The Increasing Role of Nonradiologists in Performing Ultrasound-Guided Invasive Procedures

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Purpose: Recent proliferation of mobile diagnostic ultrasound (US) units and improved resolution have allowed for widespread use of US by more providers, both for diagnosis and US-guided procedures (USGP). This study aims to document recent trends in utilization for USGP in the Medicare population.

Methods: Source data were obtained from the CMS Physician Supplier Procedure Summary Master Files from 2004 to 2010. Allowed billing claims submitted for USGP were extracted and volume was analyzed by provider type and setting. Compound annual growth rates were calculated.

Results: The total utilization rate for all USGP was 2,425 per 100,000 in 2004 and 4,870 in 2010, an increase of 100.8% (+2,445 per 100,000) with a compound annual growth rate of 12.3%. The year 2010 represents the first year that nonradiologists as a group performed more USGP than radiologists, at 922,672 versus 794,497 examinations, respectively. Nonradiologists accounted for 72.2% (599,751 of 830,925) of the USGP volume growth from 2004 to 2010.

Most 2010 claims were submitted by radiologists (n = 794,497; 46.3%) and surgeons (n = 332,294; 19.4%). The largest overall volume increases from 2004 to 2010 were observed among radiologists, surgeons, anesthesiologists, rheumatologists, midlevel providers, primary care physicians, nonrheumatologist internal medicine subspecialists, and the aggregate of all other provider types.

Conclusion: The year 2010 represents the first year that nonradiologists performed more USGP than radiologists. From 2004 to 2010, radiologists and surgeons experienced only modest growth in USGP volume, whereas several other provider types experienced more rapid growth. It is likely that many procedures that were previously performed without US guidance are now being performed with US guidance.

Key Words: Ultrasound, ultrasound-guided procedures, invasive procedures, nonradiologists, aspiration, injection, percutaneous biopsy, utilization, health care economics, Medicare

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INTRODUCTION

Image guidance has become a common addition for various types of procedures [1]. The promise of less invasive interventions with decreased morbidity and mortality may be driving more health care providers to rely on image guidance for increased numbers of procedures. However, safe use of image guidance for procedures requires considerable skill and training in the imaging modality being employed.

It has been suggested that ultrasound (US) may be increasingly used for procedural guidance; however, specific trends have not been investigated. The frequency of needle placement, localization, aspiration, biopsy, injection, and vascular access procedures performed with US guidance is not known.

This paper describes the trends in use of ultrasound-guided procedure (USGP) utilization within the Medicare population from 2004 through 2010, according to provider type.

METHODS

The source data sets were the CMS Part B Physician/Supplier Procedure Summary Master Files (PSPSMFs) for 2004 through 2010. This data set summarizes the

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complete billing record for all procedures paid under Fee For Service Medicare Part B. For every Current Procedural Terminology, version 4, (CPT-4) code in each year, the PSPSMFs provide the volume of services performed nationwide. This data set describes the billing records of approximately 35.3 million beneficiaries enrolled in traditional fee-for-service Medicare Part B, but does not include the approximately 11.9 million who are enrolled in Medicare Advantage plans (these are 2010 estimates), as these patients are not included in this data set. The PSPSMF is a government-published, anonymized, aggregated data set that does not follow individual patients or outcomes and our study is, therefore, IRB exempt.

The PSPSMF data categorize claims by including the specialty of the providers and practice setting. There are over 100 physician specialty codes. Practice settings are characterized as hospital inpatient, hospital outpatient, private offices, emergency departments, and various others, such as ambulatory surgical centers, nursing homes, and rehabilitation centers. The vast majority of imaging studies are performed in the first 4 settings.

