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Patient-centered Health Care Delivery Uniting MTM, EHRs and Patients: Opportunities for Pharmacists

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Abstract

Objective: To describe a patient-centered approach to health care delivery for chronically ill patients that emphasizes incorporation of HIT-driven Medication Therapy Management with Electronic Health Records.

Summary: Health care delivery for patients with chronic conditions is often ineffective and costly. A consolidated approach is needed, and there has never been a more opportune time for pharmacists to implement improvements through HIT-driven Medication Therapy Management (MTM) incorporating Electronic Health Records. The primary role of the MTM provider is to identify and resolve barriers in treatment before the health and welfare of the patient are adversely affected. The proposed approach incorporates MTM services and Electronic Health Records and would help to achieve optimal drug therapy and address deficiencies in treatment for patients with chronic illnesses to improve quality of life. The EHR will be considered to be the "centerpiece" of health care delivery with the potential to improve patient safety, productivity, and data retrieval. The EHR will likely be the focal point of all patient encounters in the future, and the major access point of patient information for pharmacists in a variety of clinical settings.

Conclusion: Current healthcare initiatives that promote MTM services and the use of Health Information Technology such as Electronic Health Records can improve on patient monitoring and favorably impact the prognosis for the patients with chronic illnesses.

Keywords: Medication therapy management; Health information technology; Electronic health record; Personal Health record; Meaningful use

Introduction

"The future of a company is driven almost 100 percent by the ability of that company's product or services to be rendered in digital form."

Nicholas Negroponte, Ph.D.

Director, MIT Media Lab

Author, Being Digital, 1995 [1]

Let's consider a patient in the U.S. healthcare system with a chronic illness. Currently, chronic illnesses account for 70% of deaths and for the expenditure of over 75% of direct health care costs in the U.S. [2]. In terms of numbers, direct costs of chronic diseases are now estimated at over $1.5 trillion, and indirect costs—in the form of lost productivity and non-reimbursed personal costs—add several more hundreds of billions of dollars each year to health care costs.

Our patient could have any number of conditions. With the trend toward increased longevity, and given enough time, many conditions such as arthritis, cardiovascular diseases, and neurodegenerative diseases, including Alzheimer's disease, have become prevalent [3]. Further, many diseases that were considered fatal in the past, such as Type I diabetes, HIV infection, and certain forms of cancer, are now considered chronic conditions with a resultant increase in a patient's life expectancy.

Among the array of chronic illnesses, for illustrative purposes let's consider a patient with mental illness, such as schizophrenia. As is the case with many chronic diseases, with this condition there may be a range in severity of symptoms, and since there is no cure, treatment primarily involves maintenance to drug regimens with the goal of controlling symptoms and improving quality of life. Often patients must rely on treatment on an outpatient basis where adherence to a drug regimen is difficult, and are relegated to a lifetime of nonadherence, relapse, and rehospitalization [4]. The medical literature is replete with reports of deficiencies in our healthcare system that allow for recurrent hospitalization and ongoing outpatient care in this distinct patient population.

Objective

With the advent of the Internet, World Wide Web, high speed computers, and subsequently wireless and mobile technology, smartphones, and even social networking, clinicians have many more digital tools available with the potential to help augment better patient care. As expressed by Hoyt et al. "…more healthcare workers will need to be 'bilingual' in both technology and medicine." [5].

The purpose of this report is to describe a patient-centered approach to health care delivery by pharmacists with focus on patients with chronic illnesses. The emphasis is on the incorporation of Health Information Technology (HIT)-driven Medication Therapy Management with the centerpiece of health data management, the Electronic Health Record, and the potential for transforming pharmacist-mediated healthcare services.

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Towards A Consolidated Model of Health Care Delivery

The current delivery of treatment for patients with a chronic condition such as schizophrenia is often ineffective and costly. A different approach is called for, and there has never been a more opportune time for implementation of pharmacist-mediated change—the advancement of patient care with integration of HIT in innovative ways.

Pharmacists were early adopters of computer technology and are comfortable using computer databases and the Internet. Various comprehensive electronic databases are available for the pharmacist to use. With collaborative practice agreements and using their well-honed computer skills, pharmacists can provide comprehensive care involving proper medication use to patients with acute and chronic medical conditions.

