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Ambulatory Specialist Use by Nonhospitalized Patients in US Health Plans

Correlates and Consequences

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Abstract: Approximately 7 of 10 (and 95% of the elderly) people in US health plans see one or more specialists in a year. Controlling for extent of morbidity, discontinuity of primary care physician visits is associated with seeing more different specialists. Having a general internist as the primary care physician is associated with more different specialists seen. Controlling for differences in the degree of morbidity, receiving care from multiple specialists is associated with higher costs, more procedures, and more medications, independent of the number of visits and age of the patient.
Key words: *continuity of care*, *costs of care*, *family physicians*, *general internists*, *primary care*, *resource use*, *specialist care*

MAJOR professional policy groups in the United States advocate expanding the supply of specialists (Weiner, 2007), although the role and contributions of ambulatory specialty care within health systems are largely unknown. In fact, it has been suggested that a surfeit of specialty services is detrimental to population health (Starfield et al., 2005b).

People's use of specialty services is increasing rapidly, at least in the United States. The likelihood of referrals to specialists is greater than in other countries where comparisons have been made (Forrest et al., 2000, 2002; Jaakkimainen et al., 2006; Sicras-Mainar et al., 2007).

We examined the use of ambulatory specialist services and its relationships with other resource use in the context of the receipt of primary care services in 5 private health plans. Controlling for morbidity burden, we explored the relationship between number of different specialists seen and costs and examined whether the number and type of primary care physicians (PCPs) are related to seeking of care from specialists.

METHODS

Insurance claims data from all outpatient visits of individuals continuously enrolled for at least the entire year 2001 and with at least one ambulatory visit to any PCP or other specialist were analyzed. We excluded patients who had been hospitalized in this year because the use of specialists in hospitals is likely to differ markedly from that in the ambulatory sector.

A commercially available database (PharMetrics, 2007) was the source of information on visits and the use of resources in 5 health plans in 3 different US (census) regions (east,

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Disclaimer: *The Johns Hopkins University has copyrighted software based on the ACG case-mix system applied in this study. Royalties are paid to the university when this software is used by insurance plans and commercial organizations.*

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Table 1. Groupings of morbidity burden

Morbidity burden group	65 years and older	>65 years old
High	8 or more types of morbidity	5 or more types of morbidity
Medium	5–7 types of morbidity	3–4 types of morbidity
Low	0–4 types of morbidity	0–2 types of morbidity

west, midwest) having between 52 000 and 465 000 people younger than 65 years with commercial insurance and people 65 years and older in Medicare Managed Care who were continuously enrolled for at least a year. PharMetrics health plans in the database capture a geographically diverse sample. The database is compliant with the Health Insurance Portability and Accountability Act (HIPAA), and the institutional review board of the Johns Hopkins Bloomberg School of Public Health approved the research as not involving human subjects.

Data extracted for each individual included age; sex; number of diagnostic procedures (hereafter designated as "procedures"); number of different PCPs seen, their type, and number of visits; number of different specialists seen and number of specialist visits; and number of medications prescribed. Degree of morbidity burden was specified by the Johns Hopkins Adjusted Clinical Groups case-mix system (www.acg.jhsph.edu), which categorizes diagnoses made in a year on the basis of their likelihood of persistence over time. This method of categorizing morbidity burden has been used for various purposes, including studies of primary care and specialty use in the elderly and nonelderly (Forrest et al., 2001; Omar et al., 2008; Starfield et al., 2002, 2003, 2005a). Examples of the 32 basic diagnostic categories (adjusted diagnostic groups) are acute but self-limited conditions (major and non-major), acute but likely to recur, chronic medical or chronic surgical (stable and unstable), acute exacerbations, and psychosocial conditions. The case-mix system software combines the 32 categories into approximately 100 unique groups according to their type and number (and, for a small number of groups, additionally by age and/or gender) for each individual over the year. Individuals in the database were trichotomized (into approximately equal size groups) as low, medium, or high morbidity burden on the basis of these groupings. Cutoffs for the 3 groups were different for those aged 65 years and older and those younger than 65 years; the "high" group for the elderly was those with 8 or more types of morbidity as compared with 5 or more in those younger than 65 years, medium was 5 to 7 types in the elderly versus 3 to 4 types in those younger than 65 years, and low was 0 to 4 types in the elderly and 0 to 2 types in the nonelderly (Table 1). We did separate analyses for the elderly and nonelderly, using SAS software Version 9.1 (SAS Institute, Inc, Cary, North Carolina) for 2 reasons: the very different extent of morbidity burden and the different type of health insurance coverage (which could affect resource use). Furthermore, this splitting of the population provides one way of examining robustness of the findings across different age groups.

