Depression screening using an optical mark reader interfaced to an ambulatory electronic health record; a pilot experience and implementation plan

by

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CERTIFICATE OF APPROVAL

This is to certify that the Master's thesis of

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Abstract

Depression is a common problem that is frequently overlooked in ambulatory care settings. The US Preventive Services Task Force recommends routine screening for depression to improve patient outcomes. However, screening has not been widely implemented in primary care. Linking optical mark reader (OMR) technology with an electronic health record (EHR) offers a process to facilitate screening by reducing the time burden of screening. In addition, universal screening can reduce the stigma often associated with mental health screening. I report a pilot experience with patient-completed depression questionnaires interfaced into an EHR using OMR technology. During the study week, every adult patient presenting to the study ambulatory clinic received a validated depression-screening tool, the Patient Health Questionnaire-9 (PHQ-9). Eighty-night percent of subjects had the PHQ-9 scanned into the EHR and available for the clinician to evaluate prior to entering the exam room. Feedback from study participants including staff, physicians, and patients was favorable. These pilot results suggest that it is technically and administratively feasible to use OMR technology for depression screening in an ambulatory setting. A detailed implementation plan and training materials are presented to allow implementation of this protocol in additional clinics.

Introduction

Depression is a common disorder in the primary care setting. Estimates of the prevalence of depression are as high as 19% in patients presenting to primary care providers.(1) Depression causes suffering and functional impairment on par with many chronic medical illnesses.(2) The associated economic costs are estimated at over $40 billion annually in the United States alone.(3) Fortunately, identification and treatment of depression can improve outcomes for most patients.(4) Despite the high prevalence of disease, the burden of suffering, and the availability of effective treatment, many depressed patients go undiagnosed. Studies have shown as many as two-thirds of depressed patients are undiagnosed by their primary care provider.(5;6)

One way to improve the rate of diagnosis is through depression screening. The US Preventive Services Task Force (USPSTF) recently reviewed the evidence for depression screening. They concluded that depression screening can improve outcomes, particularly when coupled with interventions that ensure adequate treatment and follow-up.(7) The relative cost-effectiveness of this intervention remains debatable,(3;8) but the concept of depression screening has been introduced into the standard of care for primary care clinics.

Many barriers to effective screening and treatment of depressed patients have been identified. Barriers can be grouped as patient, provider and system barriers. Patient barriers include the stigma associated with mental illness, financial issues, and a tendency to focus on somatic complaints. Provider barriers include lack of expertise or education regarding depression, negative attitudes towards mental illness, competing physical complaints from patients, and lack of time. Reimbursement models, lack of specialist

availability, and provider models (e.g., "gatekeeper model") constitute system level barriers.(9)

Electronic health records and emerging technologies may provide a mechanism for overcoming these barriers and promoting screening for chronically under diagnosed conditions like depression. Patient compliance with screening requests, particularly for sensitive issues like depression, may be enhanced by allowing them to use secure, private, self-administered screening tools. An EHR that could then score these results and present them to the clinician with suggestions for action could overcome concerns regarding the time burden of screening. Seamlessly integrating this workflow into a primary care setting could greatly increase compliance with screening recommendations.

The first part of this report describes a pilot that tests the technical and administrative feasibility of using EHR and OMR technology to accomplish depression screening. Most studies of depression screening involved research staff to administer, collect, and distribute the depression screening materials.(10;11) This makes it difficult to translate these results into a primary care setting where additional staff would not be available. In addition, in many studies of depression screening the screening results were not available to providers at the time of the patient visit. Results needed to be tabulated and recorded by research staff prior to distribution to providers. In that type of screening model, intervention on abnormal results entailed additional work outside of the clinic. This pilot examined a technological solution for accomplishing depression screening within a primary care setting so that screening results were available at the time of the visit without requiring additional staff. OMR technology can address several of the administrative barriers in collecting depression-screening data.

Optical mark reader (OMR) technology is a fast, accurate, and reliable technology for collecting data.(12) It involves using a pencil or pen to fill in "bubbles" on a preprinted form. An OMR can then quickly scan and tabulate these results. The technology is familiar and acceptable to most patients. By using optically scannable patient-completed depression questionnaires, part of the time burden of depression screening can be assumed by the patient. When the OMR is linked to an electronic health record (EHR) the process becomes automated making screening results readily available to the provider at the time of the patient visit.

The second part of this report outlines an implementation plan for an internal medicine residency ambulatory clinic. Using the pilot experience, the workflow was improved to achieve higher patient throughput. Written documentation is provided to describe the purpose and operation of the depression screening protocol to clinic personnel. With these materials and the provided implementation timeline, this depression screening protocol may be implemented in additional clinics.

Pilot Methods

Design

To evaluate the feasibility of using OMR technology to accomplish depression screening, all consecutive adult patients were screened during a one-week period in August 2004. The Institutional Review Board of Providence Health System approved the study.

Setting

The pilot study was performed in the Providence Milwaukie Family Practice Residency clinic in Milwaukie, Oregon. This is an outpatient family practice clinic that serves as a training site for family medicine residents. Clinic staff consists of 3 front office staff, 7 medical assistants, 1 registered nurse, 6 faculty physicians, and 12 resident physicians. Annual patient volume is approximately 12,000 visits.

