



## Family Physicians' Referral Decisions

### Results From the ASPN Referral Study

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■ **OBJECTIVE** To examine family physicians' referral decisions, which we conceptualized as having 2 phases: whether to refer followed by to whom to refer.

■ **STUDY DESIGN** Prospective cohort study.

■ **POPULATION** All visits (N = 34,519) and new referrals (N = 2534) occurring during 15 consecutive business days in the offices of 141 family physicians in 87 practices located in 31 states.

■ **OUTCOMES MEASURED** Rates of referral, reasons for referral, practitioners referred to, health problems prompting referral, and reasons for selecting particular specialists.

■ **RESULTS** Approximately 1 in 20 (5.1%) office visits led to referral. Although 68% of referrals were made by physicians during office visits, 18% were made by physicians during telephone conversations with patients, 11% by office staff with input from the physician, and 3% by staff without physician input. Physicians endorsed a mean of 1.8 reasons for making a referral. They sought specialists' advice on either diagnosis or treatment for 52.1% of referrals and asked the specialist to direct medical management for 25.9% and surgical management for 37.8%. Patient request was one reason for 13.6% of referrals. Fifty conditions accounted for 76% of all referrals. Surgical specialists were sent the largest share of referrals (45.4%), followed by medical specialists (31.0%), nonphysician clinicians (12.1%), obstetrician-gynecologists (4.6%), mental health professionals (4.2%), other practitioners (2.0%), and generalists (0.8%). Physicians recommended a specific practitioner to the patient for most (86.2%) referrals. Personal knowledge of the specialist was the most important reason for selecting a specific specialist.

■ **CONCLUSIONS** Referrals are commonly made during encounters other than office visits, such as telephone conversations or staff-patient interactions, in primary care practice. Training in the referral process should ensure that family physicians obtain the skills necessary to expand their scope of practice, when appropriate; determine when and why a

#### KEY POINTS FOR CLINICIANS

- Approximately one third of referrals are made during encounters other than office visits to physicians.
- The type of presenting problem is a powerful determinant of whether a patient is referred.
- Obtaining advice is by far the most common reason for referral.
- Family physicians choose a specific specialist for most of their patients and value personal knowledge of specialists over all other factors during this selection process.

patient should be referred; and identify the type of practitioner to whom the patient should be sent.

■ **KEY WORDS** Referral and consultation; primary health care; family physicians; specialists. (*J Fam Pract* 2002; 51:215-222)

Conventionally, primary care physicians decided when to refer and to whom a patient should be referred.<sup>1,2</sup> Specialists' assistance was sought for diagnostic or therapeutic dilemmas,<sup>3,4</sup> management of conditions that presented too infrequently to maintain clinical competence,<sup>5</sup> and specialized procedures that fell outside a physician's scope of practice.<sup>3,4</sup> In some cases, physicians referred because patients requested to see a specialist.<sup>1,4</sup>

The reorganization of health care over the past few decades has dramatically altered the interactions between primary care physicians and specialists. The growth in multispecialty group practice arrange-

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**TABLE 1** **FAMILY PHYSICIAN STUDY SAMPLE**

Personal Characteristics (N = 141 physicians)	Mean or Percentage
Age, mean (SD)	45.3 (7.2)
Years in primary care practice, mean (SD)	14.0 (7.9)
% female	21.3
Hours/week spent in:	
Direct patient care, mean (SD)	34.7 (16.2)
Administration, mean (SD)	6.5 (5.7)
Academic medicine, mean (SD)	3.0 (5.3)
Research, mean (SD)	1.2 (3.2)
Medical education, mean (SD)	5.9 (8.8)
General Practice Characteristics (N = 87 practices)	
Practice arrangement, %	
Solo practice	27.6
2- or 3-physician practice	13.8
Family practice group (more than 3 physicians)	33.3
Multispecialty group	16.1
Community health center	5.8
Hospital-based practice or clinic	3.4
Practice ownership, %	
Hospital	46.5
Insurer	5.8
Another medical group	4.6
Subgroup of physicians in practice	5.8
All physicians in practice	30.2
Publicly owned clinic	7.0
Number of physician FTEs per practice, mean (SD)	4.6 (5.9)
Staff: physician FTE ratio per practice, mean (SD)	3.7 (2.4)
Practice Characteristics Related to Referrals (N = 87 Practices)	
Practice has an administrative referral coordinator, %	60.0
Personnel permitted to refer a patient, %	
Nurses with physician input	85.9
Nurses without physician input	14.5
Administrative staff with physician input	67.4
Administrative staff without physician input	7.1
Referrals are made during telephone conversations with patients, %	90.8
Practice allows patients to request a referral by leaving a recorded message, %	19.5
FTE denotes full-time equivalents; SD, standard deviation.	

ments<sup>6</sup> has led to formal, organizationally defined linkages between practitioners. Managed health plans and medical groups<sup>7</sup> encourage primary care physicians' control over the referral process through such mechanisms as specialty referral authorizations, financial disincentives for making a referral, performance assessment of referral patterns, and referral guidelines. These changes have transformed a once-informal process into one rife with administrative restrictions on referral decision making.

