BRIEF REPORTS

Physicians' Reports of Focused Expertise in Clinical Practice

Nancy L. Keating, MD, MPH, Alan M. Zaslavsky, PhD, John Z. Ayanian, MD, MPP

Little is known about the prevalence of focused expertise (special areas of expertise within a clinical field) among physicians, yet such expertise may influence how care is delivered. We surveyed general internists, pediatricians, cardiologists, infectious disease specialists, and orthopedic surgeons to describe the prevalence of focused expertise and identify associated physician and practice characteristics. About one quarter of generalists and three quarters of specialists reported a focused expertise within their primary specialty. Hospital-based physicians more often reported such expertise, and physicians reimbursed by capitation less often reported expertise. Learning how focused expertise affects processes and outcomes of care will contribute to decisions about physician training and staffing of medical groups.

KEY WORDS: physician training; primary care; specialty care; manpower.

J GEN INTERN MED 2000;15:417-420.

The rapid expansion of medical knowledge and technology has fueled the growth of medical specialization over recent decades.¹ Many physicians have specialized their practice beyond traditional disciplines. Cardiologists, for example, may concentrate in areas such as echocardiography, electrophysiology, or interventional cardiology. The expansion of specialty boards, including increasing opportunities for certification within the traditional specialties, has further encouraged this trend toward more specialized training.²

Expertise within generalist fields has been described less well than within specialist disciplines. In 1994, the American College of Physicians Task Force on Physician Supply envisioned general internists of the future as both experts in the general care of adults and local authorities with more specialized expertise, either in traditional, organ-system-based subspecialties or in new areas of internal medicine such as women's health and geriatrics.³ One aca-

demic medical center now offers a fourth year of internal medicine residency training to foster focused expertise in the practice of general internal medicine.⁴ Similar trends are evident in pediatrics, with the emergence of fellowship training and certification in fields such as adolescent medicine and behavioral-developmental pediatrics.^{5,6} Generalists with focused expertise may be particularly useful in managed care organizations or in geographic areas with fewer specialists. A group of primary care physicians, each with complementary expertise, might share knowledge and skills and thus require fewer consultations with specialists.

In this study, we sought to understand the prevalence and distribution of self-reported expertise in generalist and specialist fields so that future studies can investigate its effect on processes and outcomes of care. We asked physicians in 5 specialties whether they have focused expertise within their primary specialty. We also examined physician and practice characteristics associated with reporting focused expertise.

METHODS

Sampling and data collection for this study were described previously.⁷ Briefly, our sampling frame included all licensed general internists, pediatricians, cardiologists (representing procedure-oriented medical specialists), infectious disease specialists (representing nonprocedural medical specialists), and orthopedic surgeons (representing surgical specialists) in Massachusetts who graduated from medical school before 1993 and reported practicing at least 20 hours per week. In the state licensing database, physicians could report up to 2 specialties in any order. Physicians were sampled as general internists or pediatricians if they listed 1 of these 2 specialties and no second specialty. Orthopedic surgeons, cardiologists, or infectious disease specialists were eligible if they listed that specialty as either of the 2 specialties.

The sample included 300 each of the 1,518 general internists, 808 pediatricians, 606 cardiologists, and 331 orthopedic surgeons, and all 200 infectious disease specialists. Thirty of these 1,400 physicians participated in a pilot survey, and 1,370 were surveyed in July 1997.

Physicians were asked their primary specialty, then asked: "Do you consider yourself to have any special areas of expertise within your clinical field?" If so, they specified the areas of expertise. They also reported their

Received from the Division of General Internal Medicine, Department of Medicine, Brigham and Women's Hospital (NLK, JZA), and the Department of Health Care Policy, Harvard Medical School, Boston, Mass (NLK, AMZ, JZA).

Address correspondence and reprint requests to Dr. Keating: Department of Health Care Policy, Harvard Medical School, 180 Longwood Ave., Boston, MA 02115 (e-mail: keating@hcp.med.harvard.edu).

practice type, practice setting, sources of clinical income, and the proportion of patients for whom they mainly provide primary care.

