

The Increasing Role of Radiologists in Thoracic Diagnosis: More Thoracic Biopsies Are Performed Percutaneously

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Purpose: The rate of thoracic biopsies overall and by type of biopsy from 1998 to 2010 is not known. The aim of this study was to examine the utilization rate of various types of thoracic biopsies within the Medicare population.

Methods: Source data was obtained from the CMS Physician/Supplier Procedure Summary Master Files from 1998 to 2010. Allowed primary claims submitted for percutaneous thoracic biopsy, bronchoscopic thoracic biopsy, and surgical thoracic biopsy were extracted. Annual volume and utilization rates were calculated and analyzed by biopsy type and provider type.

Results: Total thoracic biopsy volume in 1998 was 176,125 and in 2010 was 167,911 (−4.7%). The utilization rate for all thoracic biopsies decreased from 5.47 per 1,000 in 1998 to 4.76 per 1,000 (−13.0%) in 2010. The percutaneous biopsy utilization rate increased 3.6% from 1998 to 2010, while the rate for surgical biopsy decreased by 20.9% and the rate of bronchoscopic biopsy decreased by 19.6% during the same time period. In 2010, radiologists performed 96.4% (58,679) of all percutaneous biopsies. Radiologists' thoracic biopsy market share increased from 26.2% (46,084 of 176,125) in 1998 to 35.0% (58,700 of 167,911) in 2010 (+33.6%).

Conclusions: The overall rate of thoracic biopsy decreased from 1998 to 2010, with fewer biopsies being performed surgically and bronchoscopically and more biopsies being performed percutaneously. Radiologists are responsible for an increasing role in thoracic diagnosis, as they have increased market share of thoracic biopsies. These findings may be the result of changing trends toward less invasive procedures, changing patterns of reimbursement, and increased availability of percutaneous biopsy.

Key Words: CT imaging, utilization, health care economics, Medicare, thoracic radiology, thoracic biopsy, percutaneous biopsy

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INTRODUCTION

The chest CT utilization rate increased significantly in the early 2000s [1]. It is possible that the growth in chest CT utilization could have resulted in the detection of

more lesions, which could have in turn resulted in an increase in thoracic biopsies. However, recent thoracic biopsy utilization rates are not known.

Furthermore, the expansion of minimally invasive procedures has in some cases replaced more invasive procedures, such as the replacement of open abdominal aortic aneurysm repair with less invasive stent graft placement [2]. It is not known whether a similar trend has occurred with respect to thoracic biopsies.

Given the trends previously reported in the literature about increasing noninvasive vascular procedures, our hypothesis was that a similar trend of expansion of minimally invasive procedures has occurred with respect to thoracic biopsies. We sought to evaluate whether percutaneous thoracic biopsies are replacing more invasive

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procedures, such as surgical and bronchoscopic thoracic biopsies, in the Medicare population. We further sought to describe the specific types of providers who perform thoracic biopsies in the Medicare population.

METHODS

The source data sets were the CMS Part B Physician/Supplier Procedure Summary Master Files (PSPSMFs) for 1998 through 2010. This data set summarizes the complete billing record for all procedures paid under Medicare Part B. For every Current Procedural Terminology, version 4, code in each year, the PSPSMFs provide the volume of services performed nationwide. The 2010 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. The PSPSMFs are a government-published anonymized aggregated data set that does not follow individual patients or outcomes, and our study was therefore exempt from the requirement for institutional review board approval.

For this study, we analyzed allowed billing claims submitted for Current Procedural Terminology, version 4, surgical codes for percutaneous thoracic biopsy (32400 and 32405), bronchoscopic thoracic biopsy (31625, 31628, 31629, 31632, and 31633), and surgical thoracic biopsy (32095, 32402, 32484, and 32500). Annual volumes and utilization rates were analyzed by biopsy type and provider type. The PSPSMF data categorize claims by including the specialty of the providers using 1 of more than 100 provider specialty codes. Providers were classified as radiologists, surgeons, critical care physicians (which included pulmonary physicians and critical care physicians), and all other providers.