The Ambulatory Sentinel Practice Network (ASPN) Referral Study was designed to describe and analyze

primary care physicians' referral decisions and their outcomes in the context of a changing health care system in the United States. The study occurred in the ASPN and other regional practice-based research networks. This report examines primary care physicians' referral decisions. We conceptualized the referral decision as occurring in 2 phases: whether to refer followed by to whom to refer.<sup>2</sup>

## METHODS

### Physician Sample

Physicians were recruited from March 1997 to May 1998. Recruitment activities were directed to all physician members of ASPN, physicians affiliated with the Medical Group Management Association, local and regional networks (Minnesota Academy of Family Physicians Research Network, the Wisconsin Research Network, the Dartmouth Primary Cooperative Research Network (COOP), and the larger community of primary care physicians. The study was publicized via direct mailings to physicians, articles and notices in practice-based research network newsletters and journals, and presentations at conferences. Contact with physicians expressing interest was made by telephone.

Physicians were included in the study if they practiced in the United States and were not in residency or fellowship training. Of all physicians contacted, 342 expressed interest in the study and 182 completed some aspect of data collection. A total of 141 family physicians, 12 internists, and 1 pediatrician completed all phases of data collection. In this study, the 141 family physicians (41% members of ASPN) formed the physician sample. They delivered health care in 87 practices located in 31 states.

### Procedures

Study protocols and materials, based on a similar practice-based research study conducted with pediatricians, were reviewed and approved by the Committee on Human Research of the Johns Hopkins School of Public Health and the Colorado Multi-Institutional Review Board.<sup>4,8,9</sup> We conducted a pilot test in 5 practices; this test led to further refinements of methods and questionnaires.

Data collection occurred from September 1997 to February 1999, with 94% of physicians collecting data in 1998 only. Before beginning data collection, physicians completed a questionnaire concerning their practices and personal characteristics. Each practice selected a coordinator who communicated with research staff, learned study protocols, trained office staff and physicians, and monitored data quality.

**TABLE 2** REASONS FOR REFERRAL

Reason for Referral*	% of Referrals
<b>Advice</b>	
On both treatment and diagnosis	40.3
On treatment only	7.7
On diagnosis only	3.5
<b>Specialized skill</b>	
Direct surgical management	37.8
Direct medical management	25.9
Nonsurgical technical procedure or test	11.7
Multidisciplinary care	10.6
Mental health counseling	3.5
Endoscopy	3.3
Patient education	1.0
<b>Patient or third-party request</b>	
Patient request	13.6
Specialist request	2.6
Administrative renewal	2.0
Insurance guidelines	1.0
<b>Other reasons</b>	
Failed current therapy	10.9
Medicolegal concerns	2.9
Time constraints	1.6

\* Reasons for referral are not mutually exclusive. Physicians endorsed an average of 1.8 different reasons for making the referral. The sample size of 2022 referrals was smaller than the total number of referrals because of incomplete physician response and a few questionnaires with missing data for these items.

Coordinators completed a questionnaire about the organizational and financial components of their practice. They kept a log of all visits made during 15 consecutive business days and occurring during regularly scheduled office hours. A business day was defined as a half or full work day, provided that the physician held routine office hours. Each patient's date of birth (5% missing), sex (2% missing), and principal diagnosis (5% missing) were recorded.

The coordinator kept another log of all referrals made by physicians, nurses, and other office staff. Referrals made during telephone conversations with patients were included. A referral was defined as a recommendation that a patient have a face-to-face encounter with another practitioner. We excluded referrals made to laboratories, radiologic facilities, emergency departments, hospitals for inpatient admission, and "curbside consultations" (ie, when the referring physician obtains advice from a specialist but does not send the patient for a visit).

A medical record abstractor assigned ICD-9-CM codes to diagnoses provided by office staff. We matched ICD codes to an expanded set of diagnosis clusters (EDCs). EDCs group ICD codes into clinically homogeneous categories using the methods developed by Schneeweiss.<sup>10</sup> (For more information

on EDCs, see <http://acg.jhsph.edu>.)

When physicians made a referral, they completed a questionnaire (response rate 93.9%) with items concerning the referral decision. Reasons for referral were based on our previously developed taxonomy used in a pediatric referral study<sup>4</sup> and focus groups of family physicians convened during an annual ASPN convocation.

