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Preconsultation exchange for ambulatory hepatology consultations

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Abstract

Background—Preconsultation exchange is an emerging model of specialty care proposed by the American College of Physicians that seeks to answer a clinical question without a formal patient visit to the specialty clinic. This form of specialty care has been little studied. We sought to determine the appropriateness of preconsultation exchange for ambulatory hepatology consultations within our urban healthcare system.

Methods—Retrospective study of referrals for ambulatory hepatology consultation in the safety net healthcare system of San Francisco, CA from January 2007 through April 2010.

Results—Of the 500 referrals reviewed, 87 were excluded as repeat requests. The most common reasons for referral were hepatitis B (34.9%) and hepatitis C (32.0%). 56 referrals (13.6%) were appropriate for preconsultation exchange, and 190 (46.0%) were inappropriate for preconsultation exchange. 167 (40.4%) referrals did not include enough information to determine appropriateness for preconsultation exchange. Most of these (83.8%) were made for hepatitis B or hepatitis C,

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All authors had access to the data and had roles in writing/editing the manuscript as below.
Study concept and design: Sewell, Guy, Kwon, Chen, Yee
Acquisition of data: Sewell, Guy, Kwon
Analysis and interpretation of data: Sewell, Guy, Chen, Yee
Drafting of manuscript: Sewell
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despite the presence of explicit referral guidelines. Midlevel providers were more likely than physicians to provide enough information to determine appropriateness for preconsultation exchange.

Conclusion—In our urban healthcare system, preconsultation exchange appears to be an appropriate form of specialty care for some ambulatory hepatology consultations. Communication between primary care provider and specialist appears to be an important barrier to broader implementation of preconsultation exchange. Optimizing the preconsultation exchange is critical to improve the primary-specialty care interface, and to build a true Patient Centered Medical Home Neighborhood.

Keywords

preconsultation exchange; Patient-Centered Medical Home; ambulatory medicine; health services research; hepatitis B; hepatitis C; primary care; specialty care; referral and consultation; healthcare coordination

Introduction

Utilization of specialty care in the United States continues to rise. The rate of ambulatory specialty referral rose by more than 150% during the past decade, and, in 2009 nearly 10% of all ambulatory office visits, and 20% of primary care visits, resulted in referral to specialty care.[1] In the current setting of rising healthcare costs[2] and mandates to expand coverage to the uninsured and underinsured through healthcare reform,[3] it is imperative to use healthcare resources as efficiently as possible. Emerging models of health care delivery, like the Patient Centered Medical Home (PCMH)[4] and Accountable Care Organizations (ACOs)[5, 6] have been proposed as mechanisms to improve quality, reduce costs, and increase access to health care. These models are central components of health care reform, emphasizing care coordination and collaboration between health care providers, including primary care providers and specialty care providers.[4, 5]

Despite the centrality of specialty care to the healthcare system, few standards exist that help primary care providers determine when to seek specialty care consultation, what information to include in consultation requests, or that describe the expected roles and responsibilities for specialists and primary care providers.[7–9] A recent position paper by the American College of Physicians proposes the concept of specialists as participating in the “PCMH Neighborhood” and highlights the need for effective, patient-centered communication between primary care and specialty care providers.[4] That document outlines a framework for primary care-specialty care interactions by defining three specific models of specialty consultation, including formal consultation, shared co-management, and preconsultation exchange. Preconsultation exchange is intended to provide specialty care by: (1) answering a clinical question without a formal patient visit to a specialist, or (2) streamlining the prespecialty visit workup to maximize the efficiency of specialty care. Preconsultation exchange has the potential to improve quality and efficiency of, as well as access to, specialty care. However, this form of specialty consultation has been little studied.