The proposed approach should help to achieve optimal drug therapy and address deficiencies in treatment for chronically-ill patients. Current healthcare initiatives can favorably impact the prognosis for patients with chronic illnesses such as schizophrenia. Some of the major healthcare initiatives are presented below, to help achieve the goal of optimizing patient care with integration and greater utilization of HIT by pharmacists.

Health Care Reform

The Patient Protection and Affordable Care Act of 2010 (H.R. 3590) enhances medication use in our health care system by inclusion of medication therapy management (MTM) services [6]. The bill establishes a program to provide grants to eligible entities to implement MTM services provided by licensed pharmacists, as a part of a collaborative, multidisciplinary, interprofessional approach to the treatment of chronic diseases. The legislation also establishes a Patient-Centered Medical Home pilot program through which pharmacists, working collaboratively with other providers, would deliver MTM services to improve the quality of care and reduce overall cost in the treatment of chronic diseases.

In the near future, it is likely that pharmacists in collaboration with other health care professionals, will be communicating and transferring patient information primarily electronically. Under the American Recovery and Reinvestment Act (ARRA) of 2009 federal economic stimulus package, health care providers who demonstrate "meaningful use" of certified EHRs qualify for Medicare and Medicaid incentive payments. For meaningful use to be achieved, essentially EHRs must have basic functions that support improved health care. These may include, but not be limited to, the tasks essential to creating any medical record, including the entry of basic data such as patient demographic data, vital signs, up-to-date problem lists of current and active diagnoses, active medications and allergies, and smoking status. Other essential functions include the use of software applications, such as decision support systems and clinical alerting systems, which enable the potential of EHRs to improve the safety, quality, and efficiency of care. These features can help clinicians make the best clinical decisions and prevent errors [7]. Pharmacists demonstrate meaningful use of the EHR when elements of MTM involving continuity of patient care are shared among healthcare providers [8].

As policymakers struggle with the challenges of adopting technological innovations on a large scale, it is clear that health information technology (HIT), and electronic health record-keeping in particular, is moving beyond the conceptual stages and closer to becoming commonplace for both patients and health care professionals, most notably pharmacists.

MTM Services

With the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, "a new era emerged for the practice of pharmacy" [9]. This law established a drug benefit for Medicare recipients, and also established the medication therapy management program (MTMP) as a service to be provided by Medicare Part D sponsors. In addition, other non-Medicare Part D patients can benefit from medication management interactions with a pharmacist and the advantages of medication therapy management (MTM) services can be demonstrated in a variety of healthcare settings.

The core elements of MTM include the following: medication therapy review; personal medication record; medication-related action plan; intervention and referral; and documentation [10].

Regarding medication therapy review, the unique contribution by pharmacists in MTM include, but are not limited to, medication reconciliation and care transitions, medication adherence, medication monitoring, medication safety, and evaluation of medication errors [11]. In addition, it would not be beyond the scope of practice for a pharmacist, as an MTM provider, to identify and resolve barriers in treatment before the health and welfare of the patient are adversely affected.

Again, for illustrative purposes, in the typical patient with schizophrenia, the re-emergence of previously controlled symptoms is high. Fifty percent of schizophrenic patients, under normal treatment conditions, relapse within one year after their latest episode [12]. Although many factors may influence relapse, common reasons are nonadherence to the antipsychotic regimen and loss of antipsychotic efficacy [13], both of which may be improved upon through MTM services. Strategies to improve adherence to drug therapy include minimizing adverse events, encouraging patient participation in psychoeducational programs, treating comorbid substance abuse disorders, involving family members in the treatment process, and forging a close therapeutic relationship with the patient [4]. Pharmacists have traditionally been some of the most accessible health care providers, and through MTM services, are in the most favorable position to address these aspects of care for patients with a chronic condition such as schizophrenia [14]. For the chronically-ill patient, the increased accessibility to MTM services through an abulatory care setting such as a community pharmacy would likely have had a positive impact on continuity of care [15].