At the study's conclusion, physicians received a report that compared their referral practice patterns with those of the entire sample. To defray office expenses associated with data collection, each practice was given a \$100 stipend in addition to \$5 for each physician referral.

### Generalizability Analysis

We compared referral rates of the study sample with the National Ambulatory Medical Care Survey (NAMCS), a nationally representative sample of office visits made to family physicians.<sup>11,12</sup> We pooled surveys from 1989 to 1994, inclusive, when the majority of the items in the survey instruments remained unchanged.<sup>13</sup> (The 1995–1999 surveys did not contain information on whether the visit led to referral.)

We selected visits made by patients enrolled in non-HMO health plans (NAMCS) and health plans that had neither capitated primary care physician payment nor gatekeeping arrangements (study sample). This was done because of the known effect of managed care in general, and of gatekeeping specifically, on increasing referral rates<sup>8,13</sup> and the unequal distribution of managed care plans between the 2 samples. Unweighted visits yielded a sample size of 37,145; of these, 11,676 met the selection criteria.

The proportions of office visits referred were compared overall and by age, sex, and health condition. The 10 most frequently referred conditions in the study sample were used for the condition-specific referral rate assessments. Statistical significance was assessed by the chi-square statistic.

## RESULTS

Descriptive information on the 141 family physician sample is presented in Table 1. Physicians spent an average of 51.3 hours per week in their jobs. About 68% of their time was devoted to direct patient care. In most practices, a staff member coordinated administrative aspects of specialty referrals; 20% permitted patients to request a referral by leaving a voice mail message.

### Frequency of Referral

The 141 family physicians had 34,519 office visits and made 2165 referrals during 1771 practice-days;

**TABLE 3**  
**NUMBER OF OFFICE VISITS, REFERRAL RATES, AND SPECIALISTS  
 REFERRED TO FOR TOP 15 REFERRED CONDITIONS\***

Condition (No. of Referrals)	No. of Visits for Condition	Referral Rate (% visits referred)	Two Most Common Specialists (% referrals)
Benign and unspecified neoplasm (127)	808	15.7	General surgeon (32.3) Dermatologist (22.8)
Musculoskeletal signs and symptoms (109)	1077	10.1	Orthopedic surgeon (58.7) Podiatrist (10.1)
Low back pain (77)	1149	6.7	Physical therapist (33.8) Orthopedic surgeon (19.5)
Diabetes mellitus (56)	1654	3.4	Ophthalmologist (48.2) Nutritionist (16.1)
Depression, anxiety, neuroses (53)	1472	3.6	Psychologist (39.6) Psychiatrist (26.4)
Bursitis, synovitis, tenosynovitis (44)	422	10.4	Orthopedic surgeon (50.0) Hand surgeon (15.9)
Urinary symptoms (37)	272	13.6	Urologist (75.7) Nephrologist (16.2)
External abdominal hernias (35)	77	45.5	General surgeon (100)
Peripheral neuropathy, neuritis (33)	249	13.3	Orthopedic surgeon (27.3) Neurologist (21.2)
Gastrointestinal signs and symptoms (29)	182	15.9	Gastroenterologist (79.3) General surgeon (10.3)
Deafness, hearing loss (27)	75	36.0	Audiologist (63.0) Otolaryngologist (37.0)
Acute sprains and strains (27)	641	4.2	Physical therapist (44.4) Orthopedic surgeon (33.3)
Joint disorders, trauma related (25)	108	23.1	Orthopedic surgeon (84.0) Physical therapist (8.0)
Otitis media (23)	1185	1.9	Otolaryngologist (95.7) Audiologist (4.4)
Abdominal pain (23)	645	3.6	Gastroenterologist (39.1) General surgeon (39.1)

\* A complete listing of these data for all conditions reported by study physicians can be found in Table W1 at <http://www.jfponline.com>.

5.1% of office visits were referred. Physicians saw an average of 19.7 patients per day (range 7.0 to 48.4) and made 1.23 referrals per full practice-day (range 0 to 3.90). Referrals made during telephone conversations with patients accounted for 18.9% of all referrals made by physicians (range 0% to 100% per physician).

An additional 369 referrals (a rate of 0.21 referrals per practice-day) were made by staff. Overall, 68% of all referrals were made by physicians during visits with patients, 18% by physicians during telephone conversations with patients, 11% by staff with physician input, and 3% by staff without physician input. In 43.6% of referrals made during telephone conversations with patients, the telephone encounter was the first presentation to medical care for the health problem.