The study site was selected because of the presence of a physician "champion" who already promoted depression screening and was interested in ways to make the process more efficient. The clinic had previously implemented a depression screening protocol prior to the start of this study. This pre-existing protocol stated that medical assistants screened patients who had a history of depression, coronary artery disease, diabetes, malignancy, and those who presented for a complete physical exam. Medical assistants performed the screening by asking the two-question Patient Health Questionnaire-2 (PHQ-2)(13) and manually recording the results in the EHR.

Pilot Study Sample

A convenience sample was used. All patients over the age of 18 who presented to the clinic for a scheduled visit during a one-week period in August 2004 were screened for depression. Subjects were excluded if they indicated that they were not proficient in English.

Pilot Implementation

The Patient Health Questionniare-9 (PHQ-9), a nine-item questionnaire that addresses the diagnostic criteria for depression, was used as the screening tool (Figure 1). It is a subset of the PRIME-MD survey and has been validated.(2;14;15) In a

comparative study it appeared superior to other screening tools.(16) It includes the two questions on depressed mood and anhedonia from the PHQ-2 questionnaire. The PHQ-9 was converted into a form that could be completed and then read by an OMR.

During the study period, front office personnel gave all adult patients the PHQ-9 survey when they arrived for their visit. The form included instructions (Figure 2) asking the patients to complete the questionnaire while waiting for their appointment. When the form was completed, the patient returned it to the front office staff. The staff then scanned the card with the OMR and imported the data into the patient's EHR (Logician®, v5.5, GE Healthcare, Inc.). This scanning and importing of data was accomplished with the commercial product PatientLink™ (©2004, PatientLink, Inc., Appendix A). PatientLink™ is a package of an OMR and the software interface to import data from the scanned document into Logician®. Although research staff was on-site during the study, they did not participate in the actual screening process. They were involved only in observing workflow and assessing reasons for unsuccessful screening.

Once the data was transferred into the EHR the medical assistant was notified that the patient was ready to move to an examination room. When providers opened the EHR in the examination room, they were presented with the results of the PHQ-9 survey. The study did not include education to providers on what to do with the survey results although the PHQ-9 encounter form within the EHR did contain scoring information (Figure 3).

Data Collection

On-site research staff determined successful depression screening. A successful screening was defined as the availability of an imported, patient-completed PHQ-9 within

the EHR at the time the patient was taken to an examination room. At the end of the clinic visit, on-site research staff also attempted to assess patient perception of the screening process through a patient satisfaction survey (Figure 4).

After the week of screening, the EHR database was queried to identify patients who had a PHQ-9 score indicative of major or minor depression. A manual review of the EHR was then done on these patients who screened positive to determine if there was any documentation of a pre-existing diagnosis of depression.

Focus groups were held after the intervention week to assess the qualitative impressions of providers and staff. Semi-structured focus groups, conducted by research staff, were held with front office staff, medical assistants, and providers.

Outcome Measures

The primary outcome was the percentage of eligible patients successfully screened. Secondary outcomes were the number of patients who screened positive for major or minor depression, the number of new diagnoses of depression, the costs associated with the system, and a qualitative assessment of the participants' perspective on the screening process.

Observations

Primary Outcome

A total of 189 patients met eligibility criteria during the one-week study. The average age was 44 and 28% were men. Of these patients, 169 (89.4%) had an imported PHQ-9 result available in the EHR prior to the patient entering the exam room. Of the 20 patients who were not successfully screened, 10 were too ill to complete the screening form, 2 had insufficient time, 2 were unable to read the questionnaire, and 1 patient was

too confused (Table 1). Only 5 of the 189 patients (2.6%) refused to complete the PHQ-9 survey. There were no cases of unsuccessful screening due to failure of the PatientLink™ technology.

Secondary Outcomes

Patient Perspective

Of the 169 subjects completing the PHQ-9 questionnaire, 112 (66.3%) also agreed to complete a satisfaction survey following their visit (Table 2). Overall, the average scores are quite high. The highest average scores were on questions relating to the usability of the questionnaire and the adequacy of the process (questions 1-3). The vast majority of respondents (83-90%) selected the top box ("definitely yes" for questions other than question 2). Question 5, which addressed confidentiality concerns, also scored equally high with 78% of respondents reporting that they "definitely" had enough privacy to complete the survey. Confidentiality concerns (question 4) were "definitely" addressed for 65% of respondents. Average scores were slightly lower, but still overwhelmingly positive, in questions assessing interest in continued use of this questionnaire process (questions 6,7,9). The lowest average score was on question 8 that assessed the questionnaire's impact on the quality of the visit. The score was 3.0, neutral with 28% of respondents reporting that the questionnaire "definitely" improved the quality of their visit.

Staff Perspective

All staff attended the focus group meeting. The group included the three front desk personnel, the 7 medical assistants, and the registered nurse. The front desk

personnel felt that the screening process worked well. For example, they noted that distributing the PHQ-9 questionnaire and then collecting and scanning the forms prior to each subject's visit did not prevent them from performing their normal work activities. They observed that patients were able to follow the printed directions without need for further instruction. When asked about the functionality of the technology, staff reported that it took one day to acclimate to the additional noise and workflow adjustment, but that the OMR and PatientLink™ software performed without problems.