Statistical Analysis

We identified factors associated with focused expertise for generalists (general internists and pediatricians) and specialists (cardiologists, orthopedists, and infectious disease specialists) separately using logistic regression. We were particularly interested in examining whether focused expertise was associated with practice setting or managed care and thus included practice type (staff-model HMO, multi-specialty group, single-specialty group, or solo), practice site (hospital, community health center, or office), rural practice location (<1,000 persons per square mile), and an indicator for receiving 30% or more of their clinical income from capitation in our models. We also adjusted for gender, years since medical school graduation (in 10-year intervals), board certification, and number of patient visits per week (logarithmically transformed). Data were weighted to

approximate a representative sample of physicians in these specialties practicing in Massachusetts. SUDAAN statistical software was used for multivariable analyses (Research Triangle Institute, Research Triangle Park, NC).

RESULTS

Of 1,370 physicians sampled, 1,225 were currently practicing in Massachusetts, and 705 (58%) completed the survey. The response rate was 57% for general internists, 64% for pediatricians, 47% for cardiologists, 58% for orthopedic surgeons, and 64% for infectious disease specialists. Two physicians in fellowship training were excluded. Respondents and nonrespondents did not differ statistically by years since medical school graduation, gender, board certification status, or rural practice location. Respondents practiced fewer hours per week than nonrespondents (47.3 hours vs 50.7 hours, $P = .003$), less often worked in private offices (24% vs 34%, $P = .001$), and more often worked in HMOs (8% vs 4%; $P = .009$).

FIGURE 1. Physician expertise by specialty. The left column presents the specialties in which physicians were sampled. The center column describes physicians' self-reported primary specialty. The right column lists the percentage of each group with a self-reported expertise, the most common areas of expertise reported, and the number of physicians who reported that area of expertise. ADHD is attention deficit hyperactivity disorder; HIV/AIDS, human immunodeficiency virus/acquired immunodeficiency syndrome.

Table 1. Factors Associated with Reporting Expertise Within Primary Field of Practice

Factor	Generalists*		Specialists*	
	OR	95% CI	OR	95% CI
Specialty				
General internal medicine (reference)	1.0			
Pediatrics	0.7	(0.4 to 1.2)		
Cardiology (reference)			1.0	
Infectious disease			0.9	(0.4 to 2.0)
Orthopedic surgery			1.9	(0.9 to 4.1)
Practice site				
Office (reference)	1.0		1.0	
Community health center	1.1	(0.5 to 2.4)	5.0	(0.6 to 43.8)
Hospital	2.8	(1.3 to 6.2)	2.8	(1.3 to 6.1)
Practice type				
Solo (reference)	1.0		1.0	
Single-specialty group	0.8	(0.4 to 1.8)	2.8	(1.4 to 5.8)
Multispecialty group	0.7	(0.3 to 1.6)	2.2	(0.9 to 5.3)
Staff-model HMO	1.0	(0.4 to 2.6)	0.5	(0.1 to 3.0)
Rural location of practice	1.3	(0.6 to 2.4)	0.3	(0.1 to 0.7)
Female gender	1.3	(0.7 to 2.4)	0.8	(0.3 to 2.2)
Years since graduation (in 10-y intervals)	1.3	(1.0 to 1.7)	0.9	(0.7 to 1.2)
≥30% Salary from capitation	0.6	(0.3 to 1.2)	0.4	(0.2 to 1.1)

*Using logistic regression to control simultaneously for all variables listed in each analysis as well as board certification and number of patient visits per week (logarithmically transformed). Data are weighted to reflect proportions of physicians practicing in the five specialties examined. OR indicates odds ratio; CI, confidence interval.

General internists and pediatricians provided predominantly primary care to almost all of their patients (mean, 96%; SD, 16%). About one quarter reported an expertise within their specialty (Fig. 1, upper right box), primarily focused on groups of patients, such as women, the elderly, children with developmental problems, or adolescents.

