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Patient Preferences for Receiving Test Results at San Francisco Bay Area Free Clinics: A Multi-Site Evaluation

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Abstract

Background: Laboratory follow-up is a critical aspect of patient care, and clinicians and patients communicate via both in-person and remote channels. Patient preferences for different modalities and the impact of experiencing in-person versus phone follow-up on future preferences are not well understood, especially in safety net settings.
Methods: We conducted a survey of 235 patients at two San Francisco Bay Area student-run free clinics to ascertain patient preferences for in-person and phone follow-up. We determined the clinical complexity of laboratory follow-up and overall patient care by conducting a chart review of 113 surveyed patients who received lab results and all 579 patients who received care at either clinic.
Results: Patients naïve to laboratory follow-up reported similar preferences for in-person (32%) and phone (36%) follow-up (p=0.58). Patients who received results in-person subsequently reported a greater preference for future in-person follow-up (65%, p=0.003), whereas preference for phone follow-up (43%, p=0.69) did not shift after experiencing this modality. Patients with more complex follow-up (e.g., altering medications or ordering additional diagnostic studies, versus routine health counseling) reported a greater preference for receiving results in-person (p=0.013) and a lower preference for receiving results by phone (p=0.036).
Conclusions: Patients' preferences for receiving test results shift significantly after experiencing certain modalities (i.e., in-person) but not others (i.e., phone), and these shifts may be associated with the clinical complexity of laboratory follow-up. Future research should explore the utility of these findings in personalizing laboratory follow-up to optimize care delivery and quality in safety net settings.

Introduction

Modern medical practice relies heavily on laboratory testing and imaging to guide diagnosis, treatment, and prevention; consequently, the effective communication of laboratory results to patients is critical to providing high-quality care.[1] Patients and providers now communicate via many different channels, including clinic visits, phone, mail, email, and electronic health portals. Understanding patients' preferences for receiving laboratory results may help providers select the channel that best suits their patients' needs while balancing convenience with quality.[2-4] Prior studies, mostly done at academic centers or with insured patient populations, have found that patients prefer receiving lab results through remote modalities (i.e., telehealth, mail, email, electronic health portal) because of their convenience, and these channels also have potential to reduce in-person health care utilization and costs.[2,3,5-16] However, providers and patients may prefer to sacrifice convenience to discuss sensitive tests and abnormal results in-person, which may help assuage patient concerns regarding privacy and adequacy of clinicians' investigation of new

symptoms or concerns.[3,4,17-23]

Healthcare in a safety net setting, such as a student-run free clinic, carries unique challenges that might affect preferences for receiving laboratory results. For example, work or childcare obligations and the inconvenience of commuting to the clinic site (especially if student-run clinics like ours are only open once or twice per week) might favor remote methods, but the prevalence of lower health literacy might favor in-person communication to ensure patient understanding of the results. However, little is known about laboratory follow-up preferences of patients in such settings. We conducted a study at two free clinics in the San Francisco Bay Area operated by Stanford University students to: (1) describe preferences for receiving laboratory results in a safety net setting, (2) understand the impact of receiving results in-person versus by phone on preferences for these modalities in the future, and (3) examine the complexity of follow-up at these clinics and its relationship to laboratory follow-up preferences.

Introduction to the Cardinal Free Clinics

The Cardinal Free Clinics operated by Stanford University are comprised of two free clinics – Arbor Free Clinic (Menlo Park, California) and Pacific Free Clinic (San Jose, California) – that primarily serve low-income, uninsured patients in the southern San Francisco Bay Area. According to a recent study of specialty care at our clinics, 78% of patients are uninsured, and the majority (52%) have an annual personal income less than $25,000.[24] Both clinics serve as healthcare safety net settings, however they have developed different relationships with their respective patient populations over time. Although both clinics serve as transitional care settings designed to provide patients with both referrals to primary care providers and assistance with health insurance enrollment, Pacific has increasingly functioned as a medical home for patients with chronic diseases, especially since the creation of a hepatitis B screening and liver cancer prevention clinic.[25]

Laboratory follow-up practices also differ between the two clinics. At both clinics, patients are seen in clinic by a medical student and a resident physician (both supervised by the attending physician serving as medical director of the clinic) and laboratory or imaging studies may be ordered. At Arbor, medical students under the supervision of an attending physician call the patient to inform them of their results. At Pacific, patients are scheduled to return to the clinic in 1-2 weeks and receive their results in-person from the medical student or resident physician, again, under the supervision of the attending physician. For an in-depth description of specialty clinic operations at the Cardinal Free Clinics, see Liu et al. (2017).[24] Because the clinics already differed in their methods of providing laboratory follow-up, they served as ideal settings for our multi-site evaluation of patient preferences for receiving test results.

