchment area; and (3) death certificates of residents from another catchment area who die in the registry catchment area. See Section 2.7 for information on case-sharing agreements.

Death certificates of residents in the registry catchment area who die in the registry catchment area must be included in death match. Death certificates of residents in the registry catchment area who die in another catchment area should be included whenever possible. Due to re-release restrictions in some states/provinces/territories, access to these death certificates may be prohibited. If access is provided but re-release is prohibited, registries must have procedures in place to exclude specified information from being released. Death certificates of residents from another catchment area who die in the registry catchment area are optional to include in death match because registry records for non-residents will not be included in the registry's incidence files or statistics.

3.2.3 The registry record must be updated with death and other relevant data from the mortality file for each patient match.

When a registry record matches a record in the mortality file, death information to update vital status must be incorporated into the consolidated record in the registry database.

Some data items (e.g., date of death) may be entered without review because the information from the death certificate is the most accurate for these fields. Other fields common to both mortality and registry records require best value selection based on the guidelines provided below.

Whenever coded fields are incorporated into the registry database, the coding system used in the mortality file must be identified and codes must be converted to NAACCR standard codes if a different coding scheme is used. The following data items must be updated in the registry database for each patient match between the mortality file and the registry database and may be added without review:

NAACCR Item #	NAACCR Data Item	Instructions
1750	Date of Last Contact	Enter date of death from mortality file.
1751	Date of Last Contact Flag	Leave blank when date of death is entered.
1755	Date of Death-Canada	Enter date of death by Canadian provinces/ Territories.
1756	Date of Death-Canada Flag	Leave blank when date of death is entered.
1760	Vital Status	Enter code 0 Dead (COC) or code 4 Dead (SEER).
1791	Follow-Up Source Central	Enter code 05 to indicate state death tape/death certificate file.
1910	Cause of Death*	Enter underlying cause of death code from mortality file.
1920	ICD Revision Number	Enter code from *NAACCR Standards for Cancer Registries, Volume II* to indicate coding scheme used to code the cause of death.
1942	Place of Death--State	Enter code for the state/province/territory where patient died and where certificate of death is filed; use codes referred to in *NAACCR Standards for Cancer Registries, Volume II*; convert codes if another coding system is used.
1944	Place of Death--Country	Enter code for the country where patient died and where certificate of death is filed; use codes referred to in *NAACCR Standards for Cancer Registries, Volume II*; convert codes if another coding system is used.
2380	DC State File Number	Enter death certificate identification number as assigned by the vital statistics office in the place recorded in Place of Death [1942].

* If the registry identifies a coding error or another code considered more precise or accurate and wants to retain it, a state-specific field should be designated to record the recoded cause of death. The Underlying Cause of Death field on the mortality file captures the official cause of death. Because this variable is important for record linkage purposes and has legal implications, the code must not be changed.

Best Practices for Best Value Selection

Comparison of data items common to the registry and mortality file to determine the most accurate value is referred to as *best value selection* This comparison is recommended if time and resources permit to provide the most specific and accurate information and decrease unknown values in the registry database.

Best Value Selection Guidelines: The following guidelines are recommended to select the best value when inconsistencies exist between mortality and registry records. Registries should consider who the informant on the death certificate is and the reliability of that source as well as the reliability of other sources compared to the death certificate. When applying these guidelines, it is important that registries make consistent decisions and document how decisions are made as part of registry-specific procedures:

- Defer to the record that provides information that is known over unknown.

- If both records provide known values, defer to the record that provides more specific information over less specific information, unless otherwise indicated.

- If both records provide specific information, defer to information in the registry record over information in the mortality record.

Exception: For fields such as social security number, race, birth date, and birthplace, preference may be given to the mortality record.

The following registry data items may be populated directly, converted, or derived from information in the death certificate. If time and resources permit, values in the registry database may be compared to death certificate information to provide the most accurate information.

NAACCR Item #	NAACCR Data Item
70	Addr at DX--City
80	Addr at DX--State
90	County at DX (or may be entered when geocoded)
100	Addr at DX--Postal Code
160	Race1 (converted code)
161	Race 2 (derived from Race1)
162	Race 3 (derived from Race1)
163	Race 4 (derived from Race 1)
164	Race 5 (derived from Race 1)
190	Spanish/Hispanic Origin (converted code)
220	Sex
230	Age at Diagnosis
240	Date of Birth
252	Birthplace--State
254	Birthplace--Country
280, 272, or 310	Census Ind Code 1970-2000, Census Ind Code 2010, or Text--Usual Occupation
270, 282, or 320	Census Occ Code 1970-2000, Census Occ Code 2010, or Text--Usual Industry
400	Primary Site (from ICD-10 conversion of cancer cause of death)
522	Histologic Type ICD-O-3 (from ICD-10 conversion of cancer cause of death)
523	Behavior Code ICD-O-3 (from ICD10 conversion of cancer cause of death)
2230	Name--Last
2240	Name--First
2250	Name--Middle
2320	Social Security Number
2330	Addr at DX--No & Street
2335	Addr at DX--Supplemental
2390	Name--Maiden

Differences in Primary Site/Histologic Type may indicate different primary cancers. The first step in determining if the cause of death represents an unreported primary is to review all primary cancers reported in the registry record. If the cause of death does not appear to match any reported primaries, further investigation may be needed. See Chapter 4 Death Clearance Follow-back and Appendix E Tumor Comparison Guidelines for Death Clearance.

Edits should be in place to make sure updates made to registry records did not create any errors, such as dates of diagnosis or treatment occurring after the date of death. Registry records failing edits should be reviewed to improve data quality and identify potential inappropriate matches to mortality records.

Best Practices for Updating Registry Database

Although death information must be added to the registry's consolidated record, registries may find it beneficial to update individual abstracts in the registry database as well. Having vital status updates added to abstracts makes them more complete for uses such as research, quality assurance studies, and reports.

Depending on vital records policies, registries may choose to share vital status update information with the facility that reported the case. This information will assist hospital-based cancer registries in meeting follow-up requirements. Providing the information in an electronic file will enable facilities to incorporate updates most efficiently.

4 Death Clearance Follow-back (Death Clearance): Minimum Requirements and Best Practices

This chapter documents the minimum requirements and best practices for performing death clearance follow-back to identify and incorporate deaths with reportable diagnoses not previously included in the registry database. Compliance with these requirements is essential to assure consistency and comparability of results among registries.

Although death clearance match and death clearance follow-back comprise the death clearance process, death clearance match as described in Chapter 3 is often referred to as "death match" and death clearance follow-back is often referred to as "death clearance." Death clearance follow- back deals with records in the mortality file with a reportable diagnosis that do not match a registry record. The registry investigates these non-matches to identify potentially missed incidence cases. If sufficient follow-back information is obtained, the case may be added as a missed incidence case. If no or insufficient information is received from follow-back and the only information for these cases is from the death certificate, the non-match is entered into the registry database as a DCO.

The requirements described in this chapter are **the least** the registry must do to perform death clearance follow-back. Standard setters and registries may require more than what is called for in the minimum requirements by implementing stricter policies and procedures; however, registries may not do less than each minimum requirement specifies. Before implementing a stricter version of the rule, standard setters and/or registries should identify and assess its impact on the registry's workload and results. If non-matches beyond the minimum requirements are included (e.g., contributing cause of death), additional DCO cases identified may be flagged using a state-specific field. These DCOs would not have to be included in a required annual data submission unless required by the standard setter.

4.1 At-A-Glance List of Minimum Requirements for Death Clearance

The following list is an at-a-glance list of the nine minimum requirements that must be included in death clearance follow-back for the process to be considered complete. Each requirement is discussed in detail in the following sections of this chapter.

1. Death clearance follow-back must be conducted at least once per year.

2. The official mortality file from the state, territorial, or provincial vital records office containing deaths for a specified year for the catchment area must be used to perform death clearance follow-back. Death certificates of residents in the registry catchment area who die in the registry catchment area must be included in the death clearance follow-back process. Death certificates of residents in the registry catchment who die in another catchment area may be included in the death clearance follow-back process if standard-setting organizations require and the registry is provided access to them.

3. Death certificates with a reportable condition coded as the underlying cause of death on the mortality file must be included in the death clearance follow-back process. The contributing cause of death may be included in the death clearance follow-back process if standard- setting organizations require.

4. Cancer non-matches at the patient level must be reconciled through the death clearance follow-back process. For patient matches, comparison at the tumor level is strongly recommended but required only if specified by a standard-setting organization.

5. Follow-back information to confirm the reportable diagnosis must be obtained from a medical record or clinical source.

6. Follow-back information must provide at least confirmation of the diagnosis by a medical practitioner **and** exact or estimated date of diagnosis to abstract a non-match as an incidence case.

7. A non-match must be made a DCO when the only information available is from the death certificate, regardless of the credentials of the person signing the certificate.

8. All non-matches containing reportable underlying causes of death for a specified year of the death clearance follow-back process must be resolved as either a missed incidence case, a DCO, or deleted as non-reportable.

9. All missed incidence cases and DCOs identified during a specified year of the death clearance follow-back process must be added to the registry database for the process to be considered complete.

4.2 Detailed Description of Minimum Requirements and Best Practices for Conducting Death Clearance

The following detailed description of each minimum requirement and best practices is provided to assist in implementing the requirement.

4.2.1 Death clearance follow-back must be conducted at least once per year.

Death clearance follow-back must be conducted at least once a year. The year of death must correspond with the cancer incidence year being completed.

Best Practices for Determining Frequency for Death Clearance

Registries may find it beneficial to conduct death clearance follow-back more frequently than once per year to distribute the follow-back workload over a longer period. If linkages are performed with incomplete mortality or registry files, a final linkage should be performed after the registry file and the mortality file are complete for the year. Updates to previously linked cases should be incorporated into the final linkage.

The timeline for completing death clearance follow-back is determined by the deadline for completing the incidence file for the designated year as established by the registry or by standard-setting organizations. Cases identified through the death clearance follow-back process must be included in the incidence file for the file to be considered complete.

Many factors influence the number of staff needed to complete death clearance. These factors may include: the number of deaths occurring annually in the catchment area, length of time the registry has performed death clearance, software used by the registry, level of automation of death clearance processes, size of the registry database, and tasks performed beyond the minimum requirements. The death clearance follow-back process should be automated as much as possible to minimize staff time needed to complete all aspects.

For new registries, the first year conducting death clearance is the most difficult and time consuming. The mortality file will contain a greater number of potential incidence cases not in the registry database in this first year than in succeeding years for a variety of reasons (e.g., the diagnosis date was prior to the registry reference date, the reporting source was not required to report at the time of diagnosis). As the registry matures, more cases will have been diagnosed after the registry reference date, after non-hospital facilities were required to report, or will have been identified during a casefinding audit.

4.2.2 The official mortality file from the state, territorial, or provincial vital records office containing deaths for a specified year for the catchment area must be used to perform death clearance follow-back.

The official mortality file must include all death certificates of residents in the registry catchment area who die in the registry catchment area.

Best Practices for Identifying Death Certificates in the Mortality File

Three types of death certificates are included in the mortality files: (1) death certificates of residents in the registry catchment area who die in the registry catchment area, (2) death certificates of residents in the registry catchment area who die in another catchment area, and (3) death certificates of residents from another catchment area who die in the registry catchment area. See Section 2.7 for more information on case-sharing agreements in the United States and Canada.

Death certificates of residents in the registry catchment area who die in the registry catchment area must be included in death clearance. Death certificates of residents in the registry catchment area who die in another catchment area may be included if available. Due to re-release restrictions in some states/provinces/territories, access to these death certificates may be prohibited. Registries are strongly encouraged to find out from vital records the number/percent of resident death certificates that are received through inter-jurisdictional exchange and the approximate number/percent that may and may not be re-released for death clearance. This information should be used by the registry to determine whether or not to include these death certificates in the death clearance process.

Including death certificates of residents from another catchment area who die in the registry

catchment area is optional. These deaths are included only if standard-setting organizations require or if the central registry has identified a specific reason for them to be included.

4.2.3 Death certificates with a reportable condition coded as the underlying cause of death on the mortality file must be included in the death clearance follow-back process.

Reportable conditions include diagnoses of *in situ* or malignant cancer, or benign or borderline intracranial or central nervous system (CNS) tumor (hereafter referred to as reportable condition). Death certificates with a reportable condition coded as the underlying cause of death must be compared to the registry database to identify potentially missed cases. When a death certificate with a reportable condition does not match a record in the registry database, it is referred to as a non- match and must be included in the death clearance follow-back process.

Best Practices for Identifying Causes of Death for Death Clearance Follow-back

Reportable Conditions: Death certificates included in the death clearance follow-back process are those that contain a diagnosis of *in situ* or malignant cancer, or benign or borderline intracranial or central nervous system (CNS) tumor (hereafter referred to as reportable condition).

Appendix D: ICD-10 Casefinding Codes for Death Clearance provides a list of ICD-10 codes required to identify reportable conditions on death certificates. Additional ICD-10 codes may be used by the registry for casefinding based on experience or local coding issues. For example, records coded to C449, skin cancer, may be included to verify histology. If additional conditions are reportable by agreement for the registry, these diagnoses should also be included.

Underlying Cause of Death: The underlying cause of death is defined as the disease or injury that initiated the chain of morbid events that led directly to death or the circumstance of the accident or violence that produced the fatal injury. The underlying cause is coded and tabulated in official publications of mortality.

The most accurate way to identify the underlying cause of death is to refer to the cause of death entered in the "Underlying Cause of Death" field in the mortality file. The selection of the underlying cause is based on the application of complex rules, causal relationships, and modification tables developed by the World Health Organization (WHO) and NCHS.

Although additional reportable conditions may be identified from the contributing causes of death, these causes are not consistently coded or available to all registries, and therefore are not included as a minimum requirement. Standard-setting organizations may require, or registries may choose, to include contributing causes of death in addition to underlying cause of death in the death clearance follow-back process. The decision to include contributing causes should be based on standard-setter requirements, availability of coded causes of death, the registry's prior experience in identifying valuable cases from this source, available time, and staffing. If a registry includes contributing causes of death, it should create a state-specific field to flag DCOs identified outside this minimum requirement. These would not have to be included in an annual data submission unless required by the standard setter.

4.2.4 Cancer non-matches at the patient level must be reconciled through the death clearance process.

Cancer non-matches at the patient level means the death certificate contains a reportable condition as an underlying cause of death and the patient is not in the registry database. These non-matches must be included in the death clearance follow-back process. When the death certificate contains a reportable condition as an underlying cause of death and the patient is in the registry database, comparing the cause of death with the registered tumor(s) to determine same or different primaries (comparison at the tumor level) is strongly recommended but required only if specified by a standard-setting organization.

Best Practices for Linking at the Patient and Tumor Level

There are two types of non-matches identified through death match. The first match is at the patient level. It is acceptable to perform this linkage, resulting in identification of patients in the mortality file who do not match to the registry file, and stop without comparing the cause of death with the registry tumor information. It could be quite possible that these two sources represent two different reportable conditions, but stopping at the patient match satisfies this minimum requirement.

The second type of match is at the tumor level. Additional reportable conditions may be identified from non-matches at the tumor level. These non-matches occur when the death certificate contains a reportable condition as a cause of death and the patient is in the registry database for a different reportable condition. After a patient match is identified, some registries may compare these two sources to see if they could represent separate tumors. The decision to reconcile non-matches at the tumor level should be based on standard-setter requirements, the registry's prior experience in identifying cases from this source, available time, and staffing.

Checking the registry database for other primaries, stage specifics, and available text are the first steps in determining if the conditions represent the same or different primaries. The investigation may continue with follow-back to clinical source(s). If a cause of death identifies an additional primary, some registries will include only if it is confirmed by a clinical source while other registries will enter it as a DCO. There are valid arguments to both approaches and consensus was unable to be reached.

Appendix E: Tumor Comparison Guidelines for Death Clearance provides multiple primary determination guidance for comparing a cause of death coded in a mortality file with a primary site/histology coded in a registry database. These guidelines may be used to perform tumor comparison manually or to automate the process to increase efficiency in performing comparison at the tumor level.

4.2.5 Follow-back information to confirm the reportable diagnosis must be obtained from a medical record or clinical source.

A medical record or clinical source refers to a hospital, physician, nursing home, other health care practitioner or health care facility. Only information from these sources may be used to confirm the diagnosis. The death certificate itself, whether signed by a physician or not, is not considered a clinical source for follow-back information.

Example of previous inconsistency resolved by this minimum requirement: The death certificate is signed by a non-physician coroner and no follow-back information from a clinical source was received. In the past, to remove a non-match from DCO status, some registries followed back to the non-physician coroner and used that information while other registries used information provided from a medical record or clinical source. The correct disposition is a DCO. Information from a non-clinical source (non-physician coroner, family member, etc.) may not be used to take a case out of DCO status. The information must be provided by a clinical source or medical record. Non-clinical sources may be asked to provide the names of clinical sources from whom follow-back information may be requested.

Best Practices for Identifying Sources of Follow-back Information

Follow-back for death clearance is the process of actively searching for additional information on non-matches identified from linkage of the mortality file to the central cancer registry database. The goal of follow-back is to obtain as much clinical information as possible to create the most complete abstract or to determine the non-match is not reportable.

Follow-back is not required to be conducted on all patient non-matches; however, patient non-matches containing a reportable condition for which no follow-back was requested must then be entered as DCOs in the registry database because the only source of information is the death certificate. They may not be excluded just because no follow-back was done.

a. Sources of Follow-back Information

Clinical sources are required to confirm a diagnosis or cause of death. Clinical sources include medical records from the hospital where patient was diagnosed, treated, or expired; certifying or managing physician's office; nursing homes; hospices; and other health care facilities. For the case to be confirmed or excluded as non-reportable, the clinical source (as stated above) must report the case or provide the reason why the case was not reportable. As stated above, the death certificate itself cannot be utilized as a clinical source for follow-back.

Non-clinical sources may not be used to confirm the diagnosis to take the non-match out of DCO status but may be used as resources to identify other clinical sources for follow-back. Information from non-clinical sources may provide leads to other clinical sources and may increase the likelihood of obtaining confirmation and date of diagnosis. The Uniform Billing Hospital Discharge Data Set is an example of a non-clinical data source. Cases may not be taken out of DCO status based on a match with a record on this data set.

Non-physician coroners (who complete the death certificate) and family members fall into the category of non-clinical sources and may not be used to provide confirmation and date of diagnosis. When the only follow-back source initially available is a non-physician coroner who signed the death certificate, the follow-back query should request the name of a physician or hospital where additional information may be obtained.

Other sources of follow-back information may include:

Death Certificates: Death certificates in the form of paper copies, microfiche, or electronic files from vital records processing procedures such as SuperMICAR files may provide additional information beyond what is coded. Death certificates may be used to identify miscoded causes of death or causes of death prefaced by ambiguous terms or "history of." They may also provide information from which a diagnosis date may be determined or estimated.

Other Central Cancer Registry: Information may be obtained from another central cancer registry through a case-sharing agreement when residents expire outside the catchment area. Since this information is based on a clinical source, the information received from another central cancer registry may be used to confirm or exclude a non-match.

Cancer Registry Database: When following back on tumor non-matches, the first source of information should be the registry database. Reviewing text and determining stage of the tumor in the registry database may provide insight into the potential additional primary.

b. Number of Follow-back Sources

Single Source: When follow-back is performed, the information to determine if a non-match can be taken out of DCO status must be provided by at least one clinical source. Because information provided from follow-back is used to abstract the non-match as an incidence case, the information must be from a clinical source so that the incidence cases added from the death clearance follow-back process have the same validity as incidence cases entered routinely from reporting facilities.

When a clinical source is contacted and provides no, or insufficient, information, the registry has two options: (1) enter the non-match as a DCO, or (2) follow-back to additional clinical and non-clinical sources.

Multiple Sources: Follow-back to more than one source is determined by the amount of information received from a single clinical source, type of source and the extent that time, resources, and policy permit. Follow-back to multiple clinical sources may provide additional information to use in completing the abstract. Follow-back to non-clinical sources may provide leads to clinical sources that may be contacted. Uniform Billing Hospital Discharge Data may provide an efficient way to identify hospitals where diagnosis and/or treatment occurred.

No Source Contacted: Follow-back is not required to be conducted on all non-matches. A registry may choose not to conduct follow-back on certain non-matches due to reasons such as:

- Invalid, illegible, or missing facility or physician or identification number
- No current address for physician could be found
- Physician retired or facility closed and records could not be obtained
- Past experience with a specific source not responding to follow-back requests
- Law or regulations prohibit contact
- Insufficient registry resources.

Any non-matches for which no, or insufficient, follow-back information is received or no follow- back was attempted must be entered as DCOs in the registry database because the only source of information is the death certificate. They may not be eliminated.

4.2.6 Follow-back information must provide at least confirmation of the diagnosis by a medical practitioner and date, or estimated date, of diagnosis to abstract a non- match as an incidence case.

The goal of the follow-back process is to obtain as much clinical information as possible to create the most complete abstract or to determine the non-match is not reportable. When it is not possible to obtain all required data items in the registry's data set, the follow-back source(s) must provide at least confirmation of the diagnosis and date, or estimated date, of diagnosis before the case can be taken out of DCO status.

One exception to the requirement that the diagnosis date be provided by the clinical source is when the clinical source confirms the diagnosis but does not know the diagnosis date and there is enough information on the death certificate to establish an exact or estimated date of diagnosis, the date of diagnosis from the death certificate may be used.

Confirmation of Diagnosis: Confirmation of diagnosis means the diagnosis was made by a recognized medical practitioner, is supported by information from a clinical source or medical record, and was obtained through follow-back. The physician may be the same physician who signed the death certificate or another physician identified through follow-back. Confirmation of the diagnosis may not be provided by other sources such as a non-physician coroner, family member, or hospital discharge data set linkage.

A physician's signature on a death certificate is not sufficient to confirm the diagnosis and take a non-match out of DCO status. The diagnosis can only be confirmed through follow-back to a clinical source or medical record. Many registries question why it is necessary to follow-back to the same physician who signed the death certificate when the physician may say that what was recorded on the death certificate is all that is known. Although this may occur, the purpose of follow-back is to not only confirm the diagnosis, but to obtain as much information as possible to create a complete abstract. Registries will not know until a response is received from the follow-back request exactly how much information could be provided. When cases are taken out of DCO status, the goal is for them to be as complete as possible and as comparable in quality and completeness to abstracts routinely received from reporting sources.

Date of Diagnosis: An exact or estimated date of diagnosis must be obtained. If an exact date of diagnosis is not available, the diagnosis date may be estimated from information provided by the follow-back source(s). If no information to determine a date of diagnosis is available from the clinical follow-back source or on the death certificate, the non-match remains a DCO.

