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Patient-Centered Chronic Disease Management

A technology-enabled medical home transforms the healthcare experience for both patients and physicians

The University of Missouri-Columbia School of Medicine is refocusing on chronic disease management to ensure successful medical practice. This paradigm shift from acute disease to chronic disease management is an enormous challenge for the healthcare system. However, the needed changes can be made because the necessary technology and expertise are available to transform the present system.

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Partnerships between academic medical centers, industry, and ultimately the practicing healthcare delivery system, are critical to devising successful solutions to effect healthcare advances, just as they have done over the past 100 years. Recently, the University of Missouri School of Medicine and Cerner Corporation partnered to address some of the specific changes in the healthcare system that are required for transformation. Together, we are working to create a specific innovation that we call the "medical home page," which should prove highly useful to all practitioners who manage patients with chronic illnesses.

Our idea is based on the experience of our family medicine residents and faculty working at five teaching clinics, including two that serve rural populations in mid-Missouri. Patient visits at these clinics total nearly 100,000 per year. Our practitioners

Nurse Partner Improves Care

When our colleague, Dr. Steven C. Zweig, conducted a pilot project using the medical home approach, we were encouraged to see clinical evidence that shows assigning a nurse partner has a positive impact on patient care. It also impacts physicians' attitudes toward caring for patients.

Zweig is director of MU's Interdisciplinary Center on Aging and a family physician at our Green Meadows Family Medicine Center. He conducted a two-year study of geriatric patients who were part of a medical home at the clinic.[7] The study followed 155 patients who had a nurse partner assigned to coordinate their care, and a control group of 303 patients who did not have a nurse partner. All patients were 65-plus years old with a similar number of chronic illnesses, medications and functional problems.

The study found that the medical home approach resulted in statistically significant decreases in hospital admissions (12 percent) and visits to the emergency room (17 percent). As a result, cost of care for the study group was lower, and patient satisfaction was higher. Physicians who participated in the medical home also reported a greater willingness to take on patients with chronic illnesses.

Source: Improving Care for the Chronically Ill. University of Missouri-Columbia Family & Community Medicine (www.fcm.missouri.edu), Winter 2007.

witness first hand a national trend in healthcare: The steady decline in the proportion of patients with acute illness and the rapid rise in those with chronic diseases resulting from people living longer.

Today, 45 percent of the U.S. population has a chronic medical condition and about half of those (60 million people) have multiple chronic conditions.[1] Chronic conditions can lead to disabilities, such as hip fractures and stroke, that erode the ability of elderly people to care for themselves. For this reason, our physicians, who are practice-area leaders, propose creating a special page within the electronic medical record (EMR) of an individual patient with a chronic disease. The page presents only the specific information that practitioners need to provide quality care.

Though not curable, illnesses such as diabetes, heart disease and chronic pulmonary disease can be managed effectively to enhance the quality and length of life. Evidence-based treatment protocols ensure quality care because medical innovations occur so rapidly that busy practitioners are challenged to remain abreast of standards of care. The traditional approach to patient care—in which doctors typically have a 15-minute appointment to interact with the patient, note symptoms and recommend treatment—does not adequately support practice needs.

To meet the challenge of caring for an aging population with chronic conditions, we need a fundamental shift in how healthcare is delivered. That is why MU has adopted a new approach to care which we refer to as the medical home for patient-centered care. Patients have personal physicians who are responsible for their care throughout their lifetimes wherever possible. The personal physician, in turn, leads a team of healthcare professionals who all play important roles in delivering total care to meet all patient healthcare needs efficiently and at the lowest possible cost.

In this model, the EMR is a critical component. As the repository for a patient's entire medical history, the EMR is accessible online to all members of the medical

team. It is a powerful search tool which allows practitioners to query the record and gather information at any accessible site within the health system or from remote sites. However, the available EMR still presents the clinician with an overwhelming amount of data, and requires too much time for access of routinely needed medical information for follow-up outpatients with chronic diseases. To address this barrier, our proposed "medical home page" within the EMR provides only the information needed for management of patients with chronic illnesses.

While the MU-Cerner partnership focuses on emerging information technology, it is similar to the more traditional relationships between academic medical centers and industries. In recent decades, such partnerships have facilitated the discovery, development and distribution of antibiotics, vaccines and other medical breakthroughs. These breakthroughs have contributed to significant reductions in mortality from acute disease and a 30-year increase in the human lifespan. The MU-Cerner partnership attempts to build on this recent progress by using new tools to address the most prevalent threat to human health—chronic illness.