Methods

This study was reviewed by the Stanford University Institutional Review Board and was exempted as a quality improvement (QI) project.

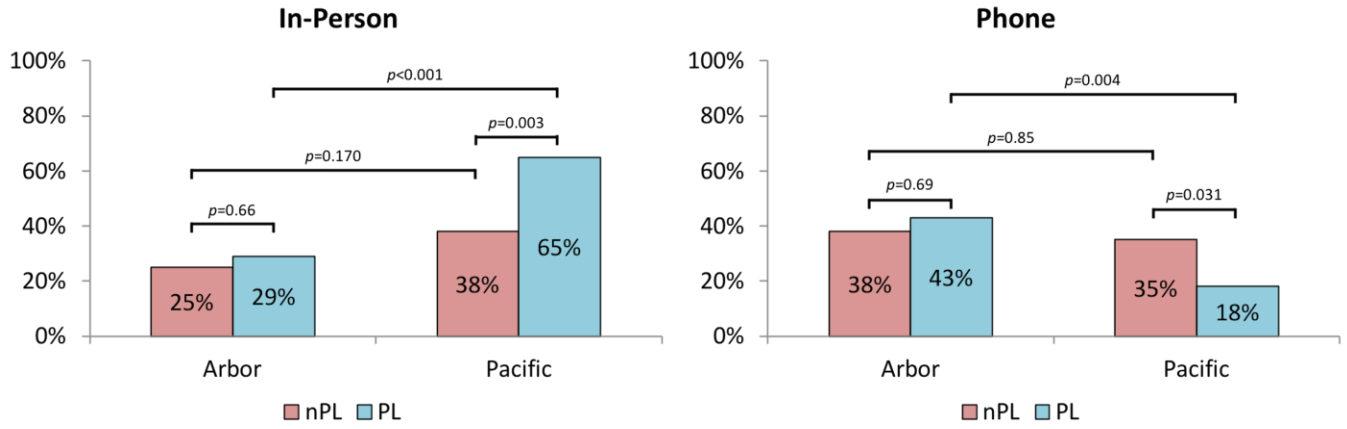
Participants

We conducted a survey of adult patients (age ≥18 years) at Arbor and Pacific between August 2015 and February 2016. Patients were sequentially sampled in order to achieve a sample size of at least 50 within each study group: (1) those who had received lab results within the past 12 months (prior labs, PL), and (2) those who had not (no prior labs, nPL). At Arbor, patients who had not received lab results were sampled in-person prior to their appointment, and patients who had received lab results were sampled over the phone after lab results were provided. At Pacific, patients who had not received lab results were sampled during their initial visit prior to seeing the clinician, and patients who had received lab results were sampled in-person after lab results were provided. Due to logistical limitations on ensuring patient follow-up, we chose not to utilize a repeated-measures design (i.e., patients sampled into the nPL group were not followed to ensure inclusion into the PL group after receiving lab results). We did not exclude any patients based on gender, ethnicity/race, spoken/written language (in-person and phone translator services were available at both clinics), or medical condition.

Survey

All patients were asked to provide their primary preference for receiving lab results (in-person, phone, or other); patients were allowed to select "other" either as their primary preference or as a secondary preference to phone/in-person options. Patients in the PL group at both clinics

Figure 1. Impact of receiving test results on patient preferences for laboratory follow-up



nPL = no prior labs; PL = prior labs.
P values were calculated using Fisher's exact test with a Bonferroni-corrected significance level of α=0.006.

rated their satisfaction (1-item measure) with lab follow-up, as well as lab follow-up quality (average 3-item measure: understanding of lab results, confidence in describing results to a friend or family member, and understanding of one clear health goal), each using a 7-point Likert scale. See the Online Appendix for survey instrument.

Chart Review

For patients who received results (PL group, n=113), we classified their follow-up encounter as either high clinical complexity (orders for additional studies, referrals, medication change, or additional appointments) or low clinical complexity (no action, health counseling, vaccination). We also reviewed all patients treated during the study period (n=579) to obtain information on demographics, health status (prevalence of hypertension, diabetes mellitus, former/current tobacco use, number of diagnoses/problems per visit), and distance from home to clinic (using Google Maps).

Statistical Analysis

Analyses were performed using SPSS 24.0 (IBM, Armonk, New York). We calculated descriptive statistics for categorical (percentages) and continuous (median [interquartile ranges]) variables. Statistical significance with respect to categorical predictors was assessed using two-tailed Fisher's exact test and Kruskal-Wallis test. Differences between dependent proportions of in-person and phone preference were assessed using McNemar's χ^2 test. A significance threshold of α=0.05 was used with Bonferroni correction for multiple comparisons.