Physician specialty was divided into primary care (internists, general family practitioners, and pediatricians) and specialists.

Resources included number of outpatient procedures and medications prescribed. Procedures included various diagnostic laboratory tests and radiology procedures, standard imaging, sonography and imaging, and routine and minor office procedures. (We considered advanced imaging, nuclear medicine, and major invasive procedures to be mostly outside the purview of ambulatory practice.) Procedures were grouped into clinical service categories (Berenson & Holahan, 1992) using current procedural terminology

codes, level II codes in the Healthcare Common Procedure Coding system, and revenue center codes. The number of different drugs prescribed was based on the Multum drug lexicon (Cerner Multum, 2007), which collapses National Drug Codes into 286 therapeutic classes on the basis of the active ingredients of drugs. Costs (plan allowed amounts) were summed to obtain total costs for each person.

For the number of different specialists seen and counts of procedures and medications, we performed Poisson regressions because of conceptual advantages when analyzing nonnegative counts (Long, 1997). For costs, we performed standard linear regressions because histograms of costs and residual plots showed patterns that were consistent with the assumptions of fitting linear regressions to our cost data. The variables included in all analyses, apart from the main dependent variables, were age, gender, morbidity burden, and an indicator variable for each of the 5 health plans to control for the clustering of patients within plans.

RESULTS

Characteristics of the study population and the use of outpatient health services in the elderly and nonelderly

A total of 1 086 667 patients met the criteria for inclusion in this study: 35% were younger than 20 years, 33% were 21 to 44 years, 29.5% were 45 to 64 years, and 2.5% were 65 years or older; 54% were women. By design, approximately one-third were in each of the 3 morbidity burden categories (high, medium, low) in the elderly and nonelderly separately (Table 2).

Almost 70% of people saw at least one specialist in a year. For the elderly, about one-third saw a specialist without seeing a PCP. The average number of visits to specialists was just

Table 2. Characteristics of the study population[a]

	Age group	
	Elderly (n = 26 494), %	**Nonelderly (n = 1 060 173), %**
Women	59.81	53.58
Morbidity burden—low	28.06	33.25
Morbidity burden—medium	33.95	30.69
Morbidity burden—high	37.99	36.06
Having any generalist visit	64.34	81.21
Having any specialist visit	94.62	68.83
Having only a specialist visit	35.66	18.79
	Mean	**Mean**
Age	74.9	31.4
Total cost	$3343.5	$1633.5
Medical cost	$2582.3	$1173.7
Pharmacy cost	$761.3	$459.8
Number of PCP visits	2.703	2.611
Number of PCPs seen	0.812	1.254
Number of specialist visits	8.851	3.312
Number of specialists seen	4.016	1.742
Number of diagnostic procedures	7.766	4.640
Number of medications	4.673	2.881

Abbreviation: PCP, primary care physician.

[a]Nonhospitalized patients continuously enrolled for a year and having at least 1 recorded generalist or specialist visit.

Table 3. Percentage increase in expected number of different specialists seen from continuity of PCP visit to noncontinuity[a] of PCP visit (by age group)

Age group	% Increase in number with noncontinuity
0–20 ($n = 254\,052$)	2.14[b] (1.19 ~ 3.12)
21–44 ($n = 164\,012$)	3.66[b] (2.77 ~ 4.54)
45–64 ($n = 175\,523$)	6.19[b] (5.39 ~ 6.99)
65 and older ($n = 14\,095$)	8.34[b] (6.11 ~ 10.62)

Abbreviation: PCP, primary care physician.
[a]Noncontinuity of PCP indicates study subjects who saw 2 or more different PCPs.
[b]P value $< .05$.

more than 3, but was almost 9 among the elderly. Most people (85%) had at least one procedure, and 74% had at least one recorded medication. The receipt of care from specialists and resource use was much higher in the elderly, but this was not the case regarding primary care services.

