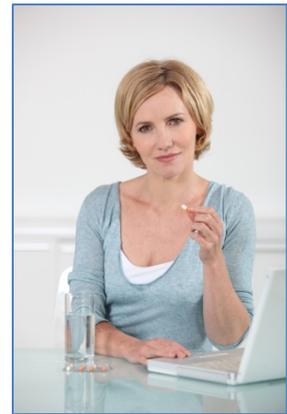
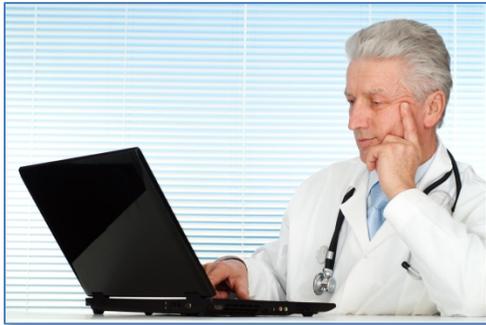


Connecting with Patients Online: E-Visits

Strategy, evaluation, and technology
recommendations for an e-visit system

Prepared for

The Department of Family and Community Medicine
Academic Health Center



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Executive Summary

E-visits are asynchronous online medical consultations between healthcare providers and patients, conducted within the confines of a secure patient portal in an electronic health record (EHR) and designed to use structured computerized medical histories to allow clinicians to care for a limited range of common nonemergency medical complaints which can be well managed without the need for a physical examination. Early research has shown that this new alternative to traditional office visits can lead to improved access to care, increased provider efficiency, good quality of care for specified conditions, increased patient and provider satisfaction, and decreased costs. These factors are especially pertinent because increasing access to health insurance starting in 2014 will likely exacerbate already ongoing physician shortages and overcrowding in primary care clinics. E-visits also fit well with the Department of Family and Community Medicine's mission and strategic priorities by allowing the department to meet more of the criteria for a Patient Centered Healthcare Home, by helping fulfill the Stage 2 Meaningful Use Criteria for electronic communication with patients, and by providing new opportunities for clinical research. For all these reasons, the department should rapidly proceed to join the growing ranks of healthcare organizations which are adding e-visit capabilities to their existing patient portal and secure messaging systems.

Although the potential benefits of e-visits are enormous, such systems must be designed and implemented in an organized thoughtful way so as to avoid or overcome the barriers and challenges encountered by early adopters of e-visit systems. Patients experienced in electronic communication in business and commercial settings will expect a polished interface and rapid communication, requiring that the system be efficiently run and well promoted in order to attract

the desired number of users. Although third-party systems are available, e-visits work best when they are tightly integrated as a module within the organization's overall EHR strategy. In order to achieve patient satisfaction and mitigate risk, the department will need to set clear policies and provide patient guidance regarding which conditions are appropriate for e-visits and the turnaround time they can expect.

To maintain physician satisfaction and derive real value from e-visits, the department will need to pay careful attention to properly integrating these activities within ongoing provider communication and workflow and developing a mechanism to properly compensate clinicians for the work involved in e-visits. Clinicians will also need to understand that these encounters are part of the legal medical record and that clear policies and procedures will be in place to enforce compliance with all relevant state and federal regulations and to mitigate legal risk by using defined best practices in all online physician-patient communications. Although some health insurance carriers provide reimbursement for e-visits, the majority still do not, so the department will need to make creative use of multiple billing models including private payment by patients, annual subscription programs, research grant support, and payments from insurance companies to put the program on a sound financial basis and make it sustainable. *Pro forma* calculations and reports from early adopters indicate that this can be accomplished and that a properly managed e-visit program has the potential to improve the department's market share and total annual revenue.

Despite the challenges, e-visits comprise a new patient centered, physician guided, team based modality of care which can provide a satisfying cost effective alternative to traditional office visits for the management of many common low acuity clinical complaints and for the ongoing care of chronic diseases. As healthcare reimbursement models relentlessly evolve

towards rewarding outcomes-based quality of care rather than units of service, a new e-visit system for the Department of Family and Community Medicine will be a sound investment in better physician-patient communication, improved patient satisfaction, and increased readiness to operate in the healthcare system of the future.

Introduction

E-visits are asynchronous online medical consultations enabled by Internet-based secure messaging software which permits communication between healthcare providers (typically but not necessarily primary-care physicians) and patients. They are designed to care for a narrow well-defined range of nonemergency clinical complaints which can be optimally managed without the need for a physical examination or to provide routine ongoing management of chronic diseases. E-visits are composed of structured electronic messages and are therefore distinct from e-mails, which consist primarily of free text.

Physician shortages, overcrowded clinic schedules, growing cultural acceptance of online services, and the critical need to reduce costs have all stimulated an increased interest in e-visits by medical providers, healthcare payers, and government agencies. Both patients and physicians increasingly recognize the value of asynchronous secure messaging capabilities. Implementation of an e-visit system will provide the Department of Family and Community Medicine (DFCM) with opportunities to improve efficiency and potentially grow revenue, to increase patient satisfaction, to spend more time on complex rather than simple patient encounters, to better meet the criteria for a Patient Centered Healthcare Home, and to fulfill the Stage 2 Meaningful Use Criteria for electronic communication with patients. Increased demand for these systems has driven electronic health record (EHR) vendors to add improved patient portal and secure messaging capabilities to their clinical products. It has also stimulated the development of a

number of third-party standalone solutions, providing ample options for system implementation and making this an excellent time for the department to move forward with an e-visit initiative.

Historical Development

Over the last 45 years an accumulating body of data has shown that the use of structured computerized interviews to obtain medical histories is an effective method of obtaining the data needed for clinical decision making. Much of that evidence indicates that computerized histories can produce a more complete and organized medical record, uncover new symptoms, serve as a “checklist” to prevent omission of critical data, and even provide greater patient satisfaction and better physician performance than traditional systems (reviewed in Bachman, 2003). Progressive improvements in computer technology, the rise of the Internet, and increasing societal comfort with the use of computers stimulated researchers and practicing clinicians to build on this foundation and develop new systems for incorporating patient-computer interaction into the front lines of primary medical care. As early as the late 1980s, physicians at Brigham and Women’s Hospital and Beth Israel Hospital in Boston began to integrate e-mail into their practice and make this line of communication available to their patients. Early adopters found that this interaction significantly improved physician-patient communication (Whitten et al., 2007). The passage of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) imposed new requirements for the privacy and security of protected health information and led to the development of new password-protected, encrypted e-mail systems termed “secure messaging”, which allowed HIPAA-compliant communication between patients and doctors. Secure messaging was most often executed within the patient portal of an electronic health record, allowing automatic incorporation of patient messages and physician replies into that electronic record (Baer, 2011).

In 2004, the Kaiser Permanente Health Plan initiated secure e-mail messaging between patients and providers within the framework of their Kaiser Permanente HealthConnect EHR starting first in their Hawaii region and progressing to their Southern California region. Patients liked secure e-mail communication with their doctors a lot, and physicians were somewhat surprised to find that their patients generally used the messaging system appropriately, asked clinically relevant questions, and did not disrupt workflows by submitting excessive numbers of long or disorganized electronic messages (Baer, 2011). Between 2004 and 2007 office visits per patient in the Hawaii region decreased by 26.2% with an equivalent increase in the number of telephone encounters and secure messages. During the same time period, Zhou et al. (2010) were able to establish a link between secure message usage and improved quality of care. They studied glucose, blood pressure, and low-density lipoprotein control and the frequency of screening for nephropathy and retinopathy in diabetic patients in the Southern California region from 2005 to 2008. Logistic regression analysis showed that the use of secure messaging was an independent predictor of improved performance on these quality measures (Baer, 2011; Zhou et al., 2010).

