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 health care system.


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%). Fifty-six referrals (13.6%) were appropriate for preconsultation exchange, and 190 (46.0%) were inappropriate for preconsultation exchange. One hundred sixty-seven (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, 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 health care 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.

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Utilization of specialty care in the US continues to increase. 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 health care costs2 and mandates to expand coverage to the uninsured and underinsured through health care reform,3 it is imperative to use health care resources as efficiently as possible. Emerging models of health care delivery, like the Patient-Centered Medical Home (PCMH)4 and Accountable Care Organizations,5,6 have been proposed as mechanisms to improve quality, reduce costs, and increase access to health care.
care. These models are central components of health care reform, emphasizing care coordination and collaboration among health care providers, including primary care providers and specialty care providers.4-5

Despite the centrality of specialty care to the health care 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 3 specific models of specialty consultation, including formal consultation, shared co-management, and preconsultation exchange. Preconsultation exchange is intended to provide specialty care by answering a clinical question without a formal patient visit to a specialist, or 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 health care 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 health care system could be managed using preconsultation exchange to answer a clinical question 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: to characterize the clarity of consultation questions asked; to characterize the type of assistance requested in ambulatory hepatology consultations; to characterize the appropriateness of preconsultation exchange to answer a clinical question without a formal patient visit to the hepatology clinic; and to determine factors associated with referrals appropriate and inappropriate for preconsultation exchange.

**METHODS**

**Study Setting**

San Francisco General Hospital and Trauma Center provides health care services to the majority of uninsured and underinsured residents of the city and county of San Francisco. The health care 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 2049 referrals during that time, we generated a random sample of 500 referrals using Microsoft Access (Microsoft Corporation, Redmond, Wash). 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 3 gastroenterologists.

The study sample was double-coded independently by 2 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: indication for referral; type of consultation requested (assistance establishing a diagnosis of liver disease, or assistance with management/treatment of a known liver condition, or request for a procedure performed by a hepatologist); clarity of the consultation request; and 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 prespecialty visit workup.

Referrals were considered appropriate for preconsultation exchange if they met all the following criteria:

- referral did not indicate need for a procedure performed by a hepatologist;
- and patient had liver disease that was neither severe nor complex;
- and there was not a clear indication for medical therapy under the supervision of a hepatologist;
- and the reason for referral could reasonably be managed by the primary care provider 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 aminotransferase 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, Tex).

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
There were 2049 referrals to the Hepatology Clinic 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, and 27.9% were midlevel providers.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Characteristics of Patients Referred and Referring Providers</th>
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<tr>
<td></td>
<td>N = 413 patients</td>
</tr>
<tr>
<td>Patient characteristics</td>
<td></td>
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<tr>
<td>Female sex, n (%)</td>
<td>194 (47.0)</td>
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<tr>
<td>Age, years (SD)</td>
<td>49.6 (12.3)</td>
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<tr>
<td>Race, n (%)</td>
<td></td>
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<tr>
<td>White</td>
<td>86 (20.8)</td>
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<tr>
<td>Black</td>
<td>60 (14.5)</td>
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<tr>
<td>Asian</td>
<td>180 (43.6)</td>
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<tr>
<td>Hispanic</td>
<td>70 (17.0)</td>
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<tr>
<td>Other/unknown</td>
<td>17 (4.1)</td>
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<tr>
<td>Referring provider characteristics</td>
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<tr>
<td>Training level of provider, n (%)</td>
<td>226 (54.7)</td>
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<tr>
<td>Attending physician</td>
<td></td>
</tr>
<tr>
<td>Trainee (resident or fellow)</td>
<td>72 (17.4)</td>
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<tr>
<td>Mid-level provider</td>
<td>115 (27.9)</td>
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<th>Indications for Referral, Clarity of Consultation Questions, and Type of Assistance Requested</th>
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<td>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 difficulty identifying the reason for consultation, whether or not an explicit consult question was asked (Table 2). Of all referrals, 78.7% included requests for assistance with the management 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.</td>
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Appropriateness of Preconsultation Exchange
Fifty-six 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.

One hundred ninety of 413 referrals (46.0%) were deemed not appropriate for preconsultation exchange. Ninety-eight (51.6%) were inappropriate due to severity, acuity, or complexity of liver disease; among these referrals, the most common 3 indications were abnormal liver tests, nonviral 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 or not the patient needed to be seen by a hepatologist (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 for 83.8% of the 167 overall referrals lacking adequate information to determine appropriateness of preconsultation exchange.

### DISCUSSION

Preconsultation exchange is recognized as an appropriate model for providing specialty care by multiple groups, including the American College of Physicians, and among thought leaders in the field, 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 health care system of San Francisco, California. Of all consultation requests, 91.5% 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 is often entirely absent, and when present, is often of poor quality. In a landmark review on primary-specialty care coordination, Mehrotra et al 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. Additionally, the few identified studies assessing quality of communication found communication between primary care providers and specialists to be inadequate in its content 17%-70% of the time. 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 health care system each year may lack adequate information to determine 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 over-utilization. Over-utilization of specialty care is a well-described phenomenon, and our findings suggest that 2-way communication between primary care providers and specialists during the referral process could be of significant value if such communication could reduce over-utilization.

In previous work, we found that the implementation of our electronic referral system, which facilitates 2-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 2-way communication with specialists improved overall clinical care for their patients. 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 provide a mechanism to perform preconsultation exchange. Additionally, the use of preconsultation exchange may be an efficient means of specialty care delivery in the setting of bundled payments to Accountable Care Organizations and health care coordination in the PCMH.

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. 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. Specialist opinions about preconsultation exchange have not been reported, but the improved health care coordination, enhanced communication, and shared responsibility for patient care implied in the PCMH Neighborhood may address potential specialist concerns about 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 2-4 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. 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 health care system. Although this may limit generalizability of our results to some populations, patients in the health care safety net are disproportionately affected by liver disease, and reduced access to specialty care, supporting the importance of our study within such populations. Furthermore, our results may be generalizable to other safety net health care 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 health care system. This study provides those supportive data, and we are planning to implement preconsultation exchange within some specialty clinics. It also should 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 prespecialty visit work up.
CONCLUSION
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, 2-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 pre-consultation exchange to improve access to, and quality of, specialty care. Future studies should prospectively assess the implementation of preconsultation exchange across diverse health care settings.

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References