Use of an Electronic Referral System to Improve the Outpatient Primary Care–Specialty Care Interface Implementation Handbook
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Implementation Handbook

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Preface

This project was funded as an Accelerating Change and Transformation in Organizations and Networks (ACTION) task order contract. ACTION is a 5-year implementation model of field-based research that fosters public–private collaboration in rapid-cycle, applied studies. ACTION promotes innovation in health care delivery by accelerating the development, implementation, diffusion, and uptake of demand-driven and evidence-based products, tools, strategies, and findings. ACTION also develops and diffuses scientific evidence about what does and does not work to improve health care delivery systems. It provides an impressive cadre of delivery-affiliated researchers and sites with a means of testing the application and uptake of research knowledge. With a goal of turning research into practice, ACTION links many of the Nation's largest health care systems with its top health services researchers. For more information about this initiative, go to http://www.ahrq.gov/research/action.htm.
What Is eReferral?

A HIPAA-compliant, Web-based referral and consultation system

• Linked to electronic medical record (EMR), with auto-population of relevant EMR data.
• Referring providers enter free text referral questions.
• Mandatory use for enrolled specialty clinics.

A new model for primary care – specialty care collaboration

• Individualized review and response to each referral by a designated specialist clinician (MD or NP).
• Iterative communication between referring and reviewing clinicians until both agree that the patient either does not need an appointment or the appointment is scheduled.

A tool that allows specialist reviewers to—

• Redirect referrals if inappropriate for clinic or other options available.
• Provide information for PCP management of condition, with or without an appointment.
• Request clarification of question or additional workup prior to specialty appointment.
• Expedite specialty clinic appointments if clinically warranted.

For more information on eReferral, contact Alice Chen at achen@medsfgh.ucsf.edu.
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University of California, San Francisco (UCSF), San Francisco General Hospital (SFGH) eReferral Program

Statement of the Problem

Over the past decade, access to specialty care has become arguably one of the most pressing issues for safety net providers and patients across the country, with wait times for some specialties extending to nearly a year. There is a dearth of specialists, particularly surgical specialists, who are willing to see uninsured and Medicaid patients, resulting in a severe mismatch between supply of and demand for specialty services. Compounding this crisis are inefficient referral processes notable for poor or absent communication between referring and specialty providers, and systems dependent on handwritten referrals and unreliable faxes to schedule appointments.

San Francisco is no exception. San Francisco General Hospital (SFGH), through a partnership with the University of California, San Francisco (UCSF), serves as the primary provider of specialty care for the city’s 72,000 uninsured as well as many of its Medi-Cal and Medicare patients. Prior to eReferral, the wait time for some routine specialty appointments was as long as 11 months.

If a referring provider wanted to expedite her patient’s appointment, she had to try to reach (call, email, or page) and convince a specialist of the urgency of the request. There was no equitable mechanism for specialists to triage urgent cases, as they only heard about patients when the referring provider made an extra effort to contact them.

When the patient did present for care, the specialist would often find that the initial evaluation was either incomplete or had not been forwarded, or that the consultative question was unclear. Sometimes the referral was unnecessary. Less frequently, but more concerning, the specialist might find that the patient’s case was urgent and should have been seen earlier.

The system was frustrating to primary care providers, specialists, and patients alike.

The Delivery System

San Francisco General Hospital is part of the San Francisco Department of Public Health (DPH), which also includes a network of community clinics and a skilled nursing facility. The City’s sole public hospital, SFGH operates 252 acute care beds. In fiscal year 2007-2008, SFGH provided 529,098 outpatient visits, 29 percent of which were specialty care visits and 20 percent of which were for diagnostic services. The payer mix for these visits was 34 percent uninsured, 28 percent Medi-Cal and 18 percent Medicare. Major specialty clinics at SFGH include (but are not limited to) cardiology, dermatology, endocrinology, gastroenterology, general surgery, hematology-oncology, nephrology, neurology, neurosurgery, obstetrics and gynecology, ophthalmology, orthopedics, otolaryngology, plastic surgery, podiatry, pulmonary, rheumatology and urology. SFGH’s physician services are provided by UCSF faculty, fellows and residents. The hospital currently uses a hybrid paper and electronic medical record (EMR).
SFGH’s core referral network for specialty clinics consists of a diverse group of 27 primary care clinics that have differing levels of access to the DPH electronic medical record (EMR) (see Figure 1). The clinics include 5 hospital-based primary care clinics, 12 Community-Oriented Primary Care (COPC) clinics, and 10 San Francisco Community Clinic Consortium (SFCCC) clinics. Referrals for diagnostic studies (e.g., MRI) originate from both primary care and specialty clinics.

