Characterizing the Performance of the Nation's Hospitals in the Hospital Outpatient Quality Reporting Program's Imaging Efficiency Measures

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Abstract

Purpose: To describe the performance of the nation's hospitals in terms of the Hospital Outpatient Quality Reporting Program's imaging efficiency measures.

Methods: Data were obtained from the Hospital Compare website and reflect outpatient Medicare claims of 4,118 hospitals for 5 imaging efficiency metrics: (1) frequency of combination abdominal CT (performed with and without intravenous contrast); (2) combination chest CT (performed with and without intravenous contrast); (3) simultaneous brain/sinus CT; (4) mammography follow-up (diagnostic imaging after screening mammography); and (5) lumbar spine MRI for low back pain without prior conservative therapy. Metrics were summarized and compared with other hospital characteristics.

Results: Median frequency was 36.7% for lumbar spine MRI for low back pain and ranged from 1.6% to 7.8% for the remaining measures; however, extreme outliers were observed (maximal frequencies of 79.2%-95.2% for mammography follow-up and combination chest and abdominal CT). Essentially no correlation was found among measures, aside from combination abdominal and chest CT. For some measures, relatively poor performance was more commonly observed among critical access hospitals and physician-owned/proprietary hospitals, and less commonly observed among *U.S. News & World Report* "best" hospitals and primary residency teaching sites. Frequencies for combination abdominal and chest CT improved from 2013 to 2014 among hospitals with relatively poorer performance.

Conclusions: Although the imaging efficiency measures help identify individual hospitals and hospital categories with relatively inefficient imaging practices, they do not readily identify distinctly positively performing hospitals. Excess utilization was suggested for lumbar spine MRI. Frequency of combination abdominal and chest CT examinations improved over a short time interval.

Key Words: Radiology, imaging utilization, quality, quality measures, hospital, Medicare, CT

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INTRODUCTION

CMS implemented the Hospital Outpatient Quality Reporting (OQR) Program as a quality initiative aimed at improving hospital outpatient care in the United States through greater transparency to consumers and an emphasis on value-driven care [1]. Since taking effect in 2009, this program has required that hospitals collect and submit to CMS for public reporting a panel of standardized measures of care in order to receive the full annual update to their HOPPS payment rate. The initiative is intended to yield a uniform set of robust metrics that patients, payers, regulatory agencies, and hospitals themselves may use to compare performance among hospitals and conduct quality-improvement efforts.

The Hospital OQR Program incorporates 6 measures related to medical imaging for purposes of 2014 HOPPS payment determinations, all of which may be computed from standard Medicare fee-for-service claims data without any additional submission of data by hospitals [2]. Three of these measures pertain to "combination" CT scans: abdominal CT scans performed with and without intravenous contrast, chest CT scans performed with and without

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intravenous contrast, and simultaneously performed brain and sinus CT scans. One measure pertains to the performance of lumbar spine MRI for low back pain without documentation of previous conservative therapy; 1 measure pertains to the frequency of diagnostic breast imaging of any modality following screening mammography; and 1 measure pertains to the use of cardiac imaging for preoperative risk assessment for noncardiac low-risk surgery [2].

CMS indicates that these measures are intended to track potentially inappropriate medical imaging and that the reporting of the measures may lead to reduced cost and lower levels of exposure to radiation and intravenous contrast agents, in addition to improving adherence to evidence-based guidelines [3-7]. CMS notes that lower percentages are generally more favorable, making exceptions for clearly indicated examinations (eg, combination abdominal CT for adrenal lesion evaluation [3]), as well as noting that for the diagnostic mammography measure, a percentage that is too low may also be inappropriate [6]. The extent of CMS's concern regarding these measures is evidenced by its statements that such examinations constitute "indiscriminate use" that "represents a serious inefficiency of practice" with "enormous cost implications," potentially relating to "a direct financial benefit to the service provider" [3-7]. Subsequent to the initiation of tracking of these measures, concern regarding overutilization of combination chest CT studies was the basis of a front-page article published in *The New York Times* in 2011 [8].

Although these hospital-reported metrics are now publicly available and can be readily accessed via the Internet [9], data summarizing the performance of the nation's hospitals and identifying potential trends are scarce. Such insights are important if the Hospital OQR Program is to achieve its intended purpose of catalyzing actual performance improvement. Likewise, any flaws in the metrics are important to uncover, given the resources involved in their collection and reporting and the potential of constructing alternative metrics. Therefore, the purpose of the current study is to describe the current level of performance of the nation's hospitals in terms of the Hospital OQR Program's imaging efficiency measures and to identify relevant associations and patterns of variation to help further characterize this data set.

METHODS

Source of Data

As this study used solely aggregate data, institutional review board approval was not required. Data files were obtained from the publicly available Hospital Compare website [9], which is managed by CMS in conjunction with the Hospital OQR Program. CMS calculates the data based on claims for beneficiaries of traditional Medicare that are submitted by hospitals paid through HOPPS. Medicare patients treated in the inpatient setting, as well as non-Medicare populations treated in any setting, are not included. The website contains data relating to the imaging efficiency metrics for 4,118 hospitals, although only 1,183 (28.7%) of these hospitals report results for all the metrics. This study used the 2 most recent distinct data sets available through the website, identified as those from January 1, 2014 and April 1, 2013. Although the website lists data sets dating back to 2005, the provided data sets dating back to October 1, 2011 are identical to the April 1, 2013 data set, and more remote data sets do not provide individual hospital-level data for the imaging efficiency metrics.

Data Collected

Hospitals' reported performance for the imaging metrics were recorded, including: (1) combination abdominal CT scans (percentage of all abdominal CT scans performed both with and without intravenous contrast, excluding examinations performed for various indications relating to the liver, kidneys, pancreas, adrenal glands, biliary system, and hematuria [3]); (2) combination chest CT scans (percentage of all chest CT scans performed both with and without intravenous contrast [5]); (3) simultaneous brain and sinus CT scans (percentage of brain CT scans for which a sinus CT was also performed at the same facility on the same day, excluding patients with cancer, trauma, orbital cellulitis, or intracranial abscess [4]); (4) lumbar spine MRI studies for low back pain [percentage of lumbar spine MRI studies performed for low back pain that lack documentation of prior conservative management (physical therapy or chiropractic care during the preceding 60 days, or office evaluation and management >28 and <60 days prior), excluding patients with trauma within the prior 45 days, lumbar spine

Table 1. Summary of performance of the nation's hospitals in terms of the Hospital Outpatient Quality Reporting Program's imaging efficiency measures

Measure	n	Mean ± SD	Median	Range
Combination abdominal CT	3,684	13.8 ± 15.3	7.8	0-95.2
Combination chest CT	3,361	5.4 ± 9.5	1.6	0-81.3
Simultaneous brain/sinus CT	2,282	2.7 ± 2.0	2.3	0-21.7
Lumbar spine MRI for low back pain	2,023	37.5 ± 7.3	36.7	14.9-67.6
Mammography follow-up rate	3,325	9.1 ± 5.0	8.3	0-79.2

Note: Values are %, unless otherwise indicated.