Hepatology may be a valuable specialty in which to investigate preconsultation exchange. Consultations to hepatologists tend to be primarily cognitive, rather than procedural requests. In our healthcare system, most hepatology referrals are disease-based, rather than symptom-based, so the scope of evaluation may be less broad, and tests ordered by our hepatologists are available to primary care providers in our system. Based on these concepts, we hypothesized that some consultations to the hepatology clinic in our urban healthcare system could be managed using preconsultation exchange to answer a clinical question

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without a formal patient visit to the clinic. As an initial test of this hypothesis, we developed this retrospective study with the following specific aims: (1) To characterize the clarity of consultation questions asked; (2) To characterize the type of assistance requested in ambulatory hepatology consultations; (3) To characterize the appropriateness of preconsultation exchange to answer a clinical question without a formal patient visit to the hepatology clinic; and (4) To determine factors associated with referrals appropriate and inappropriate for preconsultation exchange.

Methods

Study Setting

San Francisco General Hospital and Trauma Center provides healthcare services to the majority of uninsured and underinsured residents of the city and county of San Francisco. The healthcare system serves nearly 20% of San Francisco's population with a total service population of more than 150,000 people. Approximately 39% of patients have Medicaid coverage, and 19% have Medicare. Most remaining patients are covered through the Healthy San Francisco program, which ensures access to primary and specialty care for uninsured San Francisco residents who do not qualify for Medicaid or Medicare, and meet income requirements.[10] There are 26 primary care clinics with more than 600 practicing primary care providers.[11–13] Hepatology services are provided at San Francisco General Hospital by faculty and trainees of the University of California San Francisco. Our Hepatology Clinic receives more than 800 referrals per year. Patients are referred via a novel electronic referral system, linked to the medical record, which facilitates iterative communication between primary care providers and specialists.[14] This system is designed to facilitate preconsultation exchange.

Study Design

We designed a retrospective study of patients referred for ambulatory hepatology consultation from January 2007 through April 2010. Of the 2,049 referrals during that time, we generated a random sample of 500 referrals using Microsoft Access. Repeat consultations for patients recently seen in the Hepatology Clinic were excluded. We developed algorithms and used them to code reason for consultation, clarity of consultation question, appropriateness of preconsultation exchange, and adequacy of information provided. Algorithms were developed through independent coding of a separate random sample of 100 referrals by three gastroenterologists.

The study sample was independently double-coded by two gastroenterologists. Disagreements were worked out via discussion; in cases where consensus could not be reached, a third gastroenterologist served as the tie-breaker. Data coded included: (1) indication for referral; (2) type of consultation requested (assistance establishing a diagnosis of liver disease, and/or assistance with management/treatment of a known liver condition, and/or request for a procedure performed by a hepatologist); (3) clarity of the consultation request; and (4) whether the referral was appropriate for management via preconsultation exchange by answering a clinical question without a formal patient visit to the hepatology clinic. We did not assess the use of preconsultation exchange to streamline the pre-specialty visit workup.

Referrals were considered appropriate for preconsultation exchange if they met *all* the following criteria: (a) referral did not indicate need for a procedure performed by a hepatologist; *and* (b) patient had liver disease that was neither severe nor complex; *and* (c) there was not a clear indication for medical therapy under the supervision of a hepatologist; *and* (d) the reason for referral could reasonably be managed by the primary care provider

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with hepatologist recommendations without a formal in-person hepatology clinic visit. Because the majority of referrals were for management of chronic hepatitis B or chronic hepatitis C, we additionally coded whether sufficient data were provided by the primary care provider to determine eligibility for hepatitis B or hepatitis C treatment. Sufficiency of data was based on our division's requirements to determine eligibility for antiviral treatment. For hepatitis B, this included: *either* the presence of cirrhosis *or* alanine aminotransferace (ALT) level, E antigen status, and viral load. For hepatitis C this included: *either* the presence of cirrhosis *or* viral load and genotype. The requirement for these data elements for viral hepatitis referrals is prominently displayed on the electronic referral portal where it is easily accessible to referring primary care providers.

Data Analysis

Descriptive statistics were calculated for provider and communication variables. Adequacy of information provided for treatment eligibility for hepatitis B and hepatitis C was assessed using logistic regression. Analyses were performed using Stata 11.0 (College Station, TX).

Ethical Considerations

The Institutional Review Boards of the University of California San Francisco and San Francisco General Hospital and Trauma Center approved the study.