- **Hospital-based primary care clinics** include family medicine, internal medicine, pediatrics, positive health (HIV primary care), and women’s health clinics. The family medicine, internal medicine, pediatrics, and women’s health clinics serve as continuity clinic training sites for UCSF residents. While the physicians are UCSF employees, the clinic staff are city employees. Together, these five clinics serve as primary care home for more than 30,000 patients. These clinics have immediate access to the DPH EMR, with all but the women’s health clinic having computer terminals in each patient care room.

- **COPC clinics** include a network of twelve primary care clinics located in neighborhoods across San Francisco that together serve as the primary care home for nearly 45,000 patients. Both physician and clinic staff are City employees. Each of the clinics has reliable access to the DPH EMR. Many, but not all, COPC clinics have terminals in each patient care room.

- **Consortium clinics** consist of 10 independent clinics, including 3 Federally Qualified Health Centers and three free clinics. SFCCC clinics together serve over 70,000 people per year. Each health center employs its own physicians and clinic staff, and each has a local Practice Management System whose primary function is billing; two have an EMR. Connectivity to the DPH Network and EMR is provided via a limited number of workstations configured with the DPH’s VPN (Virtual Private Network) software.
To access the DPH EMR, SFCCC users must complete three authentication steps: (1) login to the VPN, (2) login to the Active Directory network domain (via Citrix Portal), and finally (3) login to the DPH EMR. Once connected, response time has been poor and there have been frequent reports of network disconnections. Figure 2 below shows an overview of the network topology and interfaces among the organizations that participate in eReferral.

Figure 2. Overview of computer networks accessing eReferral

![Network Diagram]

Referral Process Prior To eReferral

Prior to eReferral, all specialty referrals required completion of a paper referral form (Figure 3). The referring provider handwrote the patient name and telephone number, the referring provider name, provider ID, practice site, telephone and fax number. If the referring provider was a resident, he had to enter this same information for an attending provider. There was an 8.5” by 1.5” area to write in the reason for consultation, including pertinent history, physical findings, and diagnostic data.

The completed form was faxed over to the specialty clinic, typically while the patient was still in clinic. Some clinics required a phone call prior to faxing the form; others required a follow-up phone call to make the appointment after the fax was received. Referrals were scheduled on a first-received, first-scheduled basis. There was no centralized method to track referrals. If the receiving fax machine was not functioning or had run out of paper, the referral was unlikely to be completed.
As mentioned previously, if a referring provider wanted to expedite her patient’s appointment, she had to contact (call, email, or page) and convince a specialty provider of the urgency of the request. There was no systematic mechanism for specialty providers to triage urgent cases, as they only heard about patients when the referring provider made the effort to contact them. Similarly, there was no formal mechanism to obtain consultant advice regarding the need for referral or to guide pre-referral evaluation. Providers could page the fellow or resident on call for the desired specialty service to discuss the case, or contact a trusted colleague for a “curbside consultation.”

When the patient presented for the initial consultative visit, the specialist often did not have access to the faxed referral form. Even when the referral was available, the amount of information that could be conveyed in the space provided was limited; there were also problems with legibility. Given that most of our patients have low functional health literacy and up to 40 percent are limited-English-proficient, the patient was often unable to provide additional insight into the reason for the visit. As a result, specialists sometimes spent the first visit trying to elucidate the reason for consultation and ordering diagnostic studies that should have been ordered by the referring provider.