Appendix G: Estimating Date of Diagnosis for Death Clearance provides guidance for estimating a diagnosis date.

Example of previous inconsistency resolved by this minimum requirement: Follow-back on

a death certificate provides physician confirmation of cancer diagnosis but no date of diagnosis and there is no interval information appears on the death certificate to estimate a date of diagnosis. In the past, some registries considered these DCO cases using the date of death as the date of diagnosis; some took out of DCO status and abstracted as physician cases (not DCOs) because the diagnosis was confirmed by a physician but coded date of diagnosis as unknown; some did not include at all because the diagnosis was confirmed but the diagnosis date was not provided. The correct disposition is a DCO using the date of death as the date of diagnosis.

Best Practices for Developing Follow-back Queries

Queries to follow-back sources to request additional information may be conducted electronically or through post mail. These queries may include:

- Brief explanation of the DCO process, information being requested, and provisions, such as reporting law or statute to cover the release of information to the registry

- Report form or electronic abstract or link containing data from death certificate

- Method for follow-back source to provide the following information:
  - Confirmation of diagnosis by a recognized medical practitioner
  - Exact or estimated date of diagnosis. Request for diagnosis date should encourage follow-back sources to provide a general approximation if the exact date is not known (e.g., approximately 2 months ago, 3 years ago, more than 5 years ago)
  - Name of health care facility or practitioner that may provide additional information
  - State/territory/province of residence at diagnosis
  - Confirmation of information already known from the death certificate and space to complete other registry data items
  - Treatment. Provide space for date and type of surgery, radiotherapy (external or internal), chemotherapy, hormones, and other treatment
  - Stage or spread of disease at diagnosis.

4.2.7 A non-match must be made a DCO when the only information available is from the death certificate, regardless of the credentials of the person signing the certificate.

By definition, a DCO is a reportable case for which the only information the registry has is a death certificate. When insufficient or no information is obtained through follow-back or when follow-back is intentionally not conducted for specific cases, the non-match must be entered into the registry as a DCO. **The case may not be taken out of DCO status based solely on the death certificate being signed by a physician.**

The date of death is used as the date of diagnosis on a DCO unless the death certificate provides information to estimate the diagnosis date. When the date of diagnosis is taken from information on the death certificate rather than defaulted to the date of death, the case must still be entered as a DCO, regardless of the credentials of the person signing the certificate.

Example of previous inconsistency resolved by this minimum requirement: No information was obtained from follow-back to a clinical source; however, the death certificate was signed by a physician and sufficient information to estimate a date of diagnosis is documented on the death certificate. In the past, some registries took them out of DCO status and made them medical doctor only (MDO) cases; other registries considered these DCO cases. Regardless of the credentials of the person signing the death certificate, the correct disposition is DCO because the only information to abstract the case is from the death certificate. The date of diagnosis

estimated from information on the death certificate may be used as the date of diagnosis rather than the date of death.

Best Practices for Determining Disposition of Death Clearance Non-matches

This section provides best practices and guidance for determining the disposition of non-matches in the death clearance process. Appendix H of this document provides an at-a-glance summary of specific scenarios with recommended disposition.

The following references will provide assistance interpreting ambiguous terminology and abbreviations documented on death certificates and clinical sources:

- **Ambiguous Terminology:** Refer to *NAACCR Standards for Cancer Registries, Volume II, Data Standards and Data Dictionary, Chapter III: Standards for Tumor Inclusion and Reportability* for the list of Ambiguous Terminology Considered as Diagnostic of Cancer and the list of Ambiguous Terminology NOT Considered Diagnostic of Cancer by standard- setting organization. An ambiguous term not included on either list should be considered not diagnostic of cancer.

- **Abbreviations Ca and CA:** These abbreviations on a death certificate must be interpreted according to the NCHS as defined in the *NCHS Instruction Manual, Appendix D, Standard Abbreviations and Symbols.* "Ca" is an abbreviation meaning cancer; "CA" is an abbreviation meaning cancer, cardiac arrest, or carotid arteriogram. Because "CA" represents numerous life-threatening conditions, when documented without a primary site, the abbreviation should not be interpreted as specific to cancer without further query. When determined to mean cancer, Ca and CA should be coded to 8000/3.

- **History of:** Causes of death with "history of" are coded as though the term "history of" is not present. Coding instructions are provided in Part 2b, Instructions for Classifying the Multiple Causes of Death, 2008, Section II, Part E of the *NCHS Instruction Manual.*

- **Date of Diagnosis:** When the death certificate contains information to estimate the date of diagnosis, this date may be used to determine reportability and may be entered as the date of diagnosis on a DCO rather than defaulting to the date of death.

- **Follow-back:** When guidelines indicate cases may be excluded without follow-back, registries may elect to follow-back if more information would be beneficial in determining the most appropriate disposition of the case. When guidelines indicate

follow-back should be performed, experience has proven that more information is definitely needed to make the best determination.

a. Death Certificate Review

Death certificate review is the review of the textual causes of death and other information exactly as it is recorded on the death certificate rather than as they appear in coded form, such as ICD-10, in the electronic mortality file. This is accomplished by reviewing copies of the actual paper death certificates, death certificates on microfiche, or electronic files from vital records processing procedures such as SuperMICAR files. Some jurisdictions have moved to online death registration by funeral homes, physicians, hospitals, and other parties. Textual causes of death are still recorded and may be available to the registry in some form. Death certificate review is not required as death certificates or facsimiles containing textual causes of death and other information are not always available to the registry.
Death certificate review is beneficial because it is the only way certain types of non-reportable cases can be identified and eliminated. For example, if the underlying cause of death is incorrectly coded to cancer, the registry will identify this error during death certificate review and eliminate the case. However, if no death certificate review is performed and no information is obtained during follow-back, the certificate will be entered as a DCO because there is no way to identify the coding error.

Death certificate review may be conducted on non-matches either prior to follow-back to the clinical source(s) or after all follow-back efforts have been completed but before entering the case as a DCO. Reviewing death certificates prior to follow-back provides the opportunity to eliminate non-reportable cases and reduce the number of follow-back requests. Performing the review after follow-back reduces the number of death certificates to be retrieved to only those cases where insufficient or no follow-back is received.

If the death certificate is the only source of information for a reportable non-match, the non-match must be entered as a DCO. Death certificate review may provide a more specific diagnosis date for a DCO rather than defaulting to the date of death. It may also provide additional information that can be used to eliminate non-matches when insufficient or no follow- back information is received or follow-back was not conducted.

When death certificate review is performed, the following guidelines should be used to determine disposition of the case: (See also Appendix H: At-A-Glance Summary of Disposition Guidelines.)

1. **Coding Errors:** If the cause of death on the death certificate is incorrectly coded to a reportable condition, the non-match is excluded without follow-back. It is non-reportable; it is not a DCO.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). When the death certificate is reviewed, breast cancer is not listed in text as a cause of death. The case is excluded without follow-back.

2. **Ambiguous Terms:** If an ambiguous term not diagnostic of cancer is included with the

cause of death, the ICD-10 code is assigned based on the cause of death without the ambiguous term. For example, possible breast cancer is coded to breast cancer. If the cause of death includes an ambiguous term not diagnostic of cancer, the non-match may be excluded without follow-back on the basis of what is recorded on the death certificate. It is non-reportable; it is not a DCO.

Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). When the death certificate is reviewed, "possible breast cancer" is documented as the cause of death. The case may be excluded without follow-back.

3. **CA or Ca (excluding skin CA):** If CA or Ca alone without a primary site is documented as a cause of death, follow-back must be done to determine the exact cause of death.

   Examples: CA and dementia are documented as causes of death on the death certificate. Follow-back is conducted to determine whether or not the abbreviation means cancer. If breast CA or lung Ca is documented on the death certificate, follow-back is conducted to confirm the diagnosis and determine the diagnosis date.

4. **Tumor or Neoplasm (except brain and CNS):** If a cause of death includes the term tumor or neoplasm and is coded to malignant, follow-back is strongly recommended to determine the correct diagnosis.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). When the death certificate is reviewed, breast tumor is documented as a cause of death and it is coded as malignant. Follow-back is conducted to confirm the diagnosis and determine the diagnosis date if confirmed as malignant.

5. **Brain or CNS Tumor or Neoplasm:** If a cause of death is stated on the death certificate as brain or CNS tumor or neoplasm, follow-back should be conducted to try to determine behavior and diagnosis date.

   Example: The ICD-10 underlying cause-of-death code is C44.3 (pituitary gland neoplasm of uncertain or unknown behavior). When the death certificate is reviewed, pituitary gland neoplasm is documented as a cause of death. Follow-back should be conducted to try to determine if the tumor was malignant or benign and when it was diagnosed to determine if it is reportable.

6. **Skin Cancer:** If the cause of death is coded to C43 (melanoma) but is documented on the death certificate as skin cancer, the non-match may be excluded without follow-back. It is non-reportable; it is not a DCO.

   Example: The ICD-10 underlying cause-of-death code is C43.7 (malignant melanoma of the lower limb). When the death certificate is reviewed, squamous cell carcinoma of the skin, right leg was documented as the cause of death, incorrectly coded to melanoma. The case is excluded without follow-back.

7. **History of Cancer:** If the underlying cause of death documented on the death certificate includes history of cancer, follow-back should be conducted to determine the diagnosis

date. If a contributing cause-of-death includes history of cancer, the non-match may be excluded without follow-back.

Example: The underlying ICD-10 cause-of-death code is C50.9 (breast cancer). When the death certificate is reviewed, history of breast cancer is documented in text as the underlying cause of death. Follow-back should be conducted to try to determine the diagnosis date. However, if history of breast cancer is listed in text as a contributing cause of death, it may be excluded without follow-back.

8. **Diagnosis Dates:** Diagnosis dates are sometimes included on the death certificate, especially in the duration field for the specific cause of death. If the death certificate includes an actual or estimated diagnosis date that is prior to the registry reference date or prior to the date the condition became reportable, the non-match may be excluded without follow-back. It is non-reportable; it is not a DCO.

   Example: The ICD-10 cause-of-death code is D45 (polycythemia vera). The year of death was 2014. When the death certificate is reviewed, information in the duration section indicates 20 years ago, making the estimated diagnosis date 1994. This condition became reportable in 2001, therefore the case may be excluded because it was diagnosed prior to being reportable.

9. **Address Information:** The death certificate may provide additional information regarding address that may enable a case to be eliminated. The address on the coded mortality file may be within the registry catchment area, but additional information on the death certificate may indicate the patient was not a resident of the catchment area at the time of diagnosis. A non- match diagnosed outside the catchment may be excluded without follow-back. It is non-reportable; it is not a DCO.

   Example: Pennsylvania is entered in the address field on the mortality file. When the death certificate is reviewed, there is information stating the patient lived in South Carolina when diagnosed. The case may be excluded without follow-back.

b. Sufficient Follow-back Information Received

Sufficient follow-back information refers to receiving at least the minimum information needed to take a case out of DCO status, such as confirmation of the diagnosis by a clinical source or medical record and exact, or estimated, date of diagnosis (See Appendix G: Estimating Date of Diagnosis for Death Clearance). Although this is the minimum information needed to abstract the non-match as a missed incidence case, the goal is for the clinical source to report a complete abstract or provide as much information as possible to supplement the information provided on the death certificate.

To get to this point in the death clearance process, the central registry matched deaths with a reportable condition as the underlying cause of death for a specified year against the registry database. Follow-back to clinical sources was conducted on non-matches at the patient level. Clinical information received from follow-back provided at least confirmation of the diagnosis and the diagnosis date. When sufficient follow-back information is received

indicating a reportable diagnosis and diagnosis date, the case is taken out of DCO status and entered as a missed incidence case.

The following guidelines should be used to determine final disposition of the case when sufficient follow-back information is received. Even though the words "sufficient information" may not be included in each scenario, unless otherwise stated, each scenario is based on sufficient information having been received from clinical follow-back source(s).

When sufficient clinical follow-back information is received, the following guidelines should be used to determine final disposition of the case: (See also Appendix H: At-A-Glance Guidance for Determining Disposition of Death Clearance Non-matches.)

1. **Reportable ICD-10 Diagnosis Code:** If the cause of death on the death certificate is a reportable condition, and clinical follow-back source(s) provides sufficient information to confirm as reportable diagnosis and diagnosis date, the case should be entered into the registry database as a missed incidence case.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). The follow-back request was returned with a diagnosis of breast cancer and the statement "diagnosed 2 years ago" entered in the follow-back request along with other information. The case is entered into the registry database as a missed incidence case with the updated diagnosis date.

2. **No Knowledge of Reportable Condition:** If the cause-of-death code is a reportable condition but a clinical follow-back source familiar with the patient has no knowledge of the patient having the reportable condition, the non-match should be excluded. This scenario could result from situations such as a coding error or incorrect diagnosis on the death certificate. In any case, if the clinical follow-back source responds to the follow-back request by stating they have no knowledge of the patient having this condition, the non-match should be excluded. If the clinical source responds with a statement indicating this was not their patient, the response must be considered as no follow-back information received.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). The follow- back request was returned with a note stating "My patient did not have cancer." The case is excluded. Had the physician said "This is not my patient," and provided the name of another physician or hospital, additional follow-back could be attempted. If no additional follow- back, the case is entered as a DCO.

3. **Ambiguous Terminology:** Regardless of what is documented on the death certificate, if the clinical follow-back source confirms the cause of death using an ambiguous term diagnostic of cancer, the non-match should be entered as a missed incidence case. If the clinical follow-back source confirms the diagnosis using an ambiguous term not diagnostic of cancer, the non-match should be excluded.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). The request was returned with a diagnosis of "probable breast cancer, diagnosed 5 years ago".

The case is entered into the registry database as a missed incidence case. Had the diagnosis been stated as "possible breast cancer," the case would be excluded.

4. **Ca or CA:** If the clinical follow-back source uses the abbreviation Ca or CA without a primary site to confirm the diagnosis, contact the source again to confirm if cancer was meant by this abbreviation. If cancer, enter as missed case, otherwise exclude. If clinical follow-back source uses the abbreviation Ca or CA after a primary site, interpret as cancer and enter as a missed case. Code the primary site as stated, or to unknown if not stated and the histology to 8000/3.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). The request was returned with a diagnosis of "Breast Ca, diagnosed 10 years ago." The case is entered into the registry database as a missed incidence case.

5. **Tumor or neoplasm (except brain or CNS):** If clinical follow-back source can only confirm the cause of death as tumor or neoplasm without reference to being malignant (e.g., pancreatic tumor), the non-match should be excluded.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). The request was returned with a diagnosis of "Breast tumor, diagnosed 1 year ago." Since the physician did not confirm as malignant, the case is excluded.

6. **Brain or CNS tumor or neoplasm:** If clinical follow-back source confirms the brain or CNS tumor but does not specify benign or malignant, interpret as uncertain behavior. If diagnosis date from follow-back source is 2004 or after, the non-match should be entered as a missed incidence case; if diagnosed before 2004, the non-match should be excluded. If the clinical source confirms the diagnosis as benign brain or CNS tumor and provides a diagnosis date of 2004 or after, the non-match should be entered as a missed incidence case; if diagnosed prior to 2004, the non-match should be excluded. If the clinical source confirms the diagnosis as malignant brain or CNS tumor, the non-match should be entered as a missed incidence case unless diagnosis date provided is prior to the registry reference date.

   Example: The ICD-10 underlying cause-of-death code is C44.3 (pituitary gland neoplasm of uncertain or unknown behavior). The follow-back request was returned with a diagnosis of "benign pituitary gland tumor, diagnosed 2001." The case is excluded because the diagnosis was made prior to benign CNS (central nervous system) tumors being reportable.

7. **Skin Cancer:** If clinical follow-back source confirms the cause of death as skin cancer, not indicating melanoma or other reportable skin cancer, consider this non-reportable; the non- match should be excluded. It is non-reportable; it is not a DCO.

   Example: The ICD-10 underlying cause-of-death code is C43.7 (malignant melanoma of the lower limb). The follow-back request was returned with a diagnosis of "skin cancer, diagnosed 12 years ago." The case is excluded because the diagnosis of skin cancer is not reportable.

8. **History of cancer:** If the clinical follow-back source confirms a reportable cause of death with the term "history of" and the diagnosis date is reportable (after registry

reference date or after condition became reportable), the non-match should be entered as a missed incidence case.

Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). The follow-back request was returned with a diagnosis of "history of breast cancer, diagnosed 12 years ago." The case is entered as a missed incidence case.

9. **Reportable Diagnosis Date:** If the clinical follow-back source confirms a diagnosis date for a reportable cause of death after the registry reference date or after the diagnosis became reportable, the non-match should be entered as a missed incidence case.

   Example: The ICD-10 underlying cause-of-death code is D45 (polycythemia vera). The follow-back request was returned with a diagnosis of "polycythemia vera, diagnosed in 2002." The case is entered as a missed incidence case because polycythemia vera became reportable in 2001.

10. **Non-reportable Diagnosis Date:** If the clinical follow-back source confirms a diagnosis date for a reportable condition prior to the registry reference date or prior to the date the diagnosis became reportable, the non-match should be excluded.

    Example: The ICD-10 underlying cause-of-death code is C50.0 (breast cancer). The follow- back request was returned with a diagnosis of "breast cancer, diagnosed in 1990."

    The registry reference date is 1995. The case is excluded because the diagnosis date is prior to the registry reference date.

11. **No Diagnosis Date:** If the clinical follow-back source confirms a reportable diagnosis but cannot provide a diagnosis date, the non-match should be entered as a DCO unless there is a diagnosis date on the death certificate. The diagnosis date on the death certificate may be used to take the case out of DCO status as long as the diagnosis was confirmed by the clinical source. If the diagnosis date on the death certificate is after the registry reference date, the non-match should be entered as a missed incidence case; if the diagnosis date on the death certificate is before the reference date, the non-match should be excluded. If there is a diagnosis date on the death certificate and the cause of death was not confirmed by a clinical source, the non-match should be a DCO.

    Example: The ICD-10 underlying cause-of-death code is C50.0 (breast cancer). The follow- back request was returned with a diagnosis of "breast cancer, diagnosis date unknown." When the death certificate is reviewed, information on the certificate provides a diagnosis date 5 years ago. That information may be used to estimate the diagnosis date. The case is entered as a missed incidence case.

12. **Unknown Address:** If the clinical follow-back source specifically states address at diagnosis is unknown, the non-match should be entered as a missed incidence case using the address on the death certificate as the address; if there is no address on the mortality file and none is provided from follow-back, the non-match should be excluded. The registry may choose to enter the case into its database in the event it links to a late-reported abstract in the future.

Example: Massachusetts was entered as the state of residence on the death certificate. The follow-back request was returned with confirmation of the diagnosis and diagnosis date along with a note stating the physician did not know where the patient lived at the time of diagnosis. The case is entered as a missed incidence case using the Massachusetts address as the address at diagnosis.

13. **Non-resident:** If the clinical follow-back source indicates person was not a resident of the catchment area at diagnosis, the non-match should be excluded.

    Example: Texas was entered as the address on the death certificate. The follow-back request was returned with confirmation of the diagnosis and diagnosis date along with a note stating the patient was a resident of New Hampshire at the time of diagnosis. The case may be excluded.

c. Insufficient or No Follow-back Information Received

Information from follow-back is considered insufficient to take a case out of DCO status when a clinical source or medical record does not provide at least confirmation of a reportable diagnosis by a medical practitioner and the exact, or estimated, diagnosis date. Cases fall into the following scenarios for various reasons such as: central registry requests follow-back information from clinical source(s) but information received is not sufficient to meet minimum requirements; central registry requests follow-back information but clinical sources do not respond; central registry tries but is unable to identify or contact a clinical source; and central registry intentionally chooses not to conduct follow-back for reasons such as past experience with a specific source, lack of time, and/or resources.

To get to this point in the death clearance process, the central registry matched deaths with a reportable condition as the underlying cause of death from a specified year against the registry database. Follow-back to clinical sources was conducted to the extent possible on non-matches at the patient level, and the minimum information to take the case out of DCO status was not received. These cases are entered as DCOs.

The following guidelines should be used to determine final disposition of the case when insufficient or no follow-back information is received. Even though the words "insufficient or no information" may not be included in each scenario, unless otherwise stated, each scenario is based on insufficient or no information having been received from follow-back source(s).

When insufficient or no clinical follow-back information is received, the following guidelines should be used to determine final disposition of the case: (See also Appendix H: At-A-Glance Guidance for Determining Disposition of Death Clearance Non-matches.)

1. **Reportable ICD-10 Diagnosis Code:** If the cause of death is a reportable condition, and insufficient or no clinical follow-back information is received, the non-match should be entered into the registry database as a DCO.

   Example: The ICD-10 underlying cause-of-death code is C50.0 (breast cancer). No

follow- back information was received. The case is entered into the registry database as a DCO.

2. **Ambiguous Terminology:** This category is applicable only if the death certificate is reviewed. If the death certificate is not reviewed and insufficient or no clinical follow-back information is received, the only information available is the ICD-10 cause-of-death code and should be entered as a DCO.

3. **Ca or CA:** This category is applicable only if the death certificate is reviewed. If the death certificate is not reviewed and insufficient or no clinical follow-back information is received, the only information available is the ICD-10 cause-of-death code. See 1. Reportable ICD-10 Diagnosis Code in this section.

4. **Tumor or neoplasm (except brain or CNS):** This category is applicable only if the death certificate is reviewed. If the death certificate is not reviewed and insufficient or no clinical follow-back information is received, the only information available is the ICD-10 cause-of- death code. See 1. Reportable ICD-10 Diagnosis Code in this section.

5. **Brain or CNS tumor or neoplasm:** If insufficient or no clinical follow-back information is received, the non-match should be entered as a DCO using the date of death as the diagnosis date and the date used to determine reportability. If the death certificate is reviewed after insufficient or no follow-back is received and the death certificate provides a diagnosis date of 2004 or after or provides no diagnosis date, the non-match should be entered as a DCO; if the death certificate provides a date of diagnosis prior to 2004, the non-match should be excluded.
   Example: The ICD-10 underlying cause-of-death code is D44.3 (pituitary gland neoplasm of uncertain or unknown behavior). Date of death is 6/6/2014. No follow-back information was received and the death certificate was not reviewed. The case is entered as a DCO. The date of death (6/6/2014) is used as the date of diagnosis and also used to determine reportability (2004 or after). If no follow-back information was received but

   the death certificate was reviewed and a date of diagnosis of 2003 was estimated, the case is excluded because it was diagnosed prior to 2004.

