ORIGINAL ARTICLE

Code Conversion Impact Factor and Cash Flow Impact of International Classification of Diseases, 10th Revision, on a Large Multihospital Radiology Practice

Aryan Jalilvand, BA, Margaret Fleming, MD, MSc, Courtney Moreno, MD, Dan MacFarlane, BS, CPA, Richard Duszak Jr, MD

Abstract

Purpose: The 2015 conversion of the International Classification of Diseases (ICD) system from the ninth revision (ICD-9) to the 10th revision (ICD-10) was widely projected to adversely impact physician practices. We aimed to assess code conversion impact factor (CCIF) projections and revenue delay impact to help radiology groups better prepare for eventual conversion to ICD, 11th revision (ICD-11).

Methods: Studying 673,600 claims for 179 radiologists for the first year after ICD-10's implementation, we identified primary ICD-10 codes for the top 90th percentile of all examinations for the entire enterprise and each subspecialty division. Using established methodology, we calculated CCIFs (actual ICD-10 codes ÷ prior ICD-9 codes). To assess ICD-10's impact on cash flow, average monthly days in accounts receivable status was compared for the 12 months before and after conversion.

Results: Of all 69,823 ICD-10 codes, only 7,075 were used to report primary diagnoses across the entire practice, and just 562 were used to report 90% of all claims, compared with 348 under ICD-9. This translates to an overall CCIF of 1.6 for the department (far less than the literature-predicted 6). By subspecialty division, CCIFs ranged from 0.7 (breast) to 3.5 (musculoskeletal). Monthly average days in accounts receivable for the 12 months before and after ICD-10 conversion did not increase.

Conclusion: The operational impact of the ICD-10 transition on radiology practices appears far less than anticipated with respect to both CCIF and delays in cash flow. Predictive models should be refined to help practices better prepare for ICD-11.

Key Words: ICD-10, cash flow, code conversion impact factor, ICD-9, ICD-11, projections, accounts receivable

J Am Coll Radiol 2017;■:■-■.

INTRODUCTION

The International Classification of Diseases (ICD) diagnosis coding system is utilized by the US health care system as a standardized means of reporting signs, symptoms, and diagnoses to health care insurance providers [1]. The 10th revision of the ICD (ICD-10) was initially endorsed by the World Health Organization (WHO) in 1990, but it was not until 2009 that the US Department of Health and Human Services decided to adopt ICD-10 to replace the ninth revision of the ICD (ICD-9) [1,2]. The compliance date of that conversion was initially planned to take place on October 1, 2013, but was delayed twice to October 1, 2015 [3].

Delays in the transition of ICD-9 to ICD-10 were largely attributed to anxiety within the health care community about anticipated adverse impacts on revenue and cash flow. For small (three or fewer) physician practices, the costs of transitioning were estimated to be as high as $226,105. And for large (100 or more) physician practices, the costs of transitioning were predicted to be upward of $8 million [4]. Much of those costs had been attributed to the considerable resources necessary for training and education, updating policies and

Department of Radiology and Imaging Sciences, Emory University School of Medicine, Atlanta, Georgia.

Corresponding author and reprints: Aryan Jalilvand, BA, Department of Radiology and Imaging Sciences, Emory University School of Medicine, 1648 Pierce Dr NE, Atlanta, GA 30307; e-mail: Aryan.Jalilvand@emory.edu.

The authors have no conflicts of interest related to the material discussed in this article.

1546-1440/17/$36.00 ■ http://dx.doi.org/10.1016/j.jacr.2017.08.013

procedures, and creating and updating software to handle the increased granularity and complexity of ICD-10 compared with ICD-9 [4,5]. ICD-10 has 69,823 billable codes, up from 14,025 codes in ICD-9, representing a near 5-fold increase in the total number of codes [1]. A recent report estimated that radiology practices could see a 6-fold increase in the number of their diagnosis codes under ICD-10 and that musculoskeletal radiologists would bear the brunt of this with a 29-fold explosion in their diagnosis codes [6].

With ICD-11 on track for final endorsement by the World Health Assembly of the WHO in 2018, the US health care industry may soon need to begin preparing for yet another ICD code transition [7]. A better understanding of how ICD-10 code and revenue transition projections performed could help health care systems and practices better prepare for the next transition.

By retrospectively studying the experience of a large multihospital radiology practice that actively prepared for this transition, we aimed to assess the actual code conversion impact factor (CCIF) and revenue delays associated with the nation's ICD-10 conversion in 2015. Based on published reports, we hypothesized that the actual CCIF after the transition would mimic previous projections and that the radiology practice would experience considerable delays in collections coincident with the transition [6].

METHODS

This study of patient identifier-stripped billing data was deemed to not involve human subjects and thus was exempt from institutional review board oversight.

Primary ICD-10 diagnosis code information was extracted from claims data for all 673,600 radiology services rendered by 179 radiologists across multiple facilities throughout our health care system during the first 12-month period (October 1, 2015, through September 30, 2016) after the nation's conversion to ICD-10. Radiology claims included those from two adult tertiary-care university hospitals, one specialty orthopedic and spine hospital, two community hospitals, and all of their affiliated outpatient imaging sites.

For radiology claims in our health care system, Current Procedural Terminology and ICD-10 codes are assigned to radiology claims by certified coders [8] leveraging a commercially available and validated natural language-processing computer-assisted coding tool (CodeRyte, 3M Health Information Systems, Salt Lake City, Utah) [9]. After educating coders, technologists and administrative staff, and physicians about new coding rules, our staff followed standard best practices for ICD-10 coding as directed by CMS [10], coding diagnoses for all services to the highest degree of certainty based on all information available in the radiology report. That education specifically focused on improving available clinical history [11] in a manner that was previously shown to improve the radiology revenue cycle [12].

All primary ICD-10 codes from all submitted claims from these facilities were identified. From these, we targeted those most frequently used to report primary diagnoses, focusing on codes for the top 90th percentile of all ICD-10 codes used by the entire health system, as well as those for the top 90th percentile of ICD-10 codes used by each of our individual academic divisions: abdominal, breast, cardiothoracic, community, emergency, interventional, musculoskeletal, neuroradiology, and nuclear medicine.

Using a simplified and modified unidirectional approach previously utilized [6] based on that of Boyd et al [13,14], we calculated ICD-10 CCIFs as the following: (number of actual 90th percentile ICD-10 codes during the post implementation year ÷ number of 90th percentile ICD-9 codes in the reference year). The calendar year 2014 was used for reference purposes. To estimate the impact of ICD-10 implementation on professional practice cash flow, average monthly days in accounts receivable status were calculated on a monthly basis. These were compared for the 12 months before and after the October 1, 2015, ICD-10 implementation. All data analysis was performed using Excel 2010 (Microsoft, Redmond, Washington).

RESULTS

Over the course of the 12 months after the implementation of ICD-10, 673,600 radiology services were billed. For these claims, 7,075 (10.1%) of 69,823 total different ICD-10 codes were used to report the primary diagnosis. Just 562 codes (0.8% of total ICD-10 codes) accounted for 90% of all radiology claims. The 36 most frequently used codes to report 50% of all services are outlined in Table 1.

In comparison, 348 ICD-9 codes (2.5% of total ICD-9 codes) accounted for 90% of all radiology claims in 2014. This translates to a CCIF of 1.6 for the department after the transition, which is far less than the previously projected impact factor of 6 for the department as a whole.