The perspective of the medical assistants differed, reflecting their distinct job responsibilities in the clinic. Medical assistants reported a disruption in workflow when they were not able to take patients to an exam room because they were still completing surveys. To remedy this problem, they suggested modifying the screening workflow to allow patients to complete the PHQ-9 in the exam room. Since the study clinic already had a depression screening protocol in place, the medical assistants were able to compare this new technical solution to the former manual process. Their prior experience involved asking each patient two screening questions, the PHQ-2, then entering the results into the EHR. Patients who screened positive on these two questions were then given a paper copy of the PHQ-9. The medical assistants commented that the new study workflow greatly reduced their screening work efforts in comparison to the pre-existing protocol. Medical assistants reported a high degree of patient acceptance with the screening program.

Provider Perspective

All seven faculty providers attended a focus group. They reported that the use of this workflow was a powerful tool for depression screening and resulted in improved

chart documentation. There was significant variance in the reported frequency of viewing interfaced PHQ-9 data. Although some practitioners reported viewing the screening results during most visits, others reported that they seldom viewed the information. Physicians who commonly viewed the information in the EHR reported two additional benefits of accessing the PHQ-9 results. First, the information was beneficial in determining if currently treated patients with depression had successfully achieved remission. Second, having the information available for documentation in the patient record could facilitate higher reimbursement coding levels. Like medical assistants, practitioners were concerned that completing the questionnaire could potentially delay moving patients from the lobby to exam room. However, they believed that the workflow could be sufficiently modified to facilitate a timely workflow and were interested in expanding the pilot to collect additional information (e.g., new patient histories, review of systems) using this technology.

Costs

Cost data is from 2003. The PatientLink™ system is sold only as a complete unit including the hardware (OMR) and 1 software license per system. In this pilot study, one complete system was required for the one study clinic. The cost was $3,600. Annual support fees are $300 per system. The vendor translated the PHQ-9 into a card that could be read by the OMR for $1,364. Once designed, the cards cost 10 cents each, with a volume discount available. The total startup cost, therefore, was approximately $5,500 with expected ongoing annual support fees of $300 plus the ongoing printing cost for the PHQ-9 cards.

The PHQ-9 was developed through an educational grant from Pfizer, Inc. It can be used without charge in clinical, research, and educational settings.(17)

Depression Diagnoses

Analysis of the 169 PHQ-9 questionnaires from the study week identified 15 patients (8.9%) who met criteria for major depression and another 6 (3.6%) who met criteria for minor depression. A review of the EHR records for the patients found to have major depression noted that 4 (2.4%) of them did not have pre-existing documentation of depression or bipolar disorder.

Similarly, 2 (1.2%) of the patients with minor depression had not prior documentation of depressive symptoms. The number needed to screen was 12 to identify major depression and 8 to identify any depressive disorder. The number needed to screen to identify an undiagnosed depressive disorder was 28.

If the week of study data is extrapolated to a year, we would expect to diagnose 208 new cased of depression with this universal screening methodology. With ongoing yearly costs for questionnaires and support fees estimated at $1179, the cost of screening would be approximately $6 per new case of depression identified. If initial one-time fees were included, the first year of screening would cost $32 per new case identified.

Discussion

Depression is a common disease with significant associated morbidity and mortality that is commonly under-diagnosed. The USPSTF has recommended widespread depression screening of adults, but this recommendation has not been widely implemented. The current study demonstrates that a depression screening program is

feasible in an ambulatory clinic using a patient-completed PHQ-9 scanned with OMR technology and imported into an EHR using PatientLink™. Almost 90% of eligible adults completed the depression screening without adjusting provider schedules or adding staff resources. The screening results were available at the time of the visit. Moreover, the screening methodology was overwhelmingly accepted by patients and received generally favorable feedback from providers and staff. Interestingly, the front office staff, which was most directly impacted by the additional work (distributing, collecting, and scanning questionnaires), had the most favorable reviews of the process.

This pilot study was developed primarily as a feasibility study, but did allow a secondary analysis of depression diagnoses. Four previously undiagnosed cased of major depression and 2 cases of minor depression were identified during this 1-week pilot. This was not a randomized controlled trial that could quantify the incremental value of mass screening over routine care, but it does suggest that previously undiagnosed patients with depression can be identified through mass screening. The fact that the study clinic already had a standing policy of screening patients for depression likely underestimates the number of new cases of depression that would be identified in a more typical clinic. In addition, the 15 remaining patients identified by the PHQ-9, but who had a pre-existing diagnosis of depression or bipolar disorder, constitute a subgroup of patients with inadequately treated depression. Identifying these inadequately treated patients for providers could by hypothesized to improve depression care over time.

One potential limitation is the short duration of the study. The ability to maintain the screening process for one week does not guarantee that the process could be continued indefinitely. If ongoing universal screening became problematic, a solution

would be to focus this screening protocol on higher risk patients(3) or screening patients on a periodic interval rather than at every visit.

Another limitation of the pilot is the generalizability of the results. The study clinic was unique in that it was a family practice clinic and a residency training site. Results may differ in non-residency clinics where patient throughput is higher or in internal medicine ambulatory clinics where the percentage of adult patients is higher. The study clinic was also unique in having a physician champion to promote depression screening within the clinic. The clinic already had a pre-existing screening protocol that was evidence of a cultural commitment to the process. That level of commitment would not be found in all clinics. As noted earlier, the presence of a pre-existing screening protocol may have also underestimated the number of new cases of depression that would be found if this process were implemented in other clinics. Identifying more depressed patients, while presumably beneficial overall, might increase the operational impact of this intervention and decrease staff and provider satisfaction due to increased workload.