We compared percentages of office visits in which a referral was made in the study sample with percentages of such referrals by family physicians from the NAMCS surveys (1989–1994). The overall per-

centages did not significantly differ between the 2 groups (4.0% vs 3.7%,  $P > .05$ ). Although physicians in the study sample were statistically less likely than NAMCS counterparts to refer children (1.6% vs 2.5%,  $P = .030$ ), more likely to refer the elderly (4.8% vs 4.1%,  $P = .045$ ), and more likely to refer females (4.1% vs 3.9%,  $P = .009$ ), these differences were small. There were no differences between the groups in condition-specific referral rates. In sum, these results show that patients in the ASPN sample were equally likely to be referred as those in the NAMCS sample.

### Reasons for Referral

Table 2 shows the distribution of physicians' reasons for making the referral. Physicians

endorsed a mean of 1.8 different reasons for making the typical referral. Although patients requested to see a specialist for 13.6% of referrals, physicians recorded patient request as the only reason for referral just 1.1%.

We compared referrals made for uncommon conditions (lowest tertile of practice-prevalence) with common conditions (highest practice-prevalence tertile). The calculation of practice-prevalence was based on prior research: the numerator was visits made for the index condition, and the denominator was all visits in the sample.<sup>5</sup> Uncommon conditions were more likely to be referred for medical management (38.5% vs 25.4%,  $P < .001$ ), patient request (19.8% vs 12.3%,  $P = .005$ ), and specialist request (4.9% vs 2.1%,  $P = .021$ ). Common conditions were more likely to be sent to specialists because of failed current therapy (13.6% vs 3.8%,  $P < .001$ ) and endoscopy (4.3% vs 0.5%,  $P = .013$ ). There were no significant differences between the 2 groups in the chances of referral for advice on either diagnosis

**TABLE 4**  
**THREE MOST COMMON CONDITIONS REFERRED TO SELECTED SPECIALISTS\***

Type of Specialist (Nos. of Referrals)	Referred Health Problem	No. (Cumulative %)
Cardiologist (n = 94)	Cardiac arrhythmia	20 (21.3)
	Chest pain	17 (39.4)
	Ischemic heart disease	16 (56.4)
Dermatologist (n = 121)	Benign and unspecified neoplasms	36 (29.8)
	Dermatitis and eczema	18 (44.6)
	Acne	10 (52.9)
Gastroenterologist (n = 135)	Gastrointestinal signs and symptoms	26 (19.3)
	Gastroesophageal reflux	16 (31.1)
	Abdominal pain	15 (42.2)
General surgeon (n = 185)	Benign and unspecified neoplasms	52 (28.1)
	External abdominal hernias	36 (47.6)
	Cholelithiasis, cholecystitis	23 (60.0)
Ophthalmologist (n = 109)	Diabetes mellitus	32 (29.4)
	Ophthalmic signs and symptoms	17 (45.0)
	Cataract, aphakia	9 (53.2)
Orthopedic surgeon (n = 247)	Musculoskeletal signs and symptoms	78 (31.6)
	Bursitis, synovitis, tenosynovitis	26 (42.1)
	Fractures, excluding digits	22 (51.0)
Otolaryngologist (n = 141)	Otitis media	27 (19.2)
	Sinusitis	13 (28.4)
	Deafness, hearing loss	11 (36.2)
Ob/gyn (n = 93)	Menstrual disorders	17 (18.3)
	Female genital symptoms	10 (29.0)
	Uterovaginal prolapse	9 (38.7)

\* An expanded version of this table that includes 29 specialists can be found in Table W2 at <http://www.jfponline.com>.

or treatment.

### Conditions Referred

Table 3 presents condition-specific referral rates and the 2 most common types of specialists referred to for the top 25 referred health problems. (A complete listing of these data for all conditions reported by study physicians can be found in Table W1 at <http://www.jfponline.com>.) The 50 most commonly referred health problems accounted for 76% of all referrals made during office visits. Signs or symptoms accounted for 22.4% of all referrals. Condition-specific referral rates varied from a low of 1.9% for patients with otitis media to a high of 45.7% of visits referred for patients with cholelithiasis or cholecystitis. This range in referral rates translates into 24-fold variation in the chances of referral during an office visit based solely on the presenting problem.

### Specialist Selection

Referrals were made most often to surgical subspecialists (45.4%), followed by medical subspecialists (31.0%), nonphysician clinicians (12.1%), obstetrician-gynecologists (ob/gyns) (4.6%), mental health professionals (4.2%), other physicians (2.0%), and general-

ists (0.8%). The 5 most common specialists to whom patients were referred were orthopedic surgeons (12.1%), general surgeons (9.1%), otolaryngologists (6.9%), gastroenterologists (6.6%), and dermatologists (6.0%). Among male patients, referral to urologists was the second most common type; among female patients, referral to ob/gyns was the third most common type.

