The Patient-Centered Medical Home: A "new" Model for health care

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This is to acknowledge that Lynne Kirk, M.D. has not disclosed any financial interests or other relationships with commercial concerns related directly or indirectly to this program. Dr. Kirk will not be discussing off-label uses in her presentation.

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Dr. Kirk's interests include clinical prevention, medical education, and health policy.

Case:

Dr. K, a 56-year-old internist arrived at her office this morning and opened the electronic medical record (EMR). More than 100 of her diabetic patients had transmitted (in graphic form) their blood glucose measurements from the previous week. Those who had not stayed within their optimal ranges had been automatically forwarded to the diabetic nurse clinician who had adjusted therapy based on a protocol that Dr. K's four-internist group had developed. Dr. K quickly reviewed these orders and added her approval. The dietician will e-mail the recommended changes to the patients and answer any questions on their diets. Similar information was available and had been acted upon for hypertensive patients monitoring their blood pressures, anticoagulation patients monitoring their INRs at home, and congestive heart failure patients monitoring their daily weights. She reviewed and approved these also.

There was a secure email from the hospitalist for her group summarizing the inpatient care of a patient Dr. K cares for with lupus nephritis, who is being discharged today. The message contained appropriate data for the follow-up care required for the patient. This information had also gone to the patient's nephrologist and rheumatologist who had added recommendations for the patient's care. An appointment for the patient with Dr. K was automatically scheduled and transmitted to the patient.

Dr. K reviewed her schedule for today. Two patients had made appointments online in the slots she keeps open for acute problems. The first patient had self-scheduled the previous evening. He had a sore throat and was concerned that he had bacterial pharyngitis. When he had made his appointment, the EMR had prompted him to enter his chief complaint and several symptoms. Based on these, he had met the criteria (based on the EMR's evidence-based clinical decision support tool) for an office visit and a rapid strep screen. This information will be available to Dr. K when she sees him, thus facilitating the appropriate use of antibiotics.

The remaining patients had scheduled visits for follow-up of chronic medical problems. In addition to the patients with acute or chronic problems that she will see, the nurse practitioner with whom she practices will see several patients for health maintenance, and chronic and acute care. For any who are unstable or more complex, Dr. K has open schedule time to consult with the nurse practitioner and see the patient.

Furthermore, Dr. K's evidence-based patient care is automatically documented, de-identified when appropriate, and aggregated to satisfy all billing and quality reporting requirements. At appropriate intervals aggregate data is provided to the appropriate agencies for maintenance of Dr. K's certification and licensure.

What I've described above is not exactly how my practice operates today, but is what I would like it to be for myself, the professionals with whom I work, and our patients. As physicians, especially in primary care, we are frequently frustrated because we don't have the

time, resources and support for the care we provide to our increasingly ill and aging patient population. Our current health care reimbursement system rewards greater volume but not necessarily quality of care. It doesn't reinforce the development of delivery systems that facilitate coordination of care or care for chronic diseases that require significant time outside of the patient visit.

For the first time in over a decade, public and political sentiment is focusing on the need to improve the American health care system. Widespread public concern about high and rising health care costs and increasing evidence that the quality of care in the US varies greatly has put health care reform near the top of the domestic policy agenda for the foreseeable future. Recent polls of the US adult population have found that health care for the uninsured and slowing the increases in health care costs are a priority with the public. [1] (Figure 1)

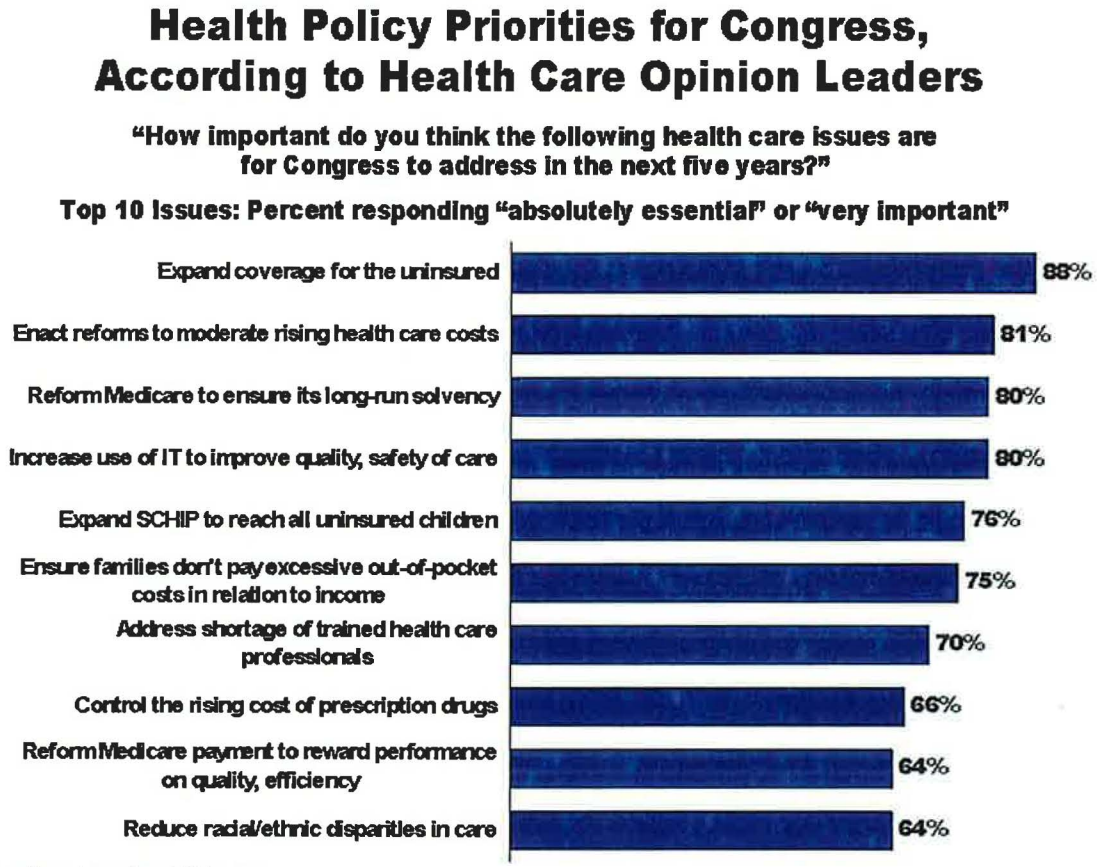


Figure 1.

Improving the US health care system was a major focus of discussion in the recent presidential election. Both parties' candidates developed fairly specific ideas for health care reform. Many of these ideas focused on mechanisms for overall financing of health care.

However both candidates also focused on health care costs and ways to reduce them. They agreed that increased prevention and better control of chronic disease are important components to address rising health care costs.

One of the proposals for payment and delivery system reform is that of the medical home, now defined as the Patient-Centered Medical Home (PCMH).[2] Since the definition of the joint principles in March of 2007, the PCMH has gained significant momentum in both the public and private sectors.

Why do we need to consider new systems of care?

