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Determinants and Impact of Generalist–Specialist Communication About Pediatric Outpatient Referrals

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ABSTRACT

OBJECTIVE. Effective communication between primary care and specialty physicians is essential for comanagement when children are referred to specialty care. We sought to determine rates of physician-reported communication between primary care physicians and specialists, the clinical impact of communication or its absence, and patient- and practice system–level determinants of communication for a cohort of children referred to specialty care.

METHODS. We enrolled 179 patients newly referred from general pediatricians in 30 community practices to 15 pediatric medical specialists in 5 specialties. Primary care physicians and specialists completed questionnaires at the first specialty visit and 6 months later. Questions covered communication received by primary care physicians and specialists, its impact on care provision, system characteristics of practices, and roles of physicians in treatment. We used multivariate logistic regression to determine associations between practice system and patient characteristics and the dependent variable of reported primary care physician–specialist communication.

RESULTS. Specialists reported communication from referring primary care physicians for only 50% of initial referrals, whereas primary care physicians reported communication from specialists after 84% of initial consultations. Communication was strongly associated with physicians' reported ability to provide optimal care. System characteristics associated with reported primary care physician–specialist communication were computer access to chart notes and lack of delays in receipt of information. Associated patient characteristics included non-Medicaid insurance, no additional specialists seen, and specialty to which referred. Physicians favored comanagement of referred patients in more than two thirds of the cases.

CONCLUSIONS. Although a prerequisite for optimal care, communication from primary care physicians to specialists is frequently absent. Interventions should promote widely accessible clinical information systems and target children with complex needs and public insurance.

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Key Words

ambulatory care, specialty care, communication, referral/consultation, medical home

Abbreviations

PCP—primary care physician
UMMHC—University of Massachusetts Memorial Health Care
EHR—electronic health record

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COORDINATION BETWEEN PRIMARY care and specialty services for children who require specialty care is essential for high-quality care.¹ Within the medical home framework,² with care coordination services typically located in the primary care setting, communication between primary care physicians (PCP) and specialty physicians is especially important. However, effective communication can be a great challenge in a busy practice environment, because it is time consuming and typically is not reimbursed.

General difficulties with interphysician communication in pediatrics have been reported for >30 years^{1,3,4} and were highlighted recently by the Institute of Medicine⁵ as potentially contributing to unmet health care needs as well as duplication or omission of needed services. In a recent national study of pediatric referrals,⁶ communication from specialists back to generalists after consultations was reported only approximately half of the time by referring generalists and was associated with increased physician satisfaction with referral outcomes. This is similar to studies in adult populations.⁷⁻⁹ However, generalist–specialist communication involves transfer of information in both directions: the request from the generalist to the specialist at the time the patient is first referred, termed “referral communication” for the purposes of this article, and the report from the specialist back to the generalist after the specialty visit, herein termed “consultation communication.” Although lack of referral communication has been identified by pediatricians as a problem¹⁰ and has been shown to occur infrequently in adults,⁸ no literature describes referral communication patterns in the care of children. Information about these patterns is essential to informing interventions to improve care, because differences in the epidemiology of childhood illnesses that require specialty involvement¹¹ and the location of most pediatric specialists in academic centers may make communication patterns different for the care of children. In addition, the impact of generalist–specialist communication on care has not been investigated in children.

Previous studies^{10,12} identified several practice system characteristics that are perceived by physicians as barriers and facilitators to generalist–specialist communication. Barriers included delays in dictation and receipt of mailed letters, difficulties in telephone contact, and incomplete communication when multiple specialists are involved in the care of a child. Facilitators included timely contact by letter or telephone and availability of dictated notes on a computer system. The importance of each of these factors in affecting communication is not known.

The purpose of this study was to identify communication patterns in the referral/consultation process from the standpoint of both PCPs and specialist physicians and to determine which practice system and patient characteristics might be associated with increased communica-

tion to serve as baseline data for improvement efforts. We also sought to assess the impact of communication on provision of care as perceived by physicians and to identify comanagement preferences between PCPs and specialist physicians, to ascertain aspects of care for which communication might be more important. We hypothesized that communication from PCPs to specialists would be infrequent, that specific practice system and patient factors could be identified to guide future interventions, and that both PCPs and specialists would favor comanagement for many aspects of care.