Mounting pressure on physicians to see more patients in less time has continued to drive innovation, leading researchers at several institutions to combine the power of computerized medical history taking and secure e-mail messaging to create electronic clinic visits (e-visits). These were first defined as asynchronous online consultations where information was exchanged between patients and providers. Patients who submitted questions or clinical problems received answers or recommendations in a timely manner, typically by the end of the business day (Whitten et al., 2007). Such systems were felt to have the potential to increase the number of patients a provider could care for and possibly even provide cost savings by reducing the need for more expensive face-to-face office visits. Unfortunately, some early systems based on

unstructured free text communications yielded disappointing results. For example, in 2009 Fairview Health System reported only 10 e-visits per week in a system with 400 physicians, and Blue Cross of Minnesota processed only 90 e-visits per month in the summer of 2009, despite having millions of members (Adamson and Bachman, 2010).

Learning from these early experiences, other major institutions implemented two additional innovations that allowed e-visits to become much more successful. The first was to implement the e-visit system within the setting of an established patient portal which already had many thousands of enrolled members and which supplied password protected, encrypted, HIPAA compliant secure messaging. This provided a target population of patients with the interest and skills to take advantage of an e-visit system and helped to allay providers' fears regarding the security and confidentiality of communications. The second was to use an interactive, branching computer-patient dialogue system to obtain a detailed problem focused medical history and provide the basis for clinicians to offer specific advice and suggestions to the patient about the diagnosis and management of common important medical problems (Slack, 2010). Together these innovations resulted in the e-visit model currently in use.

Effectiveness of E-visits for Patient Care

The progressive implementation of the Patient Protection and Affordable Care Act of 2010 (ACA) will likely flood the American healthcare system with large numbers of new patients. Based on the provisions of ACA, an estimated 32 million previously uninsured individuals will gain access to health insurance in

E-visits have been accepted by the American Academy of Family Physicians and the American College of Physicians as a means of expanding access to care.

2014 (Andrews, 2012). Most of these individuals have avoided seeing healthcare providers due to the expense, and many will have serious medical issues. With no corresponding increase in the number of providers, the ACA will create an immediate issue with access to care, which is already a challenge. The Institute of Medicine has called for healthcare organizations to provide care whenever and wherever it is needed. E-visits have received support from the American Academy of Family Physicians (AAFP) and the American College of Physicians (ACP) as a means of expanding access to care. The use of the Internet to conduct e-visits is one viable solution to this challenge. E-visits can improve outcomes, save money, and increase access to care by increasing efficiency in the management of common medical problems.

According to a survey done in 2009 by the American Medical Association (AMA), 40% of physicians were already communicating with their patients via e-mail, and the number continues to grow (Overmyer, 2012). E-visits can increase productivity and generate revenue streams

for services that are currently being provided free of charge. They can open up office appointments currently being utilized for low acuity/low reimbursement patients to see higher acuity patients. This benefits both patients and providers. Patients with common low acuity conditions can get more convenient, less expensive care; sicker patients can be seen in the office with less delay; and providers can overall care for a larger patient panel, leading to higher

University of Pittsburgh Medical Center

- 40 % of patients send e-mails outside of normal office hours.
- 57% faster than using the phone.
- 1.2 e-visits per patient per year.
- Effective treatment for chronic and acute conditions.
 - 48% of questions were updates on clinical conditions or simple questions about their health.
 - 19% of questions were about medication.
 - 7% about lab results.
- Cost effective method of expanding access to care.
- No negative effect on physician-patient relationship.

reimbursement. An average e-visit takes less than 15 minutes to complete and does not require additional staff to guide the patient or process the visit, thus decreasing operating costs. Modern e-visits that are based on a structured history model rarely require more than one e-mail interchange.

Other efficiencies associated with e-visits can also decrease practice expenditures and improve workflow. E-visits decrease phone call volume by about 20%, with the greatest reduction seen on Mondays, freeing staff to address other issues accumulated over the weekend (Adamson and Bachman, 2010). Opening extra office appointments for patients with urgent complicated issues and addressing those needs as early as possible reduces emergency room visits and inpatient hospital admissions. E-visits are self-documenting and create organized encounter notes that integrate automatically into the electronic medical record.

In addition to their financial and efficiency benefits, e-visits have also been documented to provide good quality care and produce outcomes equivalent to those achieved with office visits for the same conditions. Studies on doctor-patient interactions via the Internet have shown success in management of both acute and chronic conditions. For example, e-visits were studied as a method for follow-up of acne care at the Nantucket Dermatology Clinic, a specialty which is currently experiencing a workforce shortage (Watson et al., 2010). Following an initial in-office consultation, acne patients were followed with e-visits which included uploaded photographs of the affected areas to help the doctors assess treatment progress. Ninety percent of the patients surveyed preferred e-visits as a follow-up method, and the physicians found that the standard of care and the quality of information for clinical decision making was equivalent to that in face-to-face

2009 Kaiser Permanente Study

- 29% reduction ER visits.
- 6% reduction in hospitalizations.
- \$10.30 PMPM reduction in cost of care.

encounters. Researchers at the University of Pittsburgh Medical Center (UPMC) compared care at e-visits and physician office visits for sinusitis and urinary tract infections (UTI) and also found no difference in outcomes (Mehrotra et al., 2012).

E-visits also allow for close monitoring of chronic disease

conditions, to permit timely intervention and improved outcomes. A UCLA School of Medicine study using Internet technology, including e-visits, in the treatment of diabetes patients found that this model motivated patients to better engage in the treatment of their disease. Patients appreciated the ability to input data and receive guidance and support when convenient for them, even outside of physicians' normal office hours (Kaufman, 2010). Utilizing this model, one physician could manage more patients than possible with traditional face-to-face encounters while maintaining similar or better outcomes, because of the increase in patient engagement and compliance. A study funded by the Office of the National Coordinator for Health Information Technology (ONC) has also reported data showing that e-visits can improve care for a senior population with chronic diseases (Scott, 2010; see summary in the text box above).

ONC-Funded Study

E-visits in the Medicare population

- Two populations: a large metropolitan healthcare delivery system and a large rural healthcare delivery system.
- Medicare population will use the technology
- Access to care was improved.
- Reimbursement for the visit incentivizes physicians.
- E-visits have the potential to improve the care for a senior population with chronic conditions, decrease healthcare costs, and improve access to care.

Conclusion

E-visits comprise a new patient centered, physician guided, team based modality of care which provides a cost-effective alternative to traditional office visits for the management of common low acuity clinical complaints and chronic diseases. Early research indicates that e-

visits are associated with increased access to care, increased patient convenience and satisfaction, decreased costs, and quality outcomes at least as good as more traditional methods. They improve provider efficiency by allowing each physician to care for more

2007 Illuminas Study (Cisco)

- 47% American believed e-visits could empower them to better manage their health and well-being.
- 63% of those with chronic illnesses said e-visits could improve their health management.

patients without loss of quality. While these findings need confirmation by larger studies, the trends are compelling. As healthcare reimbursement models relentlessly evolve towards rewarding outcomes-based quality of care rather than units of service, an e-visit program represents a solid investment in physician-patient communication, patient satisfaction, and readiness to operate in the healthcare system of the future. Such programs should and likely will become an integral part of all primary care practices.