Before the advent of eReferral, the wait time for some routine specialty appointments had become unacceptably long. In the Gastroenterology Clinic, if you requested an appointment on January 1st, the next available appointment was on November 30. Most of the medical specialty clinics faced similar, if not as severe, challenges, with wait times routinely over 3 to 4 months. The table below shows a series of wait times (in days) for the next available new patient appointment for four different medical specialty clinics.
Table 1. Wait times (in days) for the next available new patient appointment for four different medical specialty clinics

<table>
<thead>
<tr>
<th>Clinic</th>
<th>4/22/05</th>
<th>2/21/06</th>
<th>5/22/06</th>
<th>8/16/06</th>
<th>11/8/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endocrine</td>
<td>157</td>
<td>226</td>
<td>231</td>
<td>232</td>
<td>204</td>
</tr>
<tr>
<td>Nephrology</td>
<td>223</td>
<td>241</td>
<td>228</td>
<td>310</td>
<td>184</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>97</td>
<td>121</td>
<td>129</td>
<td>148</td>
<td>120</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>N/A</td>
<td>169</td>
<td>184</td>
<td>141</td>
<td>205</td>
</tr>
</tbody>
</table>

eReferral History

In 2005, wait times for a routine appointment in the Gastroenterology (GI) Clinic had climbed to over 11 months. In response, the GI Division Chief Dr. Hal Yee, in collaboration with SFGH IT staff (Kjeld Molvig, Dr. Bob Brody, and Dr. Fred Strauss) developed a mandatory electronic referral system for the GI Clinic that allowed a specialist reviewer to clarify the reason for referral, provide education and guidance, request additional work-up, and triage appointment requests when needed. As part of the planning process, the proposed system was vetted with the medical directors of the SFGH, COPC, and Consortium primary care clinics.

The results of the pilot electronic referral submission and review system were dramatic: less than a year after implementation, the wait time for a routine GI Clinic appointment had dropped from 11 to 4 months without any increase in GI Clinic capacity. This was a result of referrals that were managed without an appointment, referrals that had been redirected to more expeditious care (e.g., referring patients who needed liver biopsies to interventional radiology, which had a very short wait time), as well as avoided specialty clinic follow-up visits resulting from more complete pre-visit work-up. Other benefits of the system included the elimination of illegible consults and lost faxes, and a newfound ability to track all referrals electronically as well as measure the volume of clinic referrals over time.

As a result, the San Francisco Health Plan, the local Medicaid managed care plan, awarded UCSF/ SFGH a series of three grants totaling $1.5 million to spread the system to multiple medical and surgical specialty clinics as well as to MRI, CT, and ultrasound scans. Led by Dr. Alice Chen in collaboration with specialty leads for surgery (Julia Galletty, NP) and radiology (Dr. Alex Rybkin) as well as a lead evaluator (Dr. Margot Kushel) and project coordinator (Ellen Keith), the team has now implemented eReferral in 28 clinics and services.

Technical Specifications

eReferral is a HIPAA-compliant, Web-based application for secure electronic referrals and consultations from referring providers to participating specialty clinics at SFGH. The application is hosted on a Microsoft® Internet Information Services (IIS) Web server, with a Microsoft SQL server 2000 back end. The application is a hybrid of Microsoft’s Active Server Pages Web technology and the newer .NET platform.

SFGH contracts with Siemens Corporation to access its Invision/Lifetime Clinical Record (LCR) EMR set of products. The eReferral system is tightly integrated with this EMR. Since the LCR and eReferral are both Web-based systems, user login credentials and patient context are easily passed from the LCR into the eReferral system. The navigation paths to eReferral are from within the LCR. Users move between the applications in a relatively seamless fashion.
Patient data integration between eReferral and the LCR has been much more difficult to develop and maintain than the navigational integration described above. This is primarily because the LCR application is hosted remotely in the Siemens data center located in Malvern, Pennsylvania. As a result, patient data is not immediately accessible to internally developed applications at SFGH. There are no ODBC or network connections available to the data sources in Malvern. To address this, the IS Department has developed its own patient data warehouse that is populated by evening batch data downloads from the Siemens data center.

The patient demographic data elements shown inside the eReferral form are from the SFGH data warehouse and are refreshed nightly. This means that an eReferral form always displays current patient demographics (phone number, address, and primary care physician information). Importantly, when a user wants to update demographic information for an eReferral, he is forced to make the changes in the EMR rather than in the eReferral.

Appointment scheduling is also integrated between the LCR and the eReferral system. Scheduling staff receive appointment requests through the eReferral system, but make appointments using the LCR Resource Scheduling product. During evening processing, the LCR appointment is matched with the appropriate eReferral form, marking it scheduled and completing the form without any additional input required from the clinic staff. Lastly, eReferrals are integrated into the individual patient’s LCR chart under Notes/Reports. eReferrals are uploaded into the LCR via an HL7 Results Transaction interface.