METHODS

Physicians and Practices

The study was conducted between April 2002 and January 2004 in the outpatient clinics of pediatric specialty practices at the University of Massachusetts Memorial Health Care (UMMHC), a referral center in Central Massachusetts that provides 93% of the specialty care to children in the area, and the Fallon Clinic, a large multispecialty group that provides some pediatric specialty care and is located in the same community as UMMHC. Pediatric medical specialties whose patients typically represent a wide range of children with special health care needs and also have conditions that are likely to be managed in some capacity by primary care were recruited to participate. Specialties that participated were pediatric neurology, cardiology, endocrinology, pulmonology, and gastroenterology. UMMHC provided all of these services; Fallon provided pediatric neurology, endocrinology, and gastroenterology services.

Before patient enrollment, the principal investigator (C.J.S.) contacted all pediatric PCPs' offices within a 30-minute drive of UMMHC to explain the study and invite participation. This strategy included most pediatricians who referred to the 5 specialties under study. Pediatric specialists were recruited similarly. Whole practices or individual physicians were allowed to participate. Participating physicians agreed to provide data for all enrolled patients. In return, practices were offered prepublication access to study results and the opportunity to participate in a future intervention to foster communication.

Parent and Patient Enrollment

Eligible parents were those whose child was seen at 1 of the specialty clinics between April 2002 and June 2003 for a new patient appointment, who spoke English as a first or second language, who were planning to be available for contact 6 months after the specialty visit, and who said that they were referred by their child's participating PCP. Parents were identified by the computerized scheduling system at each site 2 weeks before the specialty visit and were made aware of the study by a letter or telephone call. Consecutively eligible families were

recruited in person at their clinic appointment, unless study staff were unavailable; in this case, families were contacted by telephone after their child's visit. Informed consent was obtained from all parents, and verbal assent was obtained from children who were older than 7 years and were able to give assent, according to policies of the institutional review boards of the University of Massachusetts Medical School and the Fallon Clinic.

Procedures

Parent Surveys

At the time of enrollment, the research assistant obtained basic data about the child and the parent, including demographics, the child's condition and other conditions that the child had at the time of enrollment, and other specialists who were seen by the child. In addition, the Questionnaire for Identifying Children With Chronic Conditions-Revised¹³ was administered to parents to identify children in the study who had a chronic condition.

Physician Surveys

At the beginning of the study, each physician completed a 30-item background questionnaire about physician and practice demographics as well as practice system characteristics that were identified previously¹⁰ as having an impact on communication. For each enrolled child, PCP and specialist perceptions of communication were examined twice during the 6-month period after the child's first specialty visit. Specialists were queried at the time of the first visit and 6 months later to gather data about the initial specialty consultation and about any follow-up visits. PCPs were surveyed 1 month later than specialists (at 1 month and 7 months after the first specialty visit) to allow time for communication from the specialist to arrive and be reviewed. Questions addressed whether communication had been received, whether physicians had "enough information to provide optimal care" with the information available, and preferences for shared management.¹⁴ PCP and specialist questionnaires were worded similarly to enable comparison of responses between groups. Physicians were encouraged to consult medical charts when completing follow-up questionnaires to maximize the accuracy of recall. Before implementation, study procedures were piloted with parents and physicians for a sample of 10 children at each specialty site.

Analysis

We conducted a series of logistic regression analyses to identify practice system and patient determinants of communication from PCP to specialist. Separate analyses were conducted for practice system variables, many of which may be modifiable, and patient variables, which cannot be changed. First, continuous variables were col-

lapsed into 2 to 4 categories for reporting after examination of univariate distributions. Next, for each group of independent variables (characteristics of practice systems or patients), bivariate and multivariate logistic regression models were constructed to identify and estimate the relative importance of characteristics that were associated with reported PCP-to-specialist first-visit communication. Variables that were associated with the outcome at a level of $\alpha \leq .20$ in bivariate analysis were entered into multivariate logistic regression models using forward stepwise selection, for which a level of $\alpha \leq .05$ was used to determine significance. Odds ratios and 95% confidence intervals are presented. Because rates of communication from specialists back to PCPs were found to be very high, there was insufficient variation in the data to conduct analyses of determinants of specialist-to-PCP communication. Finally, we analyzed physician comanagement preferences by identifying relevant differences between proportions of PCP and specialist physician responses using the χ^2 statistic or Fisher's exact test for categorical variables and *t* test for continuous variables.