This pilot study demonstrated an effective and feasible way of complying with USPSTF recommendations for universal screening for depression in adults. A patient completed questionnaire scanned using OMR technology and imported into and EHR was successful almost 90% of the time. Based on these results, it is reasonable to consider implementation in additional clinics.

Further Implementation Plans

In considering a second implementation site there are several factors to consider. The pilot clinic had three unique aspects: a physician champion, family practice specialty, and resident training. A logical next step in the evaluation of this depression screening

protocol would be to introduce the system into a clinic that varied in some of these domains, but not in all of them. This report describes an implementation plan for an ambulatory clinic in an internal medicine residency program. This clinic will have residents and will have a physician champion (the author). It will differ from the pilot clinic in not having a pre-existing depression screening protocol and in seeing only adult patients. This will result in a more strenuous test of the protocol and improve generalizability of the findings. In addition, a longer trial of the protocol should be attempted in this clinic to examine the long-term feasibility of screening every adult patient.

Before this next implementation, the workflow will be changed to address the most concerning pilot feedback from the provider and staff focus groups. There main concern was the potential for disruption of patient flow caused by waiting for patients to complete the PHQ-9 prior to being taken to the exam room. This problem will only be exacerbated in an internal medicine clinic where 100 % of the patients are being screened as opposed to the situation in a family medicine clinic where children are also patients and are not screened under this protocol.

The importance of completing the PHQ-9 before being taken to the exam room is even more pronounced than might be expected due to some technical aspects of the Logician EHR. When the PHQ-9 is scanned into the EHR, it is imported through a data transfer station in the same manner as a laboratory result would import. The data from the questionnaire is entered into the Logician Oracle database as verified or "signed" data elements. Then, when the user starts a new document in the EHR to record the office visit, the PHQ-9 encounter form within the document can be programmed to display this

signed data for review (Figure 5). If the new document for the office visit is started before the PHQ-9 is scanned and imported, the PHQ-9 encounter form will not display the data. Since the office visit document is started at the time the patient is taken to the examination room, the pilot protocol was designed to ensure that the PHQ-9 was scanned prior to the patient being taken back to the room.

Despite the importance of this sequencing of events, it was clear from the pilot focus groups that an alternative solution had to be available if the patient had not completed the form yet and needed to be taken back to the examination room. For this second implementation, an alternative workflow was developed for this situation. If a questionnaire was not scanned prior to the office visit, the patient would be allowed to finish it in the examination room and then this paper copy would be given to the physician for review. This would avoid a situation where a PHQ-9 was completed and scanned into the EHR after the office visit was started without being reviewed by a provider. It would also allow the physician to review the results at the time of the visit. The results could then be manually entered into the PHQ-9 encounter form by the provider or sent back to the front office to be scanned into the chart. Scanning the questionnaires prior to the office visit was still to be the preferred workflow, but now there will be an alternative workflow for times when this was not possible.

Implementation Clinic Description

This implementation plan is for the Department of Medicine Faculty Practice (DMFP) located within Providence St. Vincent Medical Center (PSVMC) in Portland, OR. DMFP serves as the ambulatory training site for the PSVMC Internal Medicine Residency Program. The clinic is staffed by a faculty of 7 general internists and provides

a training site for 21 internal medicine residents. Support staff includes 5 front office personnel, 7 medical assistants (MA), 1 licensed practical nurse (LPN), and 2 registered nurses (RN). The clinic has approximately 14,000 ambulatory visits per year.

The clinic has a long history with the Logician EHR dating back over twelve years. All providers are well versed in use of the EHR and use a standardized template (encounter form) to record all office visits. There is no dictation. The clinic has a culture of continuous quality improvement based on data from the EHR. Recent quality improvement projects have included efforts to increase pneumococcal vaccination rates, increase diabetic cholesterol goal attainment, and improve compliance with laboratory monitoring guidelines for amiodarone use. DMFP shares a clinical information specialist with three other clinics. This resource is available to help with software installation and training issues.

Implementation Timeline

Implementation will be carried out over a 3-week period. The project will be introduced to the faculty, front office, and back office (MA, RN, LPN) staff. There will then be more in depth group training sessions for the three groups the following Tuesday. Residents will be introduced to the topic of depression screening through a didactic noon conference on Monday of the second week. They will receive hands-on small group instruction prior to their afternoon clinic that week. On the Monday of the third week an email reminder will be sent to all faculty, residents, and staff and the depression screening protocol will begin. The clinical information specialist will be on site for this week to assist with technical issues that arise.

Training Details

General Introduction

The first step will be a presentation of the rationale behind depression screening to the faculty providers and office staff. Joint faculty, front office staff, and back office staff (MA, RN, LPN) meetings occur once a month on a Tuesday. Residents are not present. A 10 minute presentation will be placed on the agenda. The presentation will be co-facilitated by the clinical information specialist and the provider champion. The presentation will outline the background of the issue, the pilot experience, and the proposed implementation.

Front Office Training

The following week, the clinical information specialist will train the front office staff during their regularly scheduled Tuesday meeting. The specialist will review the rationale for the program along with a detailed description of the front office workflow. The presentation will cover step-by-step instructions regarding the use of the OMR and the PatientLink™ technology. The staff will also receive written documentation and a brief summary of the workflow steps, a "cheat sheet". (Appendix B)

Back Office Training

Concurrent with the front office staff training, the physician champion and the lead RN will train the back office staff during their regularly schedule meeting. The back office involvement in the depression screening workflow is actually fairly limited. Their presentation will review the rationale and the overall workflow so that back office staff will be able to answer patient questions. Special emphasis will be given to the workflow

for handling patients who fail to complete their PHQ-9 prior to being taken back to the exam room.