Major risk factors for nonadherence in patients with schizophrenia have been identified [4], and similar to the strategies to improve adherence, several risk factors for nonadherence can be potentially alleviated in this new approach to care. Typical of many patients with this condition, family members may not be adequately involved in treatment, and patients may possibly have a negative attitude toward treatment, poor insight into their illness, or even a stigma of taking medications. Also, some of the risk factors can be clinician-related, such as inadequate discharge planning or lack of follow-up care, inadequate attention to medication adverse events leading to nonadherence, and poor clinician-patient relationships. The increased exposure to a health care provider—notably pharmacists monitoring patients needs during MTM visits—would offer the greatest benefit to the patient in the areas of drug tolerability and adverse drug events.

Electronic Health Records (EHRs)

The use of information technology will be the key to the success of MTM services [16]. Currently, the shift from paper-based health records to electronic-based health records is being driven by the American Recovery and Reinvestment Act (ARRA) of 2009, an economic stimulus package that includes incentive payments for adopting electronic health records (EHRs)—more than $40,000 per physician and up to several million dollars for hospitals, for a total of $19.2 billion to spur the transition to computerized patient records [17]. The intent of ARRA (a.k.a. "the "stimulus") is to support widespread deployment and utilization of health information technologies (HIT) and the availability of an electronic health record (EHR) for U.S. citizens by 2014.

The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any delivery-of-care setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. In theory, the EHR automates and streamlines the clinician's workflow and has the ability to generate a complete record of a clinical patient encounter. It also supports other care-related activities directly or indirectly via interface, including evidence-based decision support, quality management, and outcomes reporting. For an EHR, the goal is continuity of care, based upon an efficient sharing of pertinent, complete information among health care providers [18].

Often patients with chronic conditions experience 'fragmented' care, or major disconnections across the continuum of care. Today, it is not uncommon for patients to experience information "gaps" and lack of integration of their care to the point where health records are not obtainable or available, and there is virtually no communication among health care providers [19].

The EHR will be considered to be the "centerpiece" of health care delivery with the potential to improve patient safety, productivity, and data retrieval (Figure 1) [5]. The EHR will likely be the focal point of all patient encounters in the future, and the major access point of patient information for pharmacists in the clinical setting. Multiple resources that are currently "standalone" software programs can be incorporated into the EHR. For instance, a variety of disease management software tools are being developed for use alongside an EHR that will assist clinicians with chronic disease management [19]. Capabilities include electronic patient registries and chronic disease management systems (CDMS), customizable alerts and reminders for preventive and chronic care, clinical messaging systems and personal health records (PHRs.) Success with electronic clinical tools such as these has been demonstrated in limited cases with management of chronic diseases such as diabetes [20]. These software tools will support the pharmacists' practice with opportunities to participate in better patient care.

For example, Hughes et al. demonstrated that in a community pharmacy setting in Canada, patient's laboratory data accessible through an EHR can be incorporated into the drug dispensing process to help monitor appropriateness of care. The investigators noted, "Although patient care and dispensing practices involved common and unique challenges to integrating the EHR, they shared the potential to change and improve the way pharmacists care for patients" [21].

As no clear models of practice have emerged, future research can determine specifically how the EHR would best be integrated into MTM services. What is apparent, though, is that if innovations such as these can be adopted into MTM services, the transition from out-of-the-hospital to post-inpatient care can be facilitated more effectively, and readmissions may be prevented for chronically ill patients.

Interoperability

In an ideal healthcare world, pharmacists should exchange digital clinical information in a two-way, bidirectional manner with other clinicians. However, in the current healthcare environment, major obstacles such as interoperability–the extent to which devices can exchange and interpret shared data–must be overcome for this ideal to become a reality [22].

Unlike vendors in the banking and telecommunication industries, EHR vendors appear to have little incentive for enabling the sharing of health information with other HIT entities. In the New England Journal of Medicine, Mandl and Kohane [23] assert that more pressure should be placed on EHR vendors to "embrace innovation, support exchange standards and to break down data silos in support of true cross-vendor interoperability" [23].