Health care costs

Health care expenditures in the US continue to increase faster than our economy, consuming a greater and greater portion of gross domestic product (GDP). They surpassed 2 trillion dollars in 2006, accounting for 16% of our GDP.[3] The amount we spend on health care per capita ($7064 in 2007) is close to twice that of comparable developed countries.[4] (Figure 2)

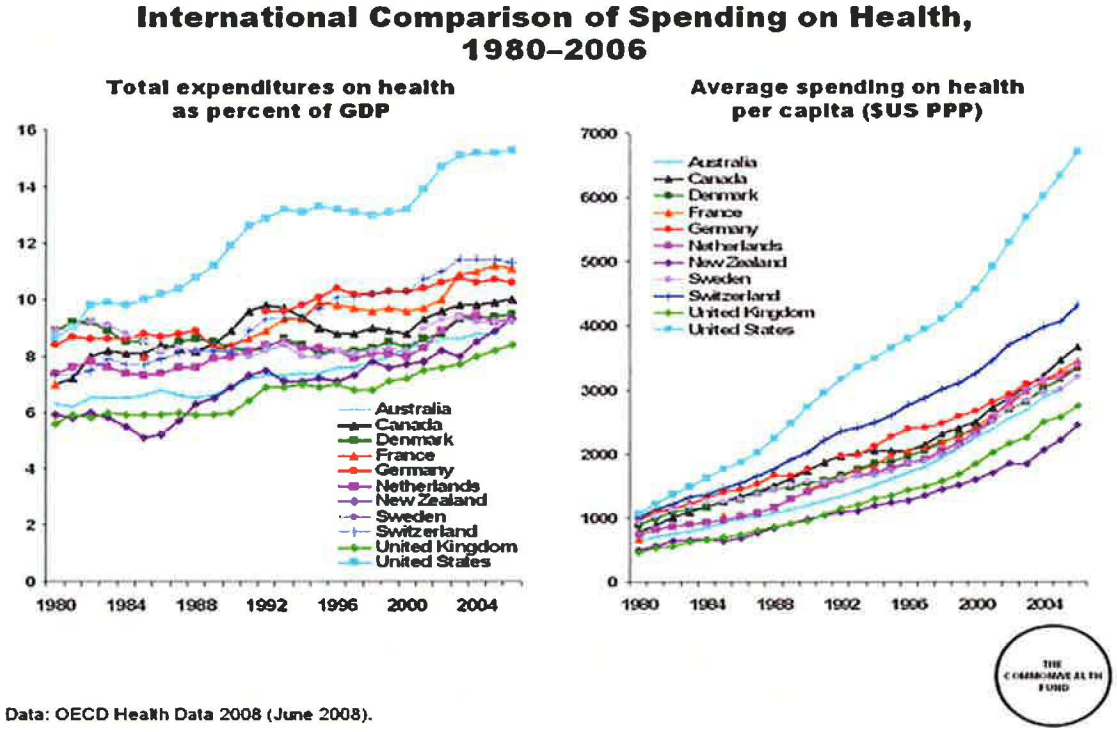
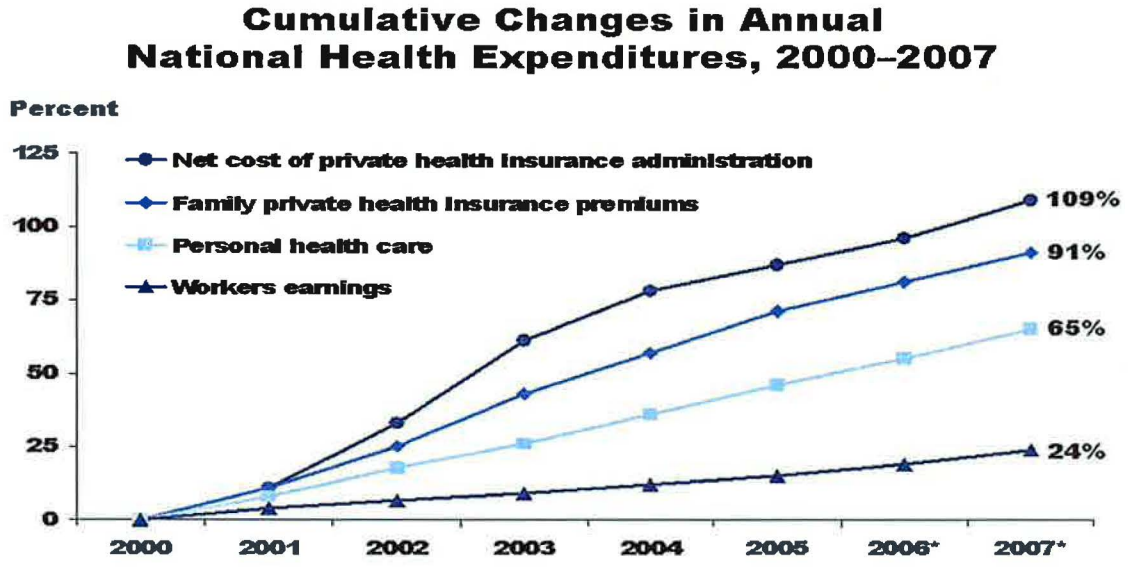


Figure 2.

The ability to meet these rising costs is exacerbated by declining employer-sponsored health insurance coverage and steadily rising health insurance premiums. Even before the recent economic downturn, the portion of earnings required to pay for employer-sponsored health

insurance was increasing significantly. From 2000 to 2006 average health insurance premiums rose 91%, while earnings only rose 24%.[5] (Figure 3)



Notes: Data on premium increases reflect the cost of health insurance premiums for a family of four/the average premium increase is weighted by covered workers. * 2006 and 2007 private insurance administration and personal health care spending growth rates are projections.
Sources: A. Catlin, C. Cowan, S. Heffler et al., "National Health Spending in 2005: The Slowdown Continues," *Health Affairs*, Jan./Feb. 2007 26(1):143–53; J. A. Poisal, C. Truffer, S. Smith et al., "Health Spending Projections Through 2016: Modest Changes Obscure Part D's Impact," *Health Affairs* Web Exclusive (Feb. 21, 2007):w242–w253; Henry J. Kaiser Family Foundation/Health Research and Educational Trust, *Employer Health Benefits Annual Surveys, 2000–2007* (Washington, D.C.: KFF/HRET).

Figure 3.