**eReferral Overview**

eReferral is an integrated electronic referral and consultation system that allows repeated exchanges between the referring provider and a specialist reviewer until the clinical issue has been addressed, with or without a specialty clinic appointment. This process allows the reviewer to sort each incoming referral into one of four categories: (1) cases that can be managed by the referring provider with guidance from the specialist and therefore do not need to be scheduled, (2) premature referrals where additional diagnostic work-up or history would make the scheduled specialty visit more efficient, (3) routine, appropriate cases that can wait for the next available appointment, and (4) urgent cases that require an expedited appointment. eReferral also provides an opportunity for case-based education by the specialist.
Figure 4. eReferral submission process

PCP submits electronic referral

Consult reviewed electronically by specialist
Includes all relevant clinical data from EMR

Appropriate specialty referral AND Pre-eReferral work-up complete

Non-urgent
Schedule next available (3)

Urgent
Overbook (4)

PCP can manage with guidance OR Pre-referral work-up incomplete

Not scheduled OR More information requested

Eventually scheduled (2)

Never Scheduled (1)

eReferral Submission Process

Figure 5. Referral submission process with step 1 highlighted
To submit an eReferral, the referring provider must first access the hospital’s EMR and select an individual patient.

Figure 6. Patient search window

The Web-based program is launched from inside the patient’s medical record, and displays a list of all prior eReferrals that have been submitted for the patient in order to alert referring providers of previous referrals.

Figure 7. Initial eReferral window
The referring provider selects the desired specialty clinic or service from a drop-down menu.

**Figure 8. Specialty clinic or service selection window**

Some clinics have screening questions that are designed to direct referring providers to the correct clinic (e.g., to prevent patients with liver conditions from being referred to the gastroenterology clinic, rather than the liver clinic).

**Figure 9. Referring provider screening questions window**

**Figure 10. Referring provider screening questions window with reason**
Each specialty clinic or service has a policy page that lists common reasons for referral and the names and contact information of the specialist reviewer; some have developed and posted pre-referral guidelines for the most common referral conditions.

**Figure 11. Sample urology clinic policy window, and posted pre-referral guidelines window**
In order to minimize the need for manual entry, which is both time consuming and subject to error, relevant provider and patient information is automatically populated from the DPH EMR into the eReferral form. If the user is an MD or NP, the program allows her to automatically select herself as the referring provider or choose another provider.

Figure 12. Referring provider selection window

![Referring provider selection window]

The program defaults the referring location to the patient’s primary care clinic (if assigned), but can be changed to another referring location as needed (e.g., if the patient is being referred by the neurologist for a MRI).

Figure 13. Referring provider location window

![Referring provider location window]
If the user is a resident or NP, he must select an attending provider.

**Figure 14. Attending provider selection window**

Based on these selections, the patient, referring provider, attending provider and primary care provider contact information is auto-populated from the DPH EMR.

The reason for referral is entered as free text.

There is also an area to enter any scheduling considerations; for example, if a patient’s work schedule only permits him to attend an appointment on a given day of the week, or if a patient will be out of town for some period of time.

**Figure 15. Patient information window**
Some diagnostic services (e.g., sleep studies) require additional standardized clinical information.

**Figure 16. Standardized clinical information selection window**

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**Initial Specialist Review**

Each clinic designates one or more specialist clinician (MD or NP) reviewers who are responsible for responding to all referrals in a timely fashion. The reviewer assesses each referral for appropriateness, completeness, and urgency, and uses the portal to either approve an appointment for the patient or to initiate further discussion with the referring provider.

Each clinic has an electronic “Consultant Worklist” that contains all eReferrals that have been submitted for that clinic.