With this in mind, pharmacists can work with pharmacy system vendors to support interoperability standards such as promoting the standardized certified pharmacist EHR functional profile [24]. An

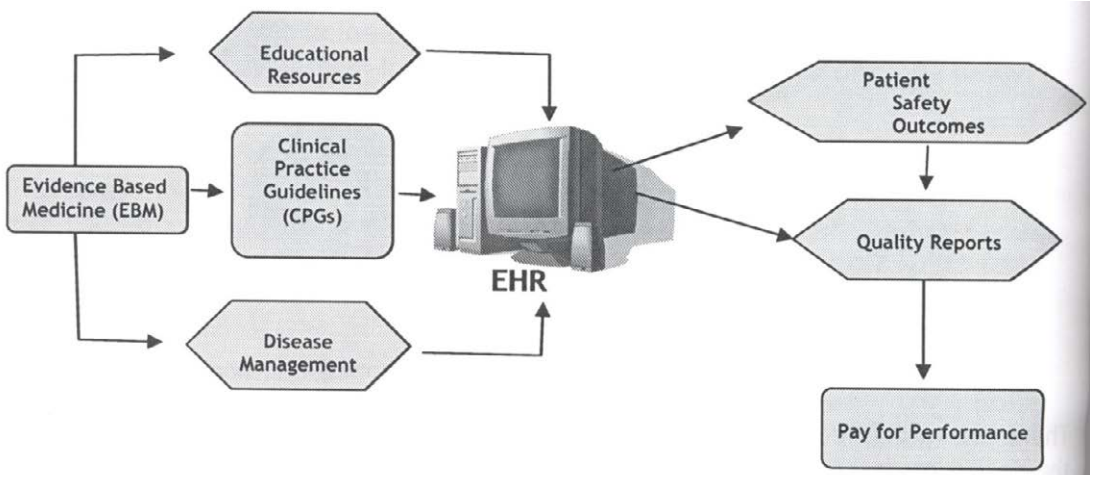

Figure 1: Electronic Health Record Dynamics.

example of interoperability and HIT integration involving pharmacists is the Walgreens Collaborative Network with Immunization Registries [25]. Traditionally, pharmacy immunization records are faxed to physicians or sent by mail. With the electronic network, pharmacists and providers contribute to the assemblage of more complete patient records. Can this be demonstrated to impact patient care in a real world setting? In 2012 it was announced that that all of the 7,800 Walgreens and Duane Reade pharmacies and 350 Take Care Clinics nationwide will use the Surescripts clinical interoperability network to deliver immunization records to the patient's primary care provider [11].

Personal Health Records (PHRs)

While an EHR is created and maintained by the health care provider for the patient, the PHR, or Personal Health Record, is created and maintained by the patient, and this data is something the patient can choose to share with his or her health care provider. Long-term objectives would have the PHR share information with the EHR, and vice versa, with the goal of continuity of care, based upon an efficient sharing of pertinent, complete information [26]. PHRs are being developed to be customized and integrated into existing IT infrastructures and "connect seamlessly" with key Electronic Health Record vendors like Meditech, Siemens, Epic, McKesson, and others [27].

Some prominent online personal health recordkeepers include Microsoft HealthVault, RevolutionHealth, and WebMD Personal Health Record. Microsoft has established early partnerships with large medical centers, including the Mayo Clinic, New York Presbyterian, the Cleveland Clinic, and Beth Israel Deaconess in Boston, and with several big pharmacies and other health care providers, and is expected to continue to partner with additional health care providers [28].

Having an electronic health record controlled by the patient that is accessible, (with his or her permission), to physicians, hospitals, and pharmacists would produce significant improvements in care. The reported benefits include reducing medical errors and potentially restraining high health care costs. Expanding beyond basic MTM services, the potential exists for pharmacists to assist patients with PHRs to manage their health.

There are divergent views on the role of the Personal Health Record (PHR) in health care delivery. On the one hand, some experts contend that PHRs will likely become a valuable component of the primary care Patient-centered Medical Home model. They allow patients access to their health information, provide tools for self-management, and enable a new means of communication with their health care providers [29]. On the other hand, other experts assert that adoption of personal health records involves a "fairly steep learning curve and a change in cultural mindset" prohibitive to widespread adoption. In addition to concerns over privacy, another major obstacle for the adoption of PHR is a lack of motivation among patients to use them unless faced with life-threatening illnesses [30]. These factors no doubt contributed to the demise of the widely-publicized PHR, Google Health, although some HIT analysts feel that Google Health may have been ahead of its time [31].