Despite this increasing health care spending, 47 million Americans remain uninsured and many millions more are underinsured.[5] (Figure 4)

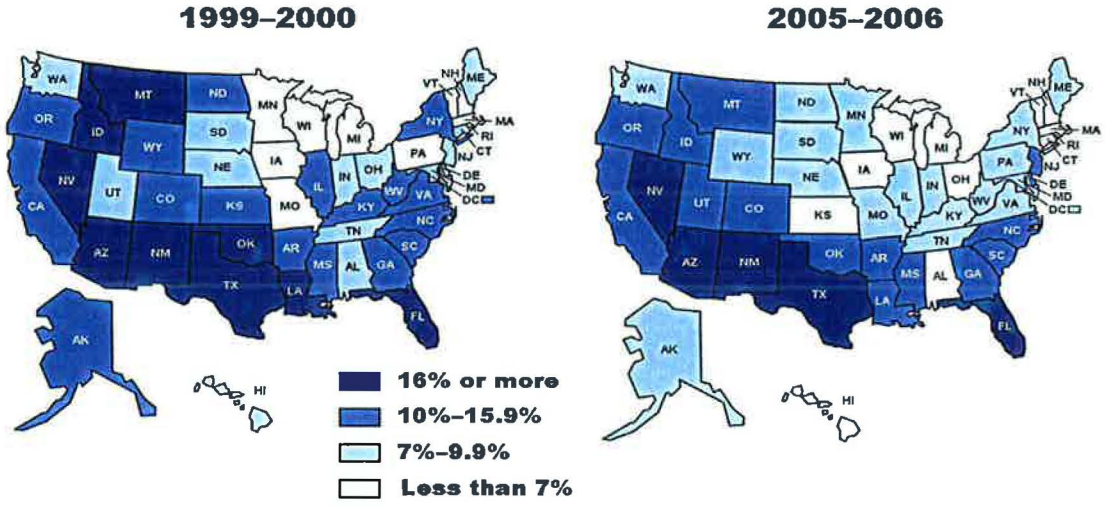


Figure 4.

These increased expenditures for health care in many cases purchase increasingly effective interventions to control diseases and their complications. They also reflect the aging of our population and the increased numbers of people living with chronic illness. However some of these expenditures reflect inefficiencies in our health care system leading to duplication and the provision of higher cost interventions than are warranted. This is contributed to by a reimbursement system based on a payment model that encourages the delivery of fragmented, high volume, high cost care. Our health care expenditures could be reduced if we were to better align incentives to achieve optimal outcomes and effective cost-control.

Gaps in quality of health care

Despite these ever higher health care expenditures, by most measures our health care system does not provide the best available outcomes. One example is deaths before the age of 75 that could be averted with optimal medical care.[6] These figures include portions of deaths due to diabetes, stroke, and heart disease. Between 1998 and 2003, the US actually worsened, becoming last among the developed nations. (Figure 5)

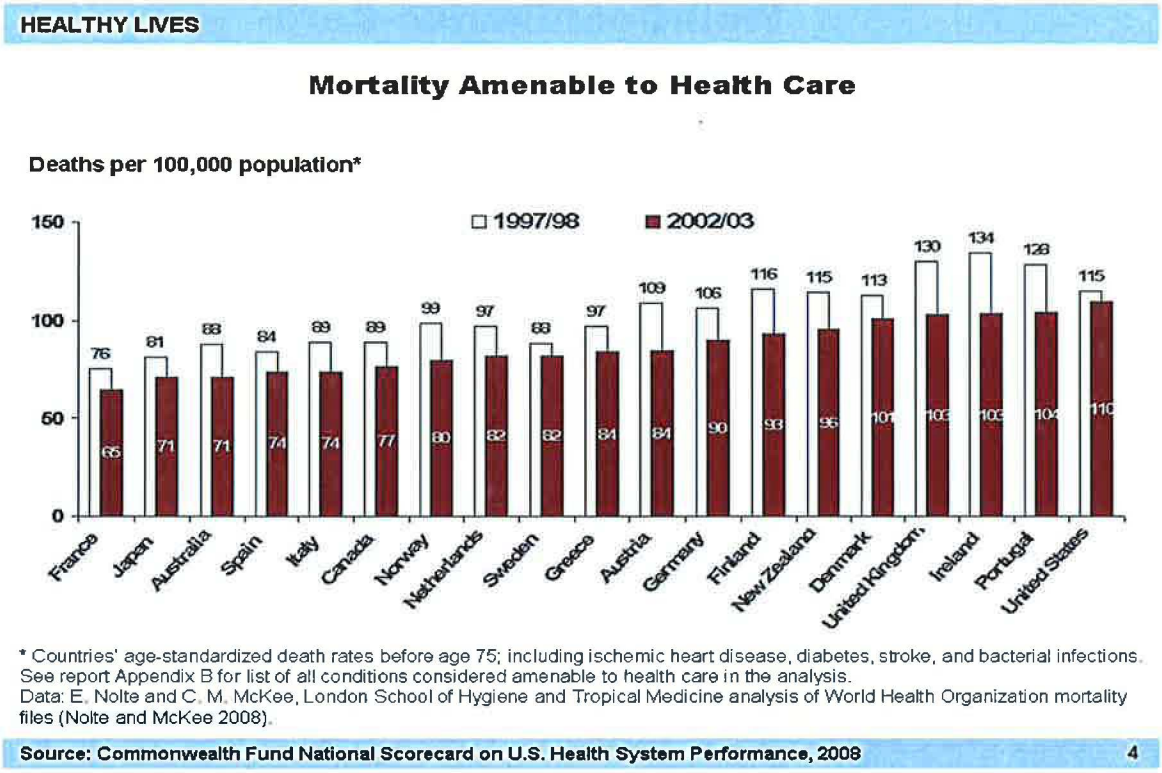


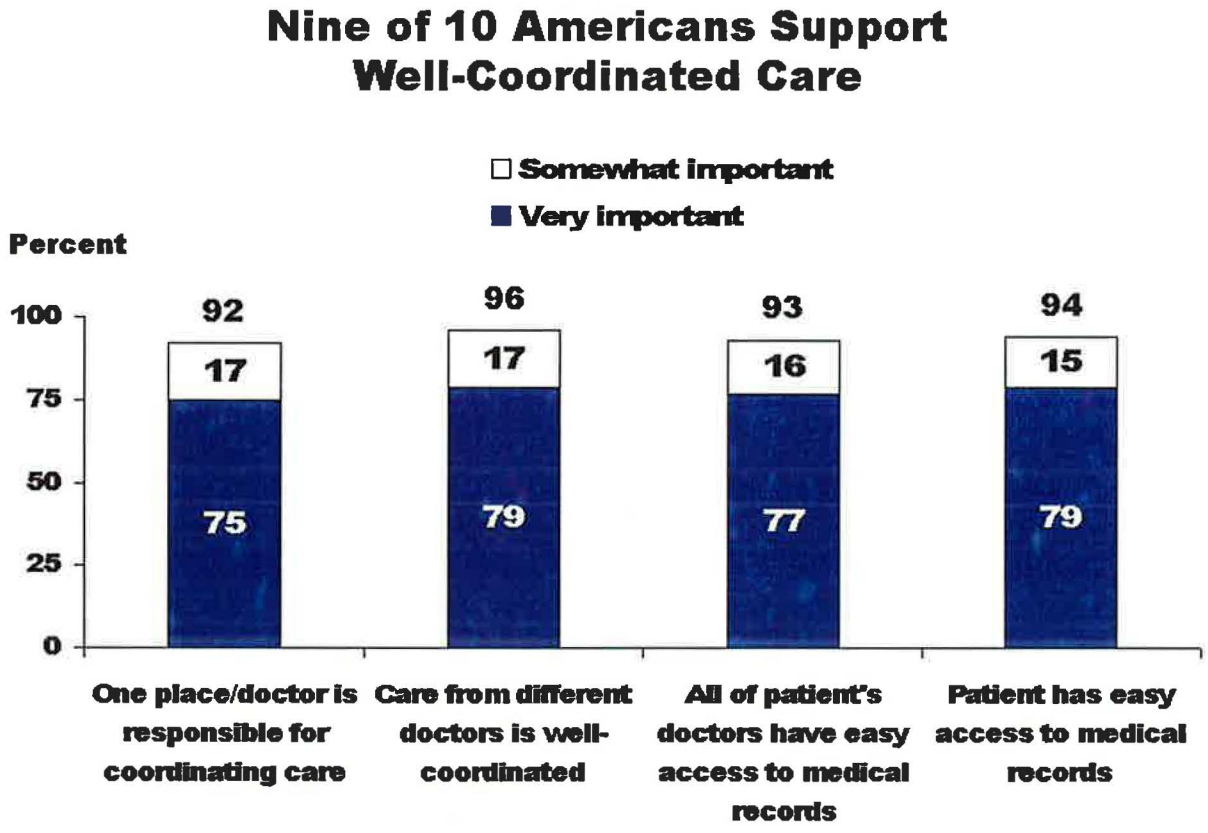
Figure 5.