Results

We sampled 258 patients, of whom 235 (91%) completed the survey; response rate did not differ significantly between clinics (Arbor: 104/116, 90%, Pacific: 131/143, 92%; *p*=0.67). The PL group had 51 patients at Arbor and 62 at Pacific. The nPL group had 53 patients at Arbor and 69 at Pacific.

Patient preferences for receiving laboratory results favored in-person follow-up (94/235, 40%) over phone follow-up (77/235, 33%, *p*=0.22), however this difference did not reach statistical significance. Notably, 31% (72/235) of patients from this low-income, uninsured population reported a preference for receiving results by web/email. Prior to receiving lab results, patients reported similar preferences for in-person (29/122, 32%) and phone follow-up (44/122, 36%; *p*=0.58), while PL patients demonstrated a greater preference for in-person (55/113, 49%) versus phone follow-up (33/113, 29%; *p*=0.019)

The impact of receiving laboratory follow-up on patient follow-up preference differed between clinics (Figure 1). Arbor PL patients reported similar preferences for in-person versus phone follow-up (*p*=0.25), and their preferences (nPL vs. PL) for in-person (13/53, 25% vs. 15/51, 29%; *p*=0.66) and phone (20/53, 38% vs. 22/51, 43%; *p*=0.69) follow-up did not differ significantly before and after experiencing phone follow-up. Pacific PL patients, who received lab results in-person, significantly

Table 1. Characteristics of clinic populations and sampled patient follow-up encounters

	Population		
	Arbor N=254	Pacific N=325	*p* value
Demographics			
Age (in years), %			
18-24	6.7	3.7	0.124
25-44	38.6	22.8	**<0.001**
45-64	38.6	48.3	**0.023**
65+	16.1	25.2	**0.008**
Female gender, %	61.0	62.8	0.67
Hispanic/Latino ethnicity, %†	10.6	14.8	0.59
Caucasian race, %†	3.5	4.0	0.49
English proficient, %†	21.7	29.2	0.34
Distance to clinic (in miles), median [IQR]	12.4 [13.1]	7.8 [9.2]	**<0.001**
Health Status			
Hypertension, %	15.7	27.7	**0.001**
Diabetes, %	10.6	21.2	**0.001**
Smoking history, %	4.3	3.1	0.50
Diagnoses per visit, median [IQR]	1.0 [1.0]	1.0 [1.0]	0.90
Total diagnoses per patient, median [IQR]	2.0 [3.0]	3.0 [3.0]	**<0.001**
	Sample		
	Arbor N=51	Pacific N=62	*p* value
Clinical Actions‡			
Low clinical complexity, %			
None	0	0	NA
Health counseling	100	98	1.00
Vaccine recommended	12	13	1.00
High clinical complexity, %			
Study ordered	12	52	**<0.001**
Referral made	6	40	**<0.001**
Medication adjusted	12	47	**<0.001**
Appointment needed	6	16	0.138
Actions per encounter, median [IQR]	1 [1]	3 [1]	**<0.001**

NA = not applicable; IQR = interquartile range.
P values for comparisons between clinics were calculated using Fisher's exact test for proportions and Kruskal-Wallis test for medians (significance level of α=0.05). Statistically significant values are bolded.
†Ethnicity and race data were not available for 123 patients and language data were not available for 157 patients.
‡Column values may not sum to 100; multiple clinical actions could be listed for each patient.

preferred in-person to phone follow-up (p<0.001); their preference for in-person follow-up (40/62, 65%) was significantly greater than that of nPL patients (26/69, 38%; p=0.003), and their preference for phone follow-up (11/62, 18%) was decreased compared to Pacific nPL patients (nPL: 24/69, 35%; p=0.031).

Encounters with higher clinical complexity were more common at Pacific (52/62, 84%) than at Arbor (14/51, 28%; p<0.001) (Table 1). Greater clinical complexity was associated with higher preference for in-person follow-up (39/66, 59% vs. 16/47, 34%; p=0.013) and lower preference for phone follow-up (14/66, 21% vs. 19/47, 40%;

p=0.036). In addition to significant differences in clinical complexity, the distinct patient populations serviced by each clinic also differed significantly in terms of age (Pacific patients were older), health status (Pacific patients displayed a higher prevalence of hypertension and diabetes and a greater number of medical diagnoses), and distance to clinic (Pacific patients lived closer to the clinic than did Arbor patients). Despite differences between the clinics, median patient satisfaction with laboratory follow-up (Arbor: 7 [1], Pacific: 7 [1], *p*=0.87) and perceptions of laboratory follow-up quality (Arbor: 7 [1], Pacific: 6 [1], *p*=0.31) were high.