Evidence exists supporting the value of PHRs in the management of chronic diseases [29], yet "this technology is currently underutilized and represents a major opportunity given the potential benefits of patient engagement and shared decision making" [32]. This suggests that pharmacists should investigate the clinical value of existing PHRs and learn from new PHR products. They should also try to better understand how patients believe their personal health information should be managed.

The Patient-centered Medical Home

Under Health Care Reform, a recognized goal of the U.S. health care system is patient-centered care [33]. A prominent health care model for delivery of patient-centered care is the medical home [34]. As notably expressed by Bates [35], "the medical home is not a physical structure but a fundamental rethinking of the way care should be delivered" [35]. Essential features of the medical home model include primary care that is: patient-centered, comprehensive, team-based, coordinated, accessible, and focused on quality and safety [36]. The medical home model has been well-received by the medical establishment largely because health care delivery may be improved by altering the manner in which primary care is organized and provided.

It goes without saying that HIT, and the EHR in particular, have the ability to support the Medical Home model through management of a patient's health information in digital format. Clinicians have the ability to collect, store, and manage a patient's personal health information. For instance, if questions arise during a patient encounter, accessing the EHR may provide answers with an overall view of the patient's care, including the intent and direction of the other healthcare providers. In addition, a patient's data in aggregate format could be used to detect deficiencies and improve processes and outcomes.

Pharmacists are capable of making significant contributions in the Medical Home model [35], and although the extent of pharmacist involvement in the Medical Home model has not yet been clearly determined, the potential exists for pharmacists to play key roles as team members in medical homes [37].

Health Information Exchange

Whether involving a single practitioner or large-scale hospital system, the implementation of EHRs has proven to be a demanding endeavor. Along with technical challenges, implementation of EHRs on a large-scale involves political, social, and organizational changes. As stated succinctly by Adler-Milstein et al., "An electronic, interconnected regional infrastructure represents the rational approach to handling the volume and specificity of health-related information required to efficiently deliver optimal care…" [38]. One such type of an "electronic regional infrastructure" is known as such as HIOs or Health Information Exchange organizations [39].

For digital health-related information to be moved and shared among healthcare organizations and providers, the format of the information must follow accepted standards. Health information exchange (HIE) is the electronic movement of health-related information among organizations according to nationally recognized standards. The goal of health information exchange is: "to facilitate access to and retrieval of clinical data to provide safer, timelier, efficient, effective, equitable, patient-centered care." HIOs have the ability to move digital clinical information among disparate health care information systems while maintaining the meaning of the information being exchanged.

Most HIOs can be conceptualized as a collection of regional networks known as regional health information organizations (RHIOs). Currently there are hundreds of Regional Health Information Organizations (RHIOs) in the U.S., many of which are now planning EHRs and have yet to share electronic patient data. RHIOs bring

together health care organizations in a defined area and control the exchange of information [39].

An example of an RHIO is FirstNet Exchange, a healthcare organization based in Tyler, Texas [40]. In 2011, the organization received a grant from the state of Texas to develop and operate a secure health information network for 37 counties in northeast Texas. A nonprofit organization, FirstNet Exchange will support and, in turn, be governed by hospitals and clinicians throughout northeast Texas.

Conclusions

Given the potential for pharmacists to engage in a critical role in the treatment of patients with chronic illnesses—as illustrated with discussion of schizophrenia—MTM and HIT offer a major opportunity for expansion of pharmacy services in several distinct patient populations. The addition of HIT tools to MTM provides a powerful model for optimizing the clinical value of MTM. By working collaboratively with physicians and other health care providers, pharmacists help patients better understand their medications in order to get the full benefit of their medication therapy. No greater healthcare need exists for HIT-driven MTM services provided by pharmacists, working with physicians and other healthcare providers, than to help improve therapeutic outcomes, reduce medication errors and adverse drug events, enhance coordination of care, improve patients' overall quality of life, and reduce healthcare costs.

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