**Figure 17. Initial specialist review window**
For each eReferral, the reviewer responds to the referring provider by either entering a free text response and/or inserting a standardized "boilerplate" response. If after reviewing a referral the specialist reviewer thinks (a) the patient can be managed by the referring provider with guidance, (b) the reason for consultation is unclear, or (c) the referral requires additional diagnostic evaluation or history in order to make a schedule visit more efficient, she responds to the referring provider and selects “Not Scheduled.”
For patients who are approved for an appointment (“Schedule” or “Overbook”), the reviewer can enter scheduling instructions for the clerical staff (e.g., “overbook in two weeks” or “schedule for next available”).
Specialist Reviewer Tools

Each clinic has a Clinic Configuration Page that gives the specialist reviewer the ability to add or edit a “Clinic News” feature that is displayed at the top of the clinic’s policy page.

Figure 22. Clinic configuration window

Figure 23. eReferral news window
The reviewer can select the diagnostic test results that, if available for a given patient, are automatically appended to the referral.

**Figure 24. Diagnostic test results window**

![Diagnostic test results window](image)

**Figure 25. Test results window with consult and lab results**

![Test results window](image)
The reviewer has the ability to develop a library of commonly encountered conditions or situations.

Figure 26. Boilerplate library table

<table>
<thead>
<tr>
<th>Boilerplate Name</th>
<th>Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address required</td>
<td>Patients are notified of eReferral scheduled appointments by mail to the address listed for them in the Invision/Lifetime Clinical Record (CLOR). Therefore, without a correct address in Invision/LOR, pa...</td>
</tr>
<tr>
<td>appending new information for visit</td>
<td>In the future, you should just open the original eReferral form and add comments to it. This is the best way to ensure that your new info is present at the time of the patient visit. This time I have...</td>
</tr>
<tr>
<td>cant schedule procedures with eReferral</td>
<td>Unfortunately, we cant schedule patients for procedures via eReferral. It is meant for new patient clinics referrals. Please contact the GI follow on call to explain the need for rescheduling the proc...</td>
</tr>
<tr>
<td>cancelled appt</td>
<td>We have investigated this, and neither the GI service or eReferral was responsible for this cancellation. The cancellation was a &quot;**&quot; by an individual with code **. It is likely that...</td>
</tr>
<tr>
<td>chronic diarrhea</td>
<td>Prior to scheduling a patient with chronic diarrhea for a GI clinic appointment please obtain the following tests: 1. Stool tests including a, b and parasites x 2, 3, 5, Clostridium difficile, c.</td>
</tr>
<tr>
<td>CRC screening program</td>
<td>For GI Hope study you need to submit an eReferral to the Colonoscopy or Colon Cancer Screening Pilot Project web portal, and the GI clinic portal. Go back to the pulldown menu where you will find it. Thanks, Hal...</td>
</tr>
<tr>
<td>duplicate</td>
<td>Duplicate</td>
</tr>
<tr>
<td>dyspepsia</td>
<td>It appears that you are referring the patient to GI Clinic for for **. We suggest you choose another diagnosis...</td>
</tr>
</tbody>
</table>

The reviewer can grant other individuals access to the reviewer and scheduler worklists.

Figure 27. Access and role settings for clinic

<table>
<thead>
<tr>
<th>Login Name</th>
<th>Access Level</th>
<th>Last Login</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloria Rojas</td>
<td>Scheduler</td>
<td>07/02/2002 12:30:20 PM</td>
</tr>
<tr>
<td>Hal Yee</td>
<td>Consultant</td>
<td>07/02/2002 11:46:50 AM</td>
</tr>
<tr>
<td>Violet Garcia</td>
<td>Scheduler</td>
<td>07/02/2002 2:14:14 PM</td>
</tr>
</tbody>
</table>
Scheduling Process

Once the reviewer approves an appointment, the eReferral is forwarded to a “Scheduler’s Worklist,” an electronic list of all the patients who need to be scheduled for an appointment. The worklist displays scheduling instructions from the specialist reviewer as well as any scheduling considerations entered by the referring provider. In addition, any “Overbook” appointments are flagged for urgency.

Designated clerical staff monitor each clinic’s Scheduler’s Worklist on a daily basis. Each patient must be manually scheduled in the hospital’s scheduling system, which is distinct from eReferral.

Overnight, when eReferral synchronizes with the hospital appointment database, the referral is removed from the worklist and an automated email is generated notifying the referring provider of the appointment. If multiple clerks are managing the worklist, they can use the “Check if scheduled” box to indicate to their colleagues that the appointment has already been made.