6. **Skin Cancer:** This category is applicable only if the death certificate is reviewed. If the death certificate is not reviewed and insufficient or no clinical follow-back information is received, the only information available is the ICD-10 cause-of-death code. Non-matches with cause of death coded to ICD-10 code C43 are entered as melanoma DCOs; causes of death coded to ICD-10 code C44 are excluded as non-reportable skin cancers.

7. **History of:** This category is applicable only if the death certificate is reviewed. If the death certificate is not reviewed and insufficient or no clinical follow-back information is received, the only information available is the ICD-10 cause-of-death code.

8. **Diagnosis Dates:** This category is applicable only if the death certificate is reviewed. If the death certificate is not reviewed and insufficient or no clinical follow-back

information is received, the only information available is the ICD-10 cause-of-death code. See 1. Reportable ICD-10 Diagnosis Code in this section.

9. **Unknown Address:** If insufficient or no clinical follow-back information is received and the address on the mortality file is unknown, the non-match should be excluded.

   Example: The ICD-10 underlying cause-of-death code is C50.9 (breast cancer). There was no address information on the mortality file, and no follow-back information relative to the address was received. The case is excluded because it will not be included as an incidence case for the registry. The registry may choose to enter the case with address unknown in the event it links to a late-reported abstract in the future.

10. **Non-resident:** If insufficient or no clinical follow-back information is received and the address on the mortality file is out of the catchment area, the non-match may be excluded or may be entered in the event it links to a late-reported abstract in the future. (Deaths with addresses out of catchment area are not required to be included in the initial linkage.)

d. Final Authority

When conflicting information is obtained through the death clearance follow-back process and there is no way to determine one source is more accurate than another, use the following guidelines to assist in determining which information to use:

Death Certificate Review Versus Information From Clinical Follow-Back Source: When there is a discrepancy between information on the death certificate and information provided from follow-back to a clinical source or medical record, the registry should use the information provided from clinical follow-back source as the final authority.
Before defaulting to the diagnosis provided by the follow-back source, a determination must be made that the death certificate and follow-back source are referring to the same primary. It is possible that the follow-back source provided information on a different primary.

Death Certificate Versus Mortality File: When there is a discrepancy between information on the death certificate and the coded mortality file, the registry should use the information from the death certificate.

4.2.8 All non-matches containing a reportable cause of death for a specified year of the death clearance follow-back process must be resolved as either a missed incidence case, a DCO, or deleted as non-reportable.

During the death clearance follow-back process, all non-matches containing a reportable cause of death must be resolved as one of the following types of cases:

- **Missed Incidence Case:** A missed incidence case is a reportable case first identified as a non- match at the patient level for which at least confirmation of the diagnosis and diagnosis date are obtained through follow-back to a clinical source(s). The goal when entering a non-match as a missed incidence case is to create the most complete abstract possible.

- **Death Certificate Only (DCO) Case:** A DCO case is a reportable case first identified as a non-match at the patient level for which the only information the registry has is a death certificate containing the reportable condition as a cause of death.

- **Non-Reportable Case:** A non-reportable case is a case first identified as a non-match which after reviewing the death certificate and/or obtaining follow-back information does not meet reporting criteria.

If follow-back source has not responded or abstracts for missed cases have not been received from the facility by the time the process must be completed, the cases must be treated as if no follow-back information was received and must be resolved as DCOs. If information is received at a later time, the DCOs may be updated.

Best Practices for Resolving All Non-Matches

Registries should have procedures in place to account for and track the status of all non-matches of death certificates containing a reportable cause of death. Examples of the different statuses of non-matches during the death clearance follow-back process include: eliminated as non-reportable; abstracted or waiting to be abstracted as missed incidence case by a reporting source; abstracted or waiting to be abstracted as missed incidence case by the central registry; abstracted or waiting to be abstracted as a DCO; or, waiting for follow-back response.

Because the deadline for completing the death clearance follow-back process is generally determined by required annual data submissions or other required incidence file production deadlines, procedures must be in place to finalize the process at some point even if not all cases have been fully resolved.

The need to finalize incompletely resolved cases may occur when:

- **Follow-Back Response is Not Received by Deadline:** If the follow-back source has not responded by the time the process must be completed, the case must be resolved as if no

  follow-back information was received. If the cause of death is a reportable condition and there is no additional information, the case is considered a DCO.

- **Abstract is Not Received by Deadline:** If the non-match has been determined to be a missed incidence case but the abstract or sufficient information to abstract the case has not been received from the follow-back source, the case is considered a DCO until the additional information is received.

Sufficient time must be allotted to finalize these incompletely resolved cases so that the registry can prepare and enter the non-matches appropriately. If the registry has not entered all cases as either a DCO or a missed case into the registry database, the death clearance follow-back process is not considered complete.

At any point in the entry of DCOs, a DCO can be deleted if an abstract exists in the registry database. This may occur if the match was missed during the record linkage step or the abstract was entered after the non-match was identified. If the registry deletes the DCO record, the abstract and incidence records may need to be updated with death information.

4.2.9 All missed incidence cases and DCOs identified during a specified year of the death clearance follow-back process must be added to the registry database for the process to be considered complete.

Death Information: Abstracts of missed incidence cases and DCOs must include death information from the mortality file as specified in Section 3.2.3 of this manual.

DCO-Specific Values: The following codes unique to a DCO must be included in the DCO record:

- Type of Reporting Source [500] – Code 7, Death Certificate Only
- Class of Case [610] – Code 49, Death Certificate Only

If the registry has not entered all non-matches determined to be either a missed incidence case or a DCO into the registry database, the death clearance process is not considered complete.

Best Practices for Creating Abstracts of Missed Incidence Cases for Inclusion in the Registry Database

Abstracts for missed incidence cases may be completed in one of three ways:

1. **Reportable Case From a Required Reporting Source:** If a missed incidence case identified from follow-back to a required reporting source should have been reported by that source, a complete abstract should be submitted by that source. The registry must establish a tracking system to assure the case is received.

2. **Non-Reportable Case from a Required Reporting Source:** If a missed incidence case identified from follow-back to a required reporting source was not required to be reported by that source, a complete abstract may be submitted by that source or the central registry may complete the abstract using information from the death certificate and from follow-back.

3. **Reportable Case from a Clinical Source Not Required to Report:** If a missed incidence case is identified from follow-back to a clinical source that is not established as a required reporting source, the central registry should complete the abstract using information from the death certificate and from follow-back.

When the central registry abstracts the missed incidence case, information from the follow-back source should be used whenever possible, specifically for primary site, histology and date of diagnosis. The death certificate is used to incorporate death information and may also be used to complete data items not provided by the follow-back source.

Although only DCO cases are used directly in completeness assessment criteria (DCO ≤ 3%), the

percent of missed incidence cases entered into the registry database from the death clearance process is a valuable source of information regarding facility reporting and other potential clinical reporting sources. Incorporating the following data item into missed incidence cases is strongly recommended to enable evaluation for improved casefinding:

- Casefinding Source [501] – Code 80, Death Certificate (case identified through death clearance)

See Chapter 5 for more information on using death clearance results in quality control for central cancer registries.

To facilitate creation of missed incidence cases, Appendix I: DCO Data Item Values and Appendix J: ICD-10 to ICD-O-3 Conversion for Death Clearance may be used to electronically create a DCO abstract for every non-match. As follow-back is received to take the case out of DCO status, appropriate fields in the DCO abstract may be updated with information from follow-back to create a missed incidence case abstract. At the end of the process, non-matches receiving no follow-back can be automatically exported as complete DCO abstracts.

Unknown: When information for required fields is not provided from the death certificate or follow-back, data item-specific defaults may be entered as documented in Appendix I. For central registries allowing blanks in required data item fields, these defaults would not be necessary.

Best Practices for Creating DCO Abstracts for Inclusion in the Registry Database

When creating abstracts for DCOs, data for populating fields originate from one of three sources:

1. **Death Certificate:** Data items in the DCO abstract are populated with data from the death certificate either directly or after conversion when different coding systems are used by vital records and the central cancer registry for the same data item. Refer to Appendix J: ICD-10 to ICD-O-3 Conversion for Death Clearance to convert the ICD-10 reportable underlying cause of death code to populate primary site, laterality, histology and behavior codes.

2. **DCO-Specific Values:** Some data items have specific values to designate a DCO. These items and appropriate values are identified above.

3. **Unknown Values:** For NAACCR data items in the registry's required data set that cannot be populated with information from the death certificate or with a specific DCO or other standard value, the appropriate value for unknown may be entered or the field may be left blank. The decision to populate with default values of unknown or leave blank is made by the standard-setting organization and/or central registry.

Appendix I: DCO Data Item Values identifies data items to be taken from the death certificate, provides the appropriate code for DCO/death fields, and includes unknown values for common data items. Unknown values for additional data items may be added as needed by the central registry. This document may be used to assist in completing or automating the completion of

DCO abstracts and minimize or eliminate manual entry and correction of edit errors.

Recommended Final Step: As the final step after entering all DCOs, the registry should run a program against the database to identify any record for which the DCO abstract is not the only abstract for the tumor. These cases should be reviewed and the DCOs deleted if another abstract exists for the tumor. Because the death clearance process takes several months to complete, it is possible that the abstract for a non-match at the patient level may have been sent by a reporting source after linkage with the mortality file or the match was not identified during the initial linkage.

5 Getting the Most Out of Death Clearance

The death clearance process provides central cancer registries the opportunity to assess and improve completeness. The death match aspect improves completeness by updating vital status and incorporating death information into incidence records. The death clearance follow-back aspect identifies missed cases, casefinding problems, potential casefinding sources, and can also provide confirmation of a registry's effective casefinding procedures.

One obvious reason to conduct death clearance follow-back is to calculate a DCO percentage as required by standard setting organizations. Additional value from this very labor-intensive process can be realized by registries in analyzing the impact of all cases added to the database through the death clearance process.

5.1 Updating Vital Status from Death Clearance Match

Updating vital status and adding death information to cancer incidence records from the state/provincial mortality file is essential for the following reasons:

- For central registries conducting active follow-up, having the death information on cases in the registry database increases efficiency by allowing these cases to be purged from follow-up.

- The death information can be shared with hospital cancer registries to aid in the active follow-up of their analytic cases. If resources allow, the central registry may offer to perform a data linkage of the hospital data set to the central registry database to identify cases that have expired to assist with hospital registry efficiency.

- Timely updates to vital status facilitates patient contact and survivorship studies by minimizing requests for study participation to patients who have expired.

- Death match is the first step in preparing the database for survival analysis.

- Linkage with the state/provincial mortality file provides most of the vital status updates and decreases the number of records needed to be linked against the National Death Index. Many registries have automated the process for adding the vital status and death information to the registry database.

5.2 Assessing Casefinding From Death Clearance Follow-back

When discussing the value of death clearance follow-back, the term Death Certificate Notification (DCN) is often used to quantify all results. The term DCN refers to a reportable case added to the registry database as a missed incidence or DCO case from the death clearance follow-back process.

A DCN case was not previously reported by any reporting source, and the first time the registry is made aware or notified of the case is during the death clearance follow-back process. Had it not been for conducting death clearance follow-back, these cases would not be entered into the

registry database. The number of cases included in the registry database as DCN cases is impacted by the timing of death clearance follow-back

5.2.1 Calculating Death Certificate Notification (DCN) Percentage

By quantifying the results, the registry can specifically describe all cases added to the registry database from the death clearance follow-back. The numbers used to quantify DCN cases can be identified from registry death clearance tracking systems or through data items included in abstracting missed incidence and DCO cases in the registry database.

DCNs can be identified from NAACCR data items as follows:

- **Total DCNs:** Number of incidence cases for a given diagnosis year with Casefinding Source equal to 80, Death Certificate (case identified through death clearance).
- **Total Missed Incidence Cases:** Number of incidence cases for a given year with Casefinding Source equal to 80 and Type of Reporting Source not equal to 7. To identify specific facilities and volume of cases by facility reported as missed cases, Type of Reporting Source 1 can be broken down by Reporting Facility.
- **Total DCOs:** Number of incidence cases for a given year with Type of Reporting Source equal to 7, Death certificate only.

The formula to calculate DCN percentage is:

$$\left(\frac{\text{Total \# of DCNs for the Year}}{\text{Total \# of Incidence Cases* for the year}}\right) \text{X } 100 = \text{DNC Percentage}$$

***** See below for case inclusion requirements for each standard-setting organization.

For example, if a registry had 500 non-matches and 300 resulted in adding a missed incidence case to the registry incidence file, 100 were added as DCOs, and 100 were eliminated as non-reportable, the net gain to the registry is 400 cases (100 DCOs and 300 missed incidence cases). If the registry has a caseload of 10,000, the DCNs or total number of cases added through the death clearance follow-back process constitute four percent of the caseload . DCOs are a subset of DCNs.

5.2.2 Calculating DCO Percentage

The DCO percentage represents the percent of cases reported by death certificate only in a specified year. This percentage is used as a measure of completeness. Compliance with these minimum requirements will ensure consistent and comparable results and correct assumptions from analysis of DCO statistics.

Confirm DCOs: The registry should have a quality assurance procedure in place to confirm that the DCO is the only abstract for the tumor. This procedure should be carried out after the death clearance follow-back procedure is complete and before the DCO percentage is calculated. Running a program to identify any records having a DCO and non-DCO abstract associated with

the same primary will provide the opportunity to investigate the matching process and also delete the DCO.

The formula to calculate DCO percentage is:

$$\left(\frac{\text{Total \# of DCO cases for the Year}}{\text{Total \# of Incidence Cases* for the year}}\right) \text{X } 100 = \text{DCO Percentage}$$

***** See below for case inclusion requirements for each standard-setting organization.

- **Total # of DCO cases for the Year:** Number of incidence cases for a given year with Type of Reporting Source equal to 7, Death certificate only. Cases not included in the denominator as specified by each standard-setting organization (e.g., in situ breast cancers for NAACCR) must also be eliminated from the numerator. DCOs added beyond minimum requirements should also be eliminated unless required to be included by standard-setting organization.

- **Total # of Incidence Cases for the Year:** The denominator used to calculate DCO percentage includes the number of incidence cases for a given year which includes the number of cases for the year classified as DCO cases. Eliminate those cases not included by the respective standard-setting organization from the total number of incidence cases for the year plus those added beyond minimum requirements unless required to be included by standard-setting organization.

Case inclusion requirements for each standard-setting organization are:

- **Surveillance, Epidemiology, and End Results (SEER) Program:** All reportable incidence cases in the catchment areas are included in the numerator and denominator for SEER's calculation of DCO percentage.

- **National Program of Cancer Registries (NPCR):** All invasive cancers plus *in situ* bladder cancers for residents of the registry catchment area are included in the numerator and denominator for NPCR's calculation of DCO percentage. Effective with the NPCR-CSS 2010 Data Submission, benign CNS DCO cases are included in the numerator and denominator.

- **North American Association of Central Cancer Registries (NAACCR):** All invasive cancers plus *in situ* bladder cancers for residents of the registry catchment area are included in the numerator and denominator for NAACCR's calculation of DCO percentage.

- **Canadian Council of Cancer Registries (CCCR):** All reportable incidence cases for provincial/territorial residents are included in the numerator and denominator for CCCR's calculation of DCO percentage.

DCO percentage requirements for each standard-setting organization are:

- **Surveillance Epidemiology End Results (SEER):** The percentage of cases diagnosed only by a death certificate shall not exceed 1.5 percent of all cancers registered in a given year after follow-back.

- **National Program of Cancer Registries (NPCR):** The percentage of included cases* from data evaluated for the National Data Quality Standard (formerly known as the 24-month data) diagnosed only by a death certificate shall be less than or equal to 3.0 percent of the total after follow-back.

- **North American Association of Central Cancer Registries (NAACCR):** The percentage of included cases* from 24-month data diagnosed by a death certificate shall be less than or equal to 5.0 percent of the total after follow-back for silver certification and less than or equal to 3.0 percent for gold certification.

- **Canadian Council of Cancer Registries (CCCR):** The percentage of reportable cases* diagnosed only by a death certificate after follow-back shall be categorized as follows: green flag ≤ 3.0%; yellow flag 3.1-5.0%; and red flag > 5.0%. CCCR's green and yellow flags line up with NAACCR's gold and silver certifications, respectively. Data submissions are expected within 16 months of the end of the diagnosis year being evaluated.

* Included cases refers to cases included in the DCO calculation by each standard-setting organization as described in Section 5.2.2.

5.3 Improving Casefinding

The new incidence cases identified during death clearance follow-back provide important information for both the central and hospital registries that can improve casefinding. Reviewing the characteristics and circumstances of both DCOs and missed incidence cases can lead to a better understanding of systemic issues that can be addressed operationally or through training to improve casefinding.

Examples of valuable information to analyze from death clearance follow-back results include:

- Percentage of missed incidence cases by type of reporting source and/or physician specialty to determine the adequacy of reporting from required sources and justification for requiring additional sources to report

- Patterns of missed incidence cases by type of diagnostic confirmation

- Patterns of missed incidence and DCO cases by primary site

- Patterns of missed incidence and DCO cases in various geographic areas of the registry catchment area.

5.4 Improving Record Matching Process

Registries can monitor the effectiveness of the matching algorithm used for death clearance follow-back by tracking the total number of false non-matches. False non-matches become apparent when cases added to the registry database as DCOs or missed incidence cases link to a tumor already in the database. If the false non-match is due to missing data in fields used for

matching, there are few options to reduce this problem. If the false non-match is due to the matching algorithm not being robust enough to find the matches, the match criteria should be revised or a more robust algorithm used. False non-matches may also be due to incompleteness of the registry at the time linkage is performed. Adjusting the timing for beginning the death clearance follow-back process may be beneficial.

5.5 Knowing When to Use and When to Exclude Death Certificate Only (DCO)

The Death Clearance Follow-back chapter stressed the importance of obtaining accurate information from a clinical source or medical record to make a non-match a missed incidence case. The goal of follow-back is to obtain enough information to create as complete an abstract as possible. Therefore, missed incidence cases added through the death clearance follow-back process should be comparable in quality to cases routinely reported from required sources.

The expectation for quality and completeness of information contained in a DCO, however, is far less. By definition, a DCO is a reportable case for which the only information the registry has is a death certificate. The person with an address within the registry catchment area expired with a reportable condition on their death certificate and that is all that is known. DCOs can easily be identified by the Type of Reporting Source.

A non-match should never be taken out of DCO status just because the death certificate was signed by a physician or there was information on the death certificate to provide an exact or estimated date of diagnosis. If the only information to abstract the case is from the death certificate but the type of reporting source is not a DCO, the case is viewed as if reported by a medical source.

Because of the distinct difference in quality between missed incidence cases and DCOs, registries should develop policies to determine when to include and when to exclude DCO cases using the following as general guidance:

DCO cancer incidence data are of limited value for use in cancer surveillance projects. This is due to the issues of general data quality and uncertainty of date of diagnosis and assigned primary site of tumor. There is often lack of documentation as to whether the primary site is an additional primary or a metastatic site. In addition, a significant number of DCO cases have unknown primary sites as well as unknown stage at diagnosis.

DCO cases are usually included in cancer incidence descriptive statistics such as statewide annual cancer incidence report. DCO cases should not be included in analytic epidemiologic studies which require pathologic diagnostic confirmation as well as high quality data items. DCO cases should be excluded from survival analysis.

Appendix A: Death Clearance Publications

Cormier M. Canadian Cancer Registry Manual: Guidelines for Abstracting and Determining Death Certificate Only (DCO) Cases for Provincial/Territorial Cancer Registries (PTCRs) in Canada, 2006 Edition. Ottawa, Canada: Statistics Canada, July 2006.

Havener L (ed). Standards for Cancer Registries, Volume III: Standards for Completeness, Quality, Analysis, and Management of Data. Springfield (IL): North American Association of Central Cancer Registries, October 2004.

Hutchison CL, Menck HR, Burch M, Gottschalk R (eds). Cancer Registry Management, Principles and Practice, 2nd Edition. Dubuque, IA: Kendall/Hunt Publishing Company, 2004.

Jensen OM, Parkin DM, MacLennan R, Muir CS, Skeet RG (eds). IARC Scientific Publications No. 95: Cancer Registry Principles and Methods. Lyon, France: International Agency for Research on Cancer, 1991.

Menck HR, Deapen D, Phillips JL, Tucker TC (eds). Central Cancer Registries Design, Management and Use, 2nd Edition. Dubuque, IA: Kendall/Hunt Publishing Company, 2007.

NAACCR Death Clearance Best Practices Work Group (eds). Series V: Resolving Death Clearance Issues, 2002. Procedure Guidelines for Cancer Registries. Springfield, IL: North American Association of Central Cancer Registries, January 2003.

NAACCR Death Clearance Manual 2009. Springfield, IL: North American Association of Central Cancer Registries, July 2009.

NAACCR Registry Operations Committee. Series II: Calculating the Death Certificate Only (DCO) Rate. Procedure Guidelines for Cancer Registries. Springfield, IL: North American Association of Central Cancer Registries, June 2000.

NAACCR Standards for Cancer Registries, Volume III: Standards for Completeness, Quality, Analysis, and Management of Data. Springfield, IL: North American Association of Central Cancer Registries, September 2000.

Riddle, BR. A Review of Death Clearance in Central Cancer Registries and Proposal for a New Regime. *Journal of Registry Management* 2004; 31(2):67-74.

Appendix B: Death Clearance Glossary

Approximate Interval Between Onset and Death: Data item at the end of lines (a), (b), (c), and (d) on death certificate used to record the interval between the presumed onset and the date of death. This should be entered for all causes—immediate cause, antecedent conditions, and the underlying cause. These intervals usually are established by the medical examiner or coroner on the basis of available information.

Cancer Deaths: For the purpose of this manual, cancer deaths refers to all death certificates containing a cause of death that is a reportable condition including benign brain and CNS tumors and excluding conditions such as basal and squamous cell carcinomas of the skin.

Catchment Area: For the purpose of this manual, catchment area refers to the geographical area and/or population served by the registry.

Cause of Death: A disease, abnormality, injury, or poisoning that contributed directly or indirectly to death. Causes of death that are coded include Immediate Cause, Cause Leading to Immediate Cause, Next Antecedent Cause, and Underlying Cause.

Clearing Deaths: The process of carefully examining all non-matched cancer deaths to determine whether they meet registry reporting requirements based on additional follow-back information, and if so, they are abstracted as a missed incidence case or included as a DCO case.