Results

Patient and Provider Characteristics

2,049 referrals to the Hepatology Clinic were made over the 40-month study period. Of our random sample of 500 referrals, 87 were excluded as repeat referrals for patients recently seen in the Hepatology Clinic, producing a final sample size of 413 referrals. Table 1 summarizes the patient and provider characteristics. Patients had a mean age of 49.6 years and were ethnically diverse. 54.7% of the referring providers were attending physicians. 17.4% were trainee physicians, while 27.9% were midlevel providers.

Indications for Referral, Clarity of Consultation Questions, and Type of Assistance Requested

The most common reasons for referral were viral hepatitis (34.9% hepatitis B, 32% hepatitis C), and abnormal liver tests (13.6%, Table 2). An explicit question was asked in 72.4% of referrals. In 91.5% of referrals, reviewers had no difficult identifying the reason for consultation, whether or not an explicit consult question was asked (Table 2).

78.7% of referrals included requests for assistance with the management and/or treatment of a known liver condition (Table 2). These referrals were most often for management of hepatitis B or hepatitis C (88.1%), or for cirrhosis (9.8%). 30.5% of referrals included requests for assistance with establishing a diagnosis of liver disease. These referrals were most often for abnormal liver tests (44.4%) or liver masses (13.5%). Only 3.4% of referrals included requests for a procedure performed by a hepatologist.

Appropriateness of Preconsultation Exchange

56 of 413 referrals (13.6%) were deemed appropriate for management via preconsultation exchange (Table 3). 58.9% of these were for management of hepatitis B, and 16.1% were for management of hepatitis C; these were generally referrals in which antiviral therapy was clearly not indicated or was clearly contraindicated.

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190 of 413 referrals (46.0%) were deemed not appropriate for preconsultation exchange. 98 (51.6%) were inappropriate due to severity, acuity, or complexity of liver disease; among these referrals, the most common three indications were abnormal liver tests, non-viral cirrhosis, and liver mass. The second most common reason was the clear need for medical therapy under supervision of a hepatologist (84 of 190, 44.2%); half of these referrals were for hepatitis B or hepatitis C.

In 167 of 413 referrals (40.4%), the appropriateness of preconsultation exchange could not be determined. In 89.2% of such referrals (149 of 167), not enough information was provided by the referring provider to determine appropriateness of preconsultation exchange. In 10.8% (18 of 167), the indication for consultation was unclear, and reviewers could not determine whether the patient needed to be seen by a hepatologist or not. See Table 3.

Adequacy of Referral Information for Hepatitis B and Hepatitis C

Of the 413 referrals, 276 (66.8%) were for hepatitis B or hepatitis C. Of these, 42 (15.2%) were appropriate for preconsultation exchange, 94 (34.1%) were not appropriate for preconsultation exchange, and 140 (50.7%) lacked adequate information to determine the appropriateness of preconsultation exchange. These 140 referrals accounted 83.8% of the 167 overall referrals lacking adequate information to determine appropriateness of preconsultation exchange.

Among referrals for hepatitis B or hepatitis C, midlevel providers were most likely to provide information adequate to determine treatment eligibility. Compared with attending physicians, midlevel providers had 2.5 times greater odds of providing adequate information (95% confidence interval 1.4,4.4). Compared with trainee physicians, midlevel providers had a 4.4 times greater odds of providing adequate information (95% confidence interval 1.9,10.0).

Discussion

Preconsultation exchange is recognized as an appropriate model for providing specialty care by multiple groups, including the American College of Physicians,[4] and among thought leaders in the field,[15] yet it remains understudied, and may be relatively unknown among many physicians. To assess the face validity of preconsultation exchange for managing ambulatory hepatology consultations, we performed this retrospective analysis within the safety net healthcare system of San Francisco, California. 91.5% of consultation requests included clear reasons for referral. We found that the majority (67%) of ambulatory hepatology referrals were made for viral hepatitis, and that most referrals included requests for assistance in managing known liver disease (79% of referrals), or establishing a diagnosis of liver disease (31% of referrals). Nearly half of the referrals were found to be inappropriate for preconsultation exchange, while only 14% were appropriate. However, despite clear indications for referral in the vast majority, 40% of referrals lacked adequate information to determine appropriateness of preconsultation exchange. More than three-quarters of referrals with inadequate information were for viral hepatitis, despite the presence of longstanding, easily accessible, explicit referral guidelines. Our findings highlight several important issues related to primary care provider-specialist communication and the role of preconsultation exchange.