Patients receive an automated appointment notification letter at the time the appointment is made. Two weeks before the appointment date, the patient receives a second automated appointment reminder letter.
Scheduled Appointments

After an appointment is scheduled, the appointment date and time are displayed at the top of the eReferral.

If the referring provider has additional information to relay to the specialist, or feels the appointment either needs to be expedited or delayed, he can submit additional information via the same eReferral.

Figure 29. Scheduled appointment

These resubmitted eReferrals are flagged on the Consultant Worklist as already having an appointment scheduled.

Figure 30. Consultant view of scheduled appointments
The specialist reviews the new information and can approve a change in the appointment date, can select “No Change” or ask the scheduler to cancel the appointment.

Figure 31. Scheduled appointment with running notes

All exchanges are captured in the eReferral with an automated name, date, and time stamp.

Figure 32. Scheduled appointment with multiple dated notes
Clinic staff print out eReferrals before the appointment and attach the referral form to the patient’s chart.

The specialist who is seeing the patient in clinic is able to review the reason for referral as well as any subsequent exchanges between the referring provider and specialist reviewer.
If the patient misses the appointment, the referring provider can resubmit the same eReferral up to 180 days after the missed appointment. After that time, a new eReferral must be submitted.

Figure 35. Scheduled appointment

![Scheduled appointment](image)

Not Scheduled eReferrals

Figure 36. Referral submission process with steps 1, 3, 4, 5, 6 highlighted

![Referral submission process](image)
When the specialist reviewer decides to “Not Schedule” an eReferral, the referring provider receives an automated email requesting him to check the referral for the specialist reviewer’s response. The referring provider can provide clarification or additional information through the eReferral.

Figure 37. Current request status
These eReferrals are flagged on the Consultant Worklist as resubmissions. Many of the referrals that are initially “Not Scheduled” are subsequently scheduled for appointments. eReferrals that are not scheduled remain open for resubmission for up to 180 days after the last specialist reviewer response. After that time, a new eReferral would have to be submitted.

Figure 38. Consultant view
eReferral Documentation and Management

eReferrals are stored as part of the patient’s EMR, and can be accessed either through the patient’s eReferral portal (shown under eReferral Submission Process) or under the patient's Notes/Reports.

We have also developed a series of worklists that can be used to manage and track eReferrals:

Figure 39. Patient's EMR
We have also developed a series of worklists that can be used to manage and track eReferrals:

Referring Provider Worklist: displays all eReferrals for a given referring provider. When the specialist reviewer responds to an eReferral, the referring provider and PCP (if different) receive an automated email asking them to check their worklists for the specialist response. New eReferrals are marked with a red exclamation point on the worklist. Opening the eReferral removes the exclamation point. If an eReferral remains unread/unopened by the referring or attending (if applicable) providers after two weeks, both receive an automated email reminder. These emails continue to be sent on a weekly basis until the eReferral is opened.

Figure 40. Referring provider worklist
**Primary Care Provider Worklist**: displays all eReferrals for a given primary care provider’s patients, regardless of who made the referral.

**Figure 41. Primary care provider worklist**

<table>
<thead>
<tr>
<th>Request Time</th>
<th>Patient Name</th>
<th>Not Scheduled</th>
<th>Displayed</th>
<th>Scheduled</th>
<th>Referral Provider</th>
<th>Referring</th>
<th>NonClinical</th>
<th>Note</th>
<th>Status</th>
<th>Help</th>
<th>Change Request</th>
<th>Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/21/2009</td>
<td>Dr. Chen</td>
<td>New Submission</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/11/2009</td>
<td>Dr. Chen</td>
<td>Draft</td>
<td>STRAUSSE</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/18/2009</td>
<td>Cardiology</td>
<td>Schedule</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/7/2009</td>
<td>HealthAtHome</td>
<td>Accept</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/26/2008</td>
<td>Respite</td>
<td>Accept</td>
<td>PORTMANN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/16/2007</td>
<td>Colonoscopy</td>
<td>Schedule</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/16/2009</td>
<td>Gynecology</td>
<td>Schedule</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9/24/2009</td>
<td>HealthAtHome</td>
<td>Accept</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
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<tr>
<td>4/6/2007</td>
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<td>Schedule</td>
<td>BAGEORF</td>
<td>NonClinical</td>
<td>Note</td>
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<tr>
<td>5/24/2007</td>
<td>Colonoscopy</td>
<td>Schedule</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
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<tr>
<td>9/10/2009</td>
<td>Diabetes</td>
<td>Schedule</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
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<tr>
<td>3/12/2009</td>
<td>Neurology</td>
<td>Complete</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
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</tr>
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<td>3/31/2009</td>
<td>Neurology</td>
<td>Complete</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/12/2009</td>
<td>Ophthalmology</td>
<td>Complete</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8/16/2009</td>
<td>Orthopedic Surgery</td>
<td>Complete</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/27/2009</td>
<td>Gastroenterology</td>
<td>Complete</td>
<td>CHEN</td>
<td>NonClinical</td>
<td>Note</td>
<td></td>
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<td></td>
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<tr>
<td>5/11/2009</td>
<td>Gastroenterology</td>
<td>Complete</td>
<td>CHEN</td>
<td>NonClinical</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Referring Location Worklist: displays all eReferrals originating from a given clinic.