Death Certificate: The official legal document and vital record, signed by a licensed physician or other designated authority, that includes cause of death, decedent's name, sex, place of residence, date of death; other information (e.g., birth date, birth place, occupation) may be included. The immediate cause of death is recorded on the first line of the certificate, followed by the condition(s) giving rise to this, with the underlying cause on the last line. The underlying cause is coded and tabulated in official publications of mortality.

Death Clearance: The process of matching registered deaths in a population against reportable conditions in the registry database for two purposes: (1) ascertainment of death information for persons in the registry (death clearance match), and (2) identification of all deaths with a reportable condition mentioned as a cause of death that are not found in the registry.

Death Certificate Review: The review of the causes of death and other information exactly as it is recorded on the death certificate rather than in coded form. This is accomplished by reviewing copies of actual death certificates, death certificates on microfiche, or electronic files from vital records office processing procedures such as SuperMICAR files.

Death Certificate Only (DCO) Case: A reportable case for which the only information the registry has is a death certificate.

Death Certificate Notification (DCN) Case: A reportable case added to the registry database as a missed incidence or DCO case from the death clearance follow-back process. The first time the registry is made aware or notified of the case is during the death clearance follow-back

process. The case was not previously reported by any other reporting source. Had it not been for conducting death clearance follow-back, these cases would not be entered into the registry database.

Death Clearance Match: Linkage of deaths from the mortality file to the registry database to identify records that match. For each match, the registry record is updated with death and other relevant data.

Death Clearance Follow-back: Process used to: (1) identify potentially missed incidence cases by taking patient and tumor non-matches from the death clearance match that mention a reportable condition as one of the causes of death, (2) request additional information from potential sources, and (3) abstract the missed case.

Death File: Same as Mortality File.

Deaths of Non-Residents: Persons who were not residents of the catchment area in which they died.

Follow-Back Process: The process of actively searching for additional information on potential incidence cases from sources such as hospitals, certifying physicians, nursing homes, other health care practitioners and facilities. See Death Clearance Follow-Back.

DCO Percentage (Percent DCO): Total number of DCO cases for a given year divided by total number of incident cases for the year. The denominator is determined by the standard setter for that particular registry.

Guidelines (for Death Clearance): Information and rationale within the text of the manual provided to facilitate understanding the death clearance process. Guidelines appear in non-bolded text.

Immediate Cause of Death: The final disease, injury, or complication leading directly to death. It may be the only entry in the cause of death section if only one condition was present at death. It is recorded on the first line of the certificate, followed by the condition(s) giving rise to this, with the underlying cause on the last line.

Minimum Requirements (for Death Clearance): Statements within the text of this manual describing methods, procedures, and decisions that represent the least a registry must do to perform death clearance match and death clearance follow-back.

Missed Incidence Case: A reportable case first identified as a non-matched cancer death for which confirmation of the diagnosis and other information are obtained through follow-back to a clinical source(s) or medical record.

Mortality File: The official state, territorial, or provincial data file containing all registered deaths in the catchment area for a specified period of time as reported to the vital records office. Two types of mortality files are used by cancer registries for death clearance:

(1) underlying cause of death file containing only the underlying cause of death, and
(2) multiple cause of death file containing all causes of death.
Multiple (Contributing) Cause of Death File: The official state, territorial, or provincial mortality file containing both underlying cause of death and all contributing causes of death.

Non-Matched Cancer Death: A death certificate containing a potentially reportable condition that cannot be matched to the registry database. Two types of non-matches are identified when mortality files are matched against the registry database: (1) non-match at the patient level, and (2) non-match at the tumor level for a matched patient.

Non-reportable Case: For the purpose of the death clearance follow-back procedure, a non-reportable case is a case first identified as a non-matched cancer death but after further investigation does not meet registry reporting requirements.

Out-of-State/Province/Territory Resident Deaths: Persons who expire in another state/territory/ province (catchment area). Records of residents of the registry catchment area who expire in another catchment area must be included in the mortality file used to conduct death clearance unless prohibited.

Patient Match: A death certificate with a potentially reportable condition that matches to a patient in the registry database.

a. ***Positive Patient Match:*** Match criteria are met, therefore no further manual review is required.

b. ***Possible Patient Match:*** Match criteria are incompletely met and must be manually reviewed to determine if the records are indeed matches. Review of case files, phone calls to providers, or correspondence with facilities may be required to verify possible matches.

Patient Non-Match: A death certificate with a potentially reportable condition that does not match to a patient in the registry database.

Registry or Registries: For the purpose of this manual, registry or registries is the term used to refer to any population-based cancer registry in the United States and Canada that performs death clearance. These population-based cancer registries may be referred to using terms such as state cancer registries, provincial and territorial cancer registries, and central cancer registries.

Resident Deaths: Persons who expire in their state/province/territory of residence.

Reportable Condition: The cause of death is reportable according to registry-specific policies and the list of reportable conditions.

SuperMICAR: An automated cause-of-death data entry system in the NCHS (National Center for Health Statistics) Mortality Medical Data System which allows data entry of causes of death and other information exactly as it appears on the death certificates. It then processes the data, dividing terms, replacing words with synonyms, dropping unnecessary words, and arranging

words in proper order to be found in NCHS MICAR (Mortality Medical Indexing, Classification, and Retrieval) dictionary. The result is a file that can be processed through MICAR software to produce ACME (Automated Classification of Medical Entities) input files. ACME automates the WHO (World Health Organization) rules applied to multiple cause-of-death codes (ICD) to select an underlying cause-of-death.

Tumor Comparison: The process of comparing reportable causes of death on a death certificate to tumors in the registry database.

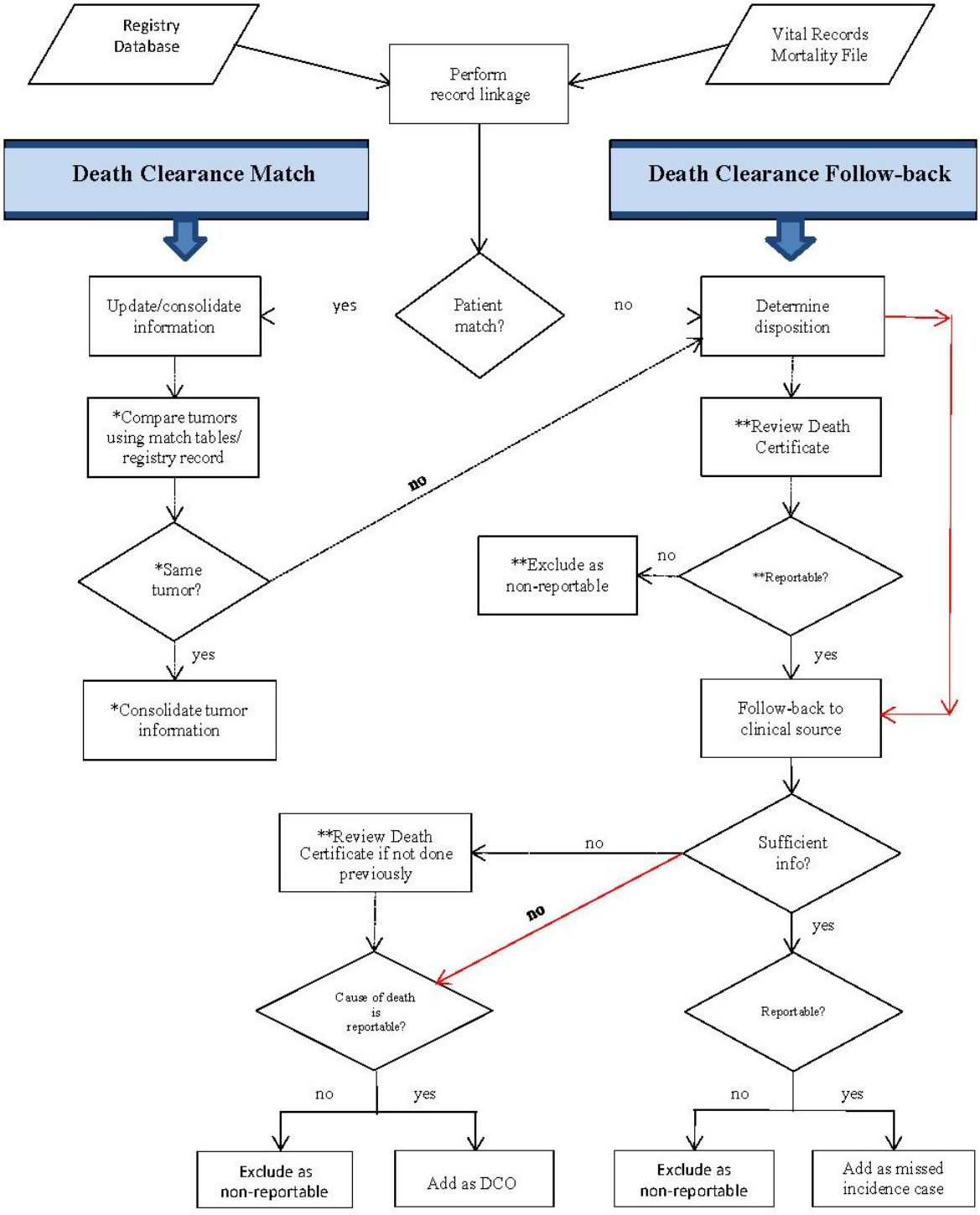
Tumor Match: A death certificate with a potentially reportable condition that matches to a patient and the patient's tumor in the registry database.

Tumor Non-Match: A death certificate with a potentially reportable condition that matches to a patient in the registry database, but not the patient's reported tumor in the registry database.

Underlying Cause of Death: The disease or injury that initiated the chain of morbid events that led directly to death or the circumstance of the accident or violence that produced the fatal injury. The underlying cause is coded and tabulated in official publications of mortality.

Underlying Cause of Death File: The official state, territorial, or provincial mortality file that contains only the disease or injury that initiated the train of morbid events leading directly to death. It does not contain any of the contributing causes of death.

Appendix C: Flow Diagram of Death Clearance Process



* Tumor comparison is optional but recommended if resources permit.
** Death certificate review is optional; may be done before or after follow-back to clinical source.

Appendix D: ICD-10 Casefinding Codes for Death Clearance

ICD-10 codes in the following table must be used to identify reportable conditions on death certificates for inclusion in the death clearance process.

When a cause of death is coded to an ICD-10 code that includes both reportable and non-reportable conditions (e.g., D46.9 and D47.1), the mortality record must be included for reconciliation through the death clearance process.

- Causes of death coded to ICD10 D46.9 are reportable except for myelodysplasia NOS.
- Causes of death coded to ICD10 D47.1 are reportable except for myelofibrosis NOS.

Additional codes may be used by the registry to identify reportable conditions.

C Codes	Code Categories	Description
C000-C979		**Malignant neoplasms**
	C000 - C759	Malignant neoplasms (stated or presumed to be primary) of specific sites, except lymphoid, hematopoietic, or related tissue
	C760 - C80	Malignant neoplasms of ill-defined, secondary, and unspecified sites
	C810 - C969	Malignant neoplasms (stated or presumed to be primary) of lymphoid, hematopoietic, and related tissue
	C97	Malignant neoplasms of independent (primary) multiple sites
D Codes	**Code Categories**	**Description**
D000-D039		***In situ* neoplasms**
	D000-D009	Carcinoma *in situ*
	D010-D019	Carcinoma *in situ* of other and unspecified organs
	D020-D029	Carcinoma *in situ* of middle ear and respiratory system
	D030-D039	Melanoma *in situ*
D050-D059	D050-D059	Carcinoma *in situ* of breast
D070-D099		**Other *in situ***
	D070-D079	Carcinoma *in situ* of other and unspecified genital organs
	D090-D099	Carcinoma *in situ* of other and unspecified sites
D320-D339		**Benign neoplasm of Brain/CNS**
	D32.0	Benign neoplasm of cerebral meninges
	D32.1	Benign neoplasm of spinal meninges
	D32.9	Benign neoplasm of meninges, unspecified
	D33.0	Benign neoplasm of brain, supratentorial
	D33.1	Benign neoplasm of brain, infratentorial
	D33.2	Benign neoplasm of brain, unspecified
	D33.3	Benign neoplasm of cranial nerves
	D33.4	Benign neoplasm of spinal cord
	D33.7	Benign neoplasm of other specified parts of central nervous system
	D33.9	Benign neoplasm of central nervous system, part unspecified
D352-D354		**Other reportable benign neoplasms**
	D35.2	Benign neoplasm of pituitary gland
	D35.3	Benign neoplasm of craniopharyngeal duct
	D35.4	Benign neoplasm of pineal gland

D Codes	Code Categories	Description
D420-D439		**Brain/CNS neoplasms of uncertain or unknown behavior**
	D42.0	Neoplasm of uncertain or unknown behavior of cerebral meninges
	D42.1	Neoplasm of uncertain or unknown behavior of spinal meninges
	D42.9	Neoplasm of uncertain or unknown behavior of meninges, unspecified
	D43.0	Neoplasm of uncertain or unknown behavior of brain, supratentorial
	D43.1	Neoplasm of uncertain or unknown behavior of brain, infratentorial
	D43.2	Neoplasm of uncertain or unknown behavior of brain, unspecified
	D43.3	Neoplasm of uncertain or unknown behavior of cranial nerves
	D43.4	Neoplasm of uncertain or unknown behavior of spinal cord
	D43.7	Neoplasm of uncertain or unknown behavior of other parts of central nervous system
	D43.9	Neoplasm of uncertain or unknown behavior of central nervous system, unspecified
D443-D445		**Other reportable neoplasms of uncertain or unknown behavior**
	D44.3	Neoplasm of uncertain or unknown behavior of pituitary gland
	D44.4	Neoplasm of uncertain or unknown behavior of craniopharyngeal duct
	D44.5	Neoplasm of uncertain or unknown behavior of pineal gland
D45	D45	Polycythemia vera (diagnosed 01/01/2001 or later)
		Myelodysplastic Syndromes
D460-D469	D46.0	Refractory Anemia without ring siderblasts
	D46.1	Refractory Anemia with ring siderblasts
	D46.2	Refractory Anemia with excess blasts
	D46.4	Refractory Anemia unspecified
	D46.9	Myelodysplastic Syndrome, unspecified
D471	D47.1	Chronic myeloproliferative disease
D473	D47.3	Essential (hemorrhagic) thrombocythemia
D721	D47.4	Eosinophilia [Hypereosinophilic (idiopathic) syndrome 9964/3]
D758	D75.8	Other specified diseases of blood and blood-forming organs [Refractory cytopenia with multilineage dysplasia 9985/3]

Appendix E: Tumor Comparison Guidelines for Death Clearance

This appendix provides guidelines for comparing a cause of death in a mortality file to a primary site/histology coded in a cancer registry database to determine if the cause of death is the same or different primary than on the registry database. Comparing patient matches at the tumor level is recommended but is not required.

While registries are strongly encouraged to perform tumor comparison, the decision to identify and reconcile non-matches at the tumor level should be based on standard-setter requirements, the registry's prior experience in identifying valuable cases from this source, available time, and staffing. When a death certificate contains a reportable condition as a cause of death and the patient is in the registry database, comparing the case at the tumor level is beneficial for several reasons: additional reportable cases may be identified, potential missed cases (hospital deaths, physician only cases) may be identified, more information on non-histologically confirmed cases may be received, and non-specific primary sites may be updated.

The following guidelines may be used to perform tumor comparison manually or to automate some of the decisions for increased efficiency and consistency.

E1 General Guidelines

E1.1 Definition of Tumor Comparison

Tumor comparison is defined as the process of comparing reportable conditions as causes of death on a death certificate to tumors in the registry database. When a patient is identified in both the registry database and the mortality file, this process looks at those patient matches to determine if the reportable condition(s) on the death certificate are accounted for in the registry database.

E1.2 Cause of Death for Tumor Comparison

Registries performing tumor comparison should compare at least the underlying cause of death on the death certificate with tumors in the registry database. Contributing causes of death may also be included in the tumor comparison. If tumor comparison is required by a standard setting organization, comparison of underlying cause of death only or all causes of death (underlying and contributing) should be specified in the requirement. If registries conduct tumor comparison voluntarily, a policy specifying comparison of underlying cause of death only or all causes of death should be established.

E1.3 Basis for Tumor Comparison Guidelines

For the death clearance process, rules for determining multiple primaries are less stringent than the guidelines for solid tumors and hematopoietic/lymphoma *Multiple Primary and Histology Coding Rules*. Because the death certificate is a legal document and not a clinical source or medical record, much more flexibility is given in determining same and different primary.

Timing rules and disease status are not factors in multiple primary decisions except as noted.

In the *Multiple Primary and Histology Coding Rules* for solid tumors, the timing associated with each schema assumes a disease-free interval. Because timing and disease status are not available when comparing to a death certificate, Rule M1 is the basis for the guidelines for determining same tumor without follow-back. Rule M1 states: "When it is not possible to determine if there is a **single** tumor **or multiple** tumors, opt for a single tumor and abstract as a single primary."

E1.4 Conversion from ICD-10 to ICD-O-3

The first step in comparing causes of death with primaries in the registry database is to convert the ICD-10 cause-of-death code to ICD-O-3 primary site/histology codes. Appendix J provides an ICD-10 to ICD-O-3 conversion for death clearance.

E1.5 Behavior [Behavior Code ICD-O-3]

While site and histology are the main data items used to determine same or different primaries, behavior (*in situ* or invasive for solid tumors; benign, borderline, or malignant for brain and central nervous system tumors) may also play a role in determining if the registry primary and the cause of death are the same primary. Section *E2 Guidelines for Determining Same Tumor without Follow-back* addresses behavior when it is the same and *E3 Guidelines for Manual Review to Determine Same and Different Primary* addresses behavior when different.

E1.6 Automation

The majority of the guidelines for determining same tumor may be automated. A computer program can be written to compare cause-of-death to primary site, histology, and/or behavior codes to determine if they are a match (same primary) based on the guidelines in section E2 below.

E1.7 Timing

Tumor comparison must be completed prior to the final submission of the death year's 24-month incidence cases. The best time to begin tumor comparison is after a majority of the death year's cancer incidence cases are complete and processed through the central registry. Because death certificates may change or get updated by Vital Records, tumor comparison should be started after the mortality file is complete. If tumor comparison is conducted before the mortality file is complete, the completed mortality file should be used to identify any death records for which changes were made.

Example: 2013 Death Year

- Late summer 2014 – mortality file is final
- February 2015 – registry 2013 incidence file is 90% complete
- February-March 2015 – tumor comparison begins
  End of November 2015 – tumor comparison complete. Any Death Certificate Only (DCO) cases are added to applied to registry's database

E2 Guidelines for Determining Same Tumor without Follow-back

The guidelines in Appendix E are designed to identify causes of death and primaries in the registry database that may be considered the same primary without the need to review multiple primary determination manuals, obtain additional information from the registry record, or follow-back to a clinical source. Although not required, registries may still choose to do follow- back.

Comparison of some tumors is based on primary site while other tumors are compared using histology. The tables in Appendix F include matching pairs for solid tumors identified by primary site (e.g. breast cancer, prostate cancer), matching pairs for solid tumors identified by histology (e.g. melanoma, mesothelioma), and matching pairs for hematopoietic and lymphoid malignancies (e.g. leukemia, lymphoma). When cause of death and registry primary are included as a match on one of these tables, the comparison indicates same primary with no additional information or follow-back needed.

The first step in tumor comparison is to convert ICD-10 cause-of-death codes to corresponding ICD-O-3 primary site, histology, and behavior codes. See Appendix J: ICD-10 to ICD-O-3 Conversion. Tumor comparison is based on the converted cause-of-death code; therefore, the columns in the tables used for comparison contain either ICD-O-3 primary site codes or ICD-O-3 histology codes, depending on how the tumors are identified.

The guidelines may be automated so the only patient matches to be manually reviewed are those not covered in the guidelines.

E2.1 Matching for Solid Tumors Identified by Primary Site

E2.1.1 ICD-O-3 Codes for Solid Tumors Identified by Primary Site: To match solid tumors by primary site, convert cause-of-death codes to ICD-O-3 primary site and histology codes, then:

a. Exclude any death certificate with a converted histology of: (see E2.2)
   - 8720 (melanoma) of any site
   - 8800 (sarcoma) of any site
   - 9050 (mesothelioma of any site)
   - 9140 (Kaposi sarcoma) of any site

b. Then exclude converted ICD-O-3 topography codes C42, C44, and C77 (see E2.3)

c. Include for converted ICD-O-3 topography codes C00-C80 (see E2.1.2-E2.1.4)

E2.1.2 Exact Match on Primary Site: When the first three (3) digits of the converted cause-of-death and registry primary site codes for solid tumors identified by primary site match exactly and behaviors are equal, consider the same primary with no additional information or follow-back needed.

Tumor comparison for excluded sites and histologies listed above are included in Section E2.2 Matching for Solid Tumors Identified by Histology.

Example: Patient had a breast primary (C50.4) in registry database diagnosed in 2000 and died in 2012 with C50.9 listed as a cause of death. Behavior of both is invasive. Consider this to be the same primary regardless of laterality or timing.

E2.1.3 Match Table for Solid Tumors Identified by Primary Site: When the first three (3) digits of the converted cause-of-death and registry primary site codes for solid tumors identified by primary site do not match exactly but are included as a match in Appendix F Site and Histology Match Tables for solid tumors identified by primary site, and behaviors are equal, consider the same primary with no additional information or follow-back needed.

Example: Refer to Appendix F Site and Histology Match Tables for solid tumors identified by primary site. Patient died in 2014 with colon cancer NOS (C189) as the underlying cause of death and primary in the registry database was rectosigmoid (C199). Behavior of both is invasive. Since the primary site codes appear as a match on the table for solid tumors identified by primary site and behaviors are equal, consider to be the same primaries.

E2.1.4 Not an Exact Match, Not on Match Table: When the first three (3) digits of the converted cause-of-death and registry primary site codes for solid tumors identified by primary site do not match exactly, are not on included on the Site and Histology Match Table for solid tumors identified by primary site, or behaviors are different, additional information and/or follow-back is required to determine if the cause of death and primary in the registry database are the same or different primary.

Example: Refer to Appendix F Site and Histology Match Tables for solid tumors identified by primary site. Patient died in 2014 with colon cancer NOS (C189) as the underlying cause of death and primary in the registry database was esophageal cancer (C159). Behavior of both is invasive. Since the primary sites are not the same and are not included as a match on the table of solid tumors identified by site, additional information and/or follow-back is required to determine if the cause of death and primary in the registry database are the same or different primaries.