In its landmark report, *Crossing the Quality Chasm*, the Institute of Medicine pointed out that all too often the care delivered to patients in the US health care system is not the best care

possible.[7] They propose six aims to create a more optimal health care system. Health care should be safe, effective, patient-centered, timely, efficient, and equitable. These aims should be explicitly addressed as new health care models are developed.

Patients' perceptions of care

Patients are frustrated with the fragmentation and lack of coordination that they experience with their own health care. They are challenged in trying to find the right care on their own in an ever more complex health care system. They are frustrated by having to repeat their medical history whenever they enter the health care system and not having the records available that document their previous care and tests. When given different advice by different providers (and the media's interpretation of the medical literature), they don't know where to turn to find out what is right for them. They want all their medical information in one place and easily accessible to themselves and all the health professionals providing their care.[8] (Figure 6)



Source: Commonwealth Fund Survey of Public Views of the U.S. Health Care System, 2006.

Figure 6.

Primary care

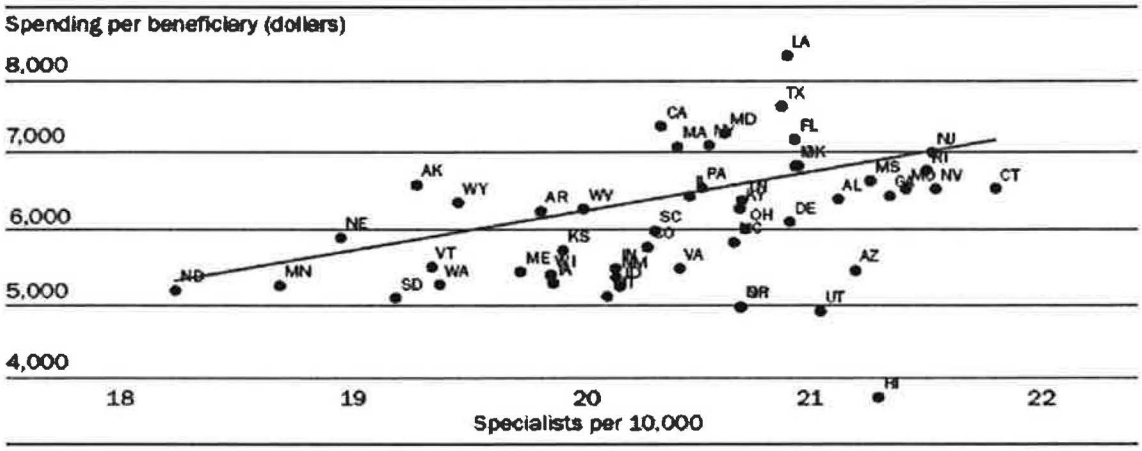
In comparing health care systems among countries and within regions of the US, several investigators have accumulated evidence to suggest that a higher portion of primary care improves outcomes and reduces costs. [9] Barbara Starfield and her colleagues have reviewed this evidence. [10] They looked at several perspectives of primary care including the supply of primary care physicians, outcomes of health for people who identified a primary care physician as their source of care, and the link between the receipt of primary care services and health status. They mainly used studies about health care in the United States.

They found that residents in states with a greater supply of primary care physicians (number of primary care physicians per 10,000 people) had better health care outcomes. These outcomes included lower rates of all cause mortality and mortality from heart disease, cancer and stroke. Residents in these states also reported better health status. All of these outcomes were controlled for sociodemographic measures and lifestyle factors.[11 12 13 14 15] Similarly improved outcomes were noted for infant mortality and the portion of infants with low birth weight. In England each additional primary care physician per 10,000 people in a region is associated with a 6 percent decrease in mortality.[16]

A nationally representative survey of US adults found that those who reported having a primary care physician as their source of care had lower subsequent five-year mortality after controlling for health status, demographics, and health insurance status. [17] Populations served by federally qualified community health centers in the US, which emphasize primary care, are healthier than similar lower socioeconomic populations who receive care in other types of physicians' offices. [18] Higher ratios of primary care access in this country also seem to be associated with reduced disparities for disadvantaged populations. [13] Other countries have tracked outcomes after significant investments in primary care services. Spain established a network of primary health care centers and showed reduced mortality associated with hypertension and stroke in those areas in which the centers were first available. [19] Even Cuba has reorganized its health care system to improve access to primary care and its infant mortality rates are now the same as those in the US. [20]

Increased supply of primary care physicians in a state within the US is associated with lower total costs of health care. This may be related to increased provision of preventive health services and decreased hospitalization rates. [17] In analyzing Medicare spending, Baicker and Chandra [21] showed increased primary care physician supply resulted in decreased spending and better quality of care (Figures 7 and 8).

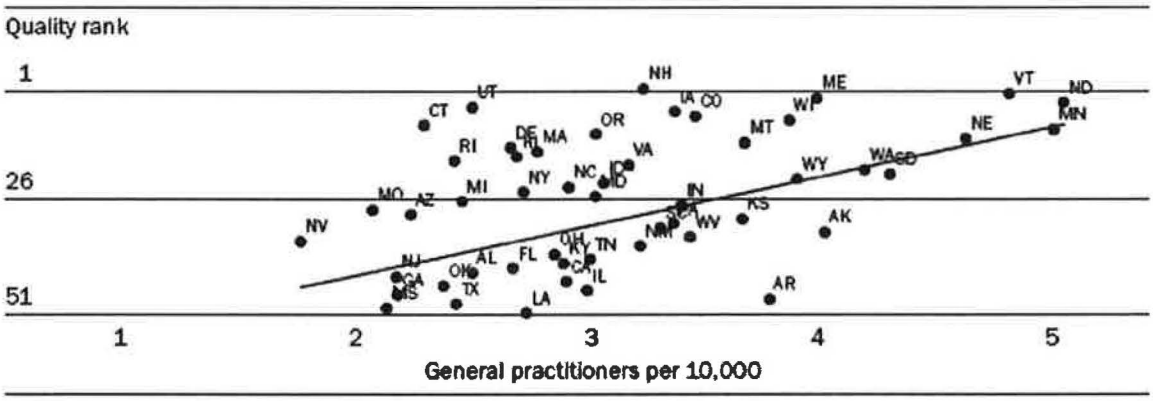
EXHIBIT 7
Relationship Between Provider Workforce And Medicare Spending: Specialists Per 10,000 And Spending Per Beneficiary In 2000



SOURCES: Medicare claims data; and Area Resource File, 2003.
NOTE: Total physicians held constant.