Resident Training

On Monday of the second implementation week, the physician champion will give a 1-hour didactic noon conference for the internal medicine residents. Faculty will also be invited. The lecture will cover the background and rationale for depression screening. It will discuss the pilot study results and describe the screening protocol. The lecture will also include information on the treatment and follow-up of patients who screen positive for depression.

During this second week of implementation, residents will also be given hands-on experience with the depression screening form and a review of the screening protocol prior to their afternoon clinic. The residents have a regularly scheduled "Pre-clinic Conference" from 1:00 to 1:15 each afternoon in the DMFP clinic. This time is usually for brief case discussions, but will be used by the physician champion each day during the second week of implementation to review depression screening. Residents who miss this conference during the second implementation week (vacation, night float, etc.) will be recorded. Each resident is paired with a faculty mentor and this mentor will be notified to individually review depression screening with absent residents.

Faculty Training

DMFP faculty will be invited to the resident noon conference as noted above. The topic will also be briefly reviewed at a regularly scheduled faculty meeting on the Tuesday morning of the second implementation week.

Post-implementation

The screening protocol will be implemented on Monday of the third implementation week. The clinical information specialist will send an email to all residents, faculty, and staff on the day of implementation. The specialist will also be on-site for up to a week to handle any technical issues that arise. From the pilot experience, the front office personnel should be comfortable with the workflow within the first 1 to 2 days.

Success Indicators

One month after implementation, the clinical information specialist will observe for ½ of a clinic day to assess the depression-screening rate. The goal screening rate will be > 80% of all eligible patients. At the same time, the physician champion will review the screening experience with faculty and residents. Based on the screening rate and qualitative feedback from residents and faculty, a decision will be made no whether to continue the screening program.

Conclusions

Depression is a common and under-diagnosed condition in primary care with significant associated morbidity and mortality. Effective treatments are available and the USPSTF has recommended universal screening for adults. The pilot results in this report demonstrate a technical solution of using a patient completed depression questionnaire, an optical mark scanner, and an interface to an EHR to facilitate screening. The implementation outlined in the second half of the report will provide additional evidence for or against the feasibility of this intervention in an internal medicine clinic and for the sustainability of this effort. Unanswered questions of quantitative clinical utility of the

intervention, the cost-effectiveness of intervention, and the applicability of the intervention in a non-academic setting could be answered in a subsequent larger study.

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Figure 1 **Patient Health Questionnaire (PHQ-9)**

Name_____ **SSN:**_____ **Date:**_____

This questionnaire is an important part of providing you with the best health care possible. Your answers will help in understanding problems that you may have.

1. Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all [0]	Several days [1]	More than half the days [2]	Nearly every day [3]
a. Little interest or pleasure in doing things...	O	O	O	O
b. Feeling down, depressed or hopeless...	O	O	O	O
c. Trouble falling or staying asleep, or sleeping too much...	O	O	O	O
d. Feeling tired or having little energy...	O	O	O	O
e. Poor appetite or overeating...	O	O	O	O
f. Feeling bad about yourself – or that you are a failure or have let yourself or your family down...	O	O	O	O
g. Trouble concentrating on things, such as reading the newspaper or watching television...	O	O	O	O
h. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual...	O	O	O	O
i. Thoughts that you would be better off dead or of hurting yourself if some way....	O	O	O	O

2. If you checked off any problems on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
O	O	O	O

Score:_____

This instrument is adapted from Spitzer R, et al. JAMA 1999;282:1737-44. PHQ9 Copyright © Pfizer Inc. All rights reserved. May be reproduced for clinical purposes or research.