Patient Utilization and Satisfaction

Multiple scholarly studies and surveys have found that 70-90% of patients with Internet access would like the ability to communicate with their physician by e-mail (Whitten et al., 2007; Baer, 2011). The use of secure messaging to provide treatment advice for minor acute conditions and close monitoring for chronic diseases allows patients to avoid many inconveniences, including finding transportation (a special issue for the elderly), traffic and parking, lost time from work, and exposure to communicable conditions in crowded waiting rooms. It provides patients with a printable copy of recommendations which might be forgotten or misunderstood if communicated verbally, and it avoids the annoyance of waiting on hold or playing “telephone tag” when seeking advice by phone. Despite the research indicating strong demand for e-visit services, adoption by patients and providers has been slow. In addition to

Kaiser Permanente, three pioneering organizations have reported experiences that are particularly informative in this field: the Henry Ford Health System in Detroit, the University of Pittsburgh Medical Center in Pittsburgh, and the Mayo Clinic in Rochester.

Henry Ford Health System

In August, 2006, the Henry Ford Health System launched an “Online Doctor Visit” program within its MyHealth patient portal (Angell, 2006). Patients enrolled in the system were allowed to electronically submit a description of a health problem, which triggered a series of questions and an opportunity for free text comments. Patient answers and comments were formatted to facilitate clinical thinking and forwarded to the associated primary care physician. Doctors were expected to respond within one business day and provide recommendations such as laboratory tests, prescriptions, actions to be taken at home, or instructions to schedule an office visit. Members of Henry Ford Medical Group’s own health plan and patients instructed to schedule an outpatient appointment were not charged, and other patients were billed \$20. As the program developed beyond the pilot stage, it began to focus on a specific set of non-emergent conditions such as stomach pain, diabetes, and hypertension and to require participants to select from a menu of non-urgent problems. This allowed the medical history-taking module to employ more targeted questions and better branching algorithms, and to more accurately obtain and format essential information just as the physician would in a live interview (Angell, n.d.).

Studies of the first 3000 e-visits found that the system improved both patient and provider satisfaction. In the patient satisfaction survey, 97% of the respondents reported they were satisfied with the quality and timeliness of the responses, and this was among the highest satisfaction scores recorded by any of the Henry Ford portal services. One hundred percent of those surveyed said they would recommend e-visits to others and would use the service again. In

the physician survey, 100% of respondents agreed that the formatted patient history provided enough information to make a clinical judgment, that the system provided a high quality interaction with their patients, and that they would encourage their patients to use e- visits. Chart review showed that the software worked properly, patients understood and used the e-visit system appropriately, and physicians answered questions with appropriate recommendations. A detailed review of 75 e-visit records showed that 86% qualified for a Health Effectiveness Data and Information Set (HEDIS) measure, and those patients showed improved outcome scores compared to patients who did not use e-visits (Angell, n.d.).

University of Pittsburgh Medical Center

In April, 2009 UPMC began implementing e-visit functionality within the setting of its HealthTrak EHR patient portal. Initially based on code from UPMC's EHR vendor (Epic Systems, Verona, WI), the system subsequently evolved through multiple custom webpage designs and software builds (Prestigiacomio, 2012). Internet transactions were handled using Microsoft Active Server Pages with security provided by Microsoft Internet Authentication Services (Microsoft Corporation, Redmond, WA), and all data was stored in a custom database from InterSystems Cache (InterSystems Corporation, Cambridge, MA). The first e-visit questionnaires were directed at the seven highest frequency episodic illnesses seen in the UPMC primary care clinics: back pain, cough, diarrhea, conjunctivitis, sinus/cold symptoms, urinary tract symptoms, and vaginal irritation/discharge. Subsequently this has expanded to a list of 25 conditions and a final "other" category for patients to request advice on health issues not covered in the menu set.

Early in the program, Albert et al. (2010) carried out a telephone survey of the first 156 e-visit users, and 121 patients participated, 71.1% women, 86% employed, and 88% under age 60.

Reasons mentioned for using the e-visit included convenience (40%), perception that symptoms were routine and did not require in-person physician contact (17.6%), and lack of availability of a timely office appointment (12%). More than 90% reported that their problems were adequately addressed with 53.7% receiving a diagnosis and a prescription, 33.1% receiving a diagnosis and action plan, and 3.3% receiving a diagnosis without need for follow-up (Albert et al., 2010). The number of patients requiring a face-to-face office visit within seven days of the e-visit was 16.9%, a figure comparable to that seen in patients treated in retail urgent care centers (Mehrotra et al., 2009).

Telephone Survey of E-Visit Users

Respondent Summary	121 of 156 e-visit users	71.1% Women	86% employed	88% under age 60
Reasons for using e-visit	Convenience	Perception that symptoms did not require in-person physician contact	Lack of availability of timely office visit	
Findings	>90% reported findings adequately addressed	53.7 % received diagnosis and a prescription	33.1% received a diagnosis and action plan	3.3% received a diagnosis w/o need for follow up

Between April 2009 and March 2012, the UPMC e-visit system logged 4060 e-visits, a number which is impressive, but also somewhat disappointing in a system which included 397 primary care physicians representing 88 practices with 277 locations of service and over 100,000 patients enrolled in the portal. The UPMC system is now approaching 800 physicians and 150,000 enrolled portal members, but still only logs 150 e-visits per month (Martich, 2012). Larger studies of patient and provider satisfaction, visit quality, and outcomes are under way but not yet published. In an interview with *Health Informatics*, Dr. G. Daniel Martich, the Chief Medical Informatics Officer (CMIO) of UPMC, predicted that e- visits will grow by 25% per year over the next few years and that physician fears of being overwhelmed by large volumes of

verbose or disorganized patient input were unfounded. Many physicians were finding that patients were more concise in filling out a form than they were on the telephone and that the system allowed them to provide a level of care comparable to what they provide in the office (Prestigiacomio, 2012). Based on preliminary data, UPMC has convinced four different insurers to reimburse charges for e-visits, but the Centers for Medicare and Medicaid Services (CMS) and many other payers are still waiting for larger studies to confirm the efficacy, quality, costs, and need for follow-up care associated with e-visits.

Mayo Clinic

From 2007 to 2009, the Department of Family Medicine at the Mayo Clinic, consisting of 56 physicians at 4 clinics in Rochester, MN, carried out a pilot study of online visits in a primary care setting (Adamson and Bachman, 2010). They utilized a custom portal platform from MedFusion (currently Intuit Corporation, Mountain View, CA) and incorporated a custom history-taking module from Instant Medical History (Columbia, SC). After entering a chief complaint in free text, patients were presented with a sequential, but potentially branched, series of questions selected from a pool of over 70,000 available, with the software organizing responses into a readable clinical format. Patients were encouraged to enter vital signs and medication lists, and the platform also supported free text to clarify concerns and file uploads such as photographs of skin rashes. The portal allowed clinicians to access Mayo Clinic template encounter forms for many common illnesses, facilitating use of premade patient education and treatment plans and allowing prescriptions to be electronically transmitted to the pharmacy.

During the two years of the study, 4282 patients were registered for the service and 1159 patients participated in a total of 2531 e-visits. Seventy-one percent of participants were female and 86% were under the age of 60. Patients requested help with 293 types of conditions, with the most common being sinusitis, depression, back pain, cough, anxiety, and hypertension. The charge for an e-visit was \$35, which was covered by insurance for Mayo Clinic employees but was largely refused by other insurers, requiring patients to pay out of their own pocket. The study authors estimated that 411 of the e-visits (16%) replaced a non-billable telephone protocol with a billable electronic encounter and that 1012 cases (40%) allowed the patient to avoid a face-to-face office visit (Adamson and Bachman, 2010). Physicians were able to respond to the great majority of their e-visit requests either between clinic patient visits or at the end of morning or afternoon clinics, and the structured history system provided sufficient information that requests for further information from patients were almost never required. The e-visit system was felt to be cost-effective, but no data for this was shown; the majority of participating patients were Mayo Clinic employees who were covered under a capitated insurance plan.