RESULTS

Patient and Referral Characteristics

Of 406 potentially eligible patients, 255 (63%) parents could be contacted. Of these, 184 (72%) consented to enrollment. Children of parents who declined enrollment were less likely to be boys (43% vs 58%; $P = .04$) and were older (9.8 vs 7.5 years; $P = .004$), but a similar proportion had Medicaid insurance (17% vs 19%; $P = .84$). Five enrolled patients were dropped from the study after enrollment when they were found to be ineligible, leaving 179. Characteristics of the 179 patients and their conditions and reasons for referral are described in Table 1. Seventy-four percent of children had a chronic condition, and a small majority were boys. Fifty-six percent took 1 or more regular medications other than vitamins or fluoride, 35% had health conditions in addition to that for which they were referred, and 45% had seen other specialists in the year before the specialty visit. Seventy-six percent had "gatekeeping" insurance plans by parent report. Patients were referred for 35 different conditions as described by parents, with asthma, gastroesophageal reflux, and chronic constipation the most common. Help in diagnosis was the most common reason for referral, reported by PCPs in 74% of cases, with parent request a factor in 20%. During the 6-month follow-up period, 48% of patients had >1 visit with the specialist, with a range of 1 to 5 additional visits.

Physician Demographics and System Characteristics

Demographic characteristics of participating pediatricians and their practices from the background physician questionnaire are summarized in Table 2. Approxi-

TABLE 1 Patient, Parent, and Referral Characteristics (n = 179)

Characteristic	n	%
Patient characteristics		
Age, mean (SD), y	7.5 (5.3)	
Male gender	103	58
Presence of chronic condition (identified by QUICCC-R)	127	74
Medications (other than vitamins/fluoride)	98	56
1	48	27
2	29	16
3	12	7
4	4	2
Presence of additional health conditions	60	35
1 additional condition	37	21
2 additional conditions	13	7
3 or more additional conditions	8	5
Other specialists seen in past year	78	45
1 other specialist	50	28
2 other specialists	14	19
3 or more other specialists	8	11
Parent characteristics		
Parental education level		
Less than high school	6	3
High school graduate	42	24
Some college	55	32
College graduate	71	41
Referral characteristics		
PCP-reported reason for initial referral		
Help in diagnosis	123	74
Help in management	114	68
Perform a specialized procedure	27	16
Assume care for a problem	14	8
Parent request	33	20
Other	9	5
Specialty at which seen		
Gastroenterology	70	39
Neurology	38	21
Endocrinology	24	13
Pulmonology	31	17
Cardiology	16	9
No. of specialty visits in 6-mo period (from scheduling computer system)		
1	88	52
2	39	23
3	22	13
4	14	8
5	5	3
6	1	1
Specialty site		
Multispecialty group	23	12
Medical school	156	87
Insurance type		
Medicaid	32	19
Fallon HMO	31	18
Commercial/other managed care	110	64
Need for PCP authorization for referral	123	76

Data are from parent reports except where noted. Percentages may vary because of missing data and/or multiple categories allowed (reason for referral). QUICCC-R indicates Questionnaire for Identifying Children With Chronic Conditions-Revised; HMO, health maintenance organization.

mately 85% of eligible PCPs and all pediatric specialists in the 5 specialties agreed to participate. Sixty-two general pediatricians in 30 practices had patients enrolled,