Among physicians sampled as specialists, 12 cardiologists (10%) and 25 infectious disease specialists (23%) reported their primary specialty as internal medicine or pediatrics. Nearly all of them reported focused expertise (Fig. 1, middle right box). These physicians provided primary care for most of their patients (mean, 81%; SD, 22%) and were similar to generalists in their site of practice and likelihood of being paid by capitation (data not shown).

About three quarters of self-described cardiologists, infectious disease specialists, and orthopedists reported focused expertise, nearly all in areas specific to their specialty (Fig. 1, lower right box). Self-described specialists provided primary care for few of their patients (mean, 10%, SD, 18%).

Characteristics associated with reporting expertise are listed in Table 1, stratified by generalist or specialist fields. Generalist and specialist physicians in hospital-based practices were more likely than those in private offices to report focused expertise. More experienced generalists were more likely to report focused expertise than recent graduates. Specialists in a single-specialty group more often reported expertise than those in solo practice, as did specialists practicing in nonrural areas. Among all physicians, those who received at least 30% of their income from capitation were less likely to report expertise (odds

ratio [OR], 0.5; 95% confidence interval [CI], 0.3 to 0.9), although this difference was of borderline statistical significance in stratified analyses (Table 1).

DISCUSSION

This study demonstrates the extent of focused expertise within several clinical disciplines. Specialists were much more likely than generalists to report such expertise, possibly reflecting the same desire to master a narrower clinical area that first prompted them to seek specialty training. Focused expertise may also secure a niche amid a potential excess of specialists, particularly in hospital and nonrural settings, and provide opportunities for additional earnings from referrals and procedures that often accompany such expertise. Generalists' expertise tended to focus on groups of patients such as women, adolescents, or the elderly, more often than on traditional, organ-system-based subspecialties. Physicians paid by capitation reported expertise less often than others; they may not yet sense a need to acquire more focused skills to reduce referrals.

Focused expertise has some clear advantages. Physicians with more training or experience with certain conditions may be more efficient at clinical problem solving within their area of expertise.⁸ They may have greater knowledge and better developed technical skills, which may translate into improved processes and outcomes.⁹⁻¹¹

Excessive and narrow subspecialization, however, may yield fragmented care and inefficient referrals to multiple or inappropriate specialists.¹² Physicians with an organ-specific focus may overlook important symptoms and signs

for patients with multiple diseases.¹³ Furthermore, trends toward subspecialization have raised concerns about professional fragmentation.^{12,14-17}

Our study has some limitations. Respondents practiced fewer hours per week and in somewhat different settings than did nonrespondents. However, reporting of expertise did not differ significantly between early and late respondents, suggesting nonrespondents may follow similar patterns. In addition, the density of physicians, particularly specialists, is greater in Massachusetts than in most other areas,¹⁸ possibly prompting more physicians to pursue focused expertise. Thus, generalization of our findings to other states and specialties requires further investigation. Finally, we sampled as general internists and pediatricians only physicians who listed no second specialty. Therefore, physicians who were practicing primarily as generalists but listed a second specialty were not included in our sampling frame. In a subsample of physicians who reported hours worked in each specialty they listed, only 16% of those who listed internal medicine or pediatrics as 1 of 2 specialties practiced more hours as generalists than as specialists. If we had defined generalists to include physicians such as these and made the extreme assumptions that they *each* considered themselves generalists *and* would have reported a focused expertise, then the prevalence of focused expertise among generalists could be as high as 44%.