Figure 2 – Patient Instructions for Completing PHQ-9

Instructions to Patient Health Questionnaire Respondent

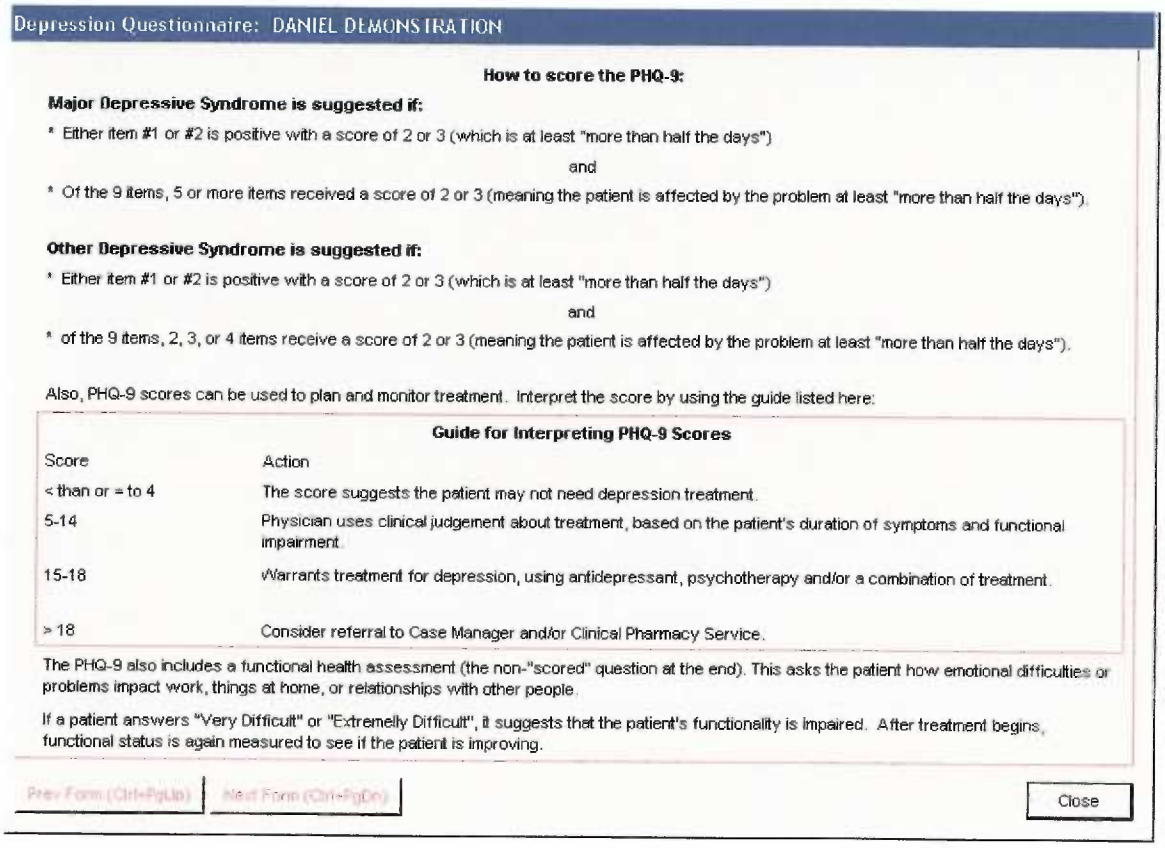
We need your help to test a new office tool. You do not have to fill out this questionnaire. If you do not fill it out, your care will not be affected. It will take just a couple of minutes to complete.

Attached you will find a patient health questionnaire card. We appreciate the time you will spend in completing this questionnaire, and would like to provide some brief instructions.

Providence Milwaukie Family Practice is looking at a new way to collect patient information using PatientLink™. PatientLink™ is a new computer tool that allows us to put your written responses into your electronic chart right away so that your doctor will be able to see it at that visit. After your responses are put into your chart, your questionnaire will be shredded.

We want to find out if this new tool works well enough to use it in our office all of the time.

Figure 3 – Scoring instructions for PHQ-9 within Logician®



Depression Questionnaire: DANIEL DEMONSTRATION

How to score the PHQ-9:

Major Depressive Syndrome is suggested if:

* Either item #1 or #2 is positive with a score of 2 or 3 (which is at least "more than half the days")

and

* Of the 9 items, 5 or more items received a score of 2 or 3 (meaning the patient is affected by the problem at least "more than half the days").

Other Depressive Syndrome is suggested if:

* Either item #1 or #2 is positive with a score of 2 or 3 (which is at least "more than half the days")

and

* of the 9 items, 2, 3, or 4 items receive a score of 2 or 3 (meaning the patient is affected by the problem at least "more than half the days").

Also, PHQ-9 scores can be used to plan and monitor treatment. Interpret the score by using the guide listed here:

Guide for Interpreting PHQ-9 Scores

Score	Action
< than or = to 4	The score suggests the patient may not need depression treatment.
5-14	Physician uses clinical judgement about treatment, based on the patient's duration of symptoms and functional impairment.
15-18	Warrants treatment for depression, using antidepressant, psychotherapy and/or a combination of treatment.
> 18	Consider referral to Case Manager and/or Clinical Pharmacy Service.

The PHQ-9 also includes a functional health assessment (the non-"scored" question at the end). This asks the patient how emotional difficulties or problems impact work, things at home, or relationships with other people.

If a patient answers "Very Difficult" or "Extremely Difficult", it suggests that the patient's functionality is impaired. After treatment begins, functional status is again measured to see if the patient is improving.

Prev Form (Ctrl+PgUp) Next Form (Ctrl+PgDn) Close

Figure 4

PATIENT LINK SATISFACTION SURVEY

Providence Milwaukie Family Practice is looking at a new way to collect patient information using PatientLink™. PatientLink is a new computer tool that allows us to put your written questionnaire answers into your electronic office chart right after you complete it. As a result, your information is available to your doctor (in your chart) at the time of your visit.

Your feedback from this survey will help us decide if we should use this new tool in our office practice all the time. Your survey results will be kept confidential. Your responses will be put with other survey results.

Please check one box for each question below.

