

# Expenditures and Quality: Hospital- and Health System–Affiliated Versus Independent Physicians in Virginia

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**Objectives:** The American Medical Association has reported that 2016 was the first year in which fewer than half (47.1%) of all practicing physicians owned their own practice. Across the United States, there has been consolidation of physicians and hospital and health systems, resulting in questions about the effect of this on healthcare expenditures. The aim of this study was to compare the expenditures per patient between hospital- and health system–affiliated physicians and independent physicians.

**Methods:** The author used Virginia's new statewide all-payer claims database to analyze expenditures and quality for 3 years for hospital- and health system–affiliated physicians versus independent physicians. The database had all claims statewide for Virginians with individual or group commercial insurance coverage: 1.95 million patients in 2013, 2 million in 2014, and 2.1 million in 2015. The average annual expenditure for each physician was adjusted for average patient condition burden (risk) and differences in geographic input costs using regression analysis. Measures of primary care quality were obtained from the claims data using evidence-based measures from national health quality organizations.

**Results:** Hospital- and health system–affiliated physicians had annual expenditures per patient ranging from 10.3% to 14.6% higher than independent physicians. Most of the measures of primary care quality were not significantly different.

**Conclusions:** Virginia patients, employers, and managed care companies incurred higher per-patient expenditures with hospital and health system physicians than with independent physicians.

**Key Words:** all-payer claims database, health economics, health expenditures, hospital and health systems, independent physicians

Virginia, as has been observed across the United States,<sup>1</sup> has experienced years of increasing consolidation in its hospital systems, including the acquisition of private physician practices by these same hospital and health systems. The American Medical Association reports that physician ownership of independent practices has now dropped below 50%.<sup>2</sup> This increasing consolidation has been associated with higher annual expenditures.<sup>3</sup> The author investigated whether this also was true in Virginia. There could be many reasons for higher or lower annual expenditures for patients with hospital and health system physicians versus independent physicians. Hospitals with physician affiliations have been shown to charge higher prices and may be encouraging the use of hospital-based ambulatory services, yet the same affiliations are known to use more electronic medical records and adopt evidence-based care management practices, which are believed to lower expenditures.<sup>4</sup> Likewise, any difference in expenditures could be due to independent physicians' using alternatives to hospital-based services in the community.

To test for differences in annual per patient expenditures, data were used from the new Virginia All-Payer Claims Database (APCD), provided by Virginia Health Information, a not-for-profit statewide organization, to examine expenditures and quality measures for 3 recent years. The purpose was to determine whether per-patient expenditures were different between hospital- and health system–affiliated physicians and independent physicians. The author also was able to use this database to examine differences in primary care measures of quality for hospital and health systems versus independent physicians.

The author found that per-patient expenditures for care were higher for physicians affiliated with hospital and health systems than for independent physicians. Most measures of primary care

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## Key Points

- Per-patient expenditures for care were higher for physicians affiliated with hospitals and health systems than for independent physicians.
- Most measures of primary care quality were not significantly different and none were consistently different across the 3 years examined.

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## Methods

Virginia's APCD was accessed via the Milliman MedInsight Platform (MMP) for all claims statewide for Virginians with individual or group commercial insurance coverage: 1.95 million patients in 2013, 2 million in 2014, and 2.1 million in 2015, for a total of 5.96 million patient-years. In each year, 21% of patients saw independent physicians and 79% saw hospital and health system physicians. Some patients with self-insured, employer-sponsored coverage and all Medicare, Medicaid, TRICARE, or veterans and other public payers were excluded. Most of the public programs use their own administered prices and would not be relevant for this study without separately examining those enrolled in managed care plans (eg, Medicaid or Medicare Advantage managed) who do negotiate prices with providers. Although public program patients were not included in this analysis, they could have an influence on the results if there were a difference between hospital and health system physicians compared with independent physicians regarding cost shifting to commercial insurance because of lower prices paid for services to public patients.