Patient Engagement

Despite great provider enthusiasm about the use of e-visits at these three pioneering organizations, the number of e-visits remains less than 5% of the total for such typical conditions as

E-visits in primary care setting

Dept. Family Medicine, Mayo Clinic, Rochester, MN

- 52% of visits were billable.
- 16% of phone calls changed to billable e-visits.
- 40% decrease in non-urgent office visits.
- Medicaid e-visits lower margin of loss.
- Eliminates access to care barrier.
- Large number of treatable conditions (294).
- Decreased malpractice risk.
- On average 2 exchanges needed to treat.
- Physicians did not feel over-burdened.

Conclusion - cost effective alternative to increase access to care, education, treatment and billing of patients for low acuity / chronic conditions.

sinusitis and UTI. Increasing patient engagement and utilization will require a planned promotional effort to make patients aware that the new service is available, show them the potential uses and value of this new type of care, and teach them how to actually initiate an e-visit. The department should decide which patients to target, how to present promotional material in a manner appropriate for the patient's age and literacy level, and how physicians and nurses can actively recruit their patients to participate in e-visits. TransforMED™, a subsidiary of the American Academy of Family Physicians which specializes in guiding family medicine practices through the transformation necessary to become Patient Centered Healthcare Homes, has developed an excellent set of guidelines for marketing e-visits to patients (TransforMED, 2012). Their recommendations follow:

Guidelines for Marketing E-visits to Patients

- (1) Print the Web Portal address on appointment cards, business cards, letterhead, and patient handouts
- (2) Conduct a print and e-mail survey to inform patients of the new service and solicit suggestions on pricing and the types of conditions they feel are suitable for e-visits
- (3) Emphasize the Web Portal on voicemail and telephone hold messages, including cues that might transfer calls for low acuity complaints to e-visits
- (4) Add a prominent clearly labeled link to the Web Portal Home page to quickly direct visitors to user friendly information on e-visits
- (5) Send e-mail to patients explaining the new service and how they can benefit from it
- (6) Duplicate the user friendly information on printed flyers that can be placed in the waiting area and handed to patients at check out
- (7) Devote an issue of the practice's print or online newsletter to a focus on e-visits
- (8) Produce brightly colored attention getting buttons or stickers for staff to wear and highlight the new offering

Conclusion

Early adopters have shown promising high patient satisfaction rates with their e-visit systems, but studies involved only a tiny fraction of the patients receiving primary care in those

healthcare systems. The data suggests that expanding patient utilization will require improvements in accessibility, simplicity, insurance coverage, and speed, as well as massive patient education and promotional campaigns to increase awareness that the service is available. The researchers at Kaiser Permanente remain optimistic, stating, “Over time, both patients and physicians have become increasingly comfortable with the use of secure messaging, and both have discovered the convenience and effectiveness of incorporating it into their workflows.” (Baer, 2011, p. 232).

Provider Utilization and Satisfaction

Concept of E-Visits

Evaluating physician satisfaction with e-visits requires addressing two separate questions: how do providers feel about the *concept* of e-visits, and how do they assess the *experience* of using e-visit systems as currently implemented. From the conceptual standpoint, a majority of physicians agree that e-visits have the potential to provide good quality care for common low acuity conditions while simultaneously improving physician efficiency and lowering costs (Whitten et al., 2007; Glabman, 2010). E-visits improve efficiency by reducing the amount of physician and staff time needed to address conditions which can be treated effectively without the need for a physical examination and by opening up office appointments to more promptly see patients with more complex problems that require face-to-face attention. On average, the cost of an e-visit is less than half the charge for a standard office visit. A substantial minority of physicians still express concern that e-visits have the potential to miss important diagnoses that would be picked up from the nonverbal cues and physical exam data available in a standard office visit. Some of these diagnoses may not even relate to the primary presenting complaint. Some physicians also initially worried that e-visits filled with unstructured free text medical

history could consume disproportionate amounts of time and disrupt workflow. Restricting e-visits to a certain defined set of conditions and requiring that the history be submitted through a structured algorithmic computer interview program have helped to ease these concerns (Whitten et al., 2007; Glabman, 2010), as have provider workflow data from the pilot studies.

The two most pressing physician conceptual concerns are legal and regulatory issues and reimbursement issues. Despite the clear data that e-visits require provider time and work and deliver patient value, the majority of payers, including Medicare and Medicaid, do not cover these visits. Several institutions doing pioneering work in the field have demonstrated that a significant number of patients are willing to pay privately for e-visit care, possibly because the cost is comparable to the co-pay for an office visit, and eliminating expenses for time away from work and transportation saves them an equal amount (Angell, n.d.; Prestigiacomo, 2012; Martich, 2012). Such private-pay arrangements can provide a significant revenue stream to support the initial and ongoing phases of an e-visit program, but this mechanism is not available to Medicare preferred providers who are forbidden by law from imposing any additional privately paid charges on Medicare beneficiaries. In addition, if only a few patients use the service, it may not provide sufficient time savings or financial benefit to attract physician participants. A really busy successful doctor will say, “Why should I spend time on this?” Overall, concerns about impact on compensation and return on investment, along with concerns about legal and regulatory issues, remain the largest barriers to physician acceptance of the e-visit concept (Glabman, 2010), and these problems will be examined in more detail in subsequent sections.

Experience with E-Visits

A number of the early studies mentioned above assessed provider satisfaction with the experience of actually using an e-visit system in either the primary care or dermatology clinic setting (Angell, n.d.; Prestigiacomo, 2012; Watson, et al., 2010). In all of these studies, between 80 and 100% of physicians surveyed were either satisfied or very satisfied with the system's ease of use, with their ability to obtain enough information to make a clinical judgment, and with the level of care they were able to provide to the patients. The physicians did not feel that the e-visits consumed excessive amounts of time or disrupted workflow, and the great majority said they would recommend e-visits to their patients. All of the studies to date suffer from similar methodological limitations. In all cases, only a very small fraction of the providers in the clinical system participated in the study. The physicians who participated were not chosen at random, but rather were volunteers who may well have been younger, more interested in technology, and more computer literate than average. There was no control for potential self-selection bias, and this may have produced evaluator groups prone to give the e-visit experience higher ratings. In addition, the e-visits during the course of the studies constituted only a tiny fraction of the total number of visits; therefore the observed lack of impact on provider workflow might not be replicated in studies when the number of e-visits is scaled up to more typical expected levels. For example, the Henry Ford Health System, which has 238,000 patients and 900 physicians enrolled on their MyHealth portal, drew their conclusions from experience with about 1000 e-visits per year between 2006 and 2009 (Angell, n.d.; Medseek, 2012). Similarly, the UPMC HealthTrak patient portal, which currently has over 150,000 patients and 800 providers enrolled, is still only seeing approximately 150 e-visits per month, and utilization of the e-visit system differs

substantially among their different primary care practices. Significant numbers of physicians do not utilize the system at all (Martich, 2012).

