

Advanced Diagnostic Imaging in Privately Insured Patients: Recent Trends in Utilization and Payments

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Recent studies have reported that the rate of growth in utilization of noninvasive diagnostic imaging has slowed, with a concomitant reduction in total payments to providers in the Medicare Part B fee-for-service population. Utilization and payment growth trends in commercially insured populations, however, are not as well understood. We used the Truven Health Analytics MarketScan[®] Commercial Claims and Encounters database containing more than 29 million individuals to investigate commercially insured population trends in utilization of and payments for CT, MRI, PET, and ultrasound procedures in the years 2007–2011. We found that imaging use—after a brief downturn in 2010—rose again in 2011, coupled with substantial increases in adjusted payments for all four imaging modalities, raising concerns about future efforts to stem growth in imaging use and associated spending.

Key Words: Diagnostic imaging, utilization, payments, commercial insurance

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INTRODUCTION

Advanced imaging technologies help physicians diagnose various medical conditions effectively and are valued for their noninvasive nature [1]. Nevertheless, many studies have identified high-end diagnostic imaging as a key driver of rapid health care spending growth over the past 2 decades, with utilization rates showing levels of financially unsustainable growth [2–4].

Levin et al. [5,6] recently reported that the utilization growth rate in noninvasive diagnostic imaging has slowed, with a concomitant reduction in provider payments for imaging procedures in the Medicare Part B fee-for-service population. Utilization and payment growth trends in commercially insured populations are not as well understood. Because expenditures for diagnostic imaging account for approximately 8% of total health care spending (Table 1), and the commercially insured population comprises about 55% [7] of the US population, any change in total payments resulting from changes in price or quantity of screening procedures might have an important impact on total US health care spending. Lee and Levy [8] conducted a limited study involving a 2000–2009 sample of commercially insured

patients in which they observed changes in utilization trends somewhat similar to those observed in the Medicare Part B fee-for-service population.

In the current study, we explore more recent trends in imaging use and payments for commercially insured patients in a larger, more representative national database. Specifically, we investigate trends in utilization of and payments for four diagnostic imaging modalities: CT, MRI, PET, and ultrasound procedures in the years 2007–2011.

METHODS

We used inpatient and outpatient data from the Truven Health Analytics (formerly known as Thomson Reuters Healthcare Inc.) MarketScan[®] Commercial Claims and Encounters database for 2007–2011. The inpatient data contain facility and professional encounters and services associated with inpatient admission; the outpatient data contain encounters in physician offices, hospital or other outpatient facilities, and emergency rooms. The data consist of individual-level, deidentified health care claims information from large employers and health plans across the United States. The analyzed payment figures include both the technical and professional components of provider payment. The number of health plans and enrollees included in the database varies by year, affecting both the size of the current study sample and the distribution of beneficiaries across types of health plans over the observed period.

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Table 1. Sample statistics and share of imaging procedures on overall payments

	2007	2008	2009	2010	2011
Size of covered population	29,310,369	34,882,686	34,261,464	38,461,931	44,061,323
Type of health plan					
Comprehensive	2.9%	2.4%	1.8%	1.8%	1.5%
Exclusive provider organization	0.6%	0.8%	0.9%	2.8%	2.6%
Health maintenance organization	15.9%	17.2%	15.1%	13.3%	12.3%
Point of service	8.7%	8.5%	7.6%	6.9%	5.8%
Preferred provider organization	65.7%	64.8%	68.0%	64.8%	62.2%
Point of service with capitation	0.8%	0.7%	0.6%	0.5%	0.5%
Consumer-Driven	2.4%	2.3%	2.1%	4.9%	4.1%
High-deductible	0.0%*	0.5%	0.8%	2.7%	3.2%
n/a	3.0%	2.9%	3.0%	2.3%	7.7%
Share of imaging procedures on overall payments (per modality) [†]					
Computed tomography	3.0%	3.2%	3.3%	3.0%	3.1%
Magnetic resonance imaging	3.0%	3.0%	2.9%	2.7%	2.9%
Positron emission tomography	0.3%	0.3%	0.3%	0.3%	0.3%
Ultrasound	1.5%	1.6%	1.6%	1.6%	1.6%
Total	7.7%	8.0%	8.0%	7.5%	7.8%

Source: Authors' tabulation of data from the MarketScan[®] Commercial Claims and Encounters database for the period 2007–2011.
*Share of high-deductible health plan beneficiaries in our study sample in 2007 was lower than 0.005%.
[†]Totals may not add up as a result of rounding.

For example, the study sample for 2011 covered almost 36% [7] of all adults aged 19–64 years with private commercial health insurance in the United States. The distribution of health plan types in the study sample (Table 1), however, did not fully reflect the distribution of health plan types for the entire commercially insured US population in that year. Hospitals and some other provider organizations often bundle charges for their services into a single amount, usually based on diagnosis, and the identified payments for these inpatient or bundled services may not always reliably reflect actual payments. Hence, inpatient data were used for analysis of utilization but not of payments. Outpatient data were used for analysis of both.

The procedures of interest (CT, MRI, PET, and ultrasound) were identified in the database by all relevant current procedural terminology (CPT)[®] codes [9] valid in 2007, supplemented by three CPT codes newly introduced by the AMA on January 1, 2011 to reflect combined CT procedures of the abdomen and pelvis. These combined procedures typically had been charged as two separate services prior to 2011. To maintain consistency in our utilization measures across years, we counted the combined CT procedures in 2011 as two separate services. Procedures with multiple (add-on) claims were considered as a single procedure. Negative payments were identified in some procedures (0.04% of CT procedures, 0.03% of MRI procedures, 0.03% of PET procedures, and 0.02% of ultrasound procedures) even after incorporation of corrections to previous claims and other insurer adjustments, owing most likely to erroneous data entries. These procedures were excluded from the analysis.

Procedures covered by capitation payments (1.96% of CT procedures, 0.88% of MRI procedures, 1.91% of PET procedures, and 1.71% of ultrasound procedures)

were included in the analysis of utilization but excluded from the analysis of payments. Visual exploration of the distribution of payments for procedures revealed few entries with extremely low or extremely high values (0.22% for CT, 0.16% for MRI, 0.19% for PET, and 0.05% for ultrasound). Hence, payments for these procedures were top-coded to avoid having disproportionate effects on total payments. Payments were adjusted to 2007 dollars, using the gross domestic product deflator [10], which is a suitable adjustment measure for health care inflation that reflects price trends in the general economy [11]. Additionally, both the number of performed procedures and the sum of corresponding payments were adjusted for annual changes in the number of enrollees by plan in the sample.

Since the MarketScan[®] data contain a different set of health plans in each year and, therefore, are subject to changes in geographic distribution, we were concerned that our results might be influenced by these variations in the study sample. Hence, we also performed a sensitivity analysis in which we excluded data from states whose representation in the study sample changed substantially over the course of the observed period. Subsequently, we compared the results with those based on the full sample. All analyses were conducted using SAS 9.3 (SAS Institute, Cary, North Carolina).

RESULTS

Figure 1 presents the established trends in diagnostic imaging use and adjusted payments for each imaging modality, with baseline measures in 2007.

Outpatient Imaging

Between 2007 and 2009, there were increases in service use in all four modalities. Except for CT utilization,

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