Influence of primary care on number of different specialists seen

Patients with at least 2 PCP visits were included in analyses to explore the influence of continuity of care on number of different specialists seen, with *continuity of care* being defined as having seen only 1 PCP in individuals with more than 1 PCP visit (Table 3). A Poisson regression model was applied to explore the percentage increase in number of specialists seen with discontinuity of primary care, controlling for age, gender, morbidity burden, and plan. Discontinuity of primary care was associated with an increase in the average number of different specialists seen by 2% in children, almost 4% in adults, 6% in older adults, and 8% in the elderly. This statistically significant increase in number of different specialists seen with discontinuity was similar when different cutoff values were used to characterize discontinuity of PCP care, for example, 2 or more PCPs versus 3 or more. That is, the findings were robust with changes in the specification of the different variables.

Because the actual number of specialists seen is heavily influenced by morbidity burden, age, gender, and possibly health plan, we used Poisson regression models to explore the relationship between continuity of PCP and number of specialists seen for each of these sample subgroups separately. Average number of visits increased markedly with increased morbidity burden, especially for the elderly. Even stratifying for morbidity burden, however, people visiting 2 or more PCPs saw more different specialists, especially so in older adults (45–64 years) and the elderly. For example, in men aged 45 to 64 years in mid-sized plans, the average number of different specialists seen in the presence of continuity of PCP was 0.47, 1.06, and 2.63 with low, medium, and high morbidity burdens, respectively, compared with 0.50, 1.12, and 2.80 in those with discontinuity of PCP, with no overlap in confidence intervals.

In another analysis, an increase in number of *visits* to PCPs in the *presence of continuity* was not associated with an increase in the number of different specialists seen in a year either in the elderly or nonelderly; rather, there was a small but statistically significant decrease, indicating that it is continuity rather than fewer PCP visits that is associated with fewer specialists seen. However, in patients *without* continuity of PCP, there was either no difference (in the elderly) or an *increase* in the number of different specialists seen with increasing numbers of PCP visits. That is, without continuity of PCP, more *visits* to PCPs were associated with greater likelihood of seeing more specialists among the nonelderly.

Influence of type of PCP on number of different specialists seen

These analyses included only adults to eliminate the confounding of childhood age with type of physician seen (pediatrician or family physician). The results showed a similar pattern for all adult age groups: having a general internist as the PCP was positively related to more different specialists seen after controlling for age, gender, morbidity burden, and number of PCPs seen (Table 4). The magnitude of the effect was much larger in the

Table 4. Percentage increase in number of different specialists seen with general internist rather than family physician PCP (by age group)[a]

Age group	% Increase (and confidence interval)
21–44 ($n = 259\,941$)	20.08[b] (19.18 ~ 21.00)
45–64 ($n = 243\,850$)	22.72[b] (21.88 ~ 23.55)
65 and older ($n = 17\,019$)	12.13[b] (9.68 ~ 14.64)

Abbreviation: PCP, primary care physician.
[a]The analysis includes adult study subjects with known type of primary care physician ($n = 520\,810$).
[b]P value $< .05$.

nonelderly (eg, 22.7% in the 44–64 age group) than in the elderly (12.1%).

Use of resources

Table 5 shows the results of the multiple linear regression model, which included number of specialists and generalists seen, morbidity burden, sex, age, and health plan.

The number of different specialists seen had a greater influence than did high morbidity burden, older age, number of generalists seen, and gender. The same pattern was seen for medical costs, that is, costs excluding those for medications. Pharmacy costs followed the same pattern, except that increasing age and the number of generalists seen, along with morbidity burden, also become significant predictors whereas the number of specialists seen, while still significantly related, had lower coefficients.

Controlling for the other variables, the expected increase in medical costs associated with one additional specialist seen was $684 in the elderly and $659 in the nonelderly; the increase was less for pharmacy costs: $56 in the elderly and $107 in the nonelderly. All differences were statistically significant, as shown in Table 5.