Figure 7.

EXHIBIT 8
Relationship Between Provider Workforce And Quality: General Practitioners Per 10,000 And Quality Rank In 2000



SOURCES: Medicare claims data; and Area Resource File, 2003.
NOTES: For quality ranking, smaller values equal higher quality. Total physicians held constant.

Figure 8.

Despite these improved outcomes with increasing supply of primary care physicians, over the past decade there has been a marked decline in interest among students and residents in entering primary care fields. [22] Figure 9 shows data on internal medicine residents planning careers in general internal medicine.

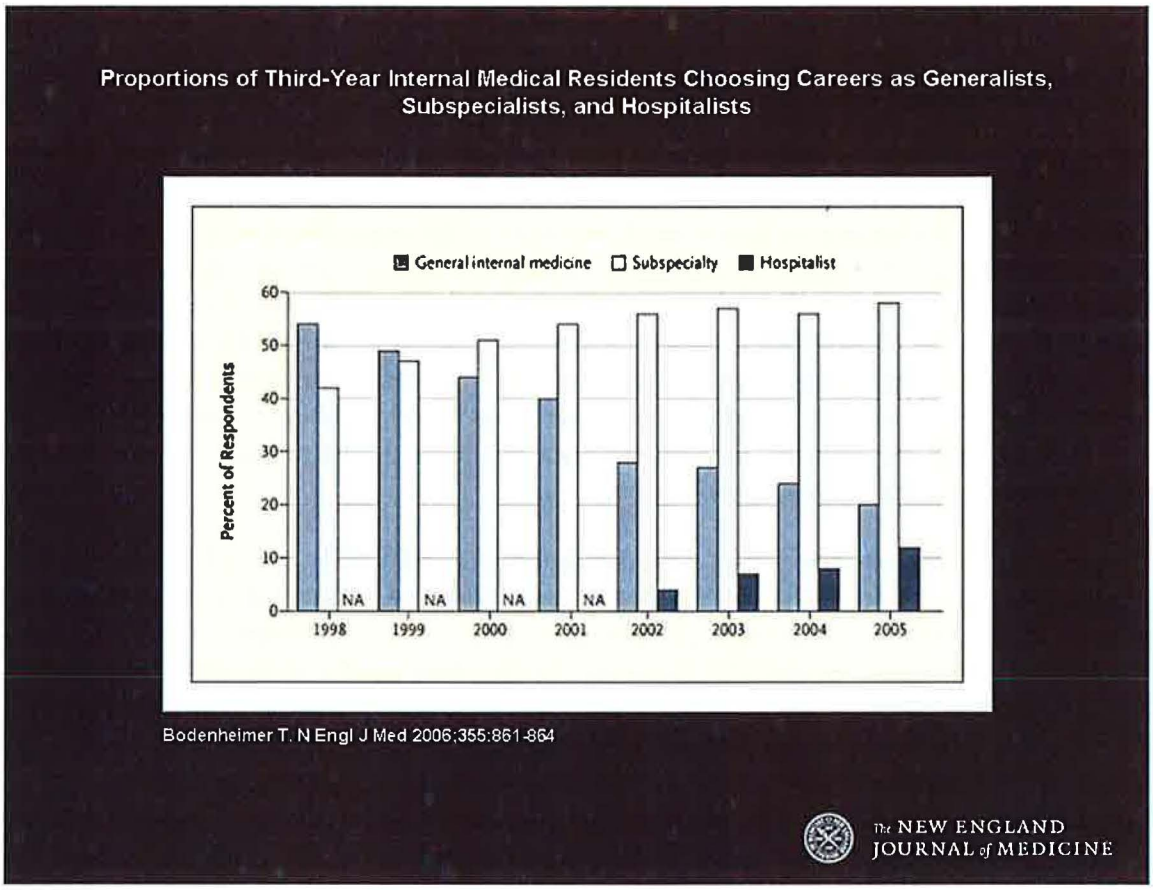


Figure 9.

Data from a recent survey suggests that this declining interest in primary care careers is decreasing even further among US medical students now entering the pipeline for medical careers. [23] In this survey of 1200 fourth year medical students, only 2% were considering careers in general internal medicine. Most surveys of students and residents indicate concerns about the ability to have a balanced lifestyle working in a primary care specialty. Students completing medical school generally have high levels of educational debt. Anecdotal accounts suggest that students initially attracted to primary care careers are dissuaded by the relative lower rate of compensation compared to most non-primary care specialties.

This decline in physicians entering primary care comes at a time when the aging of our population and the numbers of people living with chronic disease would suggest that the need for primary care physicians is great and increasing significantly. This has been particularly true in states, such as Massachusetts, that have implemented legislation that broadly increases residents' access to health care. Tom Lee, network president at Partners Healthcare System in Boston, has opined that "Revitalization (of primary care) will take something more like reinvention".[24]

Demographic and chronic disease changes

The spending growth for Medicare from 1987 to 2002 can all be accounted for by coverage of beneficiaries with five or more health conditions. [25], [26] This role of increasing costs of treatment for chronic diseases by Medicare is mirrored in the expenditures by private payers. Many approaches have been tried to provide cost-effective care to patients with chronic illnesses. Examples include programs called by names such as disease management, chronic care management, and case management. Many of these programs, sponsored by payers, operate independently of these patients' source of health care. [27] Assessment of outcomes of disease management programs in pilot studies by Medicare have failed to reveal improvement or lower cost. [28] The Chronic Care Model, discussed below, has been shown to improve outcomes for chronic diseases, while reducing overall costs.

If models of health care could be developed that increased quality and efficiency, the current financial resources used for health care in this country could be broadened to cover a larger part of the population, many of whom are currently uninsured. Such new models should organize health care to make it easy for patients to access the care they need and for physicians and other providers to deliver the best care possible. Bergeson and Dean [29] have proposed four specific changes to make health care more patient-centered, along the lines recommended by the IOM. [7] These include: 1) improving access and increasing continuity; 2) increasing patients' participation in care; 3) supporting patient self-management; and 4) increased coordination of care. One such promising model that is gaining currency is the Patient-Centered Medical Home (PCMH).