Figure 42. Referring location worklist
**Primary Care Clinic Worklist**: displays all eReferrals for patients assigned to a given primary care clinic.

Figure 43. Primary care clinic worklist
Several other functions have been developed in order to enhance the referring provider’s ability to actively manage his eReferrals. He has the ability to temporarily remove eReferrals from his worklist for a designated time period.

**Figure 44. Referring provider removing eReferral from worklist for designated time**

![Image of referring provider removing eReferral from worklist](image)

After that period has elapsed, the eReferral is flagged and returned to his worklist and the provider is notified via an automated email to check the worklist. This serves as a tickler system for the referring provider, for example, in the case of a referral where the specialist reviewer has requested additional lab results prior to deciding whether the patient needs an appointment.

**Figure 45. eReferral being returned to worklist**

![Image of eReferral being returned to worklist](image)
Providers are also able to communicate with their clinics’ support staff via a “Non-Clinical Note” that is also displayed on the clinic worklist. This serves to relieve the provider of administrative tasks such as filling out lab requisitions and calling the patient to come in for the test.

Figure 46. Referring provider worklist

![Referring provider worklist](image)

Figure 47. Referring location worklist

![Referring location worklist](image)
When a patient changes primary care providers, her new PCP has the ability to change the referring provider to herself, which then automatically transfers the eReferral to her Referring Provider Worklist.

**Figure 48. Change referring provider tool**

![Change Referring Provider Tool](image)

Finally, there is an audit function for every eReferral that tracks all activity from the time of submission, including who viewed the eReferral, any decisions made by the specialist reviewer, and any scheduling activity. Each action is automatically name, date, and time stamped.

**Figure 49. Audit trail for the eConsult to patient**

![Audit Trail for the eConsult to patient](image)
eReferral Support

**Suggestion Box:** We encourage users to contact us with any problems with or suggestions for improving the program. We depend on this function to quickly identify problems with the program.

Figure 50. eReferral suggestion box
eReferral FAQs: We have developed a series of Frequently Asked Questions and responses largely based on Suggestion Box submissions and questions from outreach and training sessions.

Figure 51. eReferral help and FAQs
eReferral News Archives: We primarily use email to communicate with our large number of institutionally dispersed users. All eReferral-related emails are archived for users’ reference.

Figure 52. eReferral news archives

Clinics and Services requiring eReferral: This list is updated each time a new clinic or service begins to use eReferral.

Figure 53. Clinics and services requiring eReferral
eReferral Activity Chart and Reviewer Audit: We have developed a report that displays the volume and disposition of eReferrals by clinic for a designated time period. This can be used to track changes in volume of referrals. It is also used by administrative staff to monitor specialist reviewer response rates on a weekly basis; reviewers who have a backlog of pending eReferrals are contacted by email.