Mental health referrals were made predominantly to psychologists (2.1% of all referrals), followed by psychiatrists (1.3%) and social workers (0.4%). The most common types of nonphysician clinicians referred to were physical therapists (4.5%), podiatrists (3.0%), nutritionists (1.5%), and audiologists (1.2%).

Referring physicians recommended a specific specialist to the patient for 86.2% of referrals. In descending rank order according to the mean importance rating (range 1 to 3), the reasons for selecting a particular specialist were personal knowledge of the specialist (2.6), quality of prior feedback (2.5), technical capacity

(2.3), appointment availability (2.0), patient's request (1.6), requirements of patient's health plan (1.6), and proximity of the specialist to the patient's home (1.6).

Table 4 shows the 3 most common health problems referred to 10 types of specialists. (An expanded version of this table that includes 29 specialists can be found in Table W2 at <http://www.jfponline.com>.) The majority of referrals for each type of specialist were for 1 to 3 health problems. Family physicians made 17.1% of all referrals to practitioners within their practices. Intrapractice referrals were significantly higher than the overall average for audiologists (40.0%,  $P = .031$ ), nutritionists (45.2%,  $P = .004$ ), and psychologists (46.3%,  $P < .001$ ) and were lower for gastroenterologists (9.3%,  $P = .022$ ) and rheumatologists (4.0%,  $P = .005$ ).

## DISCUSSION

This study shows that family physicians manage 95% of office visits without specialty referral. About one third of referrals made from primary care practices occur during encounters other than office visits. Referrals made by staff or during telephone conversations may be part of an integrated sequence of

contacts between patients and physicians. Nonetheless, assisting patients in selecting a specialist, transferring relevant patient information, and scheduling specialty appointments (referral coordination activities) are more difficult to perform when patients are not seen in the office,<sup>14</sup> because time is limited and integrating care is poorly reimbursed, if at all. When such referral decisions are made appropriately, they provide an efficient mechanism for decreasing workload in a busy primary care practice. Inappropriately made, they can lead to increased expense, unnecessary time spent with specialists, and poorly coordinated care.

We found that the rates of referral were substantially different among the most commonly referred conditions. Prior work has shown that the frequency with which conditions present to primary care physicians explains about 75% of the variation in condition-specific referral rates.<sup>5</sup> The mix and severity of comorbidities are important determinants of annual patient referral rates<sup>15,16</sup> and the chances of referral during a visit.<sup>5</sup> Thus, the epidemiology of morbidity among a patient population is a critical factor that defines the boundaries between primary care physicians and specialists. The appreciation of these clinical determinants is crucial for any valid assessment of primary care physicians' referral patterns.

### Limitations

The study's focus was on new referral decisions made by physicians to other practitioners. No information is provided about ongoing, long-term referrals in which the patient was already under the care of a specialist. The low rates of referral for conditions such as diabetes may be a consequence of this limitation. Patients with diabetes may already have been under the care of a specialist, thereby generating few new referrals. It is also important to note that even in health plans with gatekeeping arrangements, patients self-refer to specialty care<sup>13</sup>; this study did not include any information on self-referral. Patient self-referral appears to be most likely among sick patients, those with established relationships with a specialist, and patients who do not have a good relationship with a primary care physician.<sup>17</sup>

We did not obtain information on the number of telephone calls fielded by physicians each day. Without these data, we were unable to determine whether our methods had failed to capture some telephone referrals or to calculate telephone referral rates. In this study, family physicians made 18.9% of all referrals during telephone conversations, in contrast with pediatricians in another study<sup>4</sup> who made 27.5% of all referrals by telephone. The difference in

these proportions is not large and is probably explained by pediatricians' greater use of the telephone for patient care.

It could be argued that the volunteer physicians in this study systematically differ from the typical family physician. The average number of visits per day among study physicians (19.7) is similar to a national estimate of 19.9 visits/day for family physicians in single specialty group practices.<sup>18</sup> Furthermore, we found similar probabilities of referral overall and for the 10 most commonly referred conditions between study physicians and a national sample, suggesting that referral propensities between the 2 groups were similar.

### Why Family Physicians Refer

No value judgments can be made about the appropriateness of physicians' reasons for referral. Physicians most commonly referred because they were uncertain about diagnosis or treatment and sought advice from another practitioner. For about 1 in 5 referrals, physicians recorded only a sign or symptom as the diagnosis, suggesting a reasonably high level of diagnostic uncertainty. Physicians' tolerance of uncertainty varies markedly,<sup>19</sup> making it difficult to judge questions about appropriateness of referrals that are made to reduce this uncertainty.