History of the Patient-Centered Medical Home concept

Several concepts first defined in the late 1960's and the 1970's have converged in the contemporary definition of the PCMH. The first use of the term "medical home' was by the American Academy of Pediatrics (AAP). [30] The AAP Council on Pediatric Practice used the term in a 1967 publication, *Standards of Child Health Care*. [31] They were referring to a central source of a child's pediatric records for children with chronic or disabling conditions. The AAP revisited the concept of "medical home" in 1974 and in 1977 adopted a statement that "quality care is best provided when all a child's medical data are together in one place, (a medical home) readily accessible to the responsible physician or physicians." [32]

This early application of the term "medical home" occurred shortly before the concept of primary care was defined in the United States. As early as the 1920's, the Dawson Report in the United Kingdom mentions 'primary health care centers" as a goal for regionalized services in that country. [10] In the US the Institute of Medicine in 1978 defined primary care as "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community". [33] The World Health

Organization in 1978 identified four main features of primary care services: 1) first contact access for health care needs; 2) long term person-focused care; 3) comprehensive care for most health care needs; and 4) coordination of care when it must be sought elsewhere.[34]

Chronic care model

Ed Wagner working with Group Health Cooperative of Puget Sound developed a model of care to improve the care for patients with chronic illness. [35], [36] This Chronic Care Model (CCM) acknowledges that care for chronic illnesses takes place within three overlapping spheres, the community with its resources and policies, the health care system, including payment for health care, and the clinical site caring for the patients. Wagner identifies the following six essential elements for improved organization of care within these spheres.

1. Community resources and policies
2. Health care organization
3. Self management support
4. Delivery system design
5. Decision support
6. Clinical information systems

The interactions of these elements within the Chronic Care Model are depicted in Figure 10.

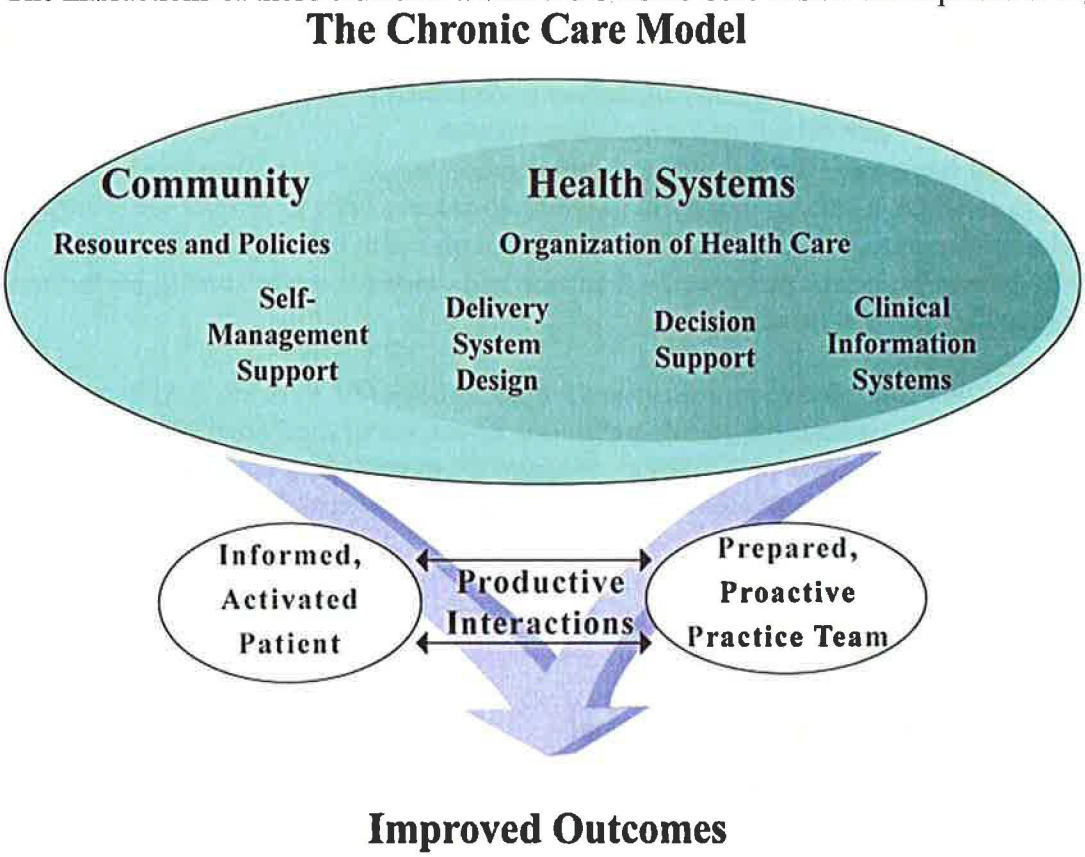


Figure 10.

Bodenheimer, with Wagner and colleagues studied outcomes of caring for chronic diseases in systems that incorporated the components of the Chronic Care Model. [37] They found improvements in outcome and reduced costs in the care of patients with diabetes, asthma, and congestive heart failure.

The American Academy of Family Physicians (AAFP) undertook a project in 2000 to define the Future of Family Medicine. In that process, they described the medical home as a model for the provision of care for family physicians. [38] The American College of Physicians (ACP) defined the "Advanced Medical Home" in a position paper in early 2006 as a model that showed promise in improving health care outcomes, especially for chronic diseases. [39] The key attributes for the Advanced Medical Home as defined by ACP are practices that:

- Use evidence-based medicine and clinical decision support tools to guide decision making at the point of care based on patient-specific factors.
- Organize the delivery of care according to the Chronic Care Model to provide enhanced care for all patients.
- Create an integrated, coherent plan for ongoing medical care in partnership with patients and their families.
- Provide enhanced and convenient access to care not only through face-to-face visits, but also via other modalities, i.e. telephone, email, online electronic health records.
- Identify and measure key quality indicators to demonstrate continuous improvement in health status for individuals and populations treated.
- Adopt and implement the use of health information technology to promote quality of care, to establish a safe environment in which to receive care, to protect the security of health information, and to promote the provision of health information exchange.
- Participate in programs that provide feedback and guidance on the overall performance of the practice and its physicians.

In March of 2007 four physician professional organizations (ACP, AAP, AAFP, and the American Osteopathic Association) jointly published Principles of the Patient-Centered Medical Home. [2] They set forward these principles as an approach to providing comprehensive primary care for children, adolescents, and adults. The principles for practices that function as medical homes include the following:

- A personal physician
- A physician directed health care team
- A whole person orientation
- Care that is coordinated and/or integrated
- Quality and safety are hallmarks of care
- Enhanced access
- Payment supporting the model

The Center for Studying Health System Change has defined the common attributes across the PCMH and the chronic care model as a tool for informing a process to identify which practices

would qualify as medical homes. [40] These practice characteristics would focus on processes that ensure that care is accessible, continuous, coordinated, and comprehensive. (Table 1)

Table 1

Commonalities Between the Physician Societies' Joint Principles, the Primary Care Model and the Chronic Care Model that Can Guide Measurement of the Patient-Centered Medical Home (PCMH)