E2.2 Matching for Solid Tumors Identified by Histology

E2.2.1 ICD-O-3 Codes for Solid Tumors Identified by Histology: ICD-O-3 codes to compare solid tumors identified by histology include ICD-10 cause-of-death codes converted (defaulted) to any of the following ICD-O-3 histology codes:

i. 8720 (melanoma) of any site
ii. 8800 (sarcoma) of any site
iii. 9050 (mesothelioma) of any site
iv. 9140 (Kaposi sarcoma) of any site

E2.2.2 Exact Match on Histology: When all four (4) digits of the converted cause-of- death and registry histology codes for solid tumors identified by histology match exactly regardless of primary site and behaviors are equal, consider the same primary with no additional information or follow-back needed.

Example: Patient died in 2014 with melanoma, NOS (C439 converted to C443 with histology of

8720) as the underlying cause of death. The histology of the primary in the registry database is 8720. Behaviors are both invasive. Since the converted cause-of-death code 8720 is an exact match with registry histology code 8720 (regardless of primary site) and behaviors are equal, consider the same primary with no additional information or follow-back is needed.

E2.2.3 Match Table for Solid Tumors Identified by Histology: When all four (4) digits of the converted cause-of-death and registry primary site codes for solid tumors identified by histology do not match exactly but are included as a match on Appendix F Site and Histology Match Tables for solid tumors identified by histology, and both behaviors are equal, consider the same primary with no additional information or follow-back needed.

Example: Refer to Appendix F Site and Histology Match Tables for solid tumors identified by histology. Patient died in 2014 with melanoma, NOS (C439 converted to C449, histology 8720) as the underlying cause of death. Primary in the registry database is C443 with histology of 8772. Registry histology code of 8772 falls in the range of 8720-8790 so consider the same primary with no additional information or follow-back needed.

E2.2.4 Not an Exact Match, Not on Match Table: When all four (4) digits of the converted cause-of-death and registry primary site codes for solid tumors identified by histology do not match exactly, are not included on the Site and Histology Match Tables for solid tumors identified by primary site, or behaviors are different, additional information and/or follow-back is required to determine if the cause of death and primary in the registry database are the same or different.

Example: Refer to Appendix F Site and Histology Match Tables for solid tumors identified by histology. Patient died in 2014 with melanoma, NOS (C439 converted to C449, histology 8720) as the underlying cause of death. Primary in the registry database is C445 with histology of 9702. Since the pair of histologies do not fall in a range specified for solid tumors identified by histology, additional information and/or follow-back is required to determine if the cause of death and primary in the registry database are the same or different primaries.

E2.3 Matching for Hematopoietic and Lymphoid Malignancies

E2.3.1 ICD-O-3 Codes for Matching Hematologic and Lymphoid Malignancies: ICD-O-3 histology codes to compare hematopoietic and lymphoid malignancies include 9590-9992.

E2.3.2 Exact Match on Histology: When all four (4) digits of the converted cause-of- death and registry histology codes for hematopoietic and lymphoid malignancies 9590-9989 match exactly regardless of primary site, consider the same primary with no additional information or follow-back needed.

Example: Refer to Appendix F Site and Histology Match Tables for hematopoietic and lymphoid malignancies. Patient died in 2014 with Leukemia, NOS (C95 converted to C421 with histology of 9800) as the underlying cause of death. The histology of the primary in the registry database is 9800, diagnosed in 2006. Since the converted cause-of-death histology code and registry histology code are an exact match (regardless of primary site) and behaviors are equal, consider the same primary with no additional information or follow-back needed.

E2.3.3 Match Table for Hematopoietic Malignancies: When all four (4) digits of the converted cause-of-death and registry histology codes for hematopoietic and lymphoid malignancies 9590-9992 do not match exactly but are included in Appendix F Site and Histology Match Tables as a match for hematopoietic and lymphoid malignancies (regardless of primary site), consider the same primary with no additional information or follow-back needed.

The following criteria for matching are included in the table:

a. Non-Hodgkins lymphoma – If the converted cause-of-death histology code and histology code in the registry database are in the same range or one histology code is in one range and the other histology code is in the other range, consider the same primary with no additional information or follow-back needed.
    - Range 9590-9597 or Range 9670-9759

Example: Refer to Appendix F Site and Histology Match Tables for hematopoietic and lymphoid malignancies. Patient died in 2014 with non-Hodgkin lymphoma, NOS (C859 converted to C779 with histology of 9590) as the underlying cause of death. The histology of the primary in the registry database is 9670. Since the converted cause-of-death code 9590 falls in one of the ranges and registry histology code 9690 falls in the other range, consider the same primary with no additional information or follow-back is needed.

b. Hodgkin Lymphoma – If the converted cause-of-death histology code and histology code in the registry database are both in the following range, consider the same primary with no additional information or follow-back needed.
    - Range 9650-9669

Example: Refer to Appendix F Site and Histology Match Tables for hematopoietic and lymphoid malignancies. Patient died in 2014 with Hodgkin lymphoma, NOS (C819 converted to C779 with histology of 9650) as the underlying cause of death. The histology of the primary in the registry database is 9664, diagnosed in 2006. Since both histologies fall in range, consider the same primary with no additional information or follow-back is needed.

c. Leukemia – If the converted cause-of-death histology code and histology code in the registry are both in the following range, consider the same primary with no additional information or follow-back needed.
    - Range 9800-9948

Example: Refer to Appendix F Site and Histology Match Tables for hematopoietic and lymphoid malignancies. Patient died in 2014 with Leukemia, NOS (C95 converted to C421 with histology of 9800) as the underlying cause of death. The histology of the primary in the registry database is 9861, diagnosed in 2006. Since both histologies fall in the range, consider the same primary with no additional information or follow-back needed.

d. Chronic lymphyocytic leukemia (CLL) (9823)/small lymphocytic lymphoma (SLL) (9670) – If the converted cause-of-death histology code is 9823 and the histology code in the registry is 9670, or vice versa, consider the same primary with no additional information or follow- back needed.

E2.3.4 Not an Exact Match, Not on Matching Table: When all four (4) digits of the converted cause-of-death and registry histology codes for hematopoietic and lymphoid malignancies 9590- 9992 do not match exactly or are not on included on the Site and Histology Match Table for hematopoietic and lymphoid malignancies regardless of primary site, additional information and/or follow-back is required to determine if the cause of death and primary in the registry database are the same or different primaries.

Example: Refer to Appendix F Site and Histology Match Tables for hematopoietic and lymphoid malignancies. Patient died in 2014 with Leukemia, NOS (C95 converted to C421 with histology of 9800) as the underlying cause of death. The histology of the primary in the registry database is 9652, diagnosed in 2006. Since both histologies do not fall in a range specified for hematopoietic and lymphoid malignancies, additional information and/or follow- back is required to determine if the cause of death and primary in the registry database are the same or different primaries.

E3 Guidelines for Manual Review to Determine Same and Different Primary

This section provides guidance when manual review and follow-back are needed to determine if the cause of death represents a primary already in the registry database or a new primary.

Follow-back: When additional information is needed to determine same or different primary, the first step should be to review all the information in the registry record. If the registry record does not provide sufficient information, the investigation may continue with review of multiple primary determination manuals and/or follow-back to clinical source(s). Refer to the minimum requirements and best practices for conducting follow-back described in Chapter 4.

E3.1 Different Behavior: Behavior (in situ or invasive for solid tumors; benign, borderline, or malignant for brain and central nervous system tumors) may play a role in determining if the registry primary and the cause of death are the same primary. When the only cause of death on the death certificate matches an in situ primary in the registry database, follow-back should be done. Since the likelihood of a person dying from only an in situ primary is low, it is reasonable to assume that at some point the in situ disease became invasive. If a malignant and benign brain tumor match, follow-back may be done to confirm behavior. The confirmed behavior is used to determine same or different primary.

E3.2 Match but Greater than Five (5) Years and Localized: If the cause of death and registry primary are an exact match or included on a match table but the date of diagnosis is more than five years prior to date of death and the original diagnosis was localized at the time of diagnosis and treated, the registry may want to follow-back to obtain additional information.

E3.3 Not Exact or Not on Match Table : If the determination of same or new cannot be made from comparison of the codes, follow-back may be done to obtain additional information.

E3.4 Clearly Different Primaries: If the condition in the registry database and the cause of death clearly represent different primaries, follow-back should be done to obtain additional information.

E3.5 Myeloproliferative disorders and myelodysplastic syndromes – If the converted cause-of-death histology code and histology code in the registry are both in the range of 9950 - 9992, manual review is necessary. The first step is to look up the histology codes in the *Hematopoietic and Lymphoid Neoplasm Database* (Heme DB) to determine if same or different primary. If same, no follow-back is needed; if different, follow-back is needed.

Example: Patient has refractory anemia (9980) and converted cause-of-death code from the mortality file is myelodysplastic syndrome (9989). Both histologies fall in the range. The Heme DB indicates they are the same primary; therefore, no follow-back is needed. If the patient has myeloproliferative disease (9975) and the converted cause-of-death code from the mortality file is myelodysplastic syndrome (9986), even though both codes are in the same range, the Heme DB indicates different primaries, and therefore follow-back is needed.

E3.6 Registry Primary Known/Cause of Death is Common Metastatic Site: If the primary site in the registry is a known primary and cause of death is a common metastatic site **for that type of cancer**, consider this to be the same primary; no follow-back is needed. The TNM Staging Manual is a good source for common metastatic sites for a particular site.

Example 1: Prostate and bone – If prostate cancer is in the registry database and the cause of death is bone, assume these are the same primary because bone is a common metastatic site for prostate cancer.

Example 2: Bladder and brain – If bladder cancer is in the registry database and the cause of death is brain cancer, these are not likely the same primary because brain is not a common metastatic site for bladder cancer.

E.3.7 Registry Primary Unknown/Cause of Death is Common Metastatic Site: If the primary site in the registry is unknown (C80.9) and the cause of death is a common metastatic (lung, liver, bone, or brain), consider both to represent the same primary; no follow-back is needed. The registry primary site remains coded to unknown primary (C80.9).

Example: Patient has an unknown primary (C809) and the death certificate lists liver (C220) as the cause of death. Assume the liver is metastatic from the unknown primary.

E3.8 Registry Primary Unknown/Cause of Death is Not Common Metastatic Site: If the primary site in the registry is unknown (C809) and the cause of death is **not** a common metastatic site (lung, liver, bone, or brain), follow-back should be done.

E3.9 Registry Primary not Histologically Confirmed: If the primary site in the registry is not histologically confirmed and there is no mention of the primary on the death certificate, follow-back may be done to determine if the diagnosis was ruled out at some point and should be deleted from the registry.

Appendix F: Site and Histology Match Tables

Guidelines for using the tables in this attachment are documented in Appendix E: Tumor Comparison Guidelines for Death Clearance, Section E2 Guidelines for Determining Same Tumor without Follow-back. These guidelines and tables should be used for Tumor Comparison in Death Clearance only.

Match Table for Solid Tumors Identified by Primary Site

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C00	C069 C148
C019	C02 C069 C148
C02	C019 C069 C148
C03	C069 C148
C04	C069 C148
C05	C06 C148
C06	C05 C148
C069	C00-C04
C079	C08 C148
C08	C079 C148
C09	C10 C140 C148
C10	C09 C140 C148

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C11	C140 C148
C129	C13 C140 C148
C13	C129 C140 C148
C140	C09-C13 C320
C148	C00-C13
C15	C260 C268, C269
C155	C160
C159	C160
C16	C260 C268 C269
C160	C155 C159
C17	C26
C171	C189
C18	C26
C187	C199 C209
C189	C171 C199 C209
C199	C187 C189 C209 C26
C209	C187 C189 C199 C21 C26

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C21	C209 C26 C445
C22	C240 C248 C249 C260 C268 C269
C239	C24 C260 C268 C269
C24	C22 C239 C260 C268 C269
C25	C260 C268 C269
C260	C15-C169 C17-C218 C221 C239-C259 C48
C268	C15-C259 C48
C269	C15-C259 C48
C30	C31 C39
C31	C30 C39
C32	C140 C39

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C339	C34 C39
C34	C339 C384 C39
C379	C38 C398 C399 C758
C38	C34 C379 C390 C398-C399
C384	C38
C39	C30-C34 C379
C40	C419 C49
C41	C40 C49
C412	C479
C445	C211
C47	C019-C446 C49 C50-C689 C74
C48	C26 C569
C49	C019-C689 C74
C51	C529 C577-C579
C52	C51 C577-C579
C53	C559 C578 C579

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C54	C559 C578 C579
C55	C53 C54 C573
C569	C48 C570-C574 C577 C578 C579
C570-C574	C569 C55
C577	C51-C529 C569
C578	C51-C529 C53-C569 C589
C579	C51-C529 C53-C569 C589 C649-C689
C589	C578 C579
C60	C63
C619	C639 C638
C62	C639 C638
C630-C637	C60
C638	C60 C619-C629
C639	C60 C619-C629 C649-C689

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C649	C659 C669 C68 C579 C639
C659	C649 C669 C68 C579 C639
C669	C649 C659 C68 C579 C639
C67	C688 C689 C579 C639 C680
C680-C681	C649-C669 C579 C639 C679
C688	C649-C669 C579 C639 C67
C689	C649-C669 C67 C579 C639
C70	C729
C71	C729
C720-C721	C722-C725
C722-C725	C720-C721
C729	C70-C71

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C739	C758 C759
C74	C75 C751
C750, C752-C755	C740
C751	C740
C758	C379 C739 C74
C759	C739 C74
C760	C00-C14 C30-C339 C410-C411 C440-C444 C470 C490 C69 C700 C71 C770
C761	C34-C39 C412-C413 C445 C473 C476 C493 C496 C701 C72 C771
C762	C16-C18 C199 C22-C269 C445 C474 C48

ICD-10 Cause-of-death Code Converted to ICD-O-3 Primary Site Code	Registry ICD-O-3 Primary Site Code
C762 (continued)	C494 C649-C669 C772
C763	C187 C199 C414 C475 C495 C51-C57 C60-C63 C67 C775
C764	C400-C401 C446 C471 C491 C773
C765	C402-C403 C447 C472 C492 C774
C809 (within 5 years of diagnosis)	Any Site

Match Table for Solid Tumors Identified by Histology

ICD-10 Cause-of-death	ICD-10 Cause-of-death Code Converted to ICD-O-3 Histology Code	Registry ICD-O-3 Histology Code
Melanoma (C43)	8720	8720-8790
Mesothelioma (C45)	9050	9050-9055
Kaposi Sarcoma (C46)	9140	9140
Sarcoma*	8800	8800-8991 8033 9120

*Most will match based on C47_ site code; for those not coded to C47_, match may be made based on histology.

Match for Hematopoietic and Lymphoid Malignancies

ICD-10 Cause-of-death	ICD-10 Cause-of-death Code Converted to ICD-O-3 Histology Code	Registry ICD-O-3 Histology Code
Hodgin Lymphoma (C81)	9650-9669	9650-9669
Non-Hodgin Lymphoma (C82-C85)	9590-9597	9590-9597
	9670-9759	9670-9759
	9590-9597	9670-9759
	9670-9759	9590-9597
Leukemia (C91-C96)	9800-9948	9800-9948
Chronic Lymphocytic Leukemia (CLL) (C911)	9823	9823 9670
Small Lymphocytic Lymphoma (SLL) (C830)	9670	9670 9823
Waldenstrom's Macroglobulinemia (C88.0)	9761	9761 9671

Appendix G: Estimating Date of Diagnosis for Death Clearance

The data item *Date of Diagnosis* may be estimated if an exact diagnosis date is not available. Use the following guidelines to estimate the date of diagnosis from information provided by follow-back source(s) or documented on the death certificate:

Term	Estimate As
Spring of	April
Summer	July
Middle of year	July
Fall or autumn	October
Winter	Try to determine whether reference is to first of year (interpret as January) or end of year (December). If part of year cannot be determined, interpret as January.
Early in year	January
Late in year	December
Recently	Use month and year of death and unknown for day. If death occurred during the first week of a month, enter the previous month.
A couple (two)	• A couple days ago is two days prior to death. Use month, day, and year. • A couple weeks ago is two weeks prior to death. Use month and year with day of diagnosis unknown. • A couple of months ago is 2 months prior to death. Use month and year with day of diagnosis unknown. • A couple years ago is 2 years prior to death. Use month and year with day of diagnosis unknown.
A few (three)	• A few days ago is 3 days prior to death. Use month, day, and year. • A few weeks ago is 3 weeks prior to death. Use month and year with day of diagnosis unknown. • A few months ago is 3 months prior to death. Use month and year with day of diagnosis unknown. • A few years ago is 3 years prior to death. Use month and year with day of diagnosis unknown.
Several (four)	• Several days ago is 4 days prior to death. Use month, day, and year. • Several weeks ago is 4 weeks prior to death. Use month and year with day of diagnosis unknown. • Several months ago is 4 months prior to death. Use month and year with day of diagnosis unknown. • Several years ago is 4 years prior to death. Use month and year with day of diagnosis unknown.
Range of weeks, months, or years ago	Take the middle of the range (e.g., 2 to 4 months ago is 3 months from the date death, with day of diagnosis unknown).

Calculating month and year of diagnosis in the absence of day of diagnosis

When information is available to calculate the month and/or year of diagnosis, use the information to calculate as much of the diagnosis date as possible with day of diagnosis unknown.

Example 1: Follow-back information or death certificate states diagnosed 7 years ago. Subtract 7 from the year of death. Use calculated year, use month of death for month of diagnosis, with day of diagnosis unknown.

Example 2: Follow-back information or death certificate states diagnosed 6 months ago. Subtract 6 months from date of death. Use calculated month and year, with day of diagnosis unknown.

Example 3: Follow-back provides information on a particular admission (e.g., admitted October 2007). History states diagnosed 7 months ago. Subtract 7 from the month of admission. Use calculated month and year, with day of diagnosis unknown.

Example 4: Follow-back provides information on an outpatient bone scan performed in January 2007 that states history of prostate cancer. The physician says the patient was diagnosed in 2007. Assume bone scan was part of initial work-up. Use the month and year of the bone scan, with day of diagnosis unknown.

Example 5: Follow-back provides information regarding the patient's diagnosis from a particular admission to the facility. No diagnosis date is provided but the information specifies an admission date. Use the month and year of admission with day of diagnosis unknown.

Appendix H: At-A-Glance Guidance for Determining Disposition of Death Clearance Non-matches

The table below provides at-a-glance guidance for determining disposition of non-matches from the death clearance process. The content is based on section *4.2.7 Best Practices for Determining Disposition of Death Clearance Non-matches*.

The following information explains the content of each column on the table and the abbreviations used within the table:

Column 1: Column 1 describes common scenarios encountered when reviewing non-matches.

Column 2: Column 2 describes disposition when death certificate (DC) review is performed before follow-back (FB). Review of death certificates may be conducted before FB to a clinical source, after FB, or not at all. Death certificate review provides additional information not available through codes that can be used to exclude cases, e.g., coding errors, causes-of-death (COD) that include ambiguous terms not diagnostic of cancer, history of cancer.

Column 3: Column 3 describes disposition when sufficient FB information is received. Sufficient FB means FB to a clinical source provided information to at least confirm diagnosis and provide an exact or estimated diagnosis date. FB to a clinical source should be conducted for all non-matches not excluded after DC review or for all non-matches when DC review is not performed. After receiving sufficient FB information, non-matches are either entered as missed cases or excluded. If a registry includes DC review in the death clearance process, no death certificates need to be reviewed for non-matches for which sufficient FB information is received.

Column 4: Column 4 describes disposition when insufficient or no FB information is received. This column includes cases such as when the registry received some information but not enough to confirm the diagnosis and provide a diagnosis date; when the registry sent a FB request and did not receive a response; or when the registry did not attempt FB. In these cases, the only information available to determine final disposition is the information on the mortality file unless DC review is performed. Disposition is either "enter as DCO" or exclude. If DC review is not performed prior to FB, death certificates of cases disposed of as "enter as DCO" after FB may be reviewed to identify any that may be excluded as indicated in column 5.

Column 5: Column 5 describes disposition when DC review is performed after FB. Death certificates reviewed include those cases determined to be a Death Certificate Only (DCO) when insufficient or FB was received.