Discussion

Our study of two San Francisco Bay Area free clinic populations revealed that (1) patients naïve to laboratory follow-up showed no significant preference for in-person or phone follow-up, and a greater than expected number (31%) demonstrated a preference for receiving results by web/email; (2) preferences shifted significantly in favor of receiving results in-person after experiencing in-person follow-up, but no such shift was observed in favor of phone follow-up; and (3) patients whose follow-up encounters involved more complexity were both more likely to prefer in-person follow-up and less likely to prefer phone follow-up. One possible explanation of the differences between the two clinics lies in their structure, with Pacific serving as a medical home for older patients with a higher burden of chronic diseases and a greater number of medical diagnoses. As a result, Pacific follow-up encounters were of greater clinical complexity and may have been better suited for in-person follow-up.

We aimed to address two gaps in the literature. Firstly, few studies have examined how patients' preferences change after being exposed to a follow-up modality. Patients may report an *a priori* preference for phone follow-up, but their preferences might change after receiving test results by phone or in-person as observed in our study. Secondly, few studies have examined the association between the complexity of lab follow-up and patients' preferences for receiving test results. Several reports have examined the impact of normal/abnormal results and the emotional valence (e.g., sensitivity) of the results on patient preferences, however the emotional valence of lab results may be challenging to interpret from the mere presence of abnormality on individual tests detached from the clinical context.[4,5,13,18] Even abnormal results, if expected or improved from a prior result, may have a positive emotional impact; conversely, normal results may be frustrating if they do not provide the patient with a diagnosis. Lab follow-up requires not just the communication of the result (whether normal or abnormal), but also the discussion of a specific plan based on the results. Patients might prefer remote communication for both normal and abnormal results if the subsequent care plan does not involve a repeat examination or more extensive counseling regarding further testing or medication changes.

We endeavored to answer a practical question regarding the impact of follow-up modality on patient preferences at two student-run clinics operating as safety net settings in the south San Francisco Bay Area. However, our study has several limitations.

Firstly, we decided not to utilize a within-subject (pre-post) design because of logistical barriers to tracking patients (which would help ensure recruitment both before and after receiving results). Among our cohort, we identified a subset of 23 patients (Arbor: n=5, Pacific: n=18) who were recruited both before and after receiving lab results purely by chance. Within this subset, pre-follow-up preferences at Arbor (in-person: n=2, phone: n=1, other: n=2) and Pacific (in-person: n=7, phone: n=2, other: n=9) shifted primarily towards other modalities at Arbor (in-person: n=0, phone: n=2, other: n=3) and towards in-person follow-up at Pacific (in-person: n=13, phone: n=1, other: n=4). The patterns observed in this subset supported the trends observed in our group-level analysis, however a larger study with a within-subject design would be ideal to confirm these findings.

Secondly, we found that the Arbor and Pacific patient populations differed on several confounding factors: age, distance to clinic, health status, and complexity of lab follow-up. Pacific patients were older, lived closer to the clinic and had a greater burden of hypertension and diabetes than Arbor patients, and Pacific follow-up encounters were more clinically complex than those at Arbor. Some of these factors have been associated with follow-up preferences in prior studies. For example, older individuals have been shown to prefer methods that are more personal (clinic or phone appointments) versus impersonal (mail, email, health portal), and patients who are more likely to have abnormal results (i.e., those with poorer health status) might prefer to discuss test

results in-person.[4,11,13] In this study, we found that greater complexity of follow-up encounters, which is also more likely in populations with a greater burden of chronic disease, was significantly associated with preference for receiving future results in-person. These inter-site differences might confound the association between experienced follow-up modality and future preferences. It is important to note that several of these factors (age, distance to clinic, health status) would be expected to impact both the pre- and post-follow-up preferences, and preferences prior to receiving laboratory results did not differ significantly between Arbor and Pacific patients. Therefore, it is possible that patient preferences for receiving laboratory results in the future are affected by experienced follow-up modality in combination with the complexity of follow-up.

According to a study conducted at Mayo Clinic Hospital in Rochester, Minnesota, only 44% of patients received laboratory results by their preferred method, and those who did not reported greater dissatisfaction with laboratory result communication.[6] Our data supports ascertaining and documenting patients' preferences for receiving test results at multiple opportunities (especially after receiving results) in order to capture changes in their preferences, and also to consider the complexity of actions necessitated by the result to improve the quality of laboratory follow-up. Our results are being used at the Cardinal Free Clinics to inform prospective QI studies on the impact of modifying the process of delivering test results to accommodate patients' preferences on follow-up quality. Student-run free clinics are dynamic sites of quality improvement and practice innovation with the potential to address this problem in the service of low-income, uninsured populations. Further research into emerging telehealth approaches (e.g., video conferencing, electronic health portals designed for patient engagement)[26], especially in safety net settings, should attempt to maximize the subjective experience of personalized care that may be more accessible through in-person care compared to remote communication channels.

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Disclosures

All authors declare that they have no conflicts of interest.

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