The medical home model

The primary goal of healthcare is to provide patients with safe, evidence-based care that is patient-centered, efficient and equitable. The medical home model is a useful way to improve the practice of family medicine so that we can achieve our patient care goal. Introduced in 1967 by the American Academy of Pediatrics as a concept for archiving medical records,[3] this model has since been refined through research and practice by the family medicine community to become an operational model with several core characteristics.

Above all, the medical home is a patient-centered team approach to the delivery of care. The Future of Family Medicine Project, an initiative of the American Academy of Family Physicians and six other national family medicine organizations, proposed a team approach as one of the core values for a new model of practice, recognizing that the family medicine physician or internist charged with primary care cannot manage chronic illnesses alone.[4] We now recognize that a team of healthcare professionals provides more efficient and cost-effective care. The team includes the primary care and specialist phsyicians, nurses, dieticians, mental health professionals and health educators.

Characteristics of a Medical Home

Personal physician provides continuous, comprehensive care

Medical team takes collective responsibility

Whole-person approach covers all stages of life

Coordinated care is facilitated by healthcare IT

Quality and safety are the hallmarks

Enhanced access encourages team communication

Payment recognizes value added

Source: American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. Joint Principles of the Patient-Centered Medical Home. AAP National Center of Medical Home Initiatives for Children with Special Needs (www.medicalhomeinfo.org), March 2007.

Newly recognized team members include the EMR and the patient. The primary care physician leads the team and coordinates patient care within the healthcare system.

In the medical home, patients assume ownership of their chronic illnesses and actively participate in their own care. They learn how to monitor and report blood pressures and glucose levels, for example, and to use a personal health record to track these values. The medical home team offers support and guidance to help patients navigate the complex healthcare system and obtain appropriate services.

The medical home model also provides for accessible, continuous and comprehensive care. By removing barriers to accessing healthcare, such as restrictive health insurance provisions, this new model enables practitioners to help patients manage chronic conditions even when they are not in the office. This model recognizes that quality healthcare can be delivered in a variety of settings according to the needs of the patient.

Finally, the medical home model calls for the use of advanced information technology, including EMRs, to inform the process of chronic condition management.

The medical home page

To make the best use of the limited time available during an office visit, the medical home team needs an executive summary of the patient's condition. The medical home page will serve this purpose and more. It plots critical data such as blood pressures, glucose levels and lab results over time, so that practitioners can quickly spot trends that indicate the need for a change in treatment protocol. Instead of thumbing through a bulky paper chart or clicking through an EMR that totals hundreds of pages, physicians find the information they use during every clinic visit with just one or two clicks.

The medical home page also recaps the patient's current medications and dosages, which are continuously updated by the pharmacy filling the prescriptions. If new medications are prescribed, side effects, counter indications and drug interactions are automatically displayed, providing an added layer of protection. Prescriptions are ordered electronically, reducing errors associated with illegible handwriting. As part of the medical home team, the pharmacist then double checks standard dosages and realizes at once if a mistake has been made.

When a new treatment is warranted, the medical home page provides one-click access to information about the most current standard of care.

When a new treatment is warranted, the medical home page provides one-click access to information about the most current standard of care and recent changes in evidence-based therapies. In this way, the personal physician has the virtual support of the entire medical community of experts while determining the best course of action for the patient. The medical home page alleviates the burden of trying to remember every new discovery that is made in the treatment of dozens of chronic diseases.

Specialists and other healthcare providers with whom the patient consults can also be given access to the medical home page and quickly get up to speed on the patient's

current condition. They enter their own observations and recommendations into the record, and this information is instantly accessible to the entire medical home team.

Perhaps most critical of all is the patient's own input to the medical home page. Patients who monitor their glucose level, blood pressure or other markers record this data directly into the EMR, rather than calling in or faxing the information to the doctor's office. Then, this data is automatically plotted on the medical home page.

Each time a patient returns to the personal physician for a follow-up visit, the medical home page reveals the latest surrogate marker trends, lab results, prescriptions and specialists' reports—delivering the information electronically, on one or two pages, at the point of care. Preventive care and health maintenance reminders ensure the team does not lose sight of the "whole patient" while focusing on the chronic condition. Ultimately, the medical home page allows physicians to spend less time searching for information and more time interacting with patients.

Future of chronic condition management

If the medical home approach is truly effective and efficient, patients will require fewer face-to-face encounters with the healthcare team. Instead of an expensive office visit or trip to the emergency room to manage a worrisome symptom, patients will consult the medical home team through a direct phone line or secure messaging system and get the needed guidance to alleviate their anxiety. We've seen this in our own clinics, where nurse partners help coordinate patient care.

In the future, primary care physicians will spend more time focusing on leading the medical home team. The majority of patient communications will be electronic, so that the team is available for consultation and on-going problem-solving, rather than for 20 minutes every three months. The fee-for-service model will be replaced by a payment system that recognizes the value of the medical home approach.