Another important reason for referral was that physicians deemed the management of the health problem to be outside their scope of practice. Physicians were more likely to refer a patient with a common problem after trying out a course of treatment than was the case for uncommon problems that were more likely to be referred for medical management.

Patients may raise the topic of possible referral. When physicians agree that referral is indicated, they almost always find other reasons for making the referral. Alternatively, physicians might make a decision to refer and justify it in part as being a result of patient request. Discussions on whether a referral is needed are common in primary care. Among referrals made in an Israeli family practice network, patients raised the topic of possible referral in 27% of cases.<sup>20</sup> In a study of 856 internal medicine visits, 45% of patients indicated some desire to discuss the need for referral with their physician; however, physicians recognized these desires only about half the time.<sup>21</sup>

### Selecting a Specialist

Our results show that primary care physicians prefer to send their patients to specialists with whom they have developed a relationship. Physicians in this study maintained a high level of involvement in spe-

cialist selection, providing patients with the name of a specific practitioner for 86.2% of referrals. The most important factor in selecting a specialist in our study was the same as that found nearly 20 years ago by Ludke<sup>1</sup>: personal knowledge of the specialist. Physicians' dissatisfaction with the specialty referral process in managed care settings<sup>22,23</sup> could be a result of their reduced choice of specialists with whom they have forged personal relationships.

Slightly more than 1 in 6 referrals were made to specialists in the referring physician's practice, consistent with movement of primary care physicians into multispecialty groups. Whether intrapractice referral holds any advantage over referrals outside the practice, such as better coordination and appointment adherence, awaits future study.

Our results show that physicians must not only select a specific practitioner but also choose among different types of practitioners. Some patients were sent to nonphysician clinicians and physicians (eg, podiatrists and orthopedic surgeons for acquired foot deformity), whereas others were sent to medical or surgical subspecialists (eg, nephrologists and urologists for urinary tract symptoms). These patterns are likely to reflect the need for multidisciplinary specialty care for some conditions. For instance, patients with diabetes may see an ophthalmologist for retinopathy evaluations and an endocrinologist for medical management consultation. For some conditions, there appears to be considerable uncertainty regarding the boundaries between specialists.<sup>24</sup> Should a patient with a skin mass be sent to a general surgeon, a dermatologist, or a plastic surgeon? When should a patient with allergic rhinitis be sent to an allergist and when to an otolaryngologist? These referral patterns may reflect local care practices and specialist availability. They may also be a consequence of a surplus of specialists in this country and competition for patients.

In a survey of family physicians that was performed in the late 1980s, respondents reported that they were more likely to refer to internal medicine subspecialists than internists for adults, but preferred general pediatricians over pediatric subspecialists.<sup>25</sup> Our findings suggest that the trend for adult patients remains, but there has been a shift away from general pediatricians toward subspecialists for pediatric referrals. These new patterns may be a consequence of greater availability of pediatric subspecialists, greater exposure of family physicians to pediatric consultants, and a larger share of family physicians who have completed residency training.

### Implications for Physician Training

Fifty conditions accounted for 76% of all specialty referrals made during office visits in this study. Interactions with most types of specialists are generally limited to a few conditions; 3 health problems accounted for more than half of referrals to most specialties. Educators should ensure that these commonly referred conditions are emphasized in curricula that provide family physicians with the skills necessary to expand their scope of practice, when appropriate; determine when a patient should be referred; and identify the type of practitioner to whom the patient should be sent.

Physicians in training should be taught the skills required to recognize the boundaries of their clinical uncertainty and scopes of practice. A challenge for educators is to assist trainees in determining when to tolerate clinical uncertainty while employing a watchful waiting approach and when to initiate a more aggressive evaluation, including when to obtain specialty referral. Modes of implementing these approaches are likely to differ across conditions. Thus, it makes sense in physician training to place the greatest emphasis on conditions for which family physicians commonly refer.

Under certain circumstances, patient request for a specialty consultation may be a sufficient and legitimate reason for referral. For example, as we found in this study, patients with uncommon health problems may seek reassurance from specialists skilled in the management of their specific condition. Managing access to specialists, particularly when the physician is acting as an administrative gatekeeper to referrals, can be challenging.<sup>21</sup> When doctors and patients disagree on the need for referral, patients may become dissatisfied with their health care<sup>26</sup> and decide to self-refer to specialty care.<sup>17</sup> In consideration of the increasing complexity of medical care, developing skills that help physicians discuss and negotiate access to specialized services with both patients and specialists has never been more timely.

