practical radiation oncology

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Original Report

Quality improvement of International Classification of Diseases, 9th revision, diagnosis coding in radiation oncology: Single-institution prospective study at University of California, San Francisco

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Abstract

Purpose: Accurate International Classification of Diseases (ICD) diagnosis coding is critical for patient care, billing purposes, and research endeavors. In this single-institution study, we evaluated our baseline ICD-9 (9th revision) diagnosis coding accuracy, identified the most common errors contributing to inaccurate coding, and implemented a multimodality strategy to improve radiation oncology coding.

Methods and materials: We prospectively studied ICD-9 coding accuracy in our radiation therapy–specific electronic medical record system. Baseline ICD-9 coding accuracy was obtained from chart review targeting ICD-9 coding accuracy of all patients treated at our institution between March and June of 2010. To improve performance an educational session highlighted common coding errors, and a user-friendly software tool, RadOnc ICD Search, version 1.0, for coding radiation oncology specific diagnoses was implemented. We then prospectively analyzed ICD-9 coding accuracy for all patients treated from July 2010 to June 2011, with the goal of maintaining 80% or higher coding accuracy. Data on coding accuracy were analyzed and fed back monthly to individual providers.

Results: Baseline coding accuracy for physicians was 463 of 661 (70%) cases. Only 46% of physicians had coding accuracy above 80%. The most common errors involved metastatic cases, whereby primary or secondary site ICD-9 codes were either incorrect or missing, and special procedures such as stereotactic radiosurgery cases. After implementing our project, overall coding

accuracy rose to 92% (range, 86%-96%). The median accuracy for all physicians was 93% (range, 77%-100%) with only 1 attending having accuracy below 80%. Incorrect primary and secondary ICD-9 codes in metastatic cases showed the most significant improvement (10% vs 2% after intervention).

Conclusions: Identifying common coding errors and implementing both education and systems changes led to significantly improved coding accuracy. This quality assurance project highlights the potential problem of ICD-9 coding accuracy by physicians and offers an approach to effectively address this shortcoming.

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Introduction

Health administrative data are used to evaluate utilization of services, quality measures, population health research, and health outcomes.[1-6] One major advantage of using administrative data is the ability to obtain detailed clinical and outcome information that can be easily analyzed over large populations. The importance of a classification system for the grouping of causes of morbidity or mortality has long been recognized as crucial for the study of disease. There have been a number of studies assessing the accuracy of administrative data,[7-16] but limited data within oncology. Additionally, administrative data such as accurate diagnosis coding can allow for better understanding of utilization rates such as for radiation therapy in cancer treatment.

Inaccurate International Classification of Diseases (ICD) coding in the medical record system has significant consequences in the oncology setting. Cancer mortality data can be underestimated or overestimated based on the concordance of initial diagnosis codes compared with death certificate codes.[17] With the advent of electronic medical records, identifying clinical study cohorts can be more efficient. However, missing or incorrect ICD codes can underrepresent the available study cohorts. As we move increasingly toward understanding the value of our care, an accurate principal diagnosis is essential in accurately reflecting hospital and provider outcomes data. From a clinical perspective, accurate ICD coding is paramount to ensure timely insurance authorization, which can impact the timeliness of initiation of therapy.

Beginning October 1, 2014, providers will convert to ICD-10 (10th revision) codes for reimbursement.

Many countries adopted ICD-10 internationally as early as 1990; however, the United States has not yet undergone this transition. ICD-10 will be more robust and descriptive but will increase the difficulty of coding for health care providers.

Given the rapid integration of new technologies to enhance workflow efficiency, electronic medical record (EMR) information systems have been employed and continuously optimized to improve documentation.[18-20] In addition, one of the priorities for methodologic research using ICD data identified by an international consortium was interventional study to enhance coding quality.[21] At our institution, the ICD-9 entry within our EMR is utilized by administrative staff during insurance authorization requests, and serves to identify diagnosis during quality assurance chart rounds, as well as research database indexing. To our knowledge, however, no data are available for ICD coding accuracy in radiation oncology electronic health records. To this end, we initiated a quality improvement project to define baseline ICD coding accuracy in our EMR, determine the common coding errors, and demonstrate implementation of an interventional strategy to improve ICD coding accuracy. The aim was to improve ICD-9 diagnosis code documentation in our EMR to >80% for at least 3 out of the 4 quarters of the year from July 2010 to June 2011.

Methods and materials

As part of a graduate medical education initiative to improve patient care and quality improvement and quality assurance, we undertook a single-institutional prospective study to improve diagnosis-coding accuracy in our radiation therapy specific EMR, Local Area Network Therapy Information System (LANTIS version 8.30R1; Siemens Medical System, Concord, CA).

Baseline ICD coding accuracy

To identify the baseline ICD-9 coding accuracy, we performed a chart review of all patients who received a treatment course of radiation therapy at our institution during the months of March 2010 to June 2010. The ICD-9 code entered by physicians into our EMR was checked by residents and compared with the diagnosis or clinical scenario described in the patient's initial consultation note, which served as the gold standard. A correct entry was counted only if the EMR had the correct primary, and when appropriate, secondary diagnoses. An incorrect entry occurred in the following scenarios: (1) No ICD-9 diagnosis code entered in EMR; (2) no primary diagnosis code when treating a metastatic secondary site; (3) no secondary code when treating a metastatic secondary site; and (4) incorrect diagnosis code. The instances of each of these errors were tabulated.