PCMH Elements as Outlined by the Physician Societies' Joint Principles[1]	Capabilities related to this PCMH Element from the Joint Principles, the Primary Care Model & Chronic Care Model
Accessibility of the practice PCMH is an accessible point of entry into the health care system each time new care is needed (i.e. first contact care).	• Open scheduling.[4,19,20] • Ease of making appointments and wait times.[2] • Expanded hours.[2,4] • Options for patients to communicate with personal physician and office staff.[4] • 24-7 phone coverage.[2,4]
Continuity of care "Each patient has an ongoing relationship with a personal physician in the PCMH." Person-focused (not just disease specific) care over time.	• Each patient has an identifiable primary care clinician for ongoing care.[2,4,5,13] • Patient is able to make appointments with that particular clinician.[2,5,13] • Discussion about PCMH role and expectations with the patient—Discussion between personal physician and patient on the roles and expectations for the medical home, including making visible to the patient who the team members are.[2,21,22] • Registry of patients.[2,4,6] PCMH has a list of patients for which it is responsible. • Complete medical records are retrievable and accessible.[2]
Coordination of care "across all domains of the health care system."	• PCMH coordinates care that patients receive from other providers (e.g. specialists, hospitals, home health agencies to assure that patients get the indicated care when and where they need and want it, including medication review and management.[2,5,14,23] • Referral tracking and follow up.[2] • Evidence-based decision making around referrals.[5,14]
Comprehensiveness PCMH recognizes and provides, or arranges for "care for all stages of life, including: acute care, chronic care, preventive services and end-of-life care."	• Planned visits.[8,25,26] • Registry of patients[4,6] facilitates comprehensive care and population health management by enabling searches of patients with particular conditions and characteristics.[2,6] • Range of services offered by PCMH.[2,5]
Physician directed medical practice with a team that "takes collective responsibility for ongoing care of patients."	• A team approach can, in theory, leverage the relative clinical and organizational training skills of each member (e.g. physician, nurse, medical assistant) to ensure that the increasingly complex and inter-related needs of patients with multiple chronic conditions are met. Teamwork can facilitate comprehensiveness and coordination of care.[2,4,27]
Quality & Safety	• Decision making guided by evidence-based medicine and decision-support tools.[4] • Quality improvement efforts.[4,6] • Patients participate in decision making.[4,6] • Patient feedback is sought to ensure expectations are met.[4,6]
Information Technology "Uses IT appropriately to support optimal patient care, performance measurement, patient education and enhanced communication."	• Registry of patients.[2,4,6] Consensus statement focused on aspects of information systems most relevant to the immediate progress of the PCMH emphasizes the use of a registry to identify the PCMH's patients, facilitate disease management, population health and evidence-based care.[28]

Table 1.

What constitutes a PCMH?

If practices that encompass the principles of the medical home actually qualify for increased payments, private and public payers will expect some documentation or certification that the practice has that capability. Thus considerable work has gone into defining and measuring the organizational components of the medical home.

In January of 2008 the National Committee for Quality Assurance (NCQA), working with the physician organizations that established the PCMH joint principles, adapted NCQA's Physician Practice Connections recognition to define standards for the PCMH, called PPC-PCMH.[41] The aspects of care addressed by these standards include:

- Access and communication
- Patient tracking and registry
- Care management
- Patient self-management support
- Electronic prescribing
- Test tracking
- Referral tracking
- Performance reporting and improvement
- Advanced electronic communications

Robert Berenson of the Urban Institute is working on a study supported by the ACP and the Commonwealth Fund to identify the incremental costs associated with adopting the PCMH as defined by these standards. In a background paper for this study, he raises concerns that the NCQA recognition tool is more "data-centered" than "patient-centered". [25] It has an emphasis on processes that facilitate access and some aspects of care coordination. It is less strong in documenting the processes required for coordination between primary and specialty care, continuity of care, and comprehensiveness of care.

Paul Grundy, chief medical officer for IBM, presented a model being used by a health care system in Tulsa to create a Patient-Centered Medical Home. This model better captures some of the practice structure and culture changes that would meet the standards for a PCMH. [42] (Table 2)

TODAY'S CARE (Tulsa, OK)		PC HOME MEDICAL CARE
My patients are those who make appointments to see me	→	Our patients are those who are registered in our medical home
Patients' chief complaints or reasons for visit determines care	→	We systematically assess all our patients' health needs to plan care
Care is determined by today's problem and time available today	→	Care is determined by a proactive plan to meet patient needs without visits
Care varies by schedule time and memory or skill of the doctor	→	Care is standardized according to evidence-based guidelines
Patients are responsible for coordinating their own care	→	A prepared team of professionals coordinates all patients' care
I know I deliver high quality care because I'm well trained	→	We measure our quality and make rapid changes to improve it
Acute care is delivered in the next available appointment and walk-ins	→	Acute care is delivered by open access and non-visit contacts
It's up to the patient to tell us what happened to them	→	We track tests and consultations and follow up after ED and hospital
Clinic operations center on meeting the doctor's needs	→	A multidisciplinary team works at the top of our licenses to serve patients

Table 2.

Funding options for the PCMH

One of the criticisms of the prevalent fee-for-service model of physician payment is that it retains the piecework payment that incentivizes a "hamster-wheel" environment. Since it relies on the Relative Value Scale Update Committee (RUC) of the AMA, it inherently undervalues evaluation and management services, despite recent updating. Most payers only recognize face-to-face visits with the physician, so the access and care that go on between visits and the significant resources required for coordination of care are unfunded or underfunded.

Addressing the broad array of options for funding the health care system in the US goes beyond the scope of this discussion. However there are several innovative payment methods that are relevant to funding the resources required for the PCMH. These include traditional fee-for-

service, combined with support for care coordination and achieving optimal patient care outcomes. The organizations who developed the PCMH Joint Principles have proposed such a hybrid model. Under this model, the current fee-for-service would cover all patient visits to their PCMH and any visits to providers outside of the medical home, i.e. specialists, non-physician providers. In addition the practice would report on patient outcomes and receive a portion of payment based on those outcomes. This component is rapidly being phased in by Medicare in its now voluntary Physician Quality Reporting Initiative (PQRI). A third component of this hybrid payment would be a new care management fee. This would be paid to the practice on a per patient, per month basis and be risk adjusted according to the complexity of care the patient is likely to require. For example, a 35 year old with no chronic medical conditions would engender a fairly low care management fee and that for an 85 year old with five chronic diseases on twelve medications would be much higher.

This is the model that has been chosen for the Medicare PCMH demonstration projects, which are just beginning and are discussed below. Allan Goroll and Robert Berenson and colleagues have proposed a different model of payment for the PCMH. [43] They suggest that a risk/needs-adjusted comprehensive payment be made to the primary care practice for the comprehensive care of each patient. This would replace all encounter-based payments. Table 3 compares these two models with traditional fee-for-service (FFS), FFS and pay for performance (P4P), and capitation models previously common in managed care.

Comparison of Payment Systems for Primary Care

	FFS + monthly coordination fee and P4P	Comprehensive primary care payment	FFS	FFS + P4P	Capitation
Monthly payment includes all primary care services	–	+	–	–	+
Payment for individual encounters	+	–	+	+	–
Primary care practice at risk for services already delivered by others	–	–	–	–	+
Measurement of performance (technical and patient experience)	+	+	–	+	–
Obligate reporting of performance	+	+	–	–	–
Expect total costs of care to decrease	+	+	–	–	+
Incentive to limit practice size	–	+	–	–	–
Incentive to treat complex patients	+	+	–	–	–

Table 3.