For both age groups, the number of different specialists seen was a significant and highly salient predictor of use of procedures, after morbidity burden and age. With each additional specialist seen, the expected number of procedures increased by 1.13 in the elderly and 1.17 in the nonelderly. In the elderly, the highest significant coefficients were found for high morbidity burden, the number of PCPs seen, and the number of specialists seen (decreasing in that order); in the nonelderly, the most highly related variables were high morbidity burden, the oldest age group, and number of specialists seen, in that order.

Morbidity burden, increasing age, and number of PCPs seen were the most influential variables related to the number of medications prescribed in both age groups. The number of medications increased by 0.35 in the elderly and 0.40 in the nonelderly with each additional specialist seen; both numbers were statistically significant, although of less magnitude than for the other resource-use categories.

Sensitivity analyses

To ascertain the sensitivity of the results to the adequacy of case-mix adjustment, we repeated the analyses on the use of resources using progressively more complex measures of morbidity burden: the 32 adjusted diagnostic groups each entered separately in the regression analysis; the number of these adjusted diagnostic groups each individual had in a year (from 1 to 10 and 11 or more); alternative cutoff points for high-medium-low morbidity categorization, and each of these 3 categorizations both with and without the inclusion of 266 specific disease groupings (expanded diagnostic clusters), each entered as present or absent—6 additional analyses in all. The R^2 values increased as the complexity of morbidity measures increased, as expected. In all 6 regression analyses, the direction and statistical significance of the variables of interest were the same as in the original analyses reported above, indicating the robustness of our findings to various ways of controlling for case-mix.

We also explored various different types of regression analyses, for example, zero-inflated Poisson and ordered logistic regression, to analyze the relationship between the number of PCPs seen and the number of different

Table 5. Relationship between number of different specialists seen and costs, procedures, and prescriptions: Results of linear regression analyses[a]

Outcome	Cost			Number of diagnostic procedures	Number of medications prescribed
	Total cost	Medical cost	Pharmacy cost		
Elderly ($n = 26,94$)					
Adjusted R^2	0.272	0.249	0.062	0.431	0.216
Number of different specialists seen	[b]747.0 (10.8)	[b]683.8 (10.4)	[b]56.2 (2.6)	[b]1.130 (0.01)	[b]0.349 (0.01)
Morbidity burden—medium	100.3 (64.1)	−14.4 (61.7)	[b]114.7 (15.2)	[b]0.706 (0.08)	[b]0.762 (0.05)
Morbidity burden—high	[b]661.0 (77.3)	[b]452.5 (74.4)	[b]208.4 (18.4)	[b]1.491 (0.10)	[b]1.792 (0.06)
Number of PCPs seen	[b]442.8 (32.6)	[b]385.9 (31.4)	[b]56.9 (7.8)	[b]1.315 (0.04)	[b]0.465 (0.03)
Men	[b]562.2 (48.5)	[b]608.1 (46.7)	[b]−45.9 (11.5)	0.047 (0.06)	[b]−0.465 (0.04)
Nonelderly ($n = 1\,060\,173$)					
Adjusted R^2	0.222	0.181	0.101	0.421	0.290
Number of specialists seen	[b]766.3 (2.0)	[b]659.0 (1.8)	[b]107.2 (0.7)	[b]1.173 (0.00)	[b]0.399 (0.00)
Morbidity burden—medium	0.06 (8.2)	[b]−53.9 (7.5)	[b]53.9 (3.0)	[b]0.691 (0.01)	[b]0.546 (0.01)
Morbidity burden—high	[b]533.5 (9.7)	[b]289.7 (8.8)	[b]243.8 (3.5)	[b]2.017 (0.01)	[b]1.748 (0.01)
Number of PCPs seen	[b]258.0 (3.5)	[b]212.6 (3.2)	[b]45.4 (1.3)	[b]0.770 (0.00)	[b]0.485 (0.00)
Men	[b]324.1 (6.4)	[b]301.5 (5.9)	[b]22.5 (2.3)	[b] −0.591 (0.01)	[b]−0.315 (0.01)
Age 21∼44	[b]54.5 (8.0)	[b]−111.3 (7.3)	[b]165.8 (2.9)	[b]0.826 (0.01)	[b]0.757 (0.01)
Age 45∼64	[b]432.6 (8.6)	[b]−42.3 (7.8)	[b]474.9 (3.1)	[b]1.969 (0.01)	[b]1.262 (0.01)

Abbreviation: PCP, primary care physician.