Figure 54. eReferral activity chart and reviewer audit

Clinic Implementation Process

Each specialty clinic or service interested in adopting eReferral must identify one or two specialist clinician reviewers who agree to review eReferrals on a regular, timely basis; referring providers expect to receive an automated email alert regarding their referral within 5 business days. Reviewers must be a licensed independent practitioner (MD or NP) who (1) has specialty knowledge and expertise covering the broad range of conditions that are referred to the clinic, (2) who is familiar with the SFGH specialty clinic’s operations through regular patient care in the clinic, and (3) will be at SFGH for at least one year (i.e., rotating residents and fellows are not eligible to serve as reviewers). For NPs, an attending physician, either the Clinic Chief or Service Chief, serves as the supervising physician. At this time, the medical specialties have physician reviewers, while all but one of the surgical clinics have NP reviewers.
Each clinic must also identify designated clerical personnel to staff the specialty clinic’s scheduling worklist. These clerical staff are hospital employees who receive training to use the eReferral program. Ideally, these individuals have basic facility with computers and internet programs, but the selection of the assigned clerical staff is the decision of each clinic’s Nurse Manager.

The eReferral Team works with the clinic to develop appropriate screening questions, policy page, and any additional modifications that are needed. These additions and modifications are then added by the eReferral IS staff to the eReferral development server for testing. If there are significant modifications from the basic intake form (e.g., MRI, CT), the program is piloted in one or two clinics prior to being implemented system-wide.

Two weeks prior to a clinic or service conversion to eReferral, an email is sent notifying all providers of the conversion; after the start date, all paper and faxed referrals are returned to the referring provider to be resubmitted as an eReferral. During the week before conversion, the clerk(s) meet with a trainer to learn how to use the scheduler’s worklist. Immediately after the clinic begins using eReferral, the designated specialist reviewer meets with the eReferral specialty lead to learn how to use the consultant worklist, and the clerks meet again with the trainer to resolve any questions or problems they have encountered.

**Ongoing Improvements**

One important feature of the eReferral program is the relative ease with which the program can be modified to meet the needs of the users. Many of the program’s current functions are a result of specific suggestions from referring providers, specialist reviewers, or clerical staff who use eReferral. The eReferral team actively solicits feedback through structured surveys as well as through informal forums and the Suggestion Box.

**Impact of eReferral**

**Decrease in Wait Times**

We measured median wait times before and after the implementation of eReferral. We also tracked the percentage of referrals that—

a. were not initially scheduled (these referrals were either inappropriate for the clinic, could be managed by the referring provider with some guidance from the specialist reviewer, needed additional diagnostic testing prior to appointment, or required clarification; prior to eReferral these would have resulted in the next available appointment),

b. resulted in expedited appointments (this represents the triage function of eReferral; prior to eReferral these would have been scheduled without regard to clinical urgency unless the referring provider attempted to contact a specialist to plead the patient’s case), and

c. were never scheduled (defined as a referral that did not result in an appointment within 180 days after the last exchange between the referring provider and the specialist reviewer).

During the first 6 months after implementing eReferral, median wait times for non-urgent visits declined in 7 of 8 medical specialty clinics by up to 90 percent (range 17 - 90 percent, all
but one greater than 60 percent). In these same clinics, data from January 2007- June 2009 show the percentage of referrals that were not initially scheduled ranged between 22 and 67 percent. The percentage of referrals that were expedited (defined as an appointment scheduled before the routinely next available appointment) ranged from 1 to 37 percent. The percentage of referrals that were “never scheduled” ranged from 16 to 53 percent. (unpublished data)

**High Levels of Primary Care Provider Acceptability**

Referring provider acceptability was gauged through a Web-based survey of primary care provider experience. Among primary care providers, 71 percent felt that eReferral improved clinical care, 71 percent felt that eReferral provided improved guidance for pre-visit evaluation, and 89 percent felt that eReferral improved their ability to track referrals. (Kim Y, Chen AH, Keith E, et al. Not perfect, but better: primary care providers’ experiences with electronic referrals in a safety net health system. *J Gen Intern Med* 2009; 24(5):614-9.)

**Improvements in Specialist Experience**

Impact on specialists was assessed through an encounter-based survey of new patient appointments comparing patients referred using the prior (paper and fax based) referral process and those referred through eReferral. The reason for referral was difficult to identify in 19 percent and 39 percent of medical and surgical clinics using paper-based methods and in 10 percent of those using eReferral. (Kim-Hwang JE, Chen AH, Bell D, et al. “Evaluating the effect of electronic referrals for specialty care at a public hospital.” *J Gen Intern Med* 2010 Oct,25(10):1123-8.)
Appendix A. Acknowledgments

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