ORIGINAL ARTICLE

Private Practice Radiologist Subspecialty Classification Using Medicare Claims

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Abstract

Purpose: The aim of this study was to assess both existing Medicare provider code assignments and a new claims-based system for subspecialty classification of private practice radiologists.

Methods: Websites of the 100 largest US radiology private practices were used to identify 1,476 radiologists self-identified with a single subspecialty ([1] abdominal, [2] breast, [3] cardiothoracic, or [4] musculoskeletal imaging; [5] nuclear medicine; [6] interventional radiology; [7] neuroradiology). Concordance of existing Medicare radiology subspecialty provider codes (present only for nuclear medicine and interventional radiology) was first assessed. Next, using a classification approach based on Neiman Imaging Types of Service (NITOS) piloted among academic practices, the percentage of subspecialty work relative value units (wRVUs) from 2012 to 2014 Medicare claims were used to assign each radiologist a unique subspecialty.

Results: Existing Medicare provider codes matched only 8.0% of nuclear medicine physicians and 10.7% of interventional radiologists to their self-reported subspecialties. The NITOS-based system mapped a median 51.9% of private practice radiologists' wRVUs to self-identified subspecialties (range, 23.3% [nuclear medicine] to 73.6% [neuroradiology]). The 50% NITOS-based wRVU threshold previously established for academic radiologists correctly assigned subspecialties to 48.8% of private practice radiologists but incorrectly categorized 2.9%. Practice patterns of the remaining 48.3% were sufficiently varied such that no single subspecialty assignment was possible.

Conclusions: Existing Medicare provider codes poorly mirror subspecialty radiologists' own practice website–designated subspecialties. Actual payer claims data permit far more granular and accurate subspecialty identification for many radiologists. As new payment models increasingly focus on subspecialty-specific performance measures, claims-based identification methodologies show promise for reproducibly and transparently matching radiologists to practice-relevant metrics.

Key Words: Radiologists, subspecialization, relative value units, Medicare, health policy

J Am Coll Radiol 2017;■:■-■.

INTRODUCTION

Historically, private practice radiology groups have been disproportionately staffed by general radiologists. In recent decades, however, a shift in staffing priorities has led to a preponderance of radiologists designated as subspecialists [1]. An accurate understanding of trends in subspecialization of private practice radiologists has potential implications for practices' workforce planning [2], radiologists' career decisions [3], and determinations of radiologists' productivity and compensation [1,4,5]. Moreover, the relative importance of general versus subspecialist radiologists in the specialty's future has been a topic of substantial debate and controversy in this journal [6-10] as well as more broadly for the ACR, which previously conducted a focus session on this topic at an annual meeting [1] and commissioned both a task force [1] and a study group [11] to address the issue. The topic is now particularly timely and important given the government's intention of greatly expanding specialty- and subspecialty-level performance-based payments under the Medicare Access and CHIP Reauthorization

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Drs Rosenkrantz and Duszak are supported by research grants from the Harvey L. Neiman Health Policy Institute. 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.2017.04.025

Act (MACRA) [12]. MACRA provides a broad range of performance measures from which physicians may select those measures most relevant to their own practices for influencing payment adjustment determinations. Without transparent and consistent methods of identifying radiologists' practice subspecialties, implementing such specialty- and subspecialty-level performance-based payments could prove operationally difficult.

Reliably characterizing the subspecialization distribution of private practice radiologists is confounded by the observation by Smith et al [11] that subspecialist private practice radiologists perform a considerable fraction of their work in practice areas outside of their primary designated subspecialties. Indeed, the authors described numerous sources of ambiguity, including discrepancies between radiologists' areas of fellowship training and current practice concentrations, substantial crossover in individual imaging examinations among different subspecialties, the lack of uniform terminology for identifying subspecialties, and variability in whether to determine subspecialties on the basis of time, effort, or relative value units [11]. Given the lack of objective criteria, current information regarding subspecialization by community radiologists has been informed largely by subjective surveys reflecting respondents' opinions regarding not only the meanings of different radiology subspecialties but also opinions regarding their own practice patterns [11]. Hence, it should not be surprising that two different surveys [2,11] yielded different results in terms of the most common radiologist subspecialties.

Physicians participating in the Medicare program are required to enroll in the electronic Provider Enrollment, Chain, and Ownership System (PECOS) [13]. PECOS entails submitting a range of physician and practice characteristics, including selection of a specialty provider designation from options provided by CMS [14]. However, the specialty codes currently available in PECOS are quite limited in scope, specifically recognizing nuclear medicine physicians and interventional radiologists, while broadly categorizing all others (eg, breast imagers, neuroradiologists) generically as "diagnostic radiologists." And despite specific provider CMS designations for nuclear medicine physicians and interventional radiologists, many of these subspecialists in academic settings are incorrectly identified by the agency as diagnostic radiologists [15]. Clearly, a better system is needed to define and reproducibly categorize the subspecialties of radiologists.

A novel system based on billed Medicare claims was recently proposed for classifying the subspecialty of academic radiologists [15]. The system correctly identified the subspecialties of 89.8% of academic radiologists, with 5.9% not mapped to a single unique subspecialty and only a 4.2% error rate [15]. However, it is widely recognized that academic subspecialists devote a particularly high fraction of their practice to their designated subspecialty areas [1,11]. Thus, it is unclear how such a claims-based subspecialty classification system would perform for private practice radiologists, who represent the majority of the nation's radiologists [2]. If that academic model could be validated in the private practice setting, such a system could provide a powerful tool for addressing the previously noted challenges in characterizing the US private practice radiology workforce. Such a system would also serve as an enabler for more robust subspecialty-based payment models that adjust reimbursements on the basis of performance metrics tailored to the work patterns of individual physicians. Thus, our aim in this study was to evaluate this recent academic-validated claims-based subspecialty classification system in the broader private practice setting.

METHODS

This study using no private identifiable information did not constitute human subjects research and thus did not require institutional review board approval.

Sample

The most recent annual directory of the 100 largest radiology private practices was obtained from the *Radiology Business Journal* [16]. Web searches were manually conducted of each practice's website. All radiologists listed on each practice website were recorded, along with their designated practice areas. A board-certified radiologist reviewed each radiologist's designated practice areas to identify those who could be uniquely assigned to a single subspecialty area recognized by the cited claims-based classification system. Radiologists were excluded if they self-identified with multiple subspecialty areas or self-identified designated areas suggesting a more broad practice (eg, general, community, or emergency radiology).

Assessment of Existing Medicare Provider Code Subspecialty Designations

In a manner previously described for academic radiology practices [15], the performance of CMS primary specialty