Workflow

Patients becoming progressively more experienced with electronic communication in business and commercial settings will expect a user-friendly e-visit interface and same-day, if not almost immediate, response from their doctors. Yet providers may be scheduled to see patients all day in the hospital and clinic with little opportunity to respond to e-visit requests until late in the work day. It will be vital to establish organizational policy and clearly inform patients about the conditions of e-visits, such as the expected time frame for response to e-visit requests (next business day) and the necessity of using the structured e-visit tool within the secure patient portal. As the number of e-visits increases, the department should require its providers to reserve time in their schedules each day to properly accomplish this clinical activity, and establish policy for how and when physicians on night and weekend call coverage will deal with e-visits. It is also important to establish the staff and systems for providing timely information technology (IT) and administrative support to solve problems, to maintain and update the e-visit software and interface, and to monitor that response times and patient satisfaction remain within acceptable ranges.

Conclusion

Providers generally feel that e-visits can provide high-quality medical care and do not disrupt workflow. Because of the very small numbers of e-visits in the pilot projects, providers accomplished this work between clinic visits or at the end of clinic sessions. Increasing numbers of e-visits will likely require workflow modification with specific time set aside for exclusively for this activity. DFCM will also need to develop financial models to properly compensate their

clinicians for e-visits, workflow models for night and weekend call coverage, and operational models for supporting the hardware and software and monitoring outcomes. Legal, regulatory, and financial issues remain the key barriers to physician adoption of these systems.

Legal and Regulatory Issues

It is universally accepted that providing a medical consultation to a patient electronically constitutes a physician-patient relationship and therefore incurs all the same legal, regulatory, and ethical responsibilities as any other patient encounter. Although there is very little case law resulting from providers' use of structured electronic medical histories transmitted by secure Internet messaging systems to serve as the basis of treatment recommendations and medical advice, physicians have already been held legally liable for medical advice dispensed by telephone and by standard e-mail (American College of Physicians, 2008). Providers are appropriately concerned about managing the legal and regulatory risks associated with e-visits. The concerns fall into three major categories: risk to the privacy and security of protected health information (PHI), risk of violating state licensure laws, and malpractice risk.

The very first implementations of patient-physician communication using unsecured e-mail predated the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Researchers and early adopters quickly realized that their risk of data breach, hacking, or otherwise exposing protected health information to unauthorized persons was far above HIPAA's permissible levels. This led to the development of secure Internet messaging systems with provisions for the authentication and encryption mechanisms necessary to meet the Department of Health and Human Services Final Rule for Security Standards (DHHS, 2003) derived from the HIPAA guidelines. Such secure messaging systems are most often implemented within the Patient Portal system of an EHR, which can provide additional privacy and security

protection beyond the secure socket layer encryption technology used widely on the Internet. For example, the portal system contains the database of registered patients, enforces the login credentials which confirm the identity of both patients and clinicians accessing the system, and maintains audit trails of all transactions. The vast majority of system designers, researchers, and practicing clinicians now agree that such implementations, when properly administered, constitute a robust solution that meets all relevant state and federal regulations. It remains important for clinicians to remember only to conduct e-visits from private locations, where sensitive information cannot be viewed by unauthorized parties, and many authorities also suggest that e-visit systems advise patients of the inherent security risk associated with online communications, even when maximum precautions are in place.

All online interactions between healthcare clinicians and patients are also subject to state medical licensure laws, and this has a significant impact on the conduct of e-visits. The Federation of State Medical Boards (FSMB) Model Guidelines for Appropriate Use of the Internet in Medical Practice (FSMB, 2002) state “Online communications of any kind are best suited for patients previously seen and evaluated in an office setting...” and “Treatment, including issuing a prescription, that is based solely on an online consultation does not constitute an acceptable standard of care.” Although these guidelines do not carry the force of law, they have been endorsed by a growing number of medical authorities, including the AMA, AAFP, and ACP (Glabman, 2010). Between 1999 and 2007, state medical boards sanctioned more than 150 physicians for prescribing over the Internet without a physical examination and a prior physician-patient relationship. Penalties included fines, public reprimand, and license revocation (Glabman, 2010). Clearly the Internet is not an acceptable venue in which to establish a physician-patient relationship. In addition, all 50 state medical boards and 14 state osteopathy

boards require that physicians engaging in synchronous telemedicine visits or asynchronous e-visits are licensed to practice medicine in the state where the patient is located at the time of the consultation (FSMB, 2012). While these requirements are routinely waived in low acuity encounters with established patients of the physician's own practice, where prior medical records are available, such activities are technically illegal in every state of the union. Currently 10 state boards issue special-purpose licenses, telemedicine licenses or certificates, or licenses to practice medicine across state lines specifically for these purposes, but few practitioners have these credentials. In addition, state legislative action to address this new modality of care continues to lag.

Malpractice risk remains one of the major barriers preventing physicians from participating in e-visits programs. E-visits open practitioners to a number of new and subtle forms of malpractice liability. Liability insurance carriers are hesitant to cover this type of risk because there is so little case law and so little track record that they have no way to calculate the potential costs and establish a price structure (Glabman, 2010). Starting in 2000, the eRisk Working Group for Healthcare, a consortium of medical societies, professional liability carriers, and state licensing boards has developed and maintained a list of "Medical eRisk Considerations," with the latest update published in 2010 (iHealth Alliance, 2010). The Working Group's recommendations can be summarized as follows:

Recommendations for Minimizing Malpractice Risk and Practicing Safely Online

- (1) Do not engage in any kind of online communication unless the patient has previously been seen and evaluated in an office of your practice.
- (2) Do not initiate online physician-patient contact. The request for care should come from the patient.
- (3) Limit online encounters to patients within the state(s) that you are licensed.
- (4) Before initiating any online consultation, clearly advise patients that acute emergency medical problems such as chest pain, shortness of breath, high fever, physical trauma, or bleeding cannot be safely addressed

within the confines of the cyber visit and that they should seek acute care for such problems in an emergency room or other more capable setting immediately.

(5) Patients must be clearly informed of any charges that might be associated with the e-visit and reminded that such charges may not be reimbursed by the patient's health insurance.

(6) The patient should electronically sign an informed consent to participate in the consultation and confirm understanding of the disclaimers in sections 4 and 5 above.

(7) The patient should be clearly informed of the identity and credentials of the consulting clinician.

(8) Clinicians should distinguish between e-visits related to a known pre-existing condition and those which require diagnosis and treatment of a new condition addressed for the first time, since the latter involve more risk to patient safety and higher risk of liability exposure. If the clinician feels that the new condition is too complex to diagnose online, he should emphasize the importance of obtaining urgent care or next day office follow-up and document this in the medical record.

(9) Any e-visit should conclude with an explicit follow-up plan that is clearly communicated to the patient and documented in the record.

(10) Clinicians are responsible for any information made available to the patient, and any patient education or care management materials, including links to third party websites, should be thoroughly vetted and come directly from the practitioner or from a recognized authoritative source.

(11) Avoid any online communication of a promotional nature that might raise patient expectations or create implicit guarantees or implied warranties that could increase liability risk.

(12) Avoid referrals to Internet pharmacies, which often involve significantly higher risk of regulatory violations and malpractice liability.

Conclusion

Most clinicians are very comfortable with the privacy and security of the current e-visit model. Medical licensure issues have not been adequately addressed and are greatly complicated by the necessity of seeking a state-by-state solution. Although malpractice issues are also complex, some observers believe that e-visits do not add dramatically to malpractice liability risk. They view it as the equivalent of a physician taking a night or weekend phone call from one of his partner's patients whom he does not know very well. In fact, the availability of a relatively complete medical record in most modern e-visit systems along with the ability to create very complete and well-organized visit documentation might even reduce liability risk compared to a

traditional telephone consultation. Implementing the eRisk Working Group recommendations as formal policy will also mitigate potential legal risks.