	Definitely No 1	2	3	4	*Definitely* Yes 5
1. Were the instructions you received about the Questionnaire easy to understand?	☐	☐	☐	☐	☐
2. Did you have difficulty in filling out the Questionnaire?	☐	☐	☐	☐	☐
3. Did the front desk staff provide you with all the information you wanted about the Questionnaire??	☐	☐	☐	☐	☐
4. Were your concerns about the confidentiality of your Questionnaire addressed well enough in the instruction handout?	☐	☐	☐	☐	☐
5. Did you feel you had enough privacy in filling out the Questionnaire in the lobby?	☐	☐	☐	☐	☐
6. Would you recommend that we continue to use Questionnaires in this manner?	☐	☐	☐	☐	☐
7. Would you be willing to fill out other kinds of Questionnaires in this manner on a regular basis as part of your routine visits?	☐	☐	☐	☐	☐
8. Did your filling out the Questionnaire improve the quality of your visit?	☐	☐	☐	☐	☐
9. Would you like to see other medical information collected in this manner and put into your electronic chart immediately?	☐	☐	☐	☐	☐

Comments:

Figure 5 – PHQ-9 form within Logician®

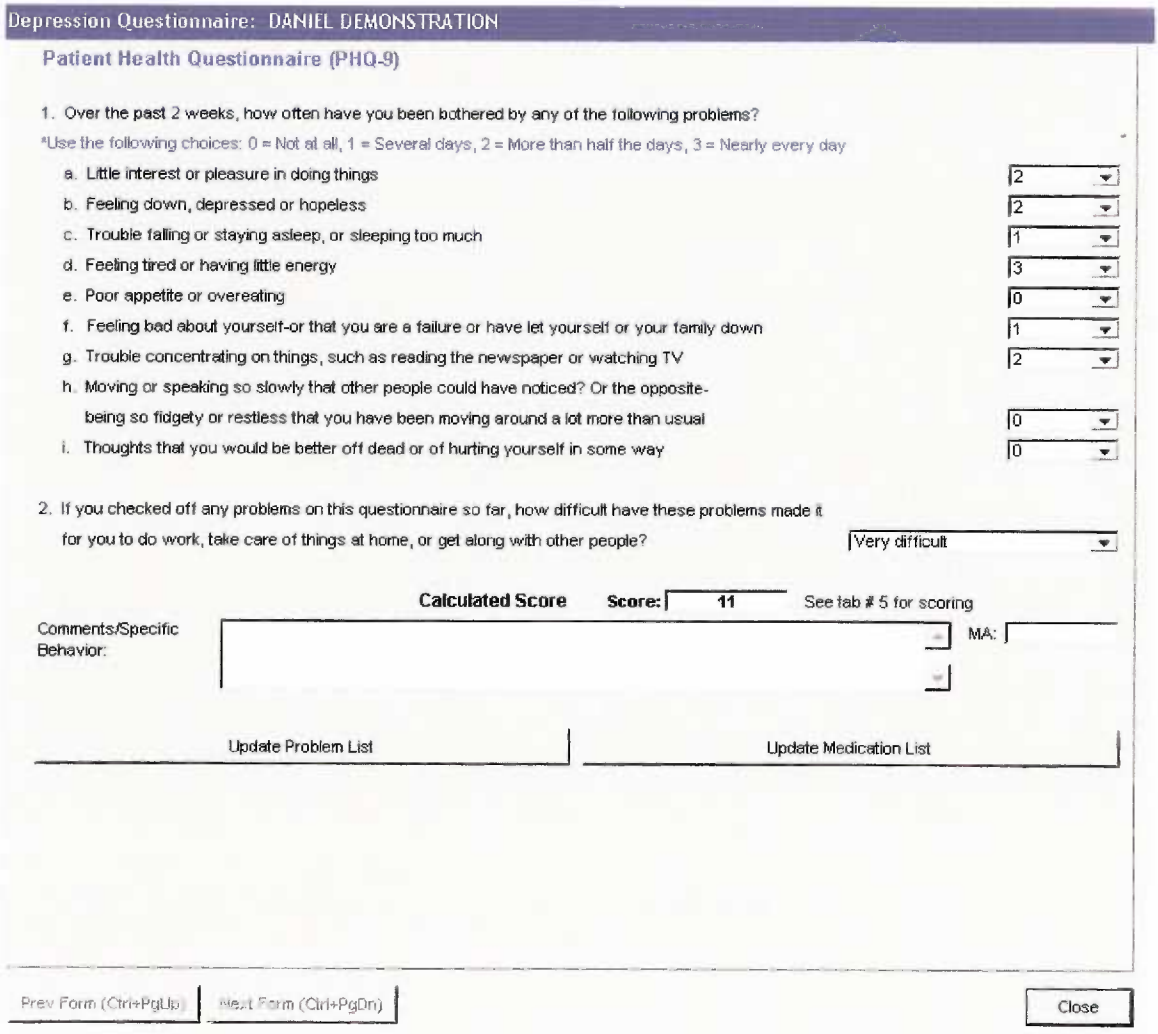


Table 1 Reasons preventing successful depression screening

Reason	Occurrence	%
Too ill	10	(5.3)
Refused	5	(2.6)
Insufficient time prior to visit	2	(1.0)
Unable to read questionnaire	2	(1.0)
Confused	1	(0.5)
Total	20	(10.6)