For this study, we analyzed allowed billing claims submitted for CPT-4 supervision and interpretation codes 76942, US-guided procedure for needle placement, localization, biopsy, aspiration, or injection; and 76937, US guidance for vascular access. To determine utilization, we tabulated global claims and professional component-only claims, but did not include technical component-only claims because doing so would have led to double counting procedures. We also used Medicare Advantage State/County Market Penetration reports, which describe annual Medicare population size, to determine the fee-for-service beneficiary population for all of Medicare. We then calculated USGP utilization rate per 100,000 beneficiaries per year. Volume and utilization rate trend lines were plotted from 2004 through 2010.

We classified billing claims by provider type, using Medicare's provider specialty codes. Providers performing more than 2.5% of total 2010 volume were analyzed individually and those performing less than 2.5% of total 2010 volume were aggregated as "all other providers." The following provider type categories were utilized for data analysis: radiologists, surgeons, anesthesiologists, rheumatologists, primary care providers, mid-level providers, and all other providers. For the purposes of this study, *primary care* specialties include family practice, general practice, general internal medicine, and osteopathic providers. The category *mid-level providers* applies to billing claims submitted with provider types corresponding to nurse practitioners and physician assistants. *Market share* was defined as the volume of a provider type divided by the total volume for all providers. We also determined growth rates and new procedure volume accrued by each specialty between 2004 and 2010.

Data were tabulated using MS-Excel: Mac 2011 v14.1.0 (Microsoft, Redmond, WA) and analyzed using SAS 9.2 for Windows (SAS Institute, Cary, NC).

RESULTS

Figure 1 demonstrates the USGP utilization rates in the Medicare population from 2004 to 2010, overall and by procedure type. The total utilization rate for all USGP was 2,425 per 100,000 in 2004 and 4,870 in 2010, an increase of 100.8% (+2,445 per 100,000) with a CAGR of 12.3%.

The total utilization rate of CPT-4 code 76942 was 1,817 per 100,000 in 2004 and 3,577 in 2010, an increase of 97% (+1,760 per 100,000) with a CAGR of 12.0%. The utilization rate of CPT-4 code 76937 was 608 per 100,000 in 2004 and 1,293 in 2010, an increase of 113% (+685 per 100,000) with a CAGR of 13.4%.

Figure 2 demonstrates the utilization rate for each type of USGP by provider type, including radiologists, surgeons and all other providers. In 2010, the highest utilization rate for CPT-4 code 76942, US-guided procedure for needle placement, localization, biopsy, aspiration, or

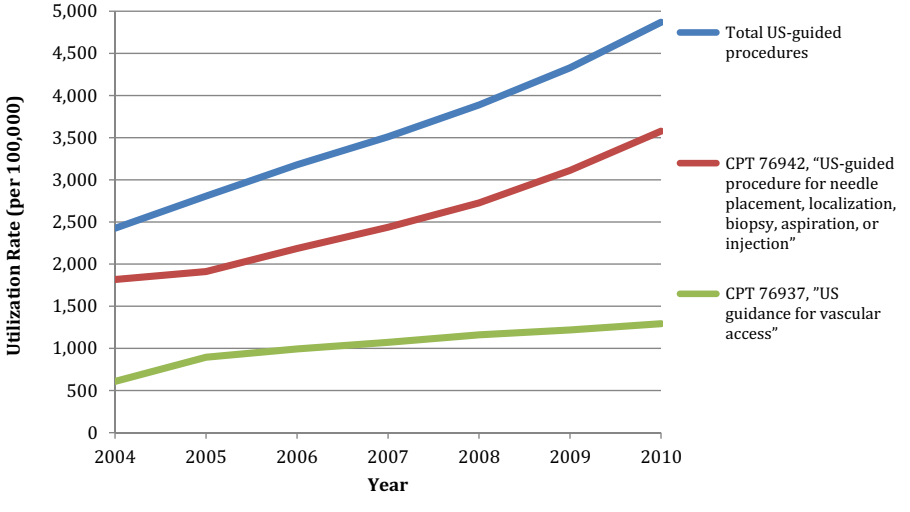

Fig 1. Rates of utilization of ultrasound-guided procedures in the Medicare population from 2004 to 2010, overall, and by procedure type.