Billing and Reimbursement Issues

The single greatest obstacle to widespread use of e-visits continues to be reimbursement. Although CPT code 99444 was established for e-visits in 2008, Medicare, Medicaid, and most major private health insurance companies still refuse to reimburse providers for visits conducted over the Internet. As early as 2007, Kerry Weems, then acting CMS Administrator, refused to reimburse e-visits saying, “I don’t want to reimburse a physician every time he sends an e-mail...” because physicians will just get “very adept” at e-mailing (Robeznieks, 2007b). CMS continues to adhere stubbornly to this policy, despite the fact that Dr. Paul Tang and collaborators at the Palo Alto Medical Foundation (Tang et al., 2006) have published a perfectly fair and rational set of modified evaluation and management criteria appropriate to billing e-visits. These criteria are based on current office visit billing standards, making adoption quick and simple. For an e-visit to be billable under the Palo Alto criteria:

- It must include a medical decision which can be traced to a documentable action.
- The provider and the patient must have a pre-existing face-to-face relationship.
- It cannot be a follow-up of a problem that was seen in the office within the preceding seven days.
- It cannot be solely for medication refills, test results, or distribution of educational material.

Multiple studies have shown that when these criteria are used to evaluate phone calls between patients and providers, approximately 15-20 % currently contain enough documented

information to qualify for e-visit billing. The percentage increases dramatically when portal-based e-visits with structured patient histories are used.

Luckily, private insurers have been faster to recognize the potential of e-visits to expand access to care and lower costs, leading to a number of demonstration projects and partnerships between health insurance companies and healthcare providers. RelayHealth, one of the larger vendors of patient portals and e-visit platforms, has also been involved in partnerships to showcase the value e-visits can bring to healthcare payers, providers and patients. Companies that have entered partnerships to incentivize the use of e-visits include Blue Cross of Massachusetts, Blue Shield of California, Aetna, Cigna, and WellPoint. These providers reimburse e-visits at \$25-\$50, which is about 40% of the standard Level 3 reimbursement, to motivate providers to offer the service to their patients. Use of e-visits has increased due to such incentives, albeit at a slow pace (Francis, 2012).

Minnesota recently took the e-visit model to a new level by becoming the first state in the nation to require all its health insurance carriers to reimburse e-visits. With co-pays ranging from \$3-\$20, e-visits have been popular with patients, but have had mixed response from physicians, especially because many have few patients signed up for the e-visit service. In Florida, where many physicians do not accept insurance payments and where large numbers of patients are uninsured, a direct fee-for-service model has taken hold. E-visits are billed at \$20-\$50 payable by credit card over the Internet before the consultation occurs. This is considerably less than the average \$75-\$120 charge for office visits, and patients have been very willing to pay it. Outcomes have been comparable to those seen with office visits for equivalent conditions. Another innovative model used by medical practices in several states is to charge annual subscription fees of \$300-\$400 for access to e-visit services ((Robeznieks, 2007a and b).

Conclusion

Until CMS lowers its barriers to e-visit reimbursement, the Department of Family and Community Medicine should implement a billing system that utilizes all three of the current reimbursement models: private payment by the patient, annual subscription, and billing to insurance. Giving patients maximal flexibility to select a suitable plan will drive utilization and provide resources to support the program until insurance coverage for e-visits becomes more universal. The Department of Family and Community Medicine should develop a robust education program to help patients understand the uses and value of e-visits, to determine whether such visits are covered by their health insurance, and to define any required copayments. Patients whose insurance excludes coverage for e-visits should be made aware of the per-visit fee-for-service and annual subscription options. For some patients the cost of an e-visit may be less than the total out-of-pocket cost (copayment, transportation, and lost time at work) associated with an office visit covered by insurance. For patients with chronic illnesses and high utilization of services, a subscription or visit package option might lower total costs. The department should also initiate meetings and education programs with local employers and insurance providers to demonstrate the employee or member health benefits and cost savings that could be achieved by reimbursing the charge for e-visits. Finally, the department might consider offering e-visits to Medicaid patients free of charge. Medicaid reimbursement rates are so low that the department loses money on every office visit by a Medicaid patient. Treating Medicaid patients via lower cost e-visits, when medically appropriate, decreases the amount lost and, if the appointment slot is filled with a higher acuity patient, may even change the financial margin to positive.

Return on Investment

Financial

E-visit Return on Investment

- A 2002 study in Berkeley, CA and Stanford, CT estimated cost savings for physicians of \$1.77 PMPM with increased satisfaction scores on access of care, convenience, and quality of care.
- Blue Shield of California showed a \$4 million/year savings for their covered patient population with a 5:1 return on investment.
- Kaiser Permanente of Colorado Springs virtual visits with in-network physicians. Physician reimbursement of \$50 per visit; the health plan was able to save \$70-120 on each virtual visit.
- Palo Alto Medical Foundation employer-sponsored e-visit program's ROI was \$4.50 saved PMPM.

A number of studies have shown that e-visits can provide a significant return on investment (ROI) for providers, insurance companies, and employers. A typical *pro forma* ROI calculation using estimates from the literature (see text box above) would be as follows:

Demographics of the DFCM Physician Workforce and Patient Population:

- 500 associated physicians working 5 days/week, 46 weeks/year
- 300,000 patients registered for the patient portal
- 25% (75,000 patients) enrolled in and utilizing the e-visit program
- 10% of patients in capitated insurance plans

Cost of e-visit implementation:

- Purchase and startup \$2,000,000
- Service and maintenance fees: \$100 per physician per month = \$600,000 first year

Revenue gain from e-visits:

- 30,000 Capitated Patients: Direct Revenue
 - 7500 covered lives enrolled in e-visit program

- Savings of \$1.77 PMPM = \$13,275 per month = \$159,300 per year
- 270,000 Non-Capitated Patients: Direct Revenue
 - 67,500 patients enrolled in e-visit program
 - 1.2 e-visits/patient/year = 81,000 total e-visits (0.7 e-visits/physician/day)
 - $0.7 \times 500 = 350$ e-visits per day @ \$30/visit = \$10,500/day X 230 = \$2,415,000 per year
- 270,000 Non-Capitated Patients: Indirect Revenue
 - 350 opened appointment slots per day @ \$100/slot (blended average reimbursement CPT code 99214) = \$35,000/day X 230 = \$8,050,000 per year

E-Visit Program Financial Projection Year 1

Costs		Revenue	
Initial	\$2,000,000	Capitated Direct	\$159,300
Maintenance	\$600,000	Non-Capitated Direct	\$2,145,000
Total	\$2,600,000	Non-Capitated Indirect	\$8,050,000
		Total	\$10,354,300
	Grand Total		\$7,754,300

Intangible

In addition to the promising financial projection, an e-visit program produces benefits that can't necessarily be quantitated in dollars and cents. These include:

- Increased market share: A 2006 Wall Street Journal/Harris Interactive Poll found that 62% of Americans said that their choice of primary care practitioner would be influenced

by whether or not e-visits were offered, and 75% said they would use e-visits if they were available.

- Improved patient satisfaction and quality of care: This can increase Academic Health Center's patient retention and standing in the community.
- Improved office staff efficiency: One study found that the number of phone messages and questions directed to the e-visit system produced a 57% increase in the speed of handling the remaining phone messages.
- Opportunities for clinical research and publication: As discussed above, early research on e-visits has involved only a tiny fraction of the patients and providers associated with the pioneering healthcare organizations doing the studies. Additional studies with larger groups of patients are needed to confirm the findings, especially in regards to improvements in care quality and cost efficiency in large populations, and to further define best practices for e-visit programs. Appropriate auditing and monitoring tools installed as part of the e-visit system can provide data to help answer these important questions with little extra effort and can facilitate the teaching and research mission of the department.