TABLE 2 Physician Demographics and Practice Characteristics

Characteristic	General	Pediatric
	Pediatricians	Specialists
No. enrolled	62	15
Gender, % male	39	47
Years since residency, mean (SD) ^a	12 (8)	18 (7)
Specialty fellowship training, %	10	100
Practice location, %		
Urban	46	86
Suburban	39	7
Rural	10	0
Practice type, %		
Solo	7	0
Pediatric group	42	0
Multispecialty group	36	21
Medical school/hospital based	10	79
Other	5	0

^a $P < .05$ by *t* test.

who were seen by 15 pediatric specialists in the 5 specialties. General pediatricians in the sample were younger than pediatric specialists (mean years since residency: 12 vs 18; $P = .04$) and were more likely to practice in a suburban location (39% vs 7%) and a non-hospital-based setting (90% vs 21%). Twenty-one general pediatricians in 9 of the practices were members of the Fallon multispecialty group. Pediatric neurology, gastroenterology, and endocrinology referrals from members of the Fallon group were within the group when possible.

System barriers that were reported most commonly by PCPs in the background questionnaire were delays in receiving written communication (70%), involvement of too many "layers" of staff (eg, secretaries, nurses) in communication (70%), and trouble reaching other physicians by telephone (58%). Specialists reported dictation system delays (86%) and poor availability of medical charts (64%) as the most common problems. Availability of clinic notes in an electronic health record (EHR) was reported by 20% of generalists (all within the Fallon group) and 50% of specialists.

Receipt of Communication

Physicians were asked to report receipt of information for each patient around the initial referral and 6 months later (Table 3). Specialty physicians reported receiving information from referring PCPs for 50% of patients by the time of the initial consultation visit, with written or electronic communication reported in 42% of cases and telephone or other verbal communication reported in 17%. Little additional information was received by specialists during the 6 months after the first visit. PCPs reported receiving information much more frequently, with 84% reporting receipt of information 1 month after the initial visit (82% written or electronic and 11% verbal) and 96% by 6 months after the initial visit.

TABLE 3 Physician-Reported Receipt of Communication

	Specialist Received Referral Information, <i>n</i> (%)	PCP Received Consultation Information, <i>n</i> (%)
Communication received		
First visit	78 (50)	141 (84)
Anytime in 6-mo period	77 (50)	155 (96)
Method of communication received for first visit		
Written or e-mail	66 (42)	137 (82)
Telephone or other verbal	27 (17)	18 (11)

Percentages vary because of missing data on some physician questionnaires.

Adequacy of Communication and Impact

There was a strong relationship between specialists' reports of receiving any communication before the first visit and their assessment of having sufficient information to provide optimal care. Specialists who reported receipt of communication reported having enough information to provide optimal care in 91% of cases, versus 45% of cases with no referral communication reported ($P < .001$). For 42 (27%) visits, specialists mentioned additional information needed, including 10 needing a reason for referral, 10 needing illness history, 17 needing information about previous workup/management, and 17 needing medical chart information (most commonly a growth chart). Satisfaction with communication reflected its receipt; 64% of specialists who reported receipt of any communication during the 6-month period were "very satisfied" with communication from the child's PCP, as opposed to 11% who reported no communication ($P < .001$). However, when specialists were asked after 6 months whether communication (or its lack) had an impact on care, a negative impact was reported in only 12% of cases for which no communication had been received.

PCPs' responses were similar to the consultants. They reported having enough information to provide optimal care 96% of the time when information was received within 1 month of the first specialist visit but only 35% of the time when no information was received ($P < .001$). Eighteen (11%) mentioned information that was needed, with wide variation in types of specific information needed. Seventy-five percent of PCPs who reported communication from the consultant were "very satisfied" with communication, versus 2 (33%) of 6 who had received no communication ($P = .04$). A negative impact on care from lack of communication was reported in 1 (17%) of 6 cases for which no communication had been received during the 6-month period.

Determinants of PCP-to-Specialist Communication

In multivariate analyses of the association of physician and practice system characteristics (from the background physician questionnaire) with specialist-reported first-visit referral communication (Table 4), 2 PCP practice system characteristics were linked with communication rates: access to chart notes in an EHR was associated

with increased communication, and delayed receipt of information was associated with decreased communication. Practice type and individual physician characteristics were not found to have independent associations with referral communication. In multivariate analyses of the association of patient-level characteristics with specialist-reported first-visit referral communication (Table 5), Medicaid insurance, specialty type (pulmonary and cardiology), and additional specialists seen in the previous 12 months were associated with decreased likelihood of specialist-reported communication from the PCP.

