Upgrading the United States Transuranium And Uranium Registries' Pathology Database

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Abstract

Initiated in the 1960's "with the mission of acquiring and providing precise information about the effects of plutonium and other transuranic elements in man, the United States Transuranium Registries (USTUR) has followed up to 'old age' almost 500 volunteer Registrants who worked at weapons sites and received measurable internal doses." [1] As a part of this follow up, it is important to accurately track Registrant causes of death. To obtain consistent, reliable pathology data, the USTUR has sub-contracted a professional nosologist to code all death certificates and autopsy reports using both revisions 9 and 10 of the International Statistical Classification of Diseases, ICD-9-CM and ICD-10 respectively. The USTUR has redesigned and significantly expanded the functionality of its internal pathology database in a manner that emphasizes these data. The upgraded database focuses on 1) obtaining and importing quality cause of death data for each deceased registrant, and 2) designing forms that enhance the accessibility of data by enabling the user to search by case number, keywords, ICD-9-CM code, and ICD-10 code. Forms, search criteria and results, and quality assurance measures are described.

Data Import

The nosologist handwrites ICD codes onto the hardcopy autopsy reports and death certificates, then types them into a Microsoft ® Excel file. Upon receipt, this file is imported into the pathology database using a custom-designed macro.

The USTUR Pathology Database is a SQL database with a Microsoft ® Access front end.

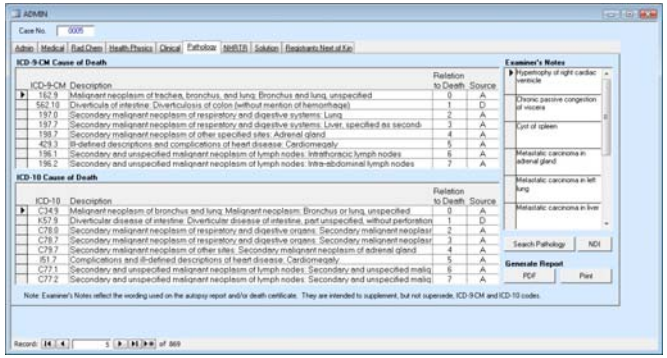
References

1. James, A.C., Brooks, B.G. The United States Transuranium and Uranium Registries (USTUR): Learning from Plutonium and Uranium Workers. Proceedings of the 4th JAEA/US EPA Workshop on Radiation Risk Assessment. Tokai-mura, Japan, November 7-8, 2006.
2. Sondik, E.J., Anderson, J.R., Madans, J.H., Cox, L.H., Makuc, D.M., Williams, P.D., Hunter, E.L., Zinn, D.L., Rothwell, C.J., Freedman, M.A., Weed, J.A., Bilgrad, R. National Death Index User's Manual. Hyattsville, MD: Division of Vital Statistics National Center for Health Studies Centers for Disease Control and Prevention. (2000).

Data Sources

ICD-9-CM and ICD-10 codes
USTUR has sub-contracted a professional nosologist to consistently code all (past and future) death certificates and autopsy reports using the "International Classification of Diseases" Revisions 9 and 10, ICD-9-CM and ICD-10, respectively.

As of August 19, 2008, underlying causes of death and up to seven contributing causes of death have been identified for 297 of our 321 deceased routine and whole body donors (93%).



The USTUR Pathology Database stores ICD-9-CM and ICD-10 codes for underlying causes of death and up to seven contributing causes of death.

Examiner's Notes
The pathology database also contains cause of death records that reproduce the wording used on the autopsy reports and/or death certificates. These 'Examiner's Notes' overlap with the ICD codes but do not correlate to them in a one-to-one relationship. They are intended to supplement, but not supersede, the ICD codes.

National Death Index ICD codes
The National Death Index (NDI) is a "central, computerized index of death record information compiled from magnetic tapes submitted under contractual arrangements to the National Center for Health Statistics (NCHS) by the State vital statistics offices."[2] The USTUR requested data from NDI for all 321 of its deceased registrants and NDI returned valid death certificate based ICD codes for 229 of these cases.

The USTUR Pathology Database enables easy access to ICD codes, Examiner's Notes, and NDI data.

Report Generator

De-identified reports can be printed directly or saved as a PDF file that can be emailed and/or saved electronically.

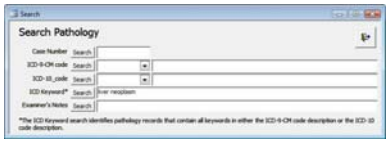
Reports contain all ICD-9-CM codes, ICD-10 codes, and Examiner's Notes associated with a single case number.

Pathology Report
United States Transuranium and Uranium Registries
Washington State University - Tri-Cities

Search Options

Once the ICD codes have been imported into the internal USTUR database, the 'Search Pathology' form allows the user to search the Pathology Database by:

- Case Number,
- ICD-9-CM Code,
- ICD-10 Code,
- Keywords, or
- Examiner's Notes



The Search Pathology form allows the user to search by Case Number, ICD-9-CM code, ICD-10 code, keywords, and Examiner's Notes.

Keyword searches identify matching search terms in both the ICD-9-CM condition descriptions and the ICD-10 descriptions.

Quality Assurance

ICD codes are subjected to three quality assurance checks when they are imported into the USTUR's internal pathology database:

- The database flags invalid ICD codes in the 'Transfer Errors' table and will not import them.
- Transcription errors are identified and corrected by comparing hand-written hardcopy codes to the imported electronic ICD codes.
- Parallel 'ICD-9-CM' and 'ICD-10' codes are visually compared to identify any conflicting classifications. (i.e. If the underlying cause of death is coded as liver disease in the 'ICD-9-CM' and heart disease in the 'ICD-10,' the case would be returned to the nosologist for clarification.)

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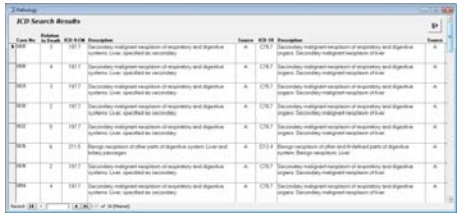

The Search Results form for a search on keywords: "Liver" and "Neoplasm." All cause of death records that contain both keywords are displayed.