System Features and Vendor Selection

E-Visit System Design Model

An effective e-visit solution will require dual application models in order to function optimally on both desktop computers and mobile devices (tablet computers and smart phones) and produce the best possible end-user experience. The primary application will be a module within the department's web portal and will function on any device capable of running a web browser. Porting the application to run as a native "App" on mobile devices will expand

accessibility and attract greater system utilization by both patients and clinicians. Currently, 67% of family physicians use smartphones, and with over half of all U.S consumers using a smartphone, an “App” on a mobile device will greatly assist utilization (Jackson, 2012; Lunden, 2012). Depending on vendor willingness and capability, the secondary mobile application model may have to be implemented at a later time. Both application models should provide for rapid evolution based on user feedback with updates pushed to the user community continually to enhance the e-visit experience.

As e-visits enter the mainstream of medical care, growing demand has greatly increased the number of vendors offering products in this area. Although some standalone (untethered) products may initially seem less expensive and easier to implement, early adopters have found that products which are part of and fully integrated with the organization’s EHR (tethered) ultimately produce significantly better performance. Our technology team developed the requirements for a best of breed e-visit solution to accomplish the objectives of DFCM and evaluated three vendors on a scoring grid based on those requirements: the department’s current EHR vendor Allscripts (Allscripts, 2012) and two vendors of well-rated third party add-on solutions, Medfusion (Intuit, 2012) and RelayHealth (RelayHealth, 2012). The analysis which follows confirms that contracting with Allscripts is the best way to produce the comprehensive, attractive, and responsive e-visit system that the department needs, primarily because of better integration with the existing EHR system.

Primary Application Model (Web Portal)

1. Basic System Features

1.1 Ability to support secure messaging between patients and clinicians.

1.2 Ability to guide patients to input a structured medical history sufficient to support clinical decision making for a defined set of non-acute clinical problems

1.3 Ability to allow the department to create customized web page views to improve system function

1.4 Ability for the department to maintain and modify a database of medical history questions and adjust the decision logic governing history taking in order to improve system functioning and expand the number of conditions amenable to care via e-visits

2. Integration and Interoperability: Information exchange with the department's current EHR and Practice Management (PM) systems, with payers, and with pharmacies

2.1 Ability to automatically generate an e-visit clinical note in the patient's existing EHR.

2.2 Ability to integrate with the department's PM System to record necessary patient billing, physician compensation, and demographic data for e-visits.

2.3 Ability to interface with payer systems to verify insurance coverage and obtain any necessary pre-authorizations.

2.4 Ability to transmit electronic prescriptions to pharmacies.

3. Reporting: Consolidating data to analyze system performance and user satisfaction and to support clinical research

3.1 Ability to report e-visit usage sorted by patient demographic factors, diagnosis, provider identity and specialty, and visit result (prescription written, advice given, office visit requested, etc.)

3.2 Ability to format all reports for either electronic display or printing.

3.3 Ability to link to pre-registrations and scheduling functionalities if the provider recommends an office visit.

3.4 Ability to revise all data for an encounter as necessary to correct errors in the original data entry.

3.5 Ability to produce any report on demand without the requirement for day end system functions.

3.6 Ability to schedule both standard and custom reports to run on a selected schedule, with automatic routing to specific user(s) or a network printer

3.7 Ability to log all events per user, down to the field level and to produce audit trail reports.

4. Technical Requirements:

- 4.1 Ability to generate and display informed consent documents, Medicare Advanced Beneficiary Notices and notices of responsibility for private insurance copayments or for the entire visit cost if not covered by insurance automatically.
- 4.2 Ability to capture patient and provider electronic signatures onto the e-visit encounter form and include the e-signature in the encounter data stored in the EHR
- 4.3 Ability to support HIPAA-compliant passwords and identity verification for both patients and providers and to allow physician sign-on from multiple locations.
- 4.4 Ability to use SSL encryption to protect all data being transferred between patient and clinician.
- 4.5 Ability to allow a proxy to conduct an e-visit on behalf of a child or other family member.
- 4.6 Ability to process online payments by credit card.

5. Other System Features:

- 5.1 Ability to confirm that the patient has an existing medical relationship with the provider responsible for the e-visit and that the patient has received the department's standard HIPAA Notice of Privacy Practices.
- 5.2 Ability to provide or link to a robust clinical decision support library to facilitate provider decision making and communication during the e-visit.
- 5.3 Ability for the patient to upload images for provider review.
- 5.4 Ability to share educational resources with the patient including DFCM-created information and follow-up forms regarding the topic of the e-visit.

The chart below is a system requirements analysis and vendor capability overview. For the requirement analysis a score was given to each requirement based on need:

1. Requirement is nice to have
2. Requirement is extremely desirable
3. Requirement is essential

The vendor capability was scored on “present” (√) or “not present” (no check).

Requirement	Weight	Vendor Option 1	Vendor Option 2	Vendor Option 3
1. Basic System Features		Allscripts	MedFusion	RelayHealth
1.1 Ability to support secure messaging between patients and clinicians.	3	√	√	√
1.2 Ability to guide patients to input a structured medical history sufficient to support clinical decision making for a defined set of non-acute clinical problems.	3	√	√	√
1.3 Ability to allow the department to create customized web page views to improve system function.	2	√		
1.4 Ability for the department to maintain and modify a database of medical history questions and adjust the decision logic governing history taking in order to improve system functioning and expand the number of conditions amenable to care via e-visits.	2	√		
2. Integration and Interoperability: Information exchange with the department’s current EHR and Practice Management (PM) systems, with payers, and with pharmacies				
2.1 Ability to automatically generate an e-visit clinical note in the patient’s existing EHR.	3	√		
2.2 Ability to integrate with the department’s PM System to record necessary patient billing, physician compensation, and demographic data for e-visits.	3	√		
2.3 Ability to interface with payer systems to verify insurance coverage and obtain any necessary pre-authorizations.	2	√		
2.4 Ability to transmit electronic prescriptions to pharmacies.	2	√	√	√
3. Reporting: Consolidating data to analyze system performance and user satisfaction, and to support clinical research				
3.1 Ability to report e-visit usage sorted by patient demographic factors, diagnosis, provider identity and specialty, and visit result (prescription written, advice given, office visit requested, etc.)	3	√	√	√
3.2 Ability to format all reports for either electronic display or printing.	3			

3.3 Ability to link to pre-registrations and scheduling functionalities if the provider recommends an office visit.	2	√		
3.4 Ability to revise all data for an encounter as necessary to correct errors in the original data entry.	2	√	√	
3.5 Ability to produce any report on demand without the requirement for any day end system functions.	2	√	√	√
3.6 Ability to schedule both standard and custom reports to run on a selected schedule, with automatic routing to specific user(s) or a network printer.	2	√		
3.7 Ability to log all events per user, down to the field level and produce audit trail reports.	2	√		
4. Technical Requirements				
4.1 Ability to generate and display informed consent documents, Medicare Advanced Beneficiary Notices and notices of responsibility for private insurance copayments or for the entire visit cost if not covered by insurance automatically.	3	√		
4.2 Ability to capture patient and provider electronic signatures onto the e-visit encounter form, and include the e-signature in the encounter data stored in the EHR.	3	√		
4.3 Ability to support HIPAA-compliant passwords and identity verification for both patients and providers and allow physician sign-on from multiple locations.	3	√	√	√
4.4 Ability to use SSL encryption to protect all data being transferred between patient and clinician.	3	√	√	√
4.5 Ability to allow a proxy to conduct an e-visit on behalf of a child or other family member.	3	√	√	√
5. Other System Features				
5.1 Ability to confirm that the patient has an existing medical relationship with the provider responsible for the e-visit and that the patient has received the department's standard HIPAA Notice of Privacy Practices.	2	√		
5.2 Ability to provide or link to a robust clinical decision support library to facilitate provider decision making and communication during the e-visit.	1	√	√	√