Physician Comanagement Preferences

Physicians' perceptions of the appropriate roles for PCP and specialty physicians are reported in Table 6. Physicians favored comanagement for issues related to the reason for referral in a majority of cases. Comanagement for serious illness related to the reason for referral was preferred by PCPs in 70% of cases and by specialists in 67% of cases. Disagreement between generalists and specialists was found in the areas of health supervision, care for minor illness related to the child's condition, and medication management.

DISCUSSION

This is the first pediatric study to describe referral and consultation communication from the simultaneous perspectives of general pediatricians and pediatric specialists on a single cohort of patients. We found low reported rates of PCP-to-specialist communication, consistent with previously published survey data,¹⁰ despite that the physicians in our study sample prefer a high degree of patient comanagement and practice in an environment that likely represents a near-optimal scenario for communication. Most generalist practices are in close proximity to the referral center, with referring physicians for 76% (136 of 179) of patients having faculty appointments at the medical school. Observed determinants of successful communication suggest that efforts to improve PCP-to-specialist communication might best focus on the creation or enhancement of existing systems to maximize easy access to, and speedy transfer of, medical charts.

Receipt of communication was perceived as very im-

TABLE 4 PCP Practice System Determinants of PCP-to-Specialist First-Visit Communication

Characteristic	Bivariate		Multivariate	
	OR (95% CI)	P	OR (95% CI)	P
PCP system characteristic (for each, reference is reported absence of factor)				
Chart notes available on computer	11.9 (1.5–95.8)	.02	11.2 (1.4–91.7)	.02
Delays in receiving written communication	0.46 (0.22–0.96)	.04	0.46 (0.22–0.97)	.04
Problems with medical chart availability	0.57 (0.29–1.11)	.10		NS
Use of form to communicate with consultants	1.40 (0.73–2.69)	.30		
Referral tracking system in practice	0.66 (0.34–1.30)	.23		
Problems contacting consulting physicians by telephone	1.10 (0.58–2.13)	.76		
Too many “layers” of staff involved in communication	1.00 (0.47–2.10)	1.00		
Years since residency				
>10	Reference			
≤10	0.52 (0.27–0.98)	.05		NS
Physician gender				
Male	Reference			
Female	0.98 (0.51–1.87)	.96		
Practice type				
Pediatric group	Reference			
Multispecialty group	2.06 (0.93–4.54)	.07		NS
Solo practice	1.34 (0.47–3.80)	.58		NS
Hospital based	0.61 (0.24–1.49)	.28		NS
Other	0.39 (0.07–2.07)	.27		NS

Odds ratios (ORs) are given for the outcome of cases for which communication was reported as compared with cases for which no communication was reported. Bivariate followed by forward stepwise logistic regression was used. CI indicates confidence interval; NS, not significant.

portant for both PCPs and specialists in their provision of care. Although communication may not always be necessary for some referrals, such as those with simple, straightforward problems, the specialties that were chosen for this study were those whose patients frequently have complex conditions that require evaluation and management by both primary and specialty care. Most physicians reported that they were unable to provide optimal care when no information was received from other physicians, and physician satisfaction reflected this finding. Perceptions of this as a problem diminished during the 6 months for which each patient was enrolled, with few physicians reporting a negative impact on care 6 months after the child’s initial consultation visit. Specialists in the current system may be accustomed to “working around” problems with communication, getting adequate, although delayed, information. Getting to know the patient over time also may mitigate initial problems with poor communication. A third explanation may be that most children required only 1 specialty visit during the 6-month period, suggesting that their problems were of low severity and that difficulties that were created by lack of communication were temporary.