[a]Numbers represent the relative change in costs, procedures, and medications with one unit increase in the variable of influence, holding other variables (including health plan) constant. For morbidity burden, the reference category is people with low morbidity burden. For men, the comparison is with women. Plan coefficients are suppressed in the presentation of this table.

[b]$P < .01$.

specialists seen. All confirmed our finding that more different PCPs seen is associated with a greater number of specialists seen, after controlling for number of generalist visits.

DISCUSSION

The major new findings are the very high use of specialist services, often without primary care use, and the relationship between patients' primary care use and specialty use.

Prior studies have hinted at the high use of specialist services in the United States by counting the number of primary care and specialist visits in people with different extents of morbidity (Pham et al., 2007; Starfield et al., 2003, 2005a). To the best of our knowledge, the study reported here is the first to show that this high use is at least partly a result of the seeking of care from multiple specialists. A very high percentage of people saw a specialist in a year. The extent to which specialist use occurred in the absence of primary care use in the elderly was surprising, as was the lower primary care use as compared with the nonelderly. The elderly saw, on average, 4 different specialists—more than twice as many as the nonelderly. The number of specialists seen was a highly salient predictor of total costs, medical costs, and number of procedures, but less so for number of types of medications (which was most highly related to morbidity burden). After controlling for morbidity burden, these analyses showed that having a family physician as the PCP is associated with fewer specialists seen. The consistency of the findings and their relative strength in both the elderly and the nonelderly provides confidence in the validity of the findings.

The influence of morbidity burden on the use of specialists is not surprising, because more seriously ill people might need greater consultation and perhaps ongoing care from specialists. However, there is a difference between seriousness of particular diagnoses and high morbidity burden as manifested by the simultaneous presence of more than one type of diagnosis in individuals. It is not intuitively obvious that an individual with multiple illnesses is more in need of specialist care if the individual illnesses themselves do not require specialist attention. In fact, existing studies of care associated with specific diseases suggest that specialists are less likely to see people with comorbidity than are generalists (Selby et al., 1999; Smetana et al., 2007). Moreover, specialists are trained to deal with particular categories of illness and would not be expected to provide higher quality of care for other types of illnesses, which is the likely reason why they do not do as well as generalists when the measures of outcome are generic rather than disease specific (Bertakis et al., 1998; Chin et al., 2000; Donohoe, 1998; Grumbach et al., 1999; Harrold et al., 1999; Hartz & James, 2006; other evidence cited in Starfield et al., 2005c, pp. 476–478). Other differences in care by specialists extend to prescribed medications. Specialists are more likely than generalists to prescribe proprietary rather than generic medications (Federman et al., 2007), thus increasing pharmaceutical costs.

Recent analyses of national data show that a large proportion of visits to specialists in the United States are for routine follow-up; the high use of specialists in our analyses may be linked to routine follow-up (Valderas et al., 2008).

Differences in tendency to refer patients may be occurring; patients of general internists may be referred more or may be more likely to self-refer to specialists, even after controlling for any differences in morbidity burden. Internists have more extensive training in the hospital than family physicians; hospitals, by their nature, attract patients with more serious illness than occurs in community settings (Dovey et al., 2003; Green et al., 2001). Exposure to patients with higher prior probabilities of illness makes general internists more suspicious of serious illness so that they are more likely to do diagnostic workups, in comparison to family physicians, whose experiences teach them that most illnesses in nonhospital settings are likely to be self-limited and not require immediate tests to rule out serious or uncommon illnesses. Moreover, general internists cover a narrower range

of health needs than family physicians, by excluding such services as minor surgery.

