Incomplete Specialty Referral among Children in Community Health Centers

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Objective To assess rates of incomplete specialty referral (referral not resulting in a specialist visit) and risk factors for incomplete referral in pediatric community health care centers.

Study design In this cross-sectional study, we used referral records and electronic health records to calculate rate of incomplete referral in 577 children referred from two health care centers in underserved communities to any of 19 pediatric specialties at an affiliated tertiary care center, over 7 months in 2008–2009. We used logistic regression to test the association of incomplete referral with child/family sociodemographic and health care system factors.

Results Of the children, 30.2% had an incomplete referral. Incomplete referral rates were similar at the two health care centers, but varied from 10% to 73% according to specialty clinic type. In multivariate analysis, sociodemographic factors of older child age, public insurance status, and no chronic health conditions correlated with incomplete referral, as did health care system factors of surgical specialty clinic type, low patient volume, longer wait for visit, and appointment rescheduling.

Conclusion Almost one-third of children referred to specialists were unable to complete the referral in a timely manner. To improve specialty access, health care organizations and policymakers should target support to families with high-risk children and remediate problematic health care system features. *(J Pediatr 2011;158:24-30)*.

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In a 2002 report, the American Academy of Pediatrics identified appropriate access to pediatric specialists as an essential element of the medical home.[1] Because specialists are likely to have greater knowledge about care for health problems that lie outside the scope of a generalist's practice,[2-5] specialist access is important an important measure of health care quality.

Nonetheless, many children are unable to access pediatric specialists when care is needed, and disparities are evident in access to specialty care: children from families who are poor, of black race/ethnicity, or uninsured use less specialty care. Minorities and families speaking other languages report more problems accessing specialty care.[6-11] Accessing specialists may be a particular problem in community health centers, where many poor and minority families seek care: in a recent survey of federally-qualified health centers, directors reported significant problems in overall specialist access and more access problems among uninsured and Medicaid patients.[12]

From a health care systems perspective, an important element of specialist access may be successful navigation of the specialty referral process. Completion of specialty referrals (ie, attending a specialty visit when referred) depends on appropriate physician referral decisions, accurate and timely referral communications, and family's actual attending a specialist visit.[10] Although multiple studies have addressed referral decision-making and communication among providers,[13-16] few studies have addressed problems with referral completion.

Referral completion likely relates both to characteristics of referred children and families and to characteristics of healthcare systems. For instance, Forrest et al showed that publicly-insured patients were less likely to complete referral and that longer patient-primary care provider relationship and clinic (rather than patient) scheduling of appointments increased the likelihood of referral completion.[10] Studies of specialty referral completion in adolescent, internal medicine, and family medicine settings have shown rates of incomplete referral ranging from 14% to 20%.[10,11,17] With the advent of more widespread electronic health record (EHR) use, collecting data about specialty referral completion is much more feasible. As a result, rate of incomplete specialty referral has the po-

CI	95% Confidence interval
EHR	Electronic Health Record
HCUP-CCI	Healthcare Cost and Utilization Project Chronic Condition Indicator
OR	Odds ratio

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tential to become an important process measure for pediatric healthcare quality. However, to our knowledge, referral completion has never been studied in the general pediatrics practice setting, and no studies have used EHR data to assess referral completion.

In this study, we used a health care system's EHR to investigate rates of incomplete specialty referral in a pediatric patient population at two Massachusetts health centers located in underserved communities. Our study questions were: (1) What is the overall rate of incomplete specialty referral in this pediatric population, and how does this rate compare with rates found in mostly adult care settings? (2) Which child/family sociodemographic features (eg, age, sex, race/ethnicity, language or insurance status) and which health care system characteristics (eg, health center location, primary care provider referral, specialty clinic type, specialty clinic patient volume, appointment wait time or appointment rescheduling) correlate with increased likelihood of incomplete specialty referral? We hypothesized that incomplete referral in these health care centers would be frequent, and that markers of socioeconomic position (race/ethnicity, language, insurance status), and health care system factors such as clinic type, patient volume, wait time, and appointment rescheduling would be associated with incomplete referral.

Methods

We carried out a 7-month study assessing completion of pediatric specialty referrals in a sample of 577 children referred from two community health care centers to an affiliated tertiary care center on consecutive weeks in 2008 and 2009. The study was set in two health care centers located in low-income Massachusetts communities with large immigrant populations. We identified the study population by systematically collecting referral records for children seeking primary care at the studied health care centers. At both health care centers, each specialist referral generates a document for the purposes of insurance payment and referral tracking. Both health care centers provided access to the information contained in these referral documents, allowing us access to all referrals (including referrals for uninsured patients) made during the study period of June 10, 2008, to January 28, 2009.

From the referral records, we included subjects if they were referred by a pediatric primary care provider to the tertiary care center for consultation with a pediatric specialist in one of the following clinics: allergy/immunology, cardiology, dermatology, endocrinology, gastroenterology, general surgery, genetics, hematology/oncology, infectious disease, nephrology, neurology, neurosurgery, ophthalmology, orthopedics, otolaryngology, pulmonology, rheumatology, and urology. These specialties represented all pediatric specialty clinics meeting at least weekly in the medical center. Because we could not distinguish follow-up referrals from insurance reauthorizations, we only included new referrals (referrals to a specialty clinic not visited in the previous 5 years or since birth). Only children under 18 years old were included, and we studied only one child per household. If multiple referrals were made for an individual child, we randomly selected one referral for inclusion.

We excluded children who were referred to adult specialties, referred to specialties other than those listed above, referred to allied health providers (eg, physical therapy or early intervention) or to locations other than the studied tertiary care center. No children meeting other study inclusion criteria were referred to adolescent medicine, so this specialty was not included in our sample. Mental health referrals were excluded because we were unable to distinguish physician referrals from nonphysician provider referrals.

For all eligible subjects, we obtained information from the child's EHR (including the electronic appointment scheduling application). We obtained EHR information through the Partners HealthCare Research Patient Data Registry, an electronic registry that extracts information from medical and billing records. This project was approved by the Partners HealthCare and Massachusetts Eye and Ear Infirmary Institutional Review Boards.

Our primary dependent variable was referral completion. We defined a complete referral as one that led to specialty visit attendance within 60 days. However, in cases where the specialty visit was scheduled more than 2 months after the referral, we considered the referral complete if a visit were attended on its initially scheduled date. Otherwise, the referral was deemed incomplete. This definition allowed some rescheduling of appointment dates by parents or providers and allowed for families that had appointments initially scheduled several months after referral. All subjects with specialty visits scheduled more than 3 months after the final month of the study period were excluded (15 potential subjects). We assessed referral completion in either of two ways: (1) assessing whether the child arrived at the visit according to the tertiary care center's scheduling application; and (2) assessing whether the specialist had written a note in the EHR for the scheduled date. A referral that did not meet one of these criteria was deemed incomplete.

We included child and family sociodemographic factors and healthcare system factors as independent variables. Model covariates were chosen as factors that the EHR could access and that previously had been shown to correlate with differential access to child health services or specialist care.[6,18-20] Child and family factors were extracted from EHR registration information, which the medical center obtains via telephone interview and updates at least yearly. These factors included child sex, child age at time of referral (in years), child race/ethnicity (classified as white, black, Hispanic or other race) child insurance status (primary insurance payor at time of referral; categorized as public, private or uninsured) and preferred family language for medical communication (parent response to question, "What is your preferred language for communication with health care providers?"; categorized as English, Spanish or other language). Because child chronic conditions might affect families' ability to use the specialty referral system,[21,22] we used