The association of system characteristics of referring physicians’ practices with communication suggests that medical record availability was a primary determinant of whether communication occurred. Two specific system

factors were independently associated with increased communication: computer access to chart notes, which was positively associated with communication, and delayed receipt of information, which was negatively associated with communication. This suggests that successful strategies to increase communication should include system supports, such as EHRs that can be shared between treatment team members and between institutions, rather than physician behavior change interventions. Although not yet in wide use in outpatient pediatrics, EHRs have been shown to improve the quality of pediatric primary care, and, in adults, shared EHRs can lead to less intensive testing and lower costs.^{15,16} However, EHRs are unlikely to be the only solution. It was very common for communication to come from consulting specialists in the study, most of whom practiced in an academic medical center without an electronic medical chart system at the time of this study. Because most specialty visits are triggered by a request from the patient’s PCP (regardless of whether communication occurs), systems that make it easy to generate letters or other communication are a likely part of the specialist’s routine practice. Because reimbursement rates are higher for consultations than for primary care office visits, the extra time spent and effort devoted to such specialist systems can be supported. In contrast, only a small minority of visits to primary care pediatricians result in referral to specialty care,¹⁷ making it less

TABLE 5 Patient-Level Determinants of PCP-to-Specialist First-Visit Communication

Characteristic	Bivariate		Multivariate	
	OR (95% CI)	P	OR (95% CI)	P
Age of child, y	1.01 (0.95–1.07)	.82		
Male gender of child	0.98 (0.52–1.84)	.94		
Education level of parent				
High school or less	Reference			
Some college	1.08 (0.55–2.15)	.81		
College graduate or higher	1.25 (0.66–2.38)	.49		
Chronic condition (by QUICCC-R)				
None	Reference			
Present	0.99 (0.49–2.00)	.98		
Medications				
0	Reference			
1 or more	0.67 (0.36–1.27)	.22		
Presence of other conditions				
No other conditions	Reference			
1 or more other conditions	0.93 (0.47–1.80)	.82		
Other specialists seen in past year				
No other specialists	Reference			
1 or more other specialists	0.40 (0.21–0.76)	.005	0.29 (0.14–0.63)	.002
No. of visits to index specialty in 6 mo				
1	Reference			
>1	1.64 (0.86–3.11)	.13		NS
Specialty to which referred				
Gastroenterology	Reference			
Endocrinology	1.85 (0.76–4.53)	.18		NS
Pulmonary	0.12 (0.04–0.36)	.0002	0.08 (0.03–0.28)	<.0001
Cardiology	0.42 (0.12–1.43)	.16	0.26 (0.07–0.99)	.05
Neurology	1.80 (0.81–4.01)	.15		NS
Insurance type				
Non-Medicaid	Reference			
Medicaid	0.41 (0.17–0.98)	.04	0.31 (0.12–0.81)	.02
Referral required for specialty visit ("gatekeeping")				
No	Reference			
Yes	1.04 (0.49–2.21)	.92		

ORs are given for the outcome of cases for which communication was reported as compared with cases for which no communication was reported. Bivariate followed by forward stepwise logistic regression was used. CI indicates confidence interval; NS, not significant.

likely that systems would arise to facilitate communication. Recognition of the need for communication and building systems into primary care delivery and reimbursement may help to increase referral communication from PCPs to specialists.

Recognition of patient factors that are associated with decreased communication from referring physicians to specialists can help to focus future efforts to improve communication. The observed pattern of poorer communication for children who had recently seen other specialists, although troubling, is not surprising. It is likely that primary care practices have more trouble coordinating specialty care for children with more complex needs, the population most likely to require care coordination. Alternatively, parents of children with more complex needs may be more likely to self-refer to specialty care, leaving the PCP without knowledge of the upcoming consultation. However, 76% of the referrals in our sample required PCP authorization before the visit, with a similar pattern of poor communication in this subgroup, making this a less likely explanation.