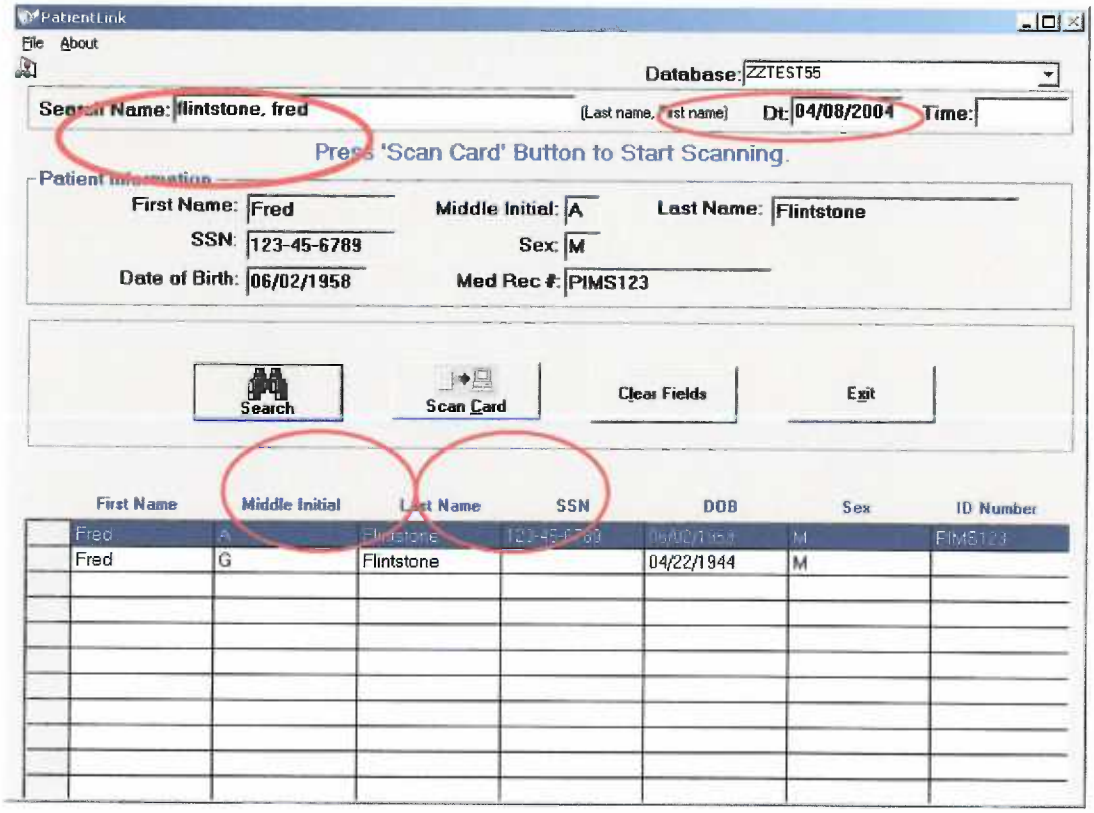
Table 2 Patient Satisfaction Survey (n=112)

Question Topic	Average Response	% top box
1. Instructions easy to understand?	4.8	86.6%
2. Difficulty filling out survey?	1.3	90.2%
3. Did front desk provide enough information?	4.7	83.0%
4. Confidentiality concerns addressed?	4.1	65.2%
5. Enough Privacy?	4.7	78.6%
6. Interest in continued use of questionnaire?	4.3	64.3%
7. Interest in questionnaires on other topics?	4.1	55.4%
8. Did questionnaire improve the quality of your visit?	3.0	27.7%
9. Would you like to see other medical information collected in this manner?	3.8	46.4%

Appendix A - PatientLink™

Appendix B – Training Handout for Front Office Staff

How to use the PatientLink System



1. **Turn on Optical Mark Reader (OMR)**

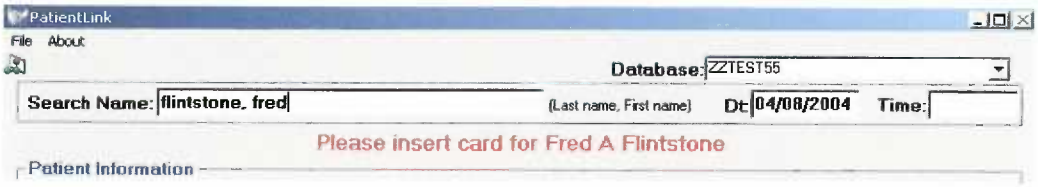
2. **Open the PatientLink application**
   - **confirm the appropriate Logician database selected**
   - **confirm OMR is turned on**

3. **In the Search Name: field, enter patient's last name, then first name**

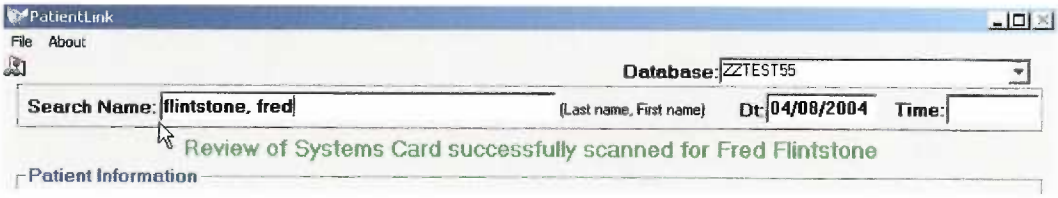
4. **Click <u>Search</u>**

5. **Select the appropriate patient from the list of <u>active</u> patients**

6. **Click the <u>Scan Card</u> button**



7. **When "Please insert card for (patient) appears, insert card into Optical Mark Reader**
   - **Insert card Patient Name first and on top**



8. **When the message "Depression Questionnaire Card successfully scanned for (patient)" appears, the answers are being sent to Logician.**
   - **The answers will appears as a document in the patient's chart**
   - **This process takes approximately one minute**

NOTES:

- **If OMR loses power or is turned off while the PatientLink system is on:**
  - **Turn OMR on**
  - **Exit PatientLink and restart**