1		2	3	4	5
		DC Review before FB	**Sufficient FB Information Received**	**No or Insufficient FB Information Received**	**DC Review after FB (if Insufficient or no FB Information Received)**
1	**Reportable condition or COD code**	COD on DC is a reportable condition – **FB;** COD on DC is not a reportable condition - **exclude**	FB source confirms COD as reportable condition and provides a reportable diagnosis date or diagnosis date is on the DC – e**nter as missed case**	FB source does not provide confirmation of diagnosis and diagnosis date – e**nter as DCO**	COD on DC is a reportable condition - **enter as DCO**
2	**Coding Error (**This scenario is only known when death certificates are reviewed.)	COD is coded to reportable condition but there is no reportable condition on the DC - **exclude**	Death certificate is not reviewed or not reviewed before FB and FB source has no knowledge of the cancer COD, e.g. COD code C50 on mortality file but FB source has no knowledge of breast cancer - **exclude**	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	COD coded to reportable condition but no reportable condition on DC - **exclude**
3	**Ambiguous term diagnostic of cancer**[1]	COD on DC includes ambiguous term diagnostic of cancer, e.g. probable breast cancer - **FB**	FB source confirms COD using ambiguous term diagnostic of cancer – **enter as missed case**	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	COD on DC includes ambiguous term diagnostic of cancer, e.g. probable breast cancer – **enter as DCO**
4	**Ambiguous term <u>not</u> diagnostic of cancer**[1] **(**this scenario would be coded to cancer)	COD on DC includes ambiguous term <u>not</u> diagnostic of cancer, e.g. possible breast cancer - **exclude**	FB source confirms COD using ambiguous term <u>not</u> diagnostic of cancer - **exclude**	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	COD on DC includes ambiguous term <u>not</u> diagnostic of cancer, e.g. possible breast cancer - **exclude**

1		2	3	4	5
		DC Review before FB	**Sufficient FB Information Received**	**No or Insufficient FB Information Received**	**DC Review after FB (if Insufficient or no FB Information Received)**
5	**Ca or CA**[2] (this scenario would be coded to cancer)	COD on DC includes CA or Ca - **FB**	FB source confirms COD as Ca or CA with-out site, confirm meaning with source. If cancer, **enter as missed case.** If primary site is included, **code primary site as provided and histology to 8000/3;** if no site provided, **code primary site to unknown and histology to 8000/3**	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	COD on DC includes CA or Ca. If the COD can be accurately interpreted as cancer, **enter as DCO**; if not, and abbreviation is Ca, consider cancer**, enter as DCO**; if not and abbreviation is CA, **exclude**
6	**Tumor or neoplasm (except brain and CNS)**	COD on DC stated as tumor or neoplasm with no reference to being malignant, e.g. pancreatic tumor - **FB**	FB source confirms COD as tumor or neoplasm without reference to being malignant, e.g. pancreatic tumor – **exclude**	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	COD on DC stated as tumor or neoplasm with no reference to being malignant, e.g. pancreatic tumor – **exclude.** (This would be a coding error.)
7	**Brain or CNS tumor or neoplasm**	COD on DC stated as brain or CNS tumor or neoplasm - **FB**	FB source confirms COD as brain or CNS tumor or neoplasm; interpret as uncertain behavior. If diagnosis date is 2004 or after,	FB source does not provide confirmation of diagnosis or diagnosis date and no diagnosis date on DC – **enter as DCO**	COD on DC stated as brain or CNS tumor or neoplasm. Interpret as uncertain behavior. If DC provides diagnosis date of 2004 or after,

1		2	3	4	5
		DC Review before FB	**Sufficient FB Information Received**	**No or Insufficient FB Information Received**	**DC Review after FB (if Insufficient or no FB Information Received)**
			enter as missed case; if diagnosed before 2004, **exclude**		**enter as DCO;** if diagnosis date on DC is prior to 2004, **exclude;** if DC provides no diagnosis date information, **enter as DCO**
8	**Skin cancer, Skin CA, Skin Ca coded to C43**	COD on DC stated as skin cancer, skin CA, or skin Ca and coded to C43 or other reportable skin cancer- e**xclude**	FB source confirms COD as skin cancer, skin CA or skin Ca, consider non-reportable – **exclude**	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	COD on DC stated as skin cancer, skin CA, or skin Ca and coded to C43 or other reportable skin cancer- e**xclude**
9	**History of cancer**[3] (this scenario would be coded to cancer)	Underlying COD on DC includes "history of" with no other information – **FB;** Contributing COD on DC includes "history of" with no other information – may **exclude**	FB source confirms underlying COD as "history of" a reportable condition but diagnosis date is reportable, **enter as missed case.** If diagnosis date is not reportable, **exclude**	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	COD on DC includes "history of" with no other information - **exclude**
10	**Reportable diagnosis date**	Diagnosis date is included on DC with reportable COD, e.g. bladder cancer diagnosed 3 years ago - **FB**	FB source confirms COD and provides diagnosis date after registry reference date – **enter as missed case;** or FB source confirms COD, does not provide diagnosis date but reportable	Not Applicable – This level of detail is not available unless the DC is reviewed or FB information is provided. See scenario 1.	Diagnosis date is included on DC with reportable COD, e.g. bladder cancer diagnosed 3 years ago – **enter as DCO using date of diagnosis from DC**

1		2	3	4	5
		DC Review before FB	**Sufficient FB Information Received**	**No or Insufficient FB Information Received**	**DC Review after FB (if Insufficient or no FB Information Received)**
			diagnosis date is on DC – **enter as missed case using date of diagnosis from DC**		
11	**No diagnosis date**	DC contains no information to establish a diagnosis date - **FB**	FB source confirms COD and does not provide a diagnosis date, but there is a diagnosis date on the DC, the diagnosis date on the DC can be used – **enter as missed case using date of diagnosis from DC**	FB source does not provide confirmation of diagnosis or diagnosis date– **enter as DCO**	DC contains no information to establish a diagnosis date – **enter as DCO**
12	**Diagnosed prior to central registry reference date**	Diagnosis date is included on DC with reportable COD and is prior to registry reference date, e.g. bladder cancer diagnosed in 1990, registry reference date is 1995 - **exclude**	FB source confirms COD and provides diagnosis date prior to registry reference date - **exclude**	FB source does not provide confirmation of diagnosis or diagnosis date – **enter as DCO**	Diagnosis date is included on DC with reportable COD and is prior to registry reference date, e.g. bladder cancer diagnosed in 1990, registry reference date is 1995 – **exclude**
13	**Diagnosed prior to being a reportable condition**	Diagnosis date is included on DC with reportable COD and is prior to condition being reportable, e.g. polycythemia vera diagnosed prior to 2001 - **exclude**	FB source confirms COD and provides diagnosis date prior to condition being reportable, e.g. polycythemia vera diagnosed prior to 2001 - **exclude**	FB source does not provide confirmation of diagnosis or diagnosis date – **enter as DCO**	Diagnosis date is included on DC with reportable COD and is prior to condition being reportable, e.g. polycythemia vera diagnosed prior to 2001 - **exclude**

1		2	3	4	5
		DC Review before FB	**Sufficient FB Information Received**	**No or Insufficient FB Information Received**	**DC Review after FB (if Insufficient or no FB Information Received)**
14	**Unknown Address**	DC contains no address for decedent – **FB;** DC includes documentation that could be interpreted as address at diagnosis, if in catchment area, **FB;** if outside catchment area, may **exclude**	FB source specifically states address at diagnosis is unknown – **enter as missed case using address on DC as address at diagnosis;** if no address on mortality file**, exclude**	FB source does not provide confirmation of diagnosis or diagnosis date – **enter as DCO using address from mortality file as address at diagnosis;** if no address on mortality file, **exclude**	DC contains no address for decedent – **may exclude;** DC includes documentation that could be interpreted as address at diagnosis, if in catchment area, **enter as DCO;** if outside catchment area, **may exclude**
15	**Non-resident**	Address on mortality file is within catchment area, but information on DC states patient was not a resident of catchment area at diagnosis - **exclude**	Address on mortality file is within catchment area, but FB source indicates person was not a resident of the catchment area at diagnosis - **exclude**	FB source does not provide confirmation of diagnosis or diagnosis date and address on mortality file is within catchment area, **enter as DCO;** if address on mortality file is not within catchment area - **exclude**	Address on mortality file is within catchment area, but information on DC states patient was not a resident of catchment area at diagnosis – may **exclude**

[1] Ambiguous Terminology: See *NAACCR Standards for Cancer Registries, Volume II, Data Standards and Data Dictionary, Chapter III: Standards for Tumor Inclusion and Reportability* for list of Ambiguous Terminology Considered as Diagnostic and not Diagnostic of Cancer.

[2] Abbreviations Ca and CA: This abbreviation on a death certificate must be interpreted according to the NCHS as defined in the *NCHS Instruction Manual,* Appendix D, Standard Abbreviations and Symbols. "Ca" is an abbreviation meaning cancer; "CA" is an abbreviation meaning cancer, cardiac arrest, or carotid arteriogram. Because "CA" represents numerous life-threatening conditions, the abbreviation should not be interpreted as specific to cancer without further inquiry.

[3] History of Cancer: Causes of death with "history of" are coded as though the term "history of" is not present. Coding instructions are provided in Part 2b, Instructions for Classifying the Multiple Causes of Death, 2008, Section II, Part E of the *NCHS Instruction Manual.*

Appendix I: Death Certificate Only (DCO) Data Item Values

(Updated to include 2018 Dx changes)

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
10	Record Type	A	3
50	NAACCR Record Version	Insert appropriate version number	3
70	Addr at DX--City	Information from Death Certificate	2
80	Addr at DX--State	Information from Death Certificate	2
90	County at DX	Information from Death Certificate or may be entered when geocoded	2 or 3
100	Addr at DX--Postal Code	Information from Death Certificate; if position 152-155 = 0000, then delete	2
150	Marital Status at DX	Information from Death Certificate	2
160	Race 1	Information from Death Certificate (converted code)	2
161	Race 2	If Race1=99, then 99; if Race1 not = 99 then 88	2
162	Race 3	If Race1=99, then 99; if Race1 not = 99 then 88	2
163	Race 4	If Race1=99, then 99; if Race1 not = 99 then 88	2
164	Race 5	If Race1=99, then 99; if Race1 not = 99 then 88	2
170	Race Coding Sys--Current	Insert appropriate code	3
190	Spanish/Hispanic Origin	Information from Death Certificate (converted code)	2
220	Sex	Information from Death Certificate	2
230	Age at Diagnosis	Information from Death Certificate	2
240	Date of Birth	Information from Death Certificate	2
252	Birthplace--State	Information from Death Certificate	2
254	Birthplace--Country	Information from Death Certificate	2
270	Census Occ Code 1970-2000	Information from Death Certificate	2
272	Census Ind Code 2010	Information from Death Certificate	2
280	Census Ind Code 1970-2000	Information from Death Certificate	2
282	Census Occ Code 2010	Information from Death Certificate	2

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend *
290	Occupation Source	If Census Occ Code 1970-2000 [270] or Census Occ Code 2010 [282] is populated, enter 2; if both fields are blank, leave blank	2
300	Industry Source	If Census Ind Code 1970-2000 [280] or Census Ind Code 2010 [272] is populated, enter 2; if both fields are blank, leave blank	2
310	Text--Usual Occupation	If Census Occ Code 1970-2000 [270] or Census Occ Code 2010 [282] is populated, enter text associated with code; If both fields are blank, enter "unknown"	2
320	Text--Usual Industry	If Census Ind Code 1970-2000 [280] or Census Ind Code 2010 [272] is populated, enter text associated with code; If both fields are blank, enter "unknown"	2
330	Census Occ/Ind Sys 70-00	If Census Occ Code 1970-2000 [270] is not blank, enter 5; if Census Occ Code 1970-2000 [270] is blank, leave blank	2
390	Date of Diagnosis	Date of Death from Death Certificate	1,2
400	Primary Site	Convert ICD-10 cancer cause-of-death code to ICD-0-3 topography code	2
410	Laterality	Use ICD-10 to ICD-O-3 conversion to populate laterality from cause-of-death code	2

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
440	Grade (Prior to 2018)	If Histologic Type ICD-O-3 [522] = 9700, 9701, 9702, 9705, 9708, 9709, 9716, 9717, 9718, 9724, 9725, 9726, 9827, 9831, 9834, 9837, enter 5; or If Histologic Type ICD-O-3 [522] = 9591, 9596, 9597, 9670, 9671, 9673, 9678, 9679, 9680, 9684, 9687, 9688, 9689, 9690, 9691, 9695, 9698, 9699, 9712, 9728, 9731, 9732, 9734, 9737, 9738, 9762, 9811, 9812, 9813, 9814, 9815, 9816, 9817, 9818, 9823, 9833, 9836, 9940, enter 6; or If Histologic Type ICD-O-3 [522] = 9719, 9948, enter 8; For all other Histologic Type ICD-O-3 codes [522], enter 9	3
450	Site Coding Sys--Current	5	3
470	Morph Coding Sys--Current	7	3
490	Diagnostic Confirmation	9	3
500	Type of Reporting Source	7 - Death Certificate Only (DCO)	1,3
501	Casefinding Source	80 - Death Certificate (identified through death clearance)	1,3
522	Histologic Type ICD-O-3	Convert ICD-10 cancer cause-of-death code to ICD-0-3 topography code	2
523	Behavior Code ICD-O-3	Use ICD-10 to ICD-O-3 conversion to populate behavior from cause-of-death code	2
540	Reporting Facility	3 options: 1) select number entered on each record; 2) accept number already on file; 3) leave blank	3
560	Sequence Number--Hospital	If Behavior Code-ICDO3 [523] = 0 or 1, enter 60; otherwise enter 00	3
580	Date of 1st Contact	Date of Death from Death	2

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
591	Date of Inpt Adm Flag	10	3
601	Date of Inpt Disch Flag	10	3
610	Class of Case	49 - Death Certificate Only	3
630	Primary Payer at DX	99	3
668	RX Hosp – Surg App 2010	Blank	3
682	Date Regional Lymph Node Dissection (2018+)	Blank	3
683	Date Regional Lymph Node Dissection Flag (2018+)	10	3
752	Tumor Size Clinical (2016+)	999	3
754	Tumor Size Pathologic (2016+)	999	3
756	Tumor Size Summary (2016+)	999	3
759	SEER Summary Stage 2000 (2001-2017)	9	3
760	SEER Summary Stage 1977 (2000 and earlier)	9	3
764	Summary Stage 2018	9	3
772	EOD Primary Tumor (2018+)	For schema = 99999 enter 888; Otherwise enter 999	3
774	EOD Regional Nodes (2018+)	For schemas = 00721-00723, 00790, 00795, 00821, 00830, 99999 enter 888; Otherwise enter 999	3
776	EOD Mets (2018+)	For schemas = 00458, 00790, 00795, 00821, 00822, 00830, 99999 enter 88; Otherwise enter 99	3
820	Regional Nodes Positive	99	3
830	Regional Nodes Examined	99	3
832	Date of Sentinel Lymph Node Biopsy (2018+)	Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
833	Date of Sentinel Lymph Node Biopsy Flag (2018+)	10	3
834	Sentinel Lymph Nodes Examined (2018+)	If Schema= 00470 or 00480, enter 99; Otherwise leave blank	3
835	Sentinel Lymph Nodes Positive (2018+)	If Schema=00470 or 00480, enter 99; Otherwise leave blank	3
1112	Mets at DX – Bone (2016+)	If Schema=00821, 00822 or 00830 or Primary site C420, C421, C423, C424 enter 8; Otherwise enter 9	3
1113	Mets at DX – Brain (2016+)	If Schema=00821, 00822 or 00830 or Primary site C420, C421, C423, C424 enter 8; Otherwise enter 9	3
1114	Mets at DX – Distant LN (2016+)	If Schema=00821, 00822 or 00830 or Primary site C420, C421, C423, C424 enter 8; Otherwise enter 9	3
1115	Mets at DX – Liver (2016+)	If Schema=00821, 00822 or 00830 or Primary site C420, C421, C423, C424 enter 8; Otherwise enter 9	3
1116	Mets at DX – Lung (2016+)	If Schema=00821, 00822 or 00830 or Primary site C420, C421, C423, C424 enter 8; Otherwise enter 9	3
1117	Mets at DX – Other (2016+)	If Schema=00821, 00822 or 00830 or Primary site C420, C421, C423, C424 enter 8; Otherwise enter 9	3
1182	Lymph-vascular Invasion	If Schema=Lymphoma or HemeRetic**, enter 8; otherwise enter 9	3
1201	RX Date Surgery Flag	10	3
1210	RX Date Radiation	Blank	
1211	RX Date Radiation Flag	10	3
1220	RX Date Chemo	Blank	