#### · ACKNOWLEDGMENTS ·

*This study was funded by grant no. R01 HS09377 from the Agency for Healthcare Research and Quality. James Werner and Laurie Vorel provided technical assistance with data collection and project implementation. Many physicians collected data for this study. Their time and devotion were invaluable to the success of this study. These physicians are listed by the states in which they practice. Arizona: Scott Ekdahl, DO; Arkansas: John Scott, MD; California: Andrew Ness, MD; Colorado: Howard Corren, MD; Nell Davis, MD; Timothy Dudley, MD; Audrey Farley, MD; Tillman Farley, MD; Charles Kay, MD; Joan*

MacEachen, MD; George Maxted, MD; John Miller, MD; Kathy Miller, MD; Steven Milligan, MD; Frank Reed, MD; Louise Schottsteadt, MD; Lynne Spicer, MD; Laura Stein, MD; Lynn Strange, MD; Dan Sullivan, MD; Georgia: Linda Casteel, MD; Randy Cronic, MD; Bruno Denis, MD; Keith Ellis, MD; Kelly Erola, MD; Craig Fabel, MD; Russell Leubbert, DO; Richard Liotta, DO; Mark Majoch, MD; David Najjar, MD; James Snow, DO; Roslyn Taylor, MD; Illinois: Steven Lidvall, MD; Anna Meenan, MD; Eduardo Scholcoff, MD; Loyd Wollstadt, MD; Indiana: Paul Daluga, MD; Steven Phillipson, MD; Iowa: Ken Miller, MD; Janet Ryan, MD; Kansas: Wendell Ellis, DO; John R. Eplee, MD; Robert Moser, MD; Daniel Sontheimer, MD; Louisiana: Linda Stewart, MD; Michigan: Linda French, MD; John Hickner, MD; Minnesota: Ravi Balasubraman, MD; Dave Bucher, MD; William Davis, MD; Richard Gebhart, MD; Katie Guthrie, MD; Anthony Jaspers, MD; Timothy Komoto, MD; Glenn McCarty, DO; Stephen Mitrione, MD; Thomas Retzinger, MD; Paul Spilseth, MD; Ashlesha Tamboli, MD; Montana: Curt Kurtz, MD; Nevada: Coleen Lyons, MD; New Hampshire: Richard Douglass, MD; Paul Friedrichs, MD; Peter Hope, MD; Jonathan Mishcon, MD; New Jersey: John Orzano, MD; Winifred Waldron, MD; New York: Carmella Abraham, MD; R. Eugene Bailey, MD; Lorne Becker, MD; John DeSimone, MD; Miguel Diaz, MD; Rebecca Elliott, MD; John Glennon, MD; James Greenwald, MD; Glenn Griffin, MD; Eileen Hoffman, MD; L. Thomas Wolff, MD; North Carolina: Ed Bujold, MD; Thomas Detesco, MD; Dave Rogers, MD; Phil Sherrod, MD; Oklahoma: Laura Miller, DO; Mike Pontious, MD; Oregon: Douglas Eliason, DO; L.J. Fagnan, MD; Jerry Flaming, DO; Tom Flaming, DO; Jeffrey Humphrey, DO; Michael Kelber, MD; John Sattenspiel, MD; Pennsylvania: John Farmer, DO; Penitha Williams, MD; South Dakota: Fred Thanel, MD; Tennessee: Dan Brewer, MD; Michael Hartsell, MD; R. Louis Murphy, MD; John Parham, MD; Texas: Michael Averitt, DO; Sharon Barber, MD; Kim Patrick Bolton, MD; Robert Cortes, MD; Paul Gerdes, MD; Robert Henry, DO; Michael Kirkpatrick, MD; John Manning, MD; Shane Maxwell, MD; Luis Moreno, MD; Larry G. Padget, MD; Peter Sullivan, MD; Utah: Scott Endsley, MD; David Flinders, MD; Jim Giovino, MD; Eric Hogenson, MD; Dwayne Roberts, MD; Virginia: Duane Lawrence, MD; James Ledwith, MD; June Tunstall, MD; George Wortley, MD; Washington: John Anderson, MD; Elizabeth Wise, MD; West Virginia: Dan Doyle, MD; J. Michael Herr, DO; Wisconsin: Richard Anstett, MD, PhD; Walter Boisvert, MD; Lea Cornell, MD; Anne Eglash, MD; Rod Erickson, MD; Tom Frisby, MD; Terry Hankey, MD; Kevin Jessen, MD; Dan Landdeck, MD; Dave Lonsdorf, MD; Michael Pace, MD; Michael Saunders, MD; Catherine Soderquist, MD; Jon Temte, MD; Vince Winklerprins, MD; Brian Woody, MD.

