ORIGINAL ARTICLE

Double Scan CT Rates: An Opportunity for Facility-Based Radiologist Measures in the Quality Payment Program

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Abstract

Purpose: The Medicare Access and CHIP Reauthorization Act (MACRA) provides CMS flexibility to evaluate radiologists using hospital outpatient quality measures in place of conventional physician measures. We explore radiologist characteristics associated with variation in performance in two such measures: abdomen and chest CT "double scan" rates (percentage of total examinations performed both with and without intravenous contrast).

Methods: Radiologists' claims for abdomen and chest CT examinations in a facility setting were identified using 2014 Medicare Physician and Other Supplier data. Individual radiologist double scan rates were computed. Associations were explored between rates and radiologist characteristics extracted from the CMS public data sets using multivariable regression with cross-validation.

Results: Radiologists' double scan rates averaged 5.9% ± 10.0% (0.0% for 52.8% of radiologists) for abdomen CT (19,867 radiologists) and 1.0% ± 4.7% (0.0% for 91.3% of radiologists) for chest CT (18,684). At multivariable analysis, abdomen rates were best predicted by geography (lowest in Northeast, greatest in West), practice size (greatest for small practices), and specialty practice pattern (lowest for general radiologists; greatest for nuclear medicine physicians). Agreement for double scan rates among radiologists within the same practice was moderate, though slightly higher for chest (intraclass correlation = 0.70) than abdomen (0.59).

Conclusion: Radiologists' facility double scan rates vary systematically based on an array of professional characteristics. MACRA grants CMS the authority to use these measures for evaluating radiologists, thereby aligning Medicare's hospital and physician performance programs and better incentivizing population radiation dose and cost reduction. Greater variation in abdomen CT double scan rates, compared with ubiquitously excellent chest CT performance, supports a particular role for abdomen rates in distinguishing disparities in radiologist performance.

Key Words: Quality measures, CT, Medicare, MACRA, health policy

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INTRODUCTION

Under the Quality Payment Program (QPP) created by CMS to implement the Medicare Access and CHIP Reauthorization Act (MACRA), most physicians will undergo payment adjustments based on their performance in the Merit-Based Incentive Payment System (MIPS). In the Quality performance category of MIPS, CMS initially focused solely on physician-level performance measures (eg, fluoroscopy exposure time, appropriate follow-up for incidental findings, and reference points for carotid stenosis measurements). The MACRA statute, however, provides CMS the flexibility to incorporate additional measures used to evaluate hospital (rather than individual physician) performance [1]. Specifically, although

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permitting CMS to use hospital inpatient performance measures (eg, surgical site infections and myocardial infarction 30-day mortality rates) for evaluating all physicians, MACRA further permits evaluation using hospital outpatient measures (eg, relating to efficiency, care coordination, and patient safety) for emergency physicians, anesthesiologists, and radiologists.

CMS has indicated it plans to create additional options in the QPP in 2018 for some physicians meeting newly established criteria for being deemed "facility" based (ie, providing most of their services in the inpatient or emergency department settings) [2]. Such facility-based physicians may apply facility-wide quality measures relating to inpatient and emergency departmenet care in place of reporting physician measures. However, the selected facility-based measure sets do not currently include any radiology-specific measures. Namely, CMS did not exercise its authority to adopt hospital outpatient measures for certain specialties including radiologists. Nonetheless, CMS's Hospital Outpatient Quality Reporting (OQR) program contains a number of existing hospital outpatient quality measures that are relevant to radiologists, thus missing an opportunity to leverage such measures in further aligning its separate hospital and physician performance programs.

Two such radiology-relevant OQR measures (measures OP-10, "abdomen CT—use of contrast material," and OP-11, "thorax CT—use of contrast material") assess the rate of so-called "double" chest and abdomen CT examinations [3]. These measures reflect the percentage of all CT scans of those body regions that are performed both with and without intravenous contrast (excluding certain examinations performed for targeted indications such as adrenal lesion characterization). Lower rates are typically considered to represent better, more efficient performance given the associated reduction in patient radiation exposure as well as in medical spending (lower payments for single-phase scans). Prior investigations support the role of double CT rates as a credible quality measure for hospital-based radiology services [4,5], with an ability for departments to achieve improved performance in the measure when incentivized.

The ACR has recommended that CMS expand its options for facility-based physicians in future years by adopting the Hospital OQR measures, which include double scan rates [6]. To provide insights into how adoption of Hospital OQR measures may apply to radiologists under MIPS, we explore radiologist characteristics associated with variation in radiologists; performance in double scan CT rates.

METHODS

This study used publicly available data sets without any private identifiable information, thus not constituting human subjects research.

The 2014 Medicare Provider Utilization and Payment Data: Physician and Other Supplier Public Use File was obtained from CMS [7]. The file provides counts of total billed services stratified by combinations of provider and service code (based on Healthcare Common Procedure Coding System [HCPCS] codes [8]), based on a 100% sample of noninstitutional line item Part B Medicare fee-for-service claims [9]. For this study, we applied three filter criteria to the file:

- Billing provider specialty of diagnostic radiology, nuclear medicine, or interventional radiology (hereafter referred to as "radiologists")
- All HCPCS codes corresponding with a chest, abdomen, or abdominopelvic CT performed without, with, or both without and with, intravenous contrast (Table 1), consistent with the criteria for these measures in the Hospital OQR program as well as previously published methodology [5,10]
- Site of service of "facility," rather than "office," reflecting radiologists' dominant site of service for relevant HCPCS codes

For each included radiologist, double scan rates were separately calculated for abdomen CT and chest CT as the fraction of all such codes performed without and with intravenous contrast. The same Physician and Other Supplier Public Use File was used to identify each radiologist's gender, state of practice (categorized into US geographic regions), and zip code (which was subsequently used for rural or urban categorization [11]). Using unique

Table 1. Codes included in analysis

HCPCS Code	Descriptor
Chest CT	
72150	Without contrast
72160	With contrast
72170	Without and with contrast
Abdomen CT	
71450	Without contrast
74160	With contrast
74170	Without and with contrast
Abdominopelvic CT	
74176	Without contrast
74177	With contrast
74178	Without and with contrast

HCPCS = Healthcare Common Procedure Coding System.