The dollar amount paid for each health service is proprietary and thus unavailable, but the Virginia APCD contains a standardized proxy reimbursement amount used to calculate average annual expenditures for physician office visits, hospital outpatient services, inpatient hospital care, clinical laboratory services, and prescribed medicines.<sup>5</sup> The actual amount paid for each claim is not used in the analysis; rather, a proxy amount is assigned to each claim by the MMP that is based upon the actual amount paid for all claims by claim type in each geographic area. The average annual expenditure for each physician was adjusted for average patient condition burden (risk)<sup>6</sup> and differences in geographic input costs. These methods follow adjustment methods from a similar California study.<sup>7</sup> The MMP also uses claims to

create evidence-based measures from three national standards organizations: the National Quality Forum, the Agency for Healthcare Research and Quality, and the National Committee for Quality Assurance. The author selected eight evidence-based measures to assess the quality of primary care in each of the 3 years to yield 24 measures of quality.

## Results

Total annual expenditures for all patients were \$5.3 billion in 2013, \$6.4 billion in 2014, and \$6.5 billion in 2015. Physicians affiliated with hospital and health systems had annual expenditures per capita higher than independent physicians in 2014 and 2015. In 2015 physicians affiliated with hospital and health systems had annual expenditures per patient of \$3651, whereas independent physicians had annual expenditures of \$3454—a measured difference of \$197. Annual expenditures for physicians with hospital and health systems increased 5.7%, or \$627 (95% confidence interval [CI] 474–781), greater than independent physicians from 2013 to 2014.

Table 1 shows at least 10% higher expenditures for hospital- and health system–affiliated physicians. After adjusting for patient health risk and geographic input costs, hospital- and health system–affiliated physicians incurred adjusted annual expenditures per patient that were 10.3% higher than independent physicians (95% CI 8.4–12.1) in 2013, 12.2% (95% CI 10.5–13.9) in 2014, and 14.6% higher (95% CI 12.9–16.3) in 2015. Adjusted hospital and health system annual expenditures were \$241 higher than independent physicians (95% CI 76–406) in 2015. A larger share of the expenditure for hospital- and health system–affiliated physicians was for inpatient and outpatient surgery, radiology, and pharmacy compared with independent physicians for each of the 3 years. Independent physicians had more office/home visits, emergency department expenditures, and office-administered drugs.

Table 2 shows no statistical difference in 17 of the 24 quality measures. Independent physicians had slightly superior quality

**Table 1. Adjusted annual expenditures differences per patient by hospital and health system physicians and independent physicians, 2013–2015**

Adjusted difference <sup>a</sup>	Independent (+) relative to health system (–)			P		
	2013	2014	2015	2013	2014	2015
Hospital and health system	1 [Reference]	1 [Reference]	1 [Reference]			
Independent practice						
Percentage annual expenditure	–10.3%	–12.2%	–14.6%	<0.01	<0.01	<0.01
Dollar annual expenditure	–\$115	–\$133	–\$241	0.19	0.17	<0.01

<sup>a</sup>Primary care physicians included 6183 in 2013, 6735 in 2014, and 7464 in 2015. Patients were assigned to primary care physicians with whom they had the greatest number of visits during a rolling 24-mo period. Approximately 18% of patients had more than one attributed provider. Physicians were assigned to independent or health system by matching tax identification number to a database from the Centers for Medicare & Medicaid Services with the entity name. Certain low-volume specialties were deleted. Patients with ≥\$100,000 in annual expenditures were omitted from the analysis. Patient condition burden was measured by Milliman Advanced Risk Adjusters, which uses medical claim history to assign a risk score. Geographic input costs were measured by the Centers for Medicare & Medicaid Services Hospital Wage Index for areas in Virginia. The percentage and dollar annual expenditure differences were derived from regression coefficients in multivariable regression analysis, with annual expenditures per patient measured in dollars or logarithmic units. Percentage differences are derived from logarithmic coefficients using the formula  $P = 100 [(exp \times B) - 1]$ , where P is the percentage difference, exp is the exponential function, and B is the coefficient from the regression equation. All regressions adjusted for patient health status and geographic differences in resource costs.