## REFERENCES

1. Ludke RL. An examination of the factors that influence patient referral decisions. *Med Care* 1982; 20:782-96.
2. Schaffer WA, Holloman FC. Consultation and referral between physicians in the new medical practice environments. *Ann Intern Med* 1985; 103:600-5.
3. Williams TF, White KL, Andrews LP, et al. Patient referral to a university clinic: patterns in a rural state. *Am J Public Health* 1960; 50:1493-507.
4. Forrest CB, Glade GB, Baker A, Bocian A, Kang M, Starfield B. The pediatric primary-specialty care interface: how pediatricians refer children and adolescents to specialty care. *Arch Pediatr Adolesc Med* 1999; 153:705-14.
5. Forrest CB, Reid RJ. Prevalence of health problems and primary care physicians' specialty referral decisions. *J Fam Pract* 2001; 50:427-32.
6. See <http://www.managedcaredigest.com/edigest/tr2000/tr2000c5s01g01.html>. Accessed May 9, 2001.
7. Landon BE, Wilson IB, Cleary PD. A conceptual model of the effects of health care organizations on the quality of medical care. *JAMA* 1998; 279:1377-82.
8. Forrest CB, Glade GB, Starfield B, Baker A, Kang M, Reid RJ. Gatekeeping and referral of children and adolescents to specialty care. *Pediatrics* 1999; 104:28-34.
9. Forrest CB, Glade GB, Baker AE, Bocian A, von Schrader S, Starfield B. Coordination of specialty referrals and physician satisfaction with referral care. *Arch Pediatr Adolesc Med* 2000; 154:499-506.
10. Schneeweiss R, Rosenblatt RA, Cherkin DC, Kirdwood CR, Hart G. Diagnosis clusters: a new tool for analyzing the content of ambulatory medical care. *Med Care* 1983; 21:105-22.
11. Tenny JB, White KL, Williamson JW. National Ambulatory Medical Care Survey: background and methodology: United States, 1967-1972. *Vital Health Stat* 2. 1974; No 61.
12. Schappert SM. National Ambulatory Medical Care Survey: 1994 summary. Advance data from vital and health statistics; no. 273. Hyattsville, Md: National Center for Health Statistics; 1996.
13. Forrest CB, Reid R. Passing the baton: HMOs' influence on referrals to specialty care. *Health Aff (Millwood)* 1997; 16(6):157-62.
14. Glade GB, Forrest CB, Starfield B, Baker AE, Bocian A, Wasserman RC. Specialty referrals made during telephone conversations with parents. *Amb Pediatrics*. In press.
15. Salem-Schatz S, Morre G, Rucker M, Pearson SD. The case for case-mix adjustment in practice profiling: when good apples look bad. *JAMA* 1994; 272:871-4.
16. Shea D, Stuart B, Vasey J, Nag S. Medicare physician referral patterns. *Health Serv Res* 1999; 34:331-48.
17. Forrest CB, Weiner JP, Fowles J, et al. Self-referral in point-of-service plans. *JAMA* 2001; 285:2223-31.
18. Aventis Pharmaceuticals. Medical Group Practice Digest. *Managed Care Digest Series* 2000. Parsippany, NJ: Aventis Pharmaceuticals; 2000.
19. Gerrity MS, DeVallis RF, Earp JL. Physicians' reactions to uncertainty in patient care: a new measure and new insights. *Med Care* 1990; 28:724-36.
20. Tabenkin H, Oren B, Steinmetz D, Tamir A, Kitai E. Referrals of patients by family practitioners to consultants: a survey of the Israeli Family Practice Research Network. *Fam Pract* 1998; 15:158-64.
21. Albertson GA, Lin CG, Kutner J, Schilling LM, Anderson SN, Anderson RJ. Recognition of patient referral desires in an academic managed care plan: frequency, determinants, and outcomes. *J Gen Intern Med* 2000; 15:242-7.
22. Halm EA, Causino N, Blumenthal D. Is gatekeeping better than traditional care? A survey of physicians' attitudes. *JAMA* 1997; 278:1677-81.
23. Kerr EA, Hays RD, Mittman BS, Siu AL, Leake B, Brook RH. Primary care physicians' satisfaction with quality of care in California capitated medical groups. *JAMA* 1997; 278:308-12.
24. Cuesta IA, Kerr K, Simpson P, Jarvis JN. Subspecialty referral for pauciarthral juvenile rheumatoid arthritis. *Arch Pediatr Adolesc Med* 2000; 154:122-5.
25. Vogt HB, Amundson LH. Family physician consultation/referral patterns. *J Am Board Fam Pract* 1988; 1:106-11.
26. Grumbach K, Selby JV, Damberg C, et al. Resolving the gatekeeper conundrum: what patients value in primary care and referrals to specialists. *JAMA* 1999; 282:261-6.