The observed association of 2 specialties in our sample (cardiology and pulmonary) with reported lack of communication received from PCPs also is interesting. Although reasons for this are unclear, we speculate that practice-specific differences related to office routines, rather than the clinical specialty itself, may contribute to this observed pattern. An alternative explanation is that referrals to these specialties actually are qualitatively different; they may be simpler referrals that require no communication in the view of the PCP. Finally, the observed association of Medicaid insurance with lower reported communication rates from PCPs to specialists is disturbing. It is unlikely that practice system characteristics of either referring or consulting practices account for this, because most practices in the study accepted Medicaid payments, there was nothing in the reimbursement model to encourage or discourage communication, and analysis of data when non-Medicaid physicians were excluded produced the same result. It is conceivable that additional demands on physician time, such as additional child and family needs identified at the time

TABLE 6 Physician Perceptions of PCP and Specialist Responsibilities in Management

Task	PCP, %	Specialist, %	<i>p</i> ^a
Who should perform health supervision?			.009 ^b
PCP	97	86	
Specialist	0	1	
Both	3	13	
Who should care for minor illness, unrelated to the reason for referral?			.62 ^c
PCP	99	97	
Specialist	0	0	
Both	1	3	
Who should care for minor illness, related to the reason for referral?			<.001 ^b
PCP	71	26	
Specialist	1	6	
Both	28	69	
Who should care for serious illness, related to the reason for referral?			.43 ^b
PCP	4	0	
Specialist	27	33	
Both	70	67	
Who should manage medications?			.007 ^b
PCP	4	0	
Specialist	31	51	
Both	66	49	

Columns indicate percentages of responses from PCPs or specialists with indicated perceptions.

^a Rows with values <5 were excluded.

^b Comparison of proportions using the χ^2 test.

^c Comparison of proportions using Fisher's exact test (≥ 1 cell with expected values <5).

of referral, are higher in children with Medicaid insurance, taking time that otherwise would be devoted to communication. This disparity in health care services has not been reported previously and suggests that children with Medicaid insurance may benefit from targeted efforts to improve PCP-to-specialist communication.

Attitudes of physicians in our sample strongly favored co-management of specialty problems for which children were referred, in agreement with a previous study.¹⁸ This finding points out a great need to improve communication so that co-management may be achieved. In fact, generalists and specialists both preferred co-management even for serious illness related to the reason for referral. They agreed that health supervision and care for unrelated minor illness typically was the PCP's responsibility, and although they disagreed about medication management and care for minor, related illness, many in both groups preferred co-management in all areas related to the child's condition. These findings are in accordance with parental co-management preferences described for cardiology care,¹⁴ although they suggest much more PCP involvement than an earlier study of physicians who cared for children with congenital heart disease.¹⁹ This suggests that a lack of desire to collaborate among clinicians is an unlikely reason for the low communication rates that were found in our study.

This study's findings have limitations. We examined referrals from the majority of community practices to a referral center in a single area, so the generalizability of findings to other centers and regions is unclear. Communication rates from referring physicians to other centers may be better if additional system supports to foster communication are present at those centers. However, because most PCPs in the area typically refer to a single center for specialty care, many specialists were familiar with their patients' referring physicians, possibly increasing rates of communication that was sent back to referring physicians after the consultation. In any case, previous surveys in children and adults^{8,10} showed a similar pattern of communication, with communication from referring physicians to specialists less common than from specialists back to PCPs, making the pattern that was observed in our study likely representative of centers elsewhere. In addition, physician self-report was used to determine outcomes of communication, and no adverse clinical outcomes were reported by physicians as a result of poor communication. If physicians were reluctant to point out problems that resulted from poor communication, then the possibility might exist that responses might not have revealed problems. Because this study examined outpatient consultations from pediatric medical specialties, it is likely that truly poor outcomes were uncommon, and this study is not powered to detect a relationship between poor communication and adverse outcomes. Future work will need to expand on outcomes that are linked closely to inefficient care, such as extra visits and lost work and school time by children and families.

CONCLUSIONS

Problems in communication from referring PCPs to specialty physicians are prevalent. Although physicians in our sample strongly favored co-treatment for referred patients, lack of communication from PCPs to specialists was common and was strongly associated with physician reports of problems with providing optimal care. Communication was more likely when system supports to increase physician access to medical information were in place and was less common for children who visited multiple specialists and those with Medicaid insurance. Interventions should focus on system supports to ensure preconsultation communication, on children who have complex needs and require visits to multiple specialists, and on ensuring equal communication for children with Medicaid.

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