**Table 2. EBM of quality primary care for hospital and health system physicians and independent physicians, 2013–2015**

Adjusted difference <sup>a</sup>	Independent (+) relative to hospital and health system (–)			No. physicians		
	2013	2014	2015	2013	2014	2015 <sup>b</sup>
Emergent/emergency department care needed/preventable/avoidable <sup>c</sup>	ns	0.3%	ns	5129	5641	2477
Avoidance of antibiotic treatment in adults with acute bronchitis	ns	ns	ns	2823	2933	920
Adolescent well-care visits	–3.5%	ns	–5.2%	4348	4582	1734
Chlamydia screening in women	ns	–2.5%	ns	3740	3903	1175
Comprehensive diabetes care				3814	4173	1470
Eye examination	–2.8%	–4.7%	ns			
HbA1c testing	ns	ns	–6.4%			
LDL-C screening	ns	ns	ns			
Medical attention for nephropathy	ns	ns	ns			
Total no. physician EBM observations				19,854	21,232	7776

All values shown are statistically significant at  $P < 0.05$ . EBM, evidence-based measure; HbA1c, hemoglobin A1c; LDL-C, low-density lipoprotein-cholesterol; ns, not statistically significant.

<sup>a</sup>The adjusted differences in EBMs of primary care quality were derived from regression coefficients in multivariable regression analysis, with average percentage of patients achieving the quality measure for each physician. EBMs could not be calculated for all physicians for each measure. All regressions were adjusted for patient health status.

<sup>b</sup>EBMs of quality primary care were available for part of the year in 2015.

<sup>c</sup>From the New York University Emergency Department Algorithm, percentage of emergency department care that was needed or not preventable or avoidable.

results in 2014 for preventable or avoidable emergency department visits. Hospital- and health system-affiliated physicians had superior quality results for adolescent well-care visits in 2013 and 2015, chlamydia screening in women in 2014, and eye examinations for diabetics in 2013 and 2014. They also had 6.4% more patients with hemoglobin A1c testing in 2015. Unlike the findings on expenditures per patient, no consistent patterns of quality differences were noted across years or between the two types of physicians.

## Discussion

Healthcare markets across the United States increasingly are facing consolidation among hospitals and increased affiliation agreements with physicians. The affiliation between hospitals and physicians can take many forms. One version is a loose-knit affiliation with hospital medical staff privileges and name-brand connection for the physician with the hospital and health system. Another version is a physician-hospital organization with separate ownership of the hospital assets and the physician assets, but a joint agreement to have a single signature for managed care contracts. The most developed version is when the hospital or health system purchases the physician practice and makes the physician an employee either in a separate but exclusively affiliated medical group or places the physician on the hospital system payroll. These varied affiliation types underscore the notion that physicians are not a homogenous group. There could be distinguishing characteristics of physicians affiliating with hospital and health systems and the markets they serve that prompt them to self-select the affiliation model and embrace the widespread trend away from managing hospitalized patients. The concerns expressed by federal officials is that these

types of hospital and health system affiliations, facing little or no competition, provide few economic incentives to keep expenditures low or to improve quality.<sup>8</sup> These results from Virginia appear to justify those concerns.

## Conclusions

This examination of the new Virginia APCD finds substantial differences in annual healthcare expenditures between physicians affiliated with hospitals and health systems and those without affiliation. Hospital- and health system-affiliated physicians had annual expenditures per capita that were higher than those of independent physicians. In 2015 physicians with hospital and health system affiliations had mean annual expenditures per patient of \$3651, whereas independent physicians had mean annual expenditures per patient of \$3454, a measured difference of \$197. Adjusted for patient health risk and geographic input costs, the difference balloons to \$241, a 14.6% difference. Virginia patients, employers, and managed care companies incurred higher annual per-patient expenditures with hospital and health system physicians than independent physicians in each of the years observed. Although consolidation may involve some benefits through better use of electronic medical records and care coordination, it also is associated with higher expenditures per patient.

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