The benefits of added specialty training, experience, and expertise must be balanced against those of an integrative generalist approach as physicians strive to provide high-quality care while containing costs. Although physicians with highly specialized skills are essential for some patients, excessive specialization by many physicians may not be ideal. Alternatively, encouraging generalists to develop expertise and structuring practices to make use of this expertise may be an efficient means of providing high-quality care; however, the optimal mix of different types of expertise remains to be defined. The effects of providing information about physicians' self-reported expertise to patients and physicians are also unknown. This information may assist patients' choice of physicians and improve appropriateness of referrals. Yet, it may also result in narrowing of physicians' clinical experiences, for example, if men rarely choose generalist physicians who report expertise in women's health. Finally, a physician's report of expertise is not necessarily a measure of quality; thus, distinguishing physicians who have been trained or certified in a specific area may be useful.

Our study demonstrates that many physicians report focused expertise, and it provides a framework for classifying expertise, which can be both disease-oriented and population-oriented. As investigators seek to better understand the effects of experience and specialty training

on health care, it will be important to refine comparisons of generalist versus specialist care to examine the role of self-reported expertise. Assessing how focused expertise among both generalist physicians and specialist physicians affects the processes and outcomes of care may have important implications for training physicians and staffing medical groups.

Dr. Keating was the recipient of a National Research Service Award from the Agency for Healthcare Research and Quality, Rockville, MD. Dr. Ayanian was a Generalist Physician Faculty Scholar of the Robert Wood Johnson Foundation, Princeton, NJ. This study was supported by the Primary Care Research and Education Fund of Brigham and Women's Hospital.

REFERENCES

1. Beeson PB. The natural history of medical subspecialties. *Ann Intern Med.* 1980;93:624-6.
2. Langsley DG, Darragh JH, ed. *Trends in Specialization: Tomorrow's Medicine.* Evanston, Ill: American Board of Medical Specialties; 1985.
3. American College of Physicians. The role of the future general internist defined. *Ann Intern Med.* 1994;121:616-22.
4. Fogelman AM. Strategies for training generalists and subspecialists. *Ann Intern Med.* 1994;120:579-83.
5. Butzin DW, Guerin RO, Langdon LO, Irwin CE. The certification process in adolescent medicine. *J Adolesc Health.* 1998;23:328-31.
6. The American Board of Medical Specialties. 1999 Annual Report and Reference Handbook. Evanston, Ill: American Board of Medical Specialties; 1999.
7. Keating NL, Zaslavsky AM, Ayanian JZ. Physicians' experiences and beliefs regarding informal consultation. *JAMA.* 1998; 280:900-4.
8. Kassirer JP, Gorry A. Clinical problem solving: a behavioral analysis. *Ann Intern Med.* 1978;89:245-55.
9. Hannan EL, Kilburn H, Bernard H, O'Donnell JF, Lukacik G, Shields EP. Coronary artery bypass surgery: the relationship between inhospital mortality rate and surgical volume after controlling for clinical risk factors. *Med Care.* 1991;29:1094-1107.
10. Donohoe MT. Comparing generalist and specialty care: discrepancies, deficiencies, and excesses. *Arch Intern Med.* 1998;158:1596-1608.
11. Harrold LR, Field TS, Gurwitz JH. Knowledge, patterns of care, and outcomes of care for generalists and specialists. *J Gen Intern Med.* 1999;14:499-511.
12. Fletcher RH, Fletcher SW. Internal medicine: whole or in pieces? *Ann Intern Med.* 1991;115:978-9.
13. Fletcher RH, Fletcher SW. What is the future of internal medicine? *Ann Intern Med.* 1993;119:1144-5.
14. Conti CR. President's page: concerns about fragmentation of adult cardiology. *J Am Coll Cardiol.* 1989;14:532-3.
15. Nolan JP. Internal medicine in the current health care environment: a need for reaffirmation. *Ann Intern Med.* 1998;128:857-62.
16. Organ CH. Fragmentation and specialization. *Arch Surg.* 1987; 122:639.
17. Jordan GL Jr. The future of general surgery. *Am J Surg.* 1991;161:194-202.
18. American Medical Association. *Physician Characteristics and Distribution in the U.S.* 1997-98 ed. Chicago, Ill: Survey and Data Resources; 1997.