Our study illustrates the importance of high-quality communication between primary care providers and specialists if preconsultation exchange is to be a safe and efficient model of specialty care provision. Multiple studies suggest that communication between primary care providers and specialists often entirely absent, and when present, is often of poor quality. In

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a landmark review on primary-specialty care coordination, Mehrotra and colleagues found that, among studies of patients referred for specialty care, communication from primary care provider to specialist was entirely absent in 28–68% of referrals, and communication from specialist to primary care provider was entirely absent in 4–45% of referrals.[16] Additionally, the few identified studies assessing quality of communication found communication between primary care providers and specialists to be inadequate in its content between 17 and 70% of the time.[16] Our study found similar results, with 40% of referrals lacking adequate initial information to determine appropriateness of preconsultation exchange, despite clear indications for referral in more than 90%. It is surprising, however, that more than 80% of these were for hepatitis B and hepatitis C – conditions with clear referral guidelines. Put in the context of our annual referral volume, nearly 300 referrals for viral hepatitis in our healthcare system each year may lack adequate information to determine whether eligibility for antiviral therapy, and whether the patient needs to be seen in the liver clinic. This represents an important potential source of specialty care overutilization. Overutilization of specialty care is a well-described phenomenon,[16] and our findings suggest that two-way communication between primary care providers and specialists during the referral process could be of significant value if such communication could reduce overutilization.

In previous work, we found that the implementation of our electronic referral system, which facilitates two-way communication between primary care provider and specialists, had a significant positive impact on clinical care from the primary care provider perspective. Sixty percent of primary care providers felt that access to specialty care improved for their patients, and 72% felt that two-way communication with specialists improved overall clinical care for their patients.[17] This contrasts sharply with what might be considered the "standard" method of specialty referral, which has historically been a unidirectional communication from primary care provider to specialist, often via fax. In the current era of electronic medical records and secure electronic communication, dialogue between primary care provider and specialist within an electronic referral system can facilitate clarification of consult questions and provides a mechanism to perform preconsultation exchange.[18] Additionally, the use of preconsultation exchange may be an efficient means of specialty care delivery in the setting of bundled payments to ACOs and healthcare coordination in the PCMH.[19, 20]

Of the referrals with adequate information provided, nearly one quarter were found to be appropriate for preconsultation exchange. With adequate information exchange, it is possible that a similar fraction of all referrals could be managed via preconsultation exchange, which stands to increase availability of specialty care. However, this requires shared responsibility for patient care with clearly defined primary care provider and specialist roles, as envisioned in the PCMH Neighborhood.[4] Studies suggest that primary care providers would use preconsultation exchange if it were available to them. In one study, primary care providers estimated that they would be able to avoid 33% of their specialty referrals if a specialist were available to provide advice.[21] Specialist opinions regarding preconsultation exchange have not been reported, but the improved healthcare coordination, enhanced communication, and shared responsibility for patient care implied in the PCMH Neighborhood may address potential specialist concerns regarding the use of preconsultation exchange, such as inadequate communication with referring providers, liability related to adverse outcomes, or lack of financial reimbursement.

Our data suggest that type of medical training may affect content of specialty referrals. We found that midlevel providers, such as nurse practitioners and physician assistants, were two to four times more likely than physicians to provide adequate information for viral hepatitis referrals. No differences were seen among referrals for conditions other than viral hepatitis.

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Our data do not identify causes underlying these findings, but suggest that type and level of medical training should be taken into consideration when designing interventions to improve primary care provider-specialist communication.