5.3 Ability for the patient to upload images for provider review.	1		√	
5.4 Ability to share educational resources with the patient including DFCM-created information and follow-up forms regarding the topic of the e-visit	1		√	

Secondary Application Model (Mobile Devices)

As discussed above, the roadmap for the evolution of the e-visit system includes the development of native mobile device applications running under the iOS and Android operating systems. Because there are no off-the-shelf solutions in this area, implementation will necessarily be delayed pending further work with the vendor. A rough outline of this second phase of the project is as follows:

1. Coding and extensive pilot testing of the applications to confirm all functionalities and compatibility with the already implemented primary application
2. Approval of the applications and posting in the iTunes® and Android Marketplace® stores
3. Patient education and publicity to make patients aware that the application is available on mobile devices in native form and encourage them to utilize the mobile version, which will be available free of charge, if appropriate.

System Implementation and Training

Implementation

Successful adoption of a new e-visit system begins with a change management plan that aligns with the mission and values of the department. Although the vendor will likely offer to provide implementation and training programs which they have used successfully with other clients, these should be carefully evaluated, and modified if necessary, to be sure they are appropriate for the people, processes, workflows, and technology currently existing in the

department. Poorly managed implementations can incur both large financial costs and large indirect costs in terms of lost provider productivity and user dissatisfaction. The following table lists categories and tasks which must be carefully addressed in the implementation plan:

Category	Tasks
Mission and Vision	<ul style="list-style-type: none"> • Create clear mission statement for project • Align with department strategic priorities including market share, patient and provider satisfaction, workflow efficiency, regulatory compliance (patient centered healthcare home, meaningful use) • Determine project priority and time frame (0-3 months, 3-6 months, 6-12 months)
Project Manager Steering Committee	<ul style="list-style-type: none"> • Manager should be a respected senior clinician • Manager will partner with vendor project manager to coordinate meetings, milestones, assignments, work plans • Executive owners (CIO, CMO, CMIO, department chair) to provide resources and guidance • Committee including clinicians, IT staff and administrators assesses plans and progress and recommends adjustments
Implementation Plan	<ul style="list-style-type: none"> • Evaluate vendor supplied plan and revise as appropriate • Create realistic goals and allow plenty of time to accomplish them • Assess whether the project should be done in phases
Budget	<ul style="list-style-type: none"> • Assess vendor price proposal and amount of work required from department staff • Assess available resources • Determine need for outside help • Create line item budget for project implementation • Operating budget year 1 and budget estimate years 2-5
Communication	<ul style="list-style-type: none"> • Determine preferred method of communications: written, telephone, e-mail, meetings etc. • Establish weekly meetings • Keep meeting notes and status reports • Problem escalation – how will problems be reported to appropriate project staff or to project managers
Phased Installation	<ul style="list-style-type: none"> • Hardware selection in close coordination with vendor • Project manager and super user evaluation of initial pilot level system • If satisfactory performance, proceed to full installation • Departmental ability to add templates for additional conditions and alter logic of the structured medical history system

<p>Training</p>	<ul style="list-style-type: none"> • Workflow analysis and integration with current processes • Determine training faculty and formats (classroom, 1 on 1, electronic and online training aids) • Review vendor training and reference tools and revise as necessary • Create schedules and timelines for training staff • Create assessment tools and methods for documenting user proficiency
<p>Workflow</p>	<ul style="list-style-type: none"> • Assess current clinician workflow and determine location for e-visit activities • Compare against best practices of early adopters • Obtain evaluation and approval of e-visit timing and location in workflow from all affected clinicians • Revise billing system to include CPT code for e-visits • Revise Super-Bills (paper and electronic) to allow providers to submit e-visit charges • Revise compensation system to capture e-visit RVU's and properly credit them to providers • Revise policies and procedures to cover potential questions related to e-visits
<p>Testing</p>	<ul style="list-style-type: none"> • Beta test e-visit system, workflows, and physician competency • Confirm that all clinical staff have completed training and demonstrated competency • Test system hardware to confirm proper working order • Test software application and interfaces to billing and physician compensation systems • IT support staff trained in new hardware and software • Support plan communicated to managers in all affected departments • System failure plan in place and understood by all staff
<p>Go-live</p>	<ul style="list-style-type: none"> • Schedule the day well in advance • Schedule a dress rehearsal if possible • Decrease workload on go-live day • Motto: Go-live is the beginning of the system not the end • Contact sheets with super user, trainer, and IT staff information • Help desk hot line for troubleshooting problems
<p>Assessment</p>	<ul style="list-style-type: none"> • Deploy tools to allow both physicians and patients to provide feedback • Deploy tools to assess physician and patient utilization and satisfaction and monitor response times to e-visit requests • Revise system based on user needs and suggestions

Training

Change is always difficult, and new systems may elicit feelings of uncertainty and resentment among the department’s physician staff. Project leadership must be sensitive to the need to educate and motivate the department’s physicians, helping them understand how the proposed e-visit system can improve physician efficiency, quality of care, patient satisfaction, and departmental revenue all at the same time. For the implementation to succeed, it is imperative that the training program respect the physicians’ time constraints and current workflows, properly order the steps and topics for maximum training impact, and present the material in multiple formats so each physician can select the time and training method which best fits his learning style. Senior members of the department must also lead by example in completing the training, demonstrating competency, and becoming early adopters of the new system. Special issues related to the training program include the following:

Category	Tasks
Schedule Plans	<ul style="list-style-type: none"> • Create timeline for training activities • Create staff training schedule
Physicians	<ul style="list-style-type: none"> • Assess number and location of physicians to be trained • Assess physicians’ pre-training computer skills <ul style="list-style-type: none"> ○ Identify skills gaps ○ Provide extra training to physicians who need it • Use the process of training super users to evaluate and improve training methods
Format	<ul style="list-style-type: none"> • Assess number and location of physicians to be trained (likely at multiple offices) • Design training formats and environments <ul style="list-style-type: none"> ○ 1 on 1 when feasible ○ Classroom ○ Online electronic lessons (multimedia) ○ Web portal with mock system environment to practice ○ Printed materials for review and reference
CME hours/Incentives	<ul style="list-style-type: none"> • Arrange criteria and sponsor for CME hours for physician training

	<ul style="list-style-type: none"> • Consider training with lunch or dinner provided or other incentive
Assessment tools	<ul style="list-style-type: none"> • Create evaluation tool to assess competency on the new system • Track and monitor training and competency of physician users • Create an evaluation tool for the training course itself and revise based on user feedback
System failure protocol	<ul style="list-style-type: none"> • Develop protocol for system failures and train physicians how to utilize it if needed • Develop protocols for recovering and inputting data after system failures • Develop communication and problem reporting protocols so users can get help if needed
Training Costs	<ul style="list-style-type: none"> • Cost of developing training and assessment tools not available from the vendor • Cost of dedicated trainers if not provided by vendors • Reimbursement of MD super users for professional time lost while training others • Increased staffing to cover for super users during training and go-live
Post Go-live	<ul style="list-style-type: none"> • Actively work model e-visit cases in the production environment • Identify and solve problems with workflow, increase proficiency, and achieve comfort level using the system

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