In the United States, most government and private insurance programs do not discourage people from going directly to specialists, and overall seeking of care would be expected to be higher than that accounted for by referrals. Franks et al. (2000) found that 40% of patients in one managed care organization saw a specialist in a year; Kuhlthau et al. (2004) estimated that 13% of children in the National Health Survey saw a specialist in a year, and the 2003 Community Tracking Study found that 37% of people (all ages) in the nationally representative survey did so. Data from the 2003 Medical Expenditure Panel Survey reported that 54% of patients (users of any services in a year) and 64% of elderly patients saw at least 1 specialist in a year—figures lower than in the health plans we studied. Lower use in the population as a whole would be expected, as Ferrer (2007) showed that the uninsured have less use of specialty services. However, the extent of seeking of care from specialists, even in the Medical Expenditures Panel Survey data, is higher than that reported from other countries: 31% in Ontario, Canada (and 68% aged 65 years and older) (Jaakkimainen et al., 2006), 15% aged younger than 65 years in the United Kingdom (Forrest et al., 2002), and 30% of the population (but 40% of those with any use in a year) in Spain (Sicras-Mainar et al., 2007).

The increased likelihood of seeing more specialists in the presence of discontinuity of PCP care is likely to be a result of greater unfamiliarity with patients and therefore greater uncertainty and greater tendency to refer.

LIMITATIONS

Although the health plans are likely to represent the predominant form of US practice for the privately insured, the population in the study is not representative of the US population; it does not include care delivered in health centers, most hospital outpatient units, and group/staff model health maintenance organizations, elderly people in traditional fee-for-service Medicare programs, or people who are hospitalized in a year. Although it is possible that seeing different PCPs could have included physicians working closely together in teams in the same practice, we were unable to ascertain the extent to which this was the case. We reran our analyses to determine whether a different specification of continuity as 1 to 2 PCPs versus 3 or more PCPs seen; the results were the same as our original definition.

It is also possible that our method of characterizing morbidity burden does not fully capture differences in either the extent of different types of morbidity or the severity of illness within morbidity categories, but this would not affect our findings regarding number or type of PCPs seen. Although the morbidity classification does not directly measure severity of illness, complications of diagnoses are entered separately and thus contribute to the morbidity burden.

POLICY IMPLICATIONS

The findings of this study have implications for health policy that encourages possibly unnecessary seeking of care from specialists and, thereby, increases costs without commensurate benefits (Baicker & Chandra, 2004; Fisher et al., 2003a, 2003b; Starfield et al., 2005b).

An excessive specialist supply with inappropriate specialist use leads to greater frequency of tests, more false-positive results, and worse outcomes than appropriate specialist use (Franks et al., 1992; Roos, 1979). The more physicians patients see, the greater the likelihood of adverse effects (Schoen et al., 2005; Skinner et al., 2006); seeking care from multiple physicians in the presence of high burdens of morbidity will be associated with a greater likelihood of adverse side effects. Projected to the 18% of the population that is not hospitalized, having 12 months of uninterrupted insurance coverage, and PCP discontinuity (having 2 or more generalist visits but seeing more than 1 generalist), cost savings from having continuity of generalist care would save about $22 billion. As hospitalized patients certainly are likely to be higher users of ambulatory care and more at risk of

seeing different physicians, savings for the entire population would be much greater.

In contrast to the plethora of evidence of the benefits of primary care, little is known about the specific contributions of specialists as a group or as individual specialties to population health overall, particularly concerning common conditions and in the presence of comorbidity. A considerable literature indicates that an excess supply of specialists leads to neither better quality of care nor better outcomes among the elderly population (Wennberg, Bronner, Skinner, Fisher, and Goodman, 2009). As noted above, less than two thirds of the *nonhospitalized* elderly see a PCP in a year whereas 95% see 1 or more specialists.

Estimates of cost savings from replacing unnecessary specialist visits with primary care visits are problematic because of the many assumptions that must be made. In addition to the ones mentioned above, there is the problem of defining what an appropriate specialist visit is. The $188 billion projected savings (based on our data) from eliminating all current specialist visits is clearly unreasonable, as many specialist referrals are undoubtedly indicated. The savings from the half of specialist visits that are for routine follow-up could save a substantial but unknown part of this. Replacing just 1 specialist seen with a generalist seen in our study population projects to a savings of $73 billion in the entire insured population (given the assumptions mentioned above).

This research suggests that the roles and responsibilities of specialty care deserve intensive study, particularly in the context of patient-centered approaches to health services. Some care (particularly routine care) could be returned to PCPs, leaving specialists to care for problems more in line with their training and interests.

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