

Percutaneous Hepatic and Renal Biopsy Procedures: An 18-Year Analysis of Changing Utilization, Specialty Roles, and Sites of Service

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ABSTRACT

Purpose: To evaluate national trends in percutaneous hepatic and renal biopsy procedures with regard to utilization, specialty group roles, and sites of service.

Materials and Methods: Service-specific claims data for percutaneous hepatic and renal biopsy procedures were identified using Medicare Physician Supplier Procedure Summary Master Files for the period 1994–2012. Longitudinal national utilization rates were calculated using annual Medicare enrollment data. Procedure volumes by specialty group and site of service were analyzed.

Results: Between 1994 and 2012, the number of hepatic and renal biopsies performed on Medicare Part B beneficiaries increased 22% (from 43,478 to 53,055) and 68% (19,508 to 32,762), respectively. Per 100,000 beneficiaries, the utilization of hepatic and renal biopsy increased 19.6% (from 134.6 to 161.0) and 69.3% (from 60.4 to 102.2). Procedures performed by radiologists disproportionately increased 81% (from 25,484 to 46,181) and 236% (from 6,855 to 23,003), respectively. Although utilization in the inpatient setting declined 28.7% (from 68.2 to 48.6 per 100,000) for hepatic biopsies and 9.4% (from 43.1 to 39.1) for renal biopsies, there were larger concurrent increases of 73.9% (from 59.2 to 103.0) and 303.9% (from 15.1 to 61.0) in utilization in the outpatient setting.

Conclusions: Between 1994 and 2012, national utilization of percutaneous hepatic and renal biopsy procedures in the Medicare population increased as services increasingly shifted from the hospital inpatient to outpatient setting. Radiologists are presently and increasingly the dominant providers of both services.

ABBREVIATION

PSPS = Physician Supplier Procedure Summary

Hepatic and renal biopsies are important diagnostic tests in the treatment algorithm for numerous diseases (1–3). Although hepatic biopsies commonly target tumors, current guidelines increasingly recommend random biopsies for various forms of liver and renal dysfunction

(4–6). Traditionally, many of these procedures have been performed in the hospital setting by clinical subspecialists (ie, gastroenterologists and nephrologists) (7,8).

Anecdotally, we have observed an overall increase in the frequency of hepatic and renal biopsies, an increase in the relative number performed by radiologists, and an ongoing shift from the inpatient to outpatient setting for many of these procedures. These observations align with trends of other imaging-guided procedures (9–12). However, after conducting an extensive literature search, we are unaware that our observations have previously been widely studied or validated. The objective of this study is to evaluate national trends in percutaneous hepatic and renal biopsy procedures with regard to utilization, specialty group roles, and sites of service using Medicare claims files.

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MATERIALS AND METHODS

This Health Insurance Portability and Accountability Act—compliant study of aggregated Medicare claims data from the Centers for Medicare and Medicaid Services designated Public Use Files was deemed exempt from institutional review board approval. National Medicare claims tracking methodology was based on that used for prior studies of imaging-guided invasive procedures (11–14). We acquired annual Medicare Physician Supplier Procedure Summary (PSPS) Master Files from 1994 through 2012 from the Centers for Medicare and Medicaid Services. PSPS Master Files aggregate Part B Medicare billing claims submitted by physicians and all other Medicare-recognized providers nationally. Data fields include codes for procedure and provider specialty and the numbers of procedures for which claims were submitted and paid. These data were retrospectively compiled and aggregated by the Centers for Medicare and Medicaid Services as designated public use files, which contain no individual patient or physician identifiers or diagnosis information.

PSPS Master Files include all claims for all beneficiaries in the traditional (Part B) Medicare fee-for-service program, which currently represents ~71% of all Medicare enrollees (15). Although Medicare enrollment increased over the last 2 decades, that growth has largely involved private Medicare managed care programs; Part B fee-for-service enrollment has remained relatively stable (32.3 million in 1994 and 33.0 million in 2012) (16).

Current Procedural Terminology codes 47000 (biopsy of liver, needle; percutaneous) and 50200 (renal biopsy; percutaneous, by trocar or needle) describe percutaneous hepatic and renal biopsy, respectively, when performed as independent procedures (16). These Current Procedural Terminology codes are organ specific and do not distinguish biopsies of targeted lesions, native parenchyma, and transplanted organs. Paid claims frequency data for these codes were extracted annually.

Health care providers are identified within PSPS Master Files with self-reported specialty and profession codes. Based on those codes, six specialty categories were created: radiologists, gastroenterologists (used for liver biopsy analysis), nephrologists (used for kidney

biopsy analysis), surgeons, primary care physicians, and advanced practice providers (nurse practitioners and physician assistants). All services identified by any other Medicare specialty code were grouped in a seventh “other” category. Service frequencies were identified by category on an annual basis.

PSPS master files also identify procedures by patient location at the time of service using various code groups. Place of service information could be extracted on an aggregated per-code basis in a similar fashion, specifically targeting inpatient (Place of Service Code 21) and outpatient (Place of Service Code 22) hospital, private office (Place of Service Code 11), and ambulatory surgical center (Place of Service Code 24) settings where these services are rendered. All other, much lower volume places of service were aggregated together in an “other” category. Longitudinal national utilization rates were calculated by dividing the annual claims data by annual Medicare Part B supplementary medical insurance enrollment. Data analysis was performed using SAS 9.1 (SAS Institute, Inc, Cary, North Carolina) and Excel 2010 (Microsoft, Redmond, Washington).

RESULTS

Between 1994 and 2012, the number of liver biopsies performed annually on Medicare Part B beneficiaries by all providers increased from 43,478 to 53,055 (+22%). The number of kidney biopsies performed annually increased from 19,508 to 32,762 (+68%). Adjusting for annual enrollment, Medicare fee-for-service utilization of hepatic and renal biopsies increased 19.6% (from 134.6 to 161.0) and 69.3% (60.4 to 102.2), respectively, per 100,000 beneficiaries.

The net increase in frequency of both procedures by radiologists was substantial. Hepatic biopsies performed by radiologists increased from 25,484 to 46,181 (+81%) (Table 1). Renal biopsies performed by radiologists increased from 6,855 to 23,003 (+236%) (Table 2). With the exception of nephrologists, who experienced a 12% increase in renal biopsy procedures from 1994 to 2012, the overall number of biopsies performed by all other physician groups declined. As a result, the proportion of liver and kidney biopsies performed by

Table 1. Hepatic Biopsies Performed by Various Specialty Groups from 1994 to 2012							
	1994		2012		Change		
	Total Biopsies	% of Biopsies Performed	Total Biopsies	% of Biopsies Performed	Total	% Change	
Radiology	25,484	59	46,181	87	+20,697	+81	
Gastroenterology	9,127	21	3,353	6	−5,774	−63	
Surgery	3,822	9	1,143	2	−2,679	−70	
Primary care	2,749	6	419	1	−2,330	−85	
All others	2,296	5	1,959	4	−337	−15	
Total	43,478	100	53,055	100	+9,577	+22	

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