We used Medicare Advantage State/County Market Penetration reports to determine the fee-for-service beneficiary population for all of Medicare. We then calculated utilization rates per 100,000 beneficiaries per year. Volume and utilization rate trend lines were plotted from 1998 through 2010. We classified billing claims by provider type, using Medicare's provider specialty codes. Market share was calculated by dividing the volume of biopsies performed by a provider by the total volume of biopsies performed.

Data were tabulated using Excel 2011 for Mac (Microsoft Corporation, Redmond, Washington) and analyzed using SAS version 9.2 for Windows (SAS Institute Inc, Cary, North Carolina).

RESULTS

Total thoracic biopsy volume was 176,125 in 1998 and 167,911 (−4.7%) in 2010. The utilization rate for all thoracic biopsies in the Medicare fee-for-service population decreased from 5.47 per 1,000 in 1998 to 4.76 per 1,000 (−13.0%) in 2010 (Fig. 1).

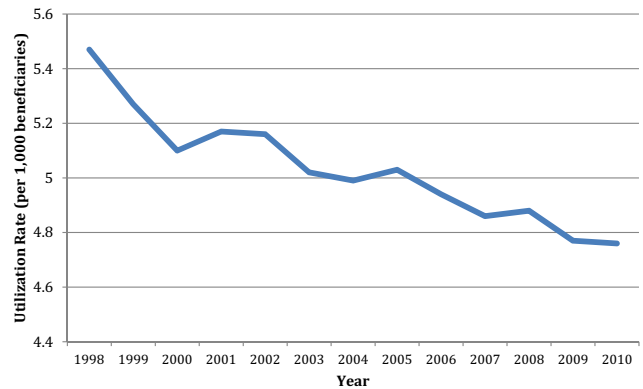


Fig 1. The utilization rate for all thoracic biopsies from 1998 to 2010.

Figure 2 demonstrates that in every year evaluated, critical care physicians performed the largest number of thoracic biopsies. In 2010, critical care physicians accounted for 78,555 procedures, 46.8% of all thoracic biopsies. In every year evaluated, radiologists had the next largest number of thoracic biopsy procedures. Radiologists performed 58,700 procedures in 2010, accounting for 35.0% of all thoracic biopsies.

Figure 3 demonstrates that the volume of bronchoscopic biopsies decreased from 108,379 in 1998 to 95,110 (−12.2%) in 2010. The volume of percutaneous biopsies increased from 53,781 in 1998 to 60,883 (+13.2%) in 2010. The volume of surgical biopsies decreased from 13,965 in 1998 to 11,918 (−14.7%) in 2010.

The bronchoscopic biopsy utilization rate decreased from 3.36 per 1,000 in 1998 to 2.70 per 1,000 (−19.6%) in 2010. Critical care physicians performed 77,882 bronchoscopic biopsies in 2010, accounting for 81.9% of all bronchoscopic biopsies.

The percutaneous biopsy utilization rate increased from 1.67 per 1,000 in 1998 to 1.73 per 1,000 (+3.6%) in 2010. Radiologists performed 58,679 percutaneous biopsies in 2010, accounting for 96.4% of all percutaneous biopsies.

The surgical biopsy utilization rate decreased from 0.43 per 1,000 in 1998 to 0.34 per 1,000 (−20.9%) in 2010. Surgeons performed 9,370 surgical biopsies in 2010, accounting for 78.6% of all surgical biopsies.

Radiologists' market share of thoracic biopsies increased from 26.2% (46,084 of 176,125) in 1998 to 35.0% (58,700 of 167,911) in 2010 (+33.6%).

DISCUSSION

From 1998 to 2010, there was a decrease in the number of thoracic biopsies performed in the Medicare population. The volumes and utilization rates of surgical biopsies and bronchoscopic biopsies decreased, while the rate of percutaneous biopsies mildly increased. Given that radiologists perform nearly all of the percutaneous biop-

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