It is important to note that our study was performed in a safety net healthcare system. Although this may limit generalizability of our results to some populations, patients in the healthcare safety net are disproportionately affected by liver disease,[22] and reduced access to specialty care,[23] supporting the importance of our study within such populations. Furthermore, our results may be generalizable to other safety net healthcare systems. An additional limitation is the retrospective study design. The study was planned as an initial test of the hypothesis that some referrals would be appropriate for preconsultation exchange. We felt that retrospective data were necessary to support future prospective interventions within our healthcare system. This study provides those supportive data, and we are planning to implement preconsultation exchange within some specialty clinics. It should also be noted that we primarily studied one arm of preconsultation exchange: to answer a clinical question without a formal patient visit to the specialist. We did not assess the use of preconsultation exchange to streamline pre-specialty visit workup.

In summary, this study supports the use of preconsultation exchange for some ambulatory hepatology consultations, and suggests that, with appropriate communication, approximately one-quarter of consultations could be managed via preconsultation exchange. Our data support the need for high-quality, two-way dialogue between primary care providers and specialists for preconsultation exchange to be safe and effective. A robust PCMH Neighborhood may facilitate the use of preconsultation exchange to improve access to, and quality of, specialty care. Future studies should prospectively assess the implementation of preconsultation exchange across diverse healthcare settings.

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Table 1

Characteristics of patients referred and referring providers.

	N = 413 patients
Patient characteristics	
Female gender, no. (%)	194 (47.0)
Age, years (SD)	49.6 (12.3)
Race, no. (%)	
White	86 (20.8)
Black	60 (14.5)
Asian	180 (43.6)
Hispanic	70 (17.0)
Other/unknown	17 (4.1)
Referring provider characteristics	
Training level of provider, no. (%)	
Attending physician	226 (54.7)
Trainee (resident or fellow)	72 (17.4)
Mid-level provider	115 (27.9)

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Table 2

Characteristics of referrals.

	N = 413 patients
Clinical indications for referral	
Hepatitis B, no. (%)	144 (34.9)
Hepatitis C, no. (%)	132 (32.0)
Abnormal liver tests, no. (%)	56 (13.6)
Cirrhosis, no. (%)	44 (10.7)
Liver mass, no. (%)	19 (4.6)
Other	18 (4.4)
Clarity of consultation question	
Consult question was explicitly stated, no. (%)	299 (72.4)
Difficulty identifying reason for consultation, no. (%)	
Not difficult at all	378 (91.5)
Somewhat difficult	31 (7.5)
Very difficult	4 (1.0)
Type of assistance requested	
Specific type of consultative assistance requested, no. (%)	
Request for assistance establishing a diagnosis *only* (A)	74 (17.9)
Request for assistance with management/treatment of a known condition *only* (B)	285 (69.0)
Request for a procedure performed by hepatologist *only* (C)	2 (0.5)
Both A and B	40 (9.7)
Both A and C	12 (2.9)
Any request for assistance establishing a diagnosis, no. (%)	126 (30.5)[a]
Any request for assistance with management/treatment of a known condition, no. (%)	325 (78.7)[a]
Any request for a procedure performed by a hepatologist, no. (%)	14 (3.4)[a]

[a]Because referrals could be counted in more than one category, percents add up to more than 100%.

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Table 3

Appropriateness of consults for management through pre-consultative exchange.

	N = 413 patients
Appropriate for pre-consultative exchange?	
Appropriate, no. (%)	56 (13.6)
Not appropriate, no. (%)	190 (46.0)
Unable to determine appropriateness, no. (%)	167 (40.4)
Reasons that pre-consultative exchange was appropriate (N=56)	
Ongoing PCP management – clinical question answered by hepatologist without in-person clinic visit, no. (%)	55 (98.2)
Referral would be more appropriate for specialist other than hepatologist, no. (%)	1 (1.8)
Reasons that pre-consultative exchange was not appropriate (N=190)	
Severe, acute, or complex liver disease, no. (%)	98 (51.6)
Medical treatment by hepatologist clearly indicated, no. (%)	84 (44.2)
Procedure with hepatologist clearly indicated, no. (%)	8 (4.2)
Reasons that appropriateness of pre-consultative exchange could not be determined (N=167)	
Not enough information provided, no. (%)	149 (89.2)
Consultation question unclear, no. (%)	18 (10.8)