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
1221	RX Date Chemo Flag	10	3
1230	RX Date Hormone	Blank	
1231	RX Date Hormone Flag	10	3
1240	RX Date BRM	Blank	
1241	RX Date BRM Flag	10	3
1250	RX Date Other	Blank	
1251	RX Date Other Flag	10	3
1260	Date Initial RX SEER	Blank	
1261	Date Initial RX SEER Flag	10	3
1270	Date 1st Crs RX--COC	Blank	
1271	Date 1st Crs Rx Flag	10	3
1285	RX Summ--Treatment Status	9	3
1290	RX Summ--Surg Prim Site	If Schema=00830 or 99999,enter 98; Otherwise enter 99	3
1292	RX Summ--Scope Reg LN Sur	9	3
1294	RX Summ--Surg Oth Reg/Dis	9	3
1296	RX Summ--Reg LN Examined	99	3
1320	Surgical Margins	9	3
1340	Reason for No Surgery	9	3
1380	RX Summ--Surg/Rad Seq	0	3
1390	RX Summ--Chemo	99	3
1400	RX Summ--Hormone	99	3
1410	RX Summ--BRM	99	3
1420	RX Summ--Other	9	3
1430	Reason for No Radiation	9	3
1460	RX Coding System--Current	06	3
1500	First Course Calc Method	1	3
1501	Phase I Dose per Fraction	Blank	3
1502	Phase I Radiation External Beam Planning Tech	Blank	3
1503	Phase I Number of Fractions	Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
1504	Phase I Radiation Primary Treatment Volume	99	3
1505	Phase I Radiation to Draining Lymph Nodes	Blank	3
1506	Phase I Radiation Treatment Modality	99	3
1507	Phase I Total Dose	Blank	3
1511	Phase II Dose per Fraction	Blank	3
1512	Phase II Radiation External Beam Planning Tech	Blank	3
1513	Phase II Number of Fractions	Blank	3
1514	Phase II Radiation Primary Treatment Volume	Blank	3
1515	Phase II Radiation to Draining Lymph Nodes	Blank	3
1516	Phase II Radiation Treatment Modality	Blank	3
1517	Phase II Total Dose	Blank	3
1521	Phase III Dose per Fraction	Blank	3
1522	Phase III Radiation External Beam Planning Tech	Blank	3
1523	Phase III Number of Fractions	Blank	3
1524	Phase III Radiation Primary Treatment Volume	Blank	3
1525	Phase III Radiation to Draining Lymph Nodes	Blank	3
1526	Phase III Radiation Treatment Modality	Blank	3
1527	Phase III Total Dose	Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
1531	Radiation Treatment Discontinued Early	Blank	3
1532	Number of Phases of Rad Treatment to this Volume	Blank	3
1533	Total Dose	Blank	3
1570	Rad--Regional RX Modality (prior to 2018)	99	3
1639	RX Summ--Systemic Sur Seq	0	3
1750	Date of Last Contact	Date of Death from Death	1,2
1751	Date of Last Contact Flag	Blank	
1755	Date of Death--Canada	Date of Death from Death	1
1756	Date of Death--CanadaFlag	Blank	
1760	Vital Status	0	1,3
1791	Follow-up Source Central	05 - State Death Tape/Death Certificate File 1,3	
1910	Cause of Death	Information from Death Certificate	1
1920	ICD Revision Number	1	1,3
1942	Place of Death--State	Information from Death Certificate	1,2
1944	Place of Death--Country	Information from Death Certificate	1,2
2090	Date Case Completed	3 options: 1) select date entered on each record; 2) accept date already on file; 3) leave blank	3
2110	Date Case Report Exported	3 options: 1) select date entered on each record; 2) accept date already on file; 3) leave blank	3
2116	ICD-O-3 Conversion Flag	0	3
2140	COC Coding Sys--Current	08	3
2152	CoC Accredited Flag	Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
2170	Vendor Name	3 options: 1) select name/code entered on each record; 2) accept name or code already on file; 3) leave blank	3
2230	Name--Last	Information from Death Certificate	2
2240	Name--First	Information from Death Certificate	2
2250	Name--Middle	Information from Death Certificate	2
2270	Name--Suffix	Information from Death Certificate	2
2300	Medical Record Number	3 options: 1) select number entered on each record; 2) accept number already on file; 3) leave blank	3
2320	Social Security Number	Information from Death Certificate	2
2330	Addr at DX--No & Street	Information from Death Certificate	2
2335	Addr at DX--Supplementl	Information from Death Certificate	2
2380	DC State File Number	Information from Death Certificate	1,2
2390	Name--Maiden	Information from Death Certificate	2
2410	Institution Referred From	3 options: 1) select number entered on each record; 2) accept number already on file; 3) leave blank	3
2470	Physician--Follow-Up	3 options: 1) select number entered on each record; 2) accept number already on file; 3) leave blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
2800	CS Tumor Size (2004-2017)	If Schema=Conjunctiva, HemeRetic, Kaposi Sarcoma, Lymphoma, MelanomaChoroid, MelanomaCiliaryBody, MelanomaIris, or Myeloma PlasmaCellDisorder enter 988; Otherwise enter 999	3
2810	CS Extension (2004-2017)	If Schema=IllDefinedOther, enter 988; Otherwise enter 999	3
2820	CS Tumor Size/Ext Eval (2004-2017)	9	3
2830	CS Lymph Nodes (2004-2017)	If Schema=HemeRetic, IllDefinedOther, Intracranial Gland, Lymphoma, or Placenta enter 988; If Schema= MyelomaPlasma Cell Disorder and histology = 9731 or 9732, enter 987; Otherwise enter 999	3
2840	CS Reg Nodes Eval (2004-2017)	9	3
2850	CS Mets at DX (2010-2017)	If Schema=HemeRetic, IllDefinedOther, Kaposi Sarcoma,Lymphoma, or MyelomaPlasmaCell Disorder, enter 98; Otherwise enter 99	3
2851	CS Mets at DX-Bone (2010-2017)	9	3
2852	CS Mets at DX-Brain (2010-2017)	9	3
2853	CS Mets at DX-Liver (2010-2017)	9	3
2854	CS Mets at DX-Lung (2010-2017)	9	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
2860	CS Mets Eval (2004-2017)	9	3
2861	CS Site-Specific Factor 7 (2010-2017)	Refer to state-specific default value***	3
2862	CS Site-Specific Factor 8 (2010-2017)	Refer to state-specific default value	3
2863	CS Site-Specific Factor 9 (2010-2017)	Refer to state-specific default value	3
2864	CS Site-Specific Factor 10 (2010-2017)	Refer to state-specific default value	3
2865	CS Site-Specific Factor 11 (2010-2017)	Refer to state-specific default value	3
2866	CS Site-Specific Factor 12 (2010-2017)	Refer to state-specific default value	3
2867	CS Site-Specific Factor 13 (2010-2017)	Refer to state-specific default value	3
2868	CS Site-Specific Factor 14 (2010-2017)	Refer to state-specific default value	3
2869	CS Site-Specific Factor 15 (2010-2017)	Refer to state-specific default value	3
2870	CS Site-Specific Factor 16 (2010-2017)	Refer to state-specific default value	3
2871	CS Site-Specific Factor 17 (2010-2017)	Refer to state-specific default value	3
2872	CS Site-Specific Factor 18 (2010-2017)	Refer to state-specific default value	3
2873	CS Site-Specific Factor 19 (2010-2017)	Refer to state-specific default value	3
2874	CS Site-Specific Factor 20 (2010-2017)	Refer to state-specific default value	3
2875	CS Site-Specific Factor 21 (2010-2017)	Refer to state-specific default value	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
2876	CS Site-Specific Factor 22 (2010-2017)	Refer to state-specific default value	3
2877	CS Site-Specific Factor 23 (2010-2017)	Refer to state-specific default value	3
2878	CS Site-Specific Factor 24 (2010-2017)	Refer to state-specific default value	3
2879	CS Site-Specific Factor 25 (2010-2017)	Refer to state-specific default value	3
2880	CS Site-Specific Factor 1 (2004-2017)	Refer to state-specific default value	3
2890	CS Site-Specific Factor 2 (2004-2017)	Refer to state-specific default value	3
2900	CS Site-Specific Factor 3 (2004-2017)	Refer to state-specific default value	3
2910	CS Site-Specific Factor 4 (2004-2017)	Refer to state-specific default value	3
2920	CS Site-Specific Factor 5 (2004-2017)	Refer to state-specific default value	3
2930	CS Site-Specific Factor 6 (2004-2017)	Refer to state-specific default value	3
2935	CS Version Input Original	Insert appropriate version number	3
2936	CS Version Derived	Insert appropriate version number	3
2937	CS Version Input Current	Insert appropriate version number	3
3231	RX Date Systemic Flag	10	3
3250	RX Summ Transplnt/Endocr	99	3
3700	SEER_SSF1: HPV Status	Leave Blank	3
3801	Chromosome 1p: Loss of Heterozygosity (LOH)	Leave Blank	3
3802	Chromosome 19q: Loss of Heterozygeosity (LOH)	Leave Blank	3
3803	Adenoid Cystic Basaloid Pattern	Leave Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
3804	Adenopathy	Leave Blank	3
3805	AFP Post-Orchiectomy Lab Value	Leave Blank	3
3806	AFP Post-Orchiectomy Range	Leave Blank	3
3807	AFP Pre-Orchiectomy Lab Value	Leave Blank	3
3808	AFP Pre-Orchiectomy Range	Leave Blank	3
3809	AFP Pretreatment Interpretation	Leave Blank	3
3810	AFP Pretreatment Lab Value	Leave Blank	3
3811	Anemia	Leave Blank	3
3812	B Symptoms	Leave Blank	3
3813	Bilirubin Pretreatment Total Lab Value	Leave Blank	3
3814	Bilirubin Pretreatment Unit of Measure	Leave Blank	3
3815	Bone Invasion	Leave Blank	3
3816	Brain Molecular Markers	Leave Blank	3
3817	Breslow Tumor Thickness	Leave Blank	3
3818	CA-125 Pretreatment Interpretation	Leave Blank	3
3819	CEA Pretreatment Interpretation	Leave Blank	3
3820	CEA Pretreatment Lab Value	Leave Blank	3
3821	Chromosome 3 Status	Leave Blank	3
3822	Chromosome 8q Status	Leave Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
3823	Circumferential Resection Margin (CRM)	Leave Blank	3
3824	Creatinine Pretreatment Lab Value	Leave Blank	3
3825	Creatinine Pretreatment Unit of Measure	Leave Blank	3
3826	Estrogen Receptor Percent Positive or Range	Leave Blank	3
3827	Estrogen Receptor Summary	Leave Blank	3
3828	Estrogen Receptor Total Allred Score	Leave Blank	3
3829	Esophagus and EGJ Tumor Epicenter	Leave Blank	3
3830	Extranodal Extension Clin (non-Head and Neck)	Leave Blank	3
3831	Extranodal Extension Head and Neck Clinical	Leave Blank	3
3832	Extranodal Extension Head and Neck Pathological	Leave Blank	3
3833	Extranodal Extension Path (non-Head and Neck)	Leave Blank	3
3834	Extravascular Matrix Patterns	Leave Blank	3
3835	Fibrosis Score	Leave Blank	3
3836	FIGO Stage	Leave Blank	3
3837	Gestational Trophoblastic Prognostic Scoring Index	Leave Blank	3
3838	Gleason Patterns Clinical	Leave Blank	3
3839	Gleason Patterns Pathological	Leave Blank	3
3840	Gleason Score Clinical	Leave Blank	3
3841	Gleason Score Pathological	Leave Blank	3
3842	Gleason Tertiary Pattern	Leave Blank	3
3843	Grade Clinical (2018+)	9	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
3844	Grade Pathological (2018+)	9	3
3845	Grade Post Therapy (2018+)	Blank	3
3846	hCG Post-Orchiectomy Lab Value	Leave Blank	3
3847	hCG Post-Orchiectomy Range	Leave Blank	3
3848	hCG Pre-Orchiectomy Lab Value	Leave Blank	3
3849	hCG Pre-Orchiectomy Range	Leave Blank	3
3850	HER2 IHC Summary	Leave Blank	3
3851	HER2 ISH Dual Probe Copy Number	Leave Blank	3
3852	HER2 ISH Dual Probe Ratio	Leave Blank	3
3853	HER2 ISH Single Probe Copy Number	Leave Blank	3
3854	HER2 ISH Summary	Leave Blank	3
3855	HER2 Overall Summary	Leave Blank	3
3856	Heritable Trait	Leave Blank	3
3857	High Risk Cytogenetics	Leave Blank	3
3858	High Risk Histologic Features	Leave Blank	3
3859	HIV Status	Leave Blank	3
3860	International Normalized Ratio Prothrombin Time	Leave Blank	3
3861	Ipsilateral Adrenal Gland Involvement	Leave Blank	3
3862	JAK2	Leave Blank	3
3863	Ki-67	Leave Blank	3
3864	Invasion Beyond Capsule	Leave Blank	3
3865	KIT Gene Immunohistochemistry	Leave Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
3866	KRAS	Leave Blank	3
3867	LDH Post-Orchiectomy Range	Leave Blank	3
3868	LDH Pre-Orchiectomy Range	Leave Blank	3
3869	LDH Pretreatment Level	Leave Blank	3
3870	LDH Upper Limits of Normal	Leave Blank	3
3871	LN Assessment Method Femoral-Inguinal	Leave Blank	3
3872	LN Assessment Method Para-Aortic	Leave Blank	3
3873	LN Assessment Method Pelvic	Leave Blank	3
3874	LN Distant Assessment Method	Leave Blank	3
3875	LN Distant: Mediastinal, Scalene	Leave Blank	3
3876	LN Head and Neck Levels I-III	Leave Blank	3
3877	LN Head and Neck Levels IV-V	Leave Blank	3
3878	LN Head and Neck Levels VI-VII	Leave Blank	3
3879	LN Head and Neck Other	Leave Blank	3
3880	LN Isolated Tumor Cells (ITC)	Leave Blank	3
3881	LN Laterality	Leave Blank	3
3882	LN Positive Axillary Level I-II	Leave Blank	3
3883	LN Size	Leave Blank	3
3884	LN Status Femoral-Inguinal, Para-Aortic, Pelvic	Leave Blank	3
3885	Lymphocytosis	Leave Blank	3
3886	Major Vein Involvement	Leave Blank	3
3887	Measured Basal Diameter	Leave Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
3888	Measured Thickness	Leave Blank	3
3889	Methylation of O6-Methylguanine-Methyltransferase	Leave Blank	3
3890	Microsatellite Instability (MSI)	Leave Blank	3
3891	Microvascular Density	Leave Blank	3
3892	Mitotic Count Uveal Melanoma	Leave Blank	3
3893	Mitotic Rate Melanoma	Leave Blank	3
3894	Multigene Signature Method	Leave Blank	3
3895	Multigene Signature Results	Leave Blank	3
3896	NCCN International Prognostic Index (IPI)	Leave Blank	3
3897	Number of Cores Examined	Leave Blank	3
3898	Number of Cores Positive	Leave Blank	3
3899	Number of Examined Para-Aortic Nodes	Leave Blank	3
3900	Number of Examined Pelvic Nodes	Leave Blank	3
3901	Number of Positive Para-Aortic Nodes	Leave Blank	3
3902	Number of Positive Pelvic Nodes	Leave Blank	3
3903	Oncotype Dx Recurrence Score-DCIS	Leave Blank	3
3904	Oncotype Dx Recurrence Score-Invasive	Leave Blank	3
3905	Oncotype Dx Risk Level-DCIS	Leave Blank	3
3906	Oncotype Dx Risk Level-Invasive	Leave Blank	3
3907	Organomegaly	Leave Blank	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
3908	Percent Necrosis Post Neoadjuvant	Leave Blank	3
3909	Perineural Invasion	Leave Blank	3
3910	Peripheral Blood Involvement	Leave Blank	3
3911	Peritoneal Cytology	Leave Blank	3
3913	Pleural Effusion	Leave Blank	3
3914	Progesterone Receptor Percent Positive or Range	Leave Blank	3
3915	Progesterone Receptor Summary	Leave Blank	3
3916	Progesterone Receptor Total Allred Score	Leave Blank	3
3917	Primary Sclerosing Cholangitis	Leave Blank	3
3918	Profound Immune Suppression	Leave Blank	3
3919	Prostate Pathological Extension	Prostate schema only (00580) = 999; Otherwise leave blank	3
3920	PSA (Prostatic Specific Antigen) Lab Value	Leave Blank	3
3921	Residual Tumor Volume Post Cytoreduction	Leave Blank	3
3922	Response to Neoadjuvant Therapy	Leave Blank	3
3923	S Category Clinical	Leave Blank	3
3924	S Category Pathological	Leave Blank	3
3925	Sarcomatoid Features	Leave Blank	3
3926	Schema Discriminator 1	If required for schema, enter 9; otherwise leave blank Exceptions (required for schema, but don't have a code 9): - C739 – Enter 1 - C760 – Enter 0 - C680 – Enter 1 - C694 – Leave blank or default to 1	3

NAACCR Item #	NAACCR Field Name	DCO Abstract Values	See Legend*
3927	Schema Discriminator 2	If required for schema, enter 9; otherwise leave blank	3
3928	Schema Discriminator 3	Blank	3
3929	Separate Tumor Nodules	Leave Blank	3
3930	Serum Albumin Pretreatment Level	Leave Blank	3
3931	Serum Beta-2 Microglobulin Pretreatment Level	Leave Blank	3
3932	LDH Pretreatment Lab Value	Leave Blank	3
3933	Thrombocytopenia	Leave Blank	3
3934	Tumor Deposits	Leave Blank	3
3935	Tumor Growth Pattern	Leave Blank	3
3936	Ulceration	Leave Blank	3
3937	Visceral and Parietal Pleural Invasion	Leave Blank	3
*	**Legend:**		
	1-Data item required for DCOs		
	2-Information from Death Certificate- direct, converted or derived		
	3-Can be defaulted by DCO program or left blank		
**	See Collaborative Stage Manual for ICD-O-3 Schema codes		

Appendix J: ICD-10 to ICD-O-3 Conversion for Death Clearance

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
1	C000	C000	0	8000	3	External upper lip
2	C001	C001	0	8000	3	External lower lip
3	C002	C002	0	8000	3	External lip, unspecified
4	C003	C003	0	8000	3	Upper lip, inner aspect
5	C004	C004	0	8000	3	Lower lip, inner aspect
6	C005	C005	0	8000	3	Lip, unspecified, inner aspect
7	C006	C006	0	8000	3	Commissure of lip
8	C008	C008	0	8000	3	Overlapping lesion of lip
9	C009	C009	0	8000	3	Lip, unspecified
10	C01	C019	0	8000	3	Malignant neoplasm of base of tongue
11	C020	C020	0	8000	3	Dorsal surface of tongue
12	C021	C021	0	8000	3	Border of tongue
13	C022	C022	0	8000	3	Ventral surface of tongue
14	C023	C023	0	8000	3	Anterior two-thirds of tongue, part unspecified
15	C024	C024	0	8000	3	Lingual tonsil
16	C028	C028	0	8000	3	Overlapping lesion of tongue
17	C029	C029	0	8000	3	Tongue, unspecified
18	C030	C030	0	8000	3	Upper gum
19	C031	C031	0	8000	3	Lower gum
20	C039	C039	0	8000	3	Gum, unspecified
21	C040	C040	0	8000	3	Anterior floor of mouth
22	C041	C041	0	8000	3	Lateral floor of mouth
23	C048	C048	0	8000	3	Overlapping lesion of floor of mouth
24	C049	C049	0	8000	3	Floor of mouth, unspecified
25	C050	C050	0	8000	3	Hard palate
26	C051	C051	0	8000	3	Soft palate
27	C052	C052	0	8000	3	Uvula
28	C058	C058	0	8000	3	Overlapping lesion of palate
29	C059	C059	0	8000	3	Palate, unspecified

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
30	C060	C060	0	8000	3	Cheek mucosa
31	C061	C061	0	8000	3	Vestibule of mouth
32	C062	C062	0	8000	3	Retromolar area
33	C068	C068	0	8000	3	Overlapping lesion of other and unspecified parts of mouth
34	C069	C069	0	8000	3	Mouth, unspecified
35	C07	C079	9	8000	3	Malignant neoplasm of parotid gland
36	C080	C080	9	8000	3	Submandibular gland
37	C081	C081	9	8000	3	Sublingual gland
38	C088	C088	0	8000	3	Overlapping lesion of major salivary glands
39	C089	C089	0	8000	3	Major salivary gland, unspecified
40	C090	C090	9	8000	3	Tonsillar fossa
41	C091	C091	9	8000	3	Tonsillar pillar (anterior) (posterior)
42	C098	C098	9	8000	3	Overlapping lesion of tonsil
43	C099	C099	9	8000	3	Tonsil, unspecified
44	C100	C100	0	8000	3	Vallecula
45	C101	C101	0	8000	3	Anterior surface of epiglottis
46	C102	C102	0	8000	3	Lateral wall of oropharynx
47	C103	C103	0	8000	3	Posterior wall of oropharynx
48	C104	C104	0	8000	3	Branchial cleft
49	C108	C108	0	8000	3	Overlapping lesion of oropharynx
50	C109	C109	0	8000	3	Oropharynx, unspecified
51	C110	C110	0	8000	3	Superior wall of nasopharynx
52	C111	C111	0	8000	3	Posterior wall of nasopharynx
53	C112	C112	0	8000	3	Lateral wall of nasopharynx
54	C113	C113	0	8000	3	Anterior wall of nasopharynx
55	C118	C118	0	8000	3	Overlapping lesion of nasopharynx
56	C119	C119	0	8000	3	Nasopharynx, unspecified
57	C12	C129	0	8000	3	Malignant neoplasm of pyriform sinus
58	C130	C130	0	8000	3	Postcricoid region
59	C131	C131	0	8000	3	Aryepiglottic fold, hypopharyngeal aspect
60	C132	C132	0	8000	3	Posterior wall of hypopharynx

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
61	C138	C138	0	8000	3	Overlapping lesion of hypopharynx
62	C139	C139	0	8000	3	Hypopharynx, unspecified
63	C140	C140	0	8000	3	Pharynx, unspecified
64	C141	C141	0	8000	3	Laryngopharynx
65	C142	C142	0	8000	3	Waldeyer's ring
66	C148	C148	0	8000	3	Overlapping lesion of lip, oral cavity, and pharynx
67	C150	C150	0	8000	3	Cervical part of esophagus
68	C151	C151	0	8000	3	Thoracic part of esophagus
69	C152	C152	0	8000	3	Abdominal part of esophagus
70	C153	C153	0	8000	3	Upper third of esophagus
71	C154	C154	0	8000	3	Middle third of esophagus
72	C155	C155	0	8000	3	Lower third of esophagus
73	C158	C158	0	8000	3	Overlapping lesion of esophagus
74	C159	C159	0	8000	3	Esophagus, unspecified
75	C160	C160	0	8000	3	Cardia of stomach
76	C161	C161	0	8000	3	Fundus of stomach
77	C162	C162	0	8000	3	Body of stomach
78	C163	C163	0	8000	3	Pyloric antrum
79	C164	C164	0	8000	3	Pylorus
80	C165	C165	0	8000	3	Lesser curvature of stomach, unspecified
81	C166	C166	0	8000	3	Greater curvature of stomach, unspecified
82	C168	C168	0	8000	3	Overlapping lesion of stomach
83	C169	C169	0	8000	3	Stomach, unspecified
84	C170	C170	0	8000	3	Duodenum
85	C171	C171	0	8000	3	Jejunum
86	C172	C172	0	8000	3	Ileum
87	C173	C173	0	8000	3	Meckel's diverticulum
88	C178	C178	0	8000	3	Overlapping lesion of small intestine
89	C179	C179	0	8000	3	Small intestine, unspecified
90	C180	C180	0	8000	3	Cecum
91	C181	C181	0	8000	3	Appendix

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
92	C182	C182	0	8000	3	Ascending colon
93	C183	C183	0	8000	3	Hepatic flexure
94	C184	C184	0	8000	3	Transverse colon
95	C185	C185	0	8000	3	Splenic flexure
95	C186	C186	0	8000	3	Descending colon
97	C187	C187	0	8000	3	Sigmoid colon
98	C188	C188	0	8000	3	Overlapping lesion of colon
99	C189	C189	0	8000	3	Colon, unspecified
100	C19	C199	0	8000	3	Malignant neoplasm of rectosigmoid junction
101	C20	C209	0	8000	3	Malignant neoplasm of rectum
102	C210	C210	0	8000	3	Anus, unspecified
103	C211	C211	0	8000	3	Anal canal
104	C212	C212	0	8000	3	Cloacogenic zone
105	C218	C218	0	8000	3	Overlapping lesion of rectum, anus, and anal canal
106	C220	C220	0	8170	3	Liver cell carcinoma
107	C221	C221	0	8160	3	Intrahepatic bile duct carcinoma
108	C222	C220	0	8970	3	Hepatoblastoma
109	C223	C220	0	9120	3	Angiosarcoma of liver
110	C224	C220	0	8800	3	Other sarcoma of liver
111	C227	C220	0	8010	3	Other specified carcinoma of liver
112	C229	C220	0	8000	3	Liver, unspecified
113	C23	C239	0	8000	3	Malignant neoplasm of gallbladder
114	C240	C240	0	8000	3	Extrahepatic bile duct
115	C241	C241	0	8000	3	Ampulla of Vater
116	C248	C248	0	8000	3	Overlapping lesion of biliary tract
117	C249	C249	0	8000	3	Biliary tract, unspecified
118	C250	C250	0	8000	3	Head of pancreas
119	C251	C251	0	8000	3	Body of pancreas
120	C252	C252	0	8000	3	Tail of pancreas
121	C253	C253	0	8000	3	Pancreatic duct
122	C254	C254	0	8000	3	Endocrine pancreas

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
123	C257	C257	0	8000	3	Other parts of pancreas
124	C258	C258	0	8000	3	Overlapping lesion of pancreas
125	C259	C259	0	8000	3	Pancreas, unspecified
126	C260	C260	0	8000	3	Intestinal tract, part unspecified
127	C261	C261	0	8000	3	Spleen
128	C268	C268	0	8000	3	Overlapping lesion of digestive system
129	C269	C269	0	8000	3	Ill-defined sites within the digestive system
130	C300	C300	9	8000	3	Nasal cavity
131	C301	C301	9	8000	3	Middle ear
132	C310	C310	9	8000	3	Maxillary sinus
133	C311	C311	0	8000	3	Ethmoidal sinus
134	C312	C312	9	8000	3	Frontal sinus
135	C313	C313	0	8000	3	Sphenoidal sinus
136	C318	C318	0	8000	3	Overlapping lesion of accessory sinuses
137	C319	C319	0	8000	3	Accessory sinus, unspecified
138	C320	C320	0	8000	3	Glottis
138	C321	C321	0	8000	3	Supraglottis
140	C322	C322	0	8000	3	Subglottis
141	C323	C323	0	8000	3	Laryngeal cartilage
142	C328	C328	0	8000	3	Overlapping lesion of larynx
143	C329	C329	0	8000	3	Larynx, unspecified
144	C33	C339	0	8000	3	Malignant neoplasm of trachea
145	C340	C340	9	8000	3	Main bronchus
146	C341	C341	9	8000	3	Upper lobe, bronchus or lung
147	C342	C342	9	8000	3	Middle lobe, bronchus or lung
148	C343	C343	9	8000	3	Lower lobe, bronchus or lung
149	C348	C348	9	8000	3	Overlapping lesion of bronchus and lung
150	C349	C349	9	8000	3	Bronchus or lung, unspecified
151	C37	C379	0	8000	3	Malignant neoplasm of thymus
125	C380	C380	0	8000	3	Heart
153	C381	C381	0	8000	3	Anterior mediastinum

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
154	C382	C382	0	8000	3	Posterior mediastinum
155	C383	C383	0	8000	3	Mediastinum, part unspecified
156	C384	C384	9	8000	3	Pleura
157	C388	C388	0	8000	3	Overlapping lesion of heart, mediastinum, and pleura
158	C390	C390	0	8000	3	Upper respiratory tract, part unspecified
159	C398	C398	0	8000	3	Overlapping lesion of respiratory and intrathoracic organs
160	C399	C399	0	8000	3	Ill-defined sites within the respiratory system
161	C400	C400	9	8000	3	Scapula and long bones of upper limb
162	C401	C401	9	8000	3	Short bones of upper limb
163	C402	C402	9	8000	3	Long bones of lower limb
164	C403	C403	9	8000	3	Short bones of lower limb
165	C408	C408	0	8000	3	Overlapping lesion of bone and articular cartilage of limbs
166	C409	C409	0	8000	3	Bone and articular cartilage of limb, unspecified
167	C410	C410	0	8000	3	Bones of skull and face
168	C411	C411	0	8000	3	Mandible
169	C412	C412	0	8000	3	Vertebral column
170	C413	C413	9	8000	3	Ribs, sternum, and clavicle
171	C414	C414	9	8000	3	Pelvic bones, sacrum, and coccyx
172	C418	C418	0	8000	3	Overlapping lesion of bone and articular cartilage
173	C419	C419	0	8000	3	Bone and articular cartilage, unspecified
174	C430	C440	0	8720	3	Malignant melanoma of lip
175	C431	C441	9	8720	3	Malignant melanoma of eyelid, including canthus
176	C432	C442	9	8720	3	Malignant melanoma of ear and external auricular canal
177	C433	C443	9	8720	3	Malignant melanoma of other and unspecified parts of face
178	C434	C444	0	8720	3	Malignant melanoma of scalp and neck
179	C435	C445	9	8720	3	Malignant melanoma of trunk
180	C436	C446	9	8720	3	Malignant melanoma of upper limb, including shoulder
181	C437	C447	9	8720	3	Malignant melanoma of lower limb, including hip
182	C438	C448	0	8720	3	Overlapping malignant melanoma of skin
183	C439	C449	0	8720	3	Malignant melanoma of skin, unspecified
184	C440	C440	0	8000	3	Skin of lip