The medical home page will also aid in overall practice management by generating "work lists"—lists of patients who are not doing as well as we would like, and whose

Preparing Personal Physicians

MU's family medicine residency program is one of only 14 residency programs in the United States to participate in the "P4: Preparing the Personal Physician for Practice" initiative, a five-year project to inspire and evaluate innovations in family medicine training.[8]

Participants in the initiative attempt new training techniques through a curriculum focused on futuristic delivery of patient care. We use "virtual patients" to teach residents how to monitor symptoms, order tests, receive results, diagnose conditions, recommend treatment and evaluate outcomes. Residents also spend more time caring for patients in an outpatient office setting, where they learn innovative ways to manage chronic illnesses using electronic medical records.

The P4 initiative is coordinated by TransforMED, an affiliate of the American Academy of Family Physicians, in partnership with the Association of Family Medicine Residency Directors and the American Board of Family Medicine. The virtual patient is a joint project of MU and Cerner Corporation.

Source: MU Family Medicine Residency Chosen for P4 Initiative. University of Missouri Health Care News Release (www.muhealth.org/news), March 1, 2007.

progress we should monitor closely to ensure outcomes that meet benchmark parameters. It will also record risk factors and prompt physicians to order appropriate preventive services. The EMR itself will become an essential member of the medical home team, making it easier for physicians to do the right thing for their patients, and making it hard to do the wrong thing.

At MU, we're discovering ways to improve healthcare so that physician interactions with patients are relevant to their medical condition and their emotional support. We want our patients to feel that their providers care about them, and that caring interactions are not lost for the sake of time spent record keeping. This affects the physician experience as well. As fewer medical residents choose primary-care internal medicine—the number of residents declined 46 percent from 1999 to 2004[5]—it is essential to make the practice of primary care attractive and rewarding.

The medical home page can help make this possible. Of course, there are challenges associated with any new technology. For example, we need to enable the busy practitioner to enter data into the EMR quickly and efficiently. Physicians who are slow typists require a voice-activated system that allows them to dictate information in response to prompts to complete each field or rapid turnaround transcription. Patients who are unable or prefer not to use the technology also must be accommodated.

As it stands now, the medical profession is not doing a good enough job managing chronic disease. This is the catalyst for change. At MU, our practitioners in primary care and other specialties have embraced the medical home model and seen measurable improvements. By teaming with Cerner's EMR experts, we are making rapid progress toward developing a medical home page that will be a fundamental component of healthcare delivery. As partners in this research, our goals are aligned: delivery of quality care that is patient-centered and safe. TCQ

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One of the most respected pediatric cancer investigators in the country, Dr. William Crist is among the scientists credited with dramatically increasing survival rates for children with leukemia. A 1969 graduate of the University of Missouri-Columbia School of Medicine, Dr. Crist returned to the school as dean in September 2000. He has since led unprecedented growth in the recruitment of physicians and scientists, research, construction and fundraising. His leadership also has resulted in an innovative effort to integrate continuous quality improvement into the curriculum and patient care. Dr. Crist previously served at the Mayo Medical School in Rochester, Minn., where he was chair of pediatric and adolescent medicine. Prior to Mayo, he served as the leader of pediatric hematology and oncology at St. Jude Children's Research Hospital in Memphis, Tenn., and at the University of Alabama in Birmingham. In addition, Dr. Crist has held leadership posts with several national pediatric cancer research groups. He was founding chair of the Children's Oncology Group, an organization that designs and directs clinical trials for children with cancer throughout North America and beyond.

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Harold Williamson Jr., MD, leads MU's Department of Family and Community Medicine, which is consistently ranked among the top three family medicine programs by U.S. News and World Report. After graduating from Case Western Reserve University Medical School in Cleveland and completing residency training at the University of Minnesota in Minneapolis, Dr. Williamson enrolled in MU's Robert Wood Johnson Academic Family Practice Fellowship Program. He was a member of the first class of fellows to graduate in 1982 and has since served on MU's family medicine faculty. During the past 25 years, Dr. Williamson has excelled as a clinician, scholar and rural health advocate. He served a year as a visiting scholar at the University of Washington in Seattle, where he helped rural communities develop health care services. Back at MU, he co-authored two successful grant proposals that led to the establishment of the Missouri Telehealth Network and the MU Area Health Education Center (MU-AHEC). He served as medical director of MU-AHEC for 11 years, and from 1993 to 1997, he served as director of the School of Medicine's Rural Health Education Initiative. Dr. Williamson was appointed department chair in 1998. In 2005, he was named president elect of the Association of Departments of Family Medicine.