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
185	C441	C441	9	8000	3	Skin of eyelid, including canthus
186	C442	C442	9	8000	3	Skin of ear and external auricular canal
187	C443	C443	9	8000	3	Skin of other and unspecified parts of face
188	C444	C444	0	8000	3	Skin of scalp and neck
189	C445	C445	9	8000	3	Skin of trunk
190	C446	C446	9	8000	3	Skin of upper limb, including shoulder
191	C447	C447	9	8000	3	Skin of lower limb, including hip
192	C448	C448	0	8000	3	Overlapping lesion of skin
193	C449	C449	0	8000	3	Malignant neoplasm of skin, unspecified
194	C450	C384	0	9050	3	Mesothelioma of pleura
195	C451	C482	0	9050	3	Mesothelioma of peritoneum
196	C452	C380	0	9050	3	Mesothelioma of pericardium
197	C457	C809	0	9050	3	Mesothelioma of other sites
198	C459	C809	0	9050	3	Mesothelioma, unspecified
199	C460	C449	9	9140	3	Kaposi's sarcoma of skin
200	C461	C499	0	9140	3	Kaposi's sarcoma of soft tissue
201	C462	C059	0	9140	3	Kaposi's sarcoma of palate
202	C463	C779	0	9140	3	Kaposi's sarcoma of lymph nodes
203	C467	C809	0	9140	3	Kaposi's sarcoma of other sites
204	C468	C809	0	9140	3	Kaposi's sarcoma of multiple organs
205	C469	C809	0	9140	3	Kaposi's sarcoma, unspecified
206	C470	C470	0	8000	3	Peripheral nerves of head, face, and neck
207	C471	C471	9	8000	3	Peripheral nerves of upper limb, including shoulder
208	C472	C472	9	8000	3	Peripheral nerves of lower limb, including hip
209	C473	C473	0	8000	3	Peripheral nerves of thorax
210	C474	C474	0	8000	3	Peripheral nerves of abdomen
211	C475	C475	0	8000	3	Peripheral nerves of pelvis
212	C476	C476	0	8000	3	Peripheral nerves of trunk, unspecified
213	C478	C478	0	8000	3	Overlapping lesion of peripheral nerves and autonomic nervous system
214	C479	C479	0	8000	3	Peripheral nerves and autonomic nervous system, unspecified
215	C480	C480	0	8000	3	Retroperitoneum

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
216	C481	C481	0	8000	3	Specified parts of peritoneum
217	C482	C482	0	8000	3	Peritoneum, unspecified
218	C488	C488	0	8000	3	Overlapping lesion of retroperitoneum and peritoneum
219	C490	C490	0	8800	3	Connective and soft tissue of head, face, and neck
220	C491	C491	9	8800	3	Connective and soft tissue of upper limb, including shoulder
221	C492	C492	9	8800	3	Connective and soft tissue of lower limb, including hip
222	C493	C493	0	8800	3	Connective and soft tissue of thorax
223	C494	C494	0	8800	3	Connective and soft tissue of abdomen
224	C495	C495	0	8800	3	Connective and soft tissue of pelvis
225	C496	C496	0	8800	3	Connective and soft tissue of trunk, unspecified
226	C498	C498	0	8800	3	Overlapping lesion of connective and soft tissue
227	C499	C499	0	8800	3	Connective and soft tissue, unspecified
228	C500	C500	9	8000	3	Nipple and areola
229	C501	C501	9	8000	3	Central portion of breast
230	C502	C502	9	8000	3	Upper-inner quadrant of breast
231	C503	C503	9	8000	3	Lower-inner quadrant of breast
232	C504	C504	9	8000	3	Upper-outer quadrant of breast
233	C505	C505	9	8000	3	Lower-outer quadrant of breast
234	C506	C506	9	8000	3	Axillary tail of breast
235	C508	C508	9	8000	3	Overlapping lesion of breast
236	C509	C509	9	8000	3	Breast, unspecified
237	C510	C510	0	8000	3	Labium majus
238	C511	C511	0	8000	3	Labium minus
239	C512	C512	0	8000	3	Clitoris
240	C518	C518	0	8000	3	Overlapping lesion of vulva
241	C519	C519	0	8000	3	Vulva, unspecified
242	C52	C529	0	8000	3	Malignant neoplasm of vagina
243	C530	C530	0	8000	3	Endocervix
244	C531	C531	0	8000	3	Exocervix
245	C538	C538	0	8000	3	Overlapping lesion of cervix uteri
246	C539	C539	0	8000	3	Cervix uteri, unspecified

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
247	C540	C540	0	8000	3	Isthmus uteri
248	C541	C541	0	8000	3	Endometrium
249	C542	C542	0	8000	3	Myometrium
250	C543	C543	0	8000	3	Fundus uteri
251	C548	C548	0	8000	3	Overlapping lesion of corpus uteri
252	C549	C549	0	8000	3	Corpus uteri, unspecified
253	C55	C559	0	8000	3	Malignant neoplasm of uterus, part unspecified
254	C56	C569	9	8000	3	Malignant neoplasm of ovary
255	C570	C570	9	8000	3	Fallopian tube
256	C571	C571	0	8000	3	Broad ligament
257	C572	C572	0	8000	3	Round ligament
258	C573	C573	0	8000	3	Parametrium
259	C574	C574	0	8000	3	Uterine adnexa, unspecified
260	C577	C577	0	8000	3	Other specified female genital organs
261	C578	C578	0	8000	3	Overlapping lesion of female genital organs
262	C579	C579	0	8000	3	Female genital organ, unspecified
263	C58	C589	0	8000	3	Malignant neoplasm of placenta
264	C600	C600	0	8000	3	Prepuce
265	C601	C601	0	8000	3	Glans penis
266	C602	C602	0	8000	3	Body of penis
267	C608	C608	0	8000	3	Overlapping lesion of penis
268	C609	C609	0	8000	3	Penis, unspecified
269	C61	C619	0	8000	3	Malignant neoplasm of prostate
270	C620	C620	9	8000	3	Undescended testis
271	C621	C621	9	8000	3	Descended testis
272	C629	C629	9	8000	3	Testis, unspecified
273	C630	C630	9	8000	3	Epididymis
274	C631	C631	9	8000	3	Spermatic cord
275	C632	C632	0	8000	3	Scrotum
276	C637	C637	0	8000	3	Other specified male genital organs
277	C638	C638	0	8000	3	Overlapping lesion of male genital organs

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
278	C639	C639	0	8000	3	Male genital organ, unspecified
279	C64	C649	9	8000	3	Malignant neoplasm of kidney, except renal pelvis
280	C65	C659	9	8000	3	Malignant neoplasm of renal pelvis
281	C66	C669	9	8000	3	Malignant neoplasm of ureter
282	C670	C670	0	8000	3	Trigone of bladder
283	C671	C671	0	8000	3	Dome of bladder
284	C672	C672	0	8000	3	Lateral wall of bladder
285	C673	C673	0	8000	3	Anterior wall of bladder
286	C674	C674	0	8000	3	Posterior wall of bladder
287	C675	C675	0	8000	3	Bladder neck
288	C676	C676	0	8000	3	Ureteric orifice
289	C677	C677	0	8000	3	Urachus
290	C678	C678	0	8000	3	Overlapping lesion of bladder
291	C679	C679	0	8000	3	Bladder, unspecified
292	C680	C680	0	8000	3	Urethra
293	C681	C681	0	8000	3	Paraurethral glands
294	C688	C688	0	8000	3	Overlapping lesion of urinary organs
295	C689	C689	0	8000	3	Urinary organ, unspecified
296	C690	C690	9	8000	3	Conjunctiva
297	C691	C691	9	8000	3	Cornea
298	C692	C692	9	8000	3	Retina
299	C693	C693	9	8000	3	Choroid
300	C694	C694	9	8000	3	Ciliary body
301	C695	C695	9	8000	3	Lacrimal gland and duct
302	C696	C696	9	8000	3	Orbit
303	C698	C698	9	8000	3	Overlapping lesion of eye and adnexa
304	C699	C699	9	8000	3	Eye, unspecified
305	C700	C700	9	8000	3	Cerebral meninges
306	C701	C701	0	8000	3	Spinal meninges
307	C709	C709	0	8000	3	Meninges, unspecified
308	C710	C710	9	8000	3	Cerebrum, except lobes and ventricles

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
309	C711	C711	9	8000	3	Frontal lobe
310	C712	C712	9	8000	3	Temporal lobe
311	C713	C713	9	8000	3	Parietal lobe
312	C714	C714	9	8000	3	Occipital lobe
313	C715	C715	0	8000	3	Cerebral ventricle
314	C716	C716	0	8000	3	Cerebellum
315	C717	C717	0	8000	3	Brain stem
316	C718	C718	0	8000	3	Overlapping lesion of brain
317	C719	C719	0	8000	3	Brain, unspecified
318	C720	C720	0	8000	3	Spinal cord
319	C721	C721	0	8000	3	Cauda equina
320	C722	C722	9	8000	3	Olfactory nerve
321	C723	C723	9	8000	3	Optic nerve
322	C724	C724	9	8000	3	Acoustic nerve
323	C725	C725	9	8000	3	Other and unspecified cranial nerves
324	C728	C728	0	8000	3	Overlapping lesion of brain and other parts of central nervous system
325	C729	C729	0	8000	3	Central nervous system, unspecified
326	C73	C739	0	8000	3	Malignant neoplasm of thyroid gland
327	C740	C740	9	8000	3	Cortex of adrenal gland
328	C741	C741	9	8000	3	Medulla of adrenal gland
329	C749	C749	9	8000	3	Adrenal gland, unspecified
330	C750	C750	0	8000	3	Parathyroid gland
331	C751	C751	0	8000	3	Pituitary gland
332	C752	C752	0	8000	3	Craniopharyngeal duct
333	C753	C753	0	8000	3	Pineal gland
334	C754	C754	9	8000	3	Carotid body
335	C755	C755	0	8000	3	Aortic body and other paraganglia
336	C758	C758	0	8000	3	Pluriglandular involvement, unspecified
337	C759	C759	0	8000	3	Endocrine gland, unspecified
338	C760	C760	0	8000	3	Head, face, and neck
339	C761	C761	0	8000	3	Thorax

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
340	C762	C762	0	8000	3	Abdomen
341	C763	C763	0	8000	3	Pelvis
342	C764	C764	0	8000	3	Upper limb
343	C765	C765	0	8000	3	Lower limb
344	C767	C767	0	8000	3	Other ill-defined sites
345	C768	C768	0	8000	3	Overlapping lesion of other and ill-defined sites
346	C770	C809	0	8000	3	Lymph nodes of head, face, and neck
347	C771	C809	0	8000	3	Intrathoracic lymph nodes
348	C772	C809	0	8000	3	Intra-abdominal lymph nodes
349	C773	C809	0	8000	3	Axillary and upper limb lymph nodes
350	C774	C809	0	8000	3	Inguinal and lower limb lymph nodes
351	C775	C809	0	8000	3	Intrapelvic lymph nodes
352	C778	C809	0	8000	3	Lymph nodes of multiple regions
353	C779	C809	0	8000	3	Lymph node, unspecified
354	C780	C809	9	8000	3	Secondary malignant neoplasm of lung
355	C781	C809	0	8000	3	Secondary malignant neoplasm of mediastinum
356	C782	C809	0	8000	3	Secondary malignant neoplasm of pleura
357	C783	C809	0	8000	3	Secondary malignant neoplasm of other and unspecified respiratory organs
358	C784	C809	0	8000	3	Secondary malignant neoplasm of small intestine
359	C785	C809	0	8000	3	Secondary malignant neoplasm of large intestine and rectum
360	C786	C809	0	8000	3	Secondary malignant neoplasm of retroperitoneum and peritoneum
361	C787	C809	0	8000	3	Secondary malignant neoplasm of liver
362	C788	C809	0	8000	3	Secondary malignant neoplasm of other and unspecified digestive organs
363	C790	C809	0	8000	3	Secondary malignant neoplasm of kidney and renal pelvis
364	C791	C809	0	8000	3	organs
365	C792	C809	0	8000	3	Secondary malignant neoplasm of skin
366	C793	C809	0	8000	3	Secondary malignant neoplasm of brain and cerebral meninges
367	C794	C809	0	8000	3	system
368	C795	C809	0	8000	3	Secondary malignant neoplasm of bone and bone marrow
369	C796	C809	0	8000	3	Secondary malignant neoplasm of ovary
370	C797	C809	0	8000	3	Secondary malignant neoplasm of adrenal gland

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
371	C798	C809	0	8000	3	Secondary malignant neoplasm of other specified sites
372	C80	C809	0	8000	3	Malignant neoplasm without specification of site
373	C810	C779	0	9659	3	Lymphocytic predominance
374	C811	C779	0	9663	3	Nodular sclerosis
375	C812	C779	0	9652	3	Mixed cellularity
376	C813	C779	0	9653	3	Lymphocytic depletion
377	C817	C779	0	9650	3	Other Hodgkin's disease
378	C819	C779	0	9650	3	Hodgkin's disease, unspecified
379	C820	C779	0	9695	3	Small cleaved cell, follicular
380	C821	C779	0	9691	3	Mixed small cleaved and large cell, follicular
381	C822	C779	0	9698	3	Large cell, follicular
382	C827	C779	0	9690	3	Other types of follicular non-Hodgkin's lymphoma
383	C829	C779	0	9690	3	Follicular non-Hodgkin's lymphoma, unspecified
384	C830	C779	0	9823	3	Small cell (diffuse)
385	C831	C779	0	9591	3	Small cleaved cell (diffuse)
386	C832	C779	0	9690	3	Mixed small and large cell (diffuse)
387	C833	C779	0	9680	3	Large cell (diffuse)
388	C834	C779	0	9680	3	Immunoblastic (diffuse)
389	C835	C779	0	9727	3	Lymphoblastic (diffuse)
390	C836	C779	0	9591	3	Undifferentiated (diffuse)
391	C837	C779	0	9687	3	Burkitt's tumor
392	C838	C779	0	9591	3	Other types of diffuse non-Hodgkin's lymphoma
393	C839	C779	0	9591	3	Diffuse non-Hodgkin's lymphoma, unspecified
394	C840	C449	0	9700	3	Mycosis fungoides
395	C841	C449	0	9701	3	Sezary's disease
396	C842	C779	0	9702	3	T-zone lymphoma
397	C843	C779	0	9702	3	Lymphoepithelioid lymphoma
398	C844	C779	0	9702	3	Peripheral T-cell lymphoma
399	C845	C779	0	9702	3	Other and unspecified T-cell lymphomas
400	C850	C779	0	9591	3	Lymphosarcoma
401	C851	C779	0	9591	3	B-cell lymphoma, unspecified

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
402	C857	C779	0	9591	3	Other specified types of non-Hodgkin's lymphoma
403	C859	C779	0	9590	3	Non-Hodgkin's lymphoma, unspecified type
404	C880	C420	0	9761	3	Waldenstrom's macroglobulinemia
405	C881	C421	0	9762	3	Alpha heavy chain disease
406	C882	C421	0	9762	3	Gamma heavy chain disease
407	C883	C421	0	9762	3	Immunoproliferative small intestinal disease
408	C887	C421	0	9760	3	Other malignant immunoproliferative diseases
409	C889	C421	0	9760	3	Malignant immunoproliferative disease, unspecified
410	C900	C421	0	9732	3	Multiple myeloma
411	C901	C421	0	9732	3	Plasma cell leukemia
412	C902	C809	0	9734	3	Plasmacytoma, extramedullary
413	C910	C421	0	9811	3	Acute lymphoblastic leukemia
414	C911	C421	0	9823	3	Chronic lymphocytic leukemia
415	C912	C421	0	9820	3	Subacute lymphocytic leukemia
416	C913	C421	0	9832	3	Prolymphocytic leukemia
417	C914	C421	0	9940	3	Hairy-cell leukemia
418	C915	C421	0	9827	3	Adult T-cell leukemia
419	C917	C421	0	9820	3	Other lymphoid leukemia
420	C919	C421	0	9820	3	Lymphoid leukemia, unspecified
421	C920	C421	0	9861	3	Acute myeloid leukemia
422	C921	C421	0	9863	3	Chronic myeloid leukemia
423	C922	C421	0	9860	3	Subacute myeloid leukemia
424	C923	C421	0	9930	3	Myeloid sarcoma
425	C924	C421	0	9866	3	Acute promyelocytic leukemia
426	C925	C421	0	9867	3	Acute myelomonocytic leukemia
427	C927	C421	0	9860	3	Other myeloid leukemia
428	C929	C421	0	9860	3	Myeloid leukemia, unspecified
429	C930	C421	0	9891	3	Acute monocytic leukemia
430	C931	C421	0	9860	3	Chronic monocytic leukemia
431	C932	C421	0	9860	3	Subacute monocytic leukemia
432	C937	C421	0	9860	3	Other monocytic leukemia

ID	ICD_10	PrimarySite	Laterality	Histology	Behavior	TextLabel
433	C939	C421	0	9860	3	Monocytic leukemia, unspecified
434	C940	C421	0	9840	3	Acute erythremia and erythroleukemia
435	C941	C421	0	9950	3	Chronic erythremia
436	C942	C421	0	9910	3	Acute megakaryoblastic leukemia
437	C943	C421	0	9742	3	Mast cell leukemia
438	C944	C421	0	9931	3	Acute panmyelosis
439	C945	C421	0	9931	3	Acute myelofibrosis
440	C947	C421	0	9800	3	Other specified leukemias
441	C950	C421	0	9801	3	Acute leukemia of unspecified cell type
442	C951	C421	0	9800	3	Chronic leukemia of unspecified cell type
443	C952	C421	0	9800	3	Subacute leukemia of unspecified cell type
444	C957	C421	0	9800	3	Other leukemia of unspecified cell type
445	C959	C421	0	9800	3	Leukemia, unspecified
446	C960	C421	0	9751	3	Letterer-Siwe disease
447	C961	C421	0	9751	3	Malignant histiocytosis
448	C962	C809	0	9740	3	Malignant mast cell tumor
449	C963	C809	0	9755	3	True histiocytic lymphoma
450	C967	C421	0	9590	3	Other specified malignant neoplasms of lymphoid, hematopoietic, and related tissue
451	C969	C421	0	9590	3	Malignant neoplasms of lymphoid, hematopoietic, and related tissue, unspecified
452	C97	C809	0	8000	3	Malignant neoplasms of independent (primary) multiple sites
453	D000	C148	0	8010	2	Lip, oral cavity and pharynx
454	D001	C159	0	8010	2	Esophagus
455	D002	C169	0	8010	2	Stomach
456	D010	C189	0	8010	2	Colon
457	D011	C199	0	8010	2	Retrosigmoid junction
458	D012	C209	0	8010	2	Rectum
459	D013	C218	0	8010	2	Anus and anal canal
460	D014	C260	0	8010	2	Other and unspecified parts of intestine
461	D015	C249	0	8010	2	Liver, gallbladder and bile ducts
462	D017	C269	0	8010	2	Other specified digestive organs
463	D019	C269	0	8010	2	Digestive organ, unspecified

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464	D020	C329	0	8010	2	Larynx
465	D021	C339	0	8010	2	Trachea
466	D022	C349	9	8010	2	Bronchus and lung
467	D023	C399	9	8010	2	Other parts of respiratory system
468	D024	C399	9	8010	2	Respiratory system, unspecified
469	D030	C440	0	8720	2	Melanoma in situ of lip
470	D031	C441	9	8720	2	Melanoma in situ of eyelid, including canthus
471	D032	C442	9	8720	2	Melanoma in situ of ear and external auricular canal
472	D033	C443	9	8720	2	Melanoma in situ of other and unspecified parts of face
473	D034	C444	0	8720	2	Melanoma in situ of scalp and neck
474	D035	C445	9	8720	2	Melanoma in situ of trunk
475	D036	C446	9	8720	2	Melanoma in situ of upper limb, including shoulder
476	D037	C447	9	8720	2	Melanoma in situ of lower limb, including hip
477	D038	C449	0	8720	2	Melanoma in situ of other sites
478	D039	C449	0	8720	2	Melanoma in situ, unspecified
479	D050	C509	9	8010	2	Lobular carcinoma in situ
480	D051	C509	9	8010	2	Intraductal carcinoma in situ
481	D057	C509	9	8010	2	Other cancinoma in situ of breast
482	D059	C509	9	8010	2	Carcinoma in situ of breast, unspecified
483	D070	C541	0	8010	2	Endometrium
484	D071	C519	0	8010	2	Vulva
485	D072	C529	0	8010	2	Vagina
486	D073	C579	0	8010	2	Other and unspecified female genital organs
487	D074	C609	0	8010	2	Penis
488	D075	C619	0	8010	2	Prostate
489	D076	C639	0	8010	2	Other and unspecified male genital organs
490	D090	C679	0	8010	2	Bladder
491	D091	C689	9	8010	2	Other and unspecified urinary organs
492	D092	C699	9	8010	2	Eye
493	D093	C739	9	8010	2	Thyroid and other endocrine glands
494	D097	C809	9	8010	2	Carcinoma in situ of other specified sites

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495	D099	C809	9	8010	2	Carcinoma in situ, unspecified
496	D320	C700	9	9530	0	Cerebral meninges
497	D321	C701	0	9530	0	Spinal meninges
498	D329	C709	0	9530	0	Meninges, unspecified
499	D330	C710	0	8000	0	Brain, supratentorial
500	D331	C717	0	8000	0	Brain, infratentorial
501	D332	C719	0	8000	0	Brain, unspecified
501	D333	C725	9	8000	0	Cranial nerves
503	D334	C720	0	8000	0	Spinal cord
504	D337	C729	0	8000	0	Other specified parts of central nervous system
505	D339	C729	0	8000	0	Central nervous system, unspecified
506	D352	C751	0	8000	0	Pituitary gland
507	D353	C752	0	8000	0	Craniopharyngeal duct
508	D354	C753	0	8000	0	Pineal gland
509	D420	C700	9	9530	1	Cerebral meninges
510	D421	C701	0	9530	1	Spinal meninges
511	D429	C709	0	9530	1	Meninges, unspecified
512	D430	C710	0	8000	1	Brain, supratentorial
513	D431	C717	0	8000	1	Brain, infratentorial
514	D432	C719	0	8000	1	Brain, unspecified
515	D433	C725	9	8000	1	Cranial nerves
516	D434	C720	0	8000	1	Spinal cord
517	D437	C729	0	8000	1	Other parts of central nervous system
518	D439	C729	0	8000	1	Central nervous system, unspecified
519	D443	C751	0	8000	1	Pituitary gland
520	D444	C752	0	8000	1	Craniopharyngeal duct
521	D445	C753	0	8000	1	Pineal gland
522	D45	C421	0	9950	3	Polycythemia vera
523	D460	C421	0	9980	3	Refractory anemia without sideroblasts, so stated
524	D461	C421	0	9982	3	Refractory anemia with sideroblasts
525	D462	C421	0	9983	3	Refractory anemia with excess of blasts

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526	D463	C421	0	9983	3	Refractory anemia with excess of blasts with transformation
527	D464	C421	0	9980	3	Refractory anemia, unspecified
528	D467	C421	0	9989	3	Other Myelodysplastic syndromes
529	D469	C421	0	9989	3	Myelodysplastic syndrome, unspecified
530	D471	C421	0	9975	3	Chronic myeloproliferative disease
531	D473	C421	0	9962	3	Essential (hemorrahgic) thrombocythemia