A third model is called the PROMETHEUS model (**P**rovider payment **R**eform for **O**utcomes, **M**argins, **E**vidence, **T**ransparency, **H**assle-reduction, **E**xcellence, **U**nderstandability and **S**ustainability.[44] This model is based upon case rates derived from the calculation of what it costs to deliver evidence-based services for a particular chronic illness, called Evidence-informed Case Rates (ECRs). These payments would be risk-adjusted to account for the severity and complexity of the patient's condition. Thus this "bundled" payment would be provided for the care of the patient.

Evidence of the benefit of the PCMH

The Geisinger Health System in Pennsylvania has implemented many of the components of the PCMH, especially health information technology. It is an integrated delivery system serving a population of 2.5 million people. They have incorporated personal care navigators and a nurse care coordinator in each primary care site. They have information technology and point-of-care decision support for evidence-based care designed to reduce hospitalization, promote health, and optimize control of chronic disease.[45] They also pay practices for coordination of care and achievement of defined patient outcomes. Early results from two such sites have demonstrated a 20 percent reduction in hospital admissions and a 7 percent reduction in overall medical costs.

The State of North Carolina Medicaid program has implemented a PCMH program for several years. In a study for their legislature by Mercer Consulting, the costs of care of Medicaid patients in a PCMH model versus those in fee-for-service were compared for 2003-2004.[46] Overall the PCMH model (after removing cost control measures to make it comparable to FFS) saved the state between 118 and 130 million dollars. The most significant savings were in reduced hospitalizations and emergency room use.

Duke University has expanded the North Carolina Medicaid model to improve the health of residents of Durham County, North Carolina. This is a component of Duke University's Clinical and Translational Science Award (CTSA) from the National Institutes of Health. [47]
This medical home system will ultimately serve 40,000 patients in Durham County. In an initial implementation for 7,000 elderly patients eligible for both Medicare and Medicaid, they have realized a ten to twenty percent reduction in costs, largely due to reduced hospitalization and emergency Room visits. [48]

Challenges to PCMH Adoption

The Patient-Centered Medical Home as a concept has gained ground very quickly with insufficient time to generate direct evidence of its effectiveness. Several challenges to implementing the model have been raised. [25] Most of us fully intend to care for patients in a way that achieves optimal control and prevention of disease. But even in the best of systems, we often succumb to the "tyranny of the urgent". The majority of our time is spent in relatively short visits that barely allow us time to address those issues with which the patient presents. Significant practice redesign would have to be added on to that work in order to approach the care of our population of patients as a Patient-Centered Medical Home.

Over 40% of the primary care in this country is still provided in practices with five or fewer physicians, the majority of these with one or two physicians. Such practices in the current reimbursement system generally have very low margins. Thus the investment required just to qualify as a PCMH and take advantage of increased revenue to support this model of care would be prohibitive. In non-urban areas it may be hard even to find the people with the credentials to comprise the team of professionals to provide this care.

We don't yet know whether all patients would benefit from a medical home. Clearly its basis upon the chronic care model suggests that it is most beneficial for those with one or more chronic diseases as it was first applied in the pediatric population. Should the resource be targeted to these groups and have those who are younger and healthier receive care in current models?

Since the model is new and none of us have trained in such a model, will we have the skills to develop the systems and lead the teams required? This will be a challenge for those of us providing clinical education. It will likely require the development of teaching sites that have components of the PCMH. Some internal medicine residencies have done this through the educational innovations program of the Internal Medicine Residency Review Committee. [49]

The current name, Patient-Centered Medical Home has also presented some challenges. It's a mouthful and is difficult to communicate in a classic "elevator statement". Even after explaining it for an hour, physicians will approach me to say, "I just don't have time to make all those home visits". Communicating it to patients and their families will be an even bigger challenge. It will also be important to educate patients about the capabilities of their medical home to assure effective communication with the patient and with the providers of their care outside of the medical home.

In some venues, the PCMH is being touted as the solution to the crisis in primary care. Its rapid increase in attention by a large number of groups, not all of whom see it in the same way, has likely raised unfettered expectations in terms of what the adoption of the PCMH can accomplish. What if beleaguered primary care physicians decline to participate in a system they perceive as being associated with unrealistic expectations and unwanted obligations? Is it likely to shift responsibilities we've assigned to the patient, i.e. keeping appointments, adhering to medications, to the medical home/physician?

On the other hand, some early adopters of practices redesigned along the lines of the PCMH have experienced it as a transformative innovation. [50]

What's next for the PCMH?

Since the joint principles have been established, a large number of physician organizations, employers, payers, and consumers group have come together to form the Patient-Centered Primary Care Collaborative.[51] This Patient-Centered Primary Care Collaborative (pcpcc.net) began about three years ago. It now has over 250 members, including businesses (purchasers), provider organizations, payers and the public. The Collaborative provides updated information

on pilot programs and demonstration projects that are implementing and evaluating the PCMH model. They currently list 22 such projects in 17 states. [52]

The Medicare Modernization Act of 2003 required the Centers for Medicare and Medicaid Services (CMS) to do demonstration projects on the PCMH. Eight such projects will begin in early 2009. The deadline for data to be reported from these projects is 2012. The Relative Value Scale Update Committee (RUC) has published the recommended reimbursement and coding for those demonstration projects. [53] Data from Medicare on these projects is outlined in a fact sheet available from CMS. [54]

These three year demonstration projects will provide reimbursement in the form of a care management fee to physician practices for the services of a "personal physician." Eligible physician practices include internal medicine, family medicine, general practice, specialty and sub-specialty practices, excluding radiology, pathology, anesthesiology, dermatology, ophthalmology, emergency medicine, chiropractic, psychiatry, and surgery. The demonstration projects will focus on "high need" patients, which CMS defines as those with prolonged or chronic illnesses that require regular medical monitoring, advising, or treatment. They estimate that up to 80 percent of Medicare patients might meet these criteria.

CMS defines a two-tier medical home model with increasing levels of capability. In this, they acknowledge that a practice might not be able to prospectively invest in some of the higher cost aspects of a medical home, such as health information technology. Achieving medical home status at either of the tiers represents an expectation that the practice has the capability and the intention to provide a certain level of care management and coordination services to patients in the demonstration.

- Tier 1 or "typical" medical home must have 17 basic medical home capabilities, such as:
  - Uses health assessment plan
  - Uses integrated care plan
  - Tracks tests and provider follow-up
  - Reviews all medications
  - Tracks referrals

- Tier 2 or "enhanced" medical home must meet Tier 1 requirements plus 2 additional capabilities (electronic medical record and coordination of care including follow-up of inpatient and outpatient care), plus three of nine optional capabilities.

Practices will qualify for medical home status on the basis of documentation submitted using the Physicians Practice Connections Patient-Centered Medical Home instrument of the NCQA as described above.

Patients are eligible to choose to receive their care in a medical home if they participate in Medicare Part A & B fee-for-service and have Medicare as primary coverage. Eligible beneficiaries must have at least one qualifying chronic disease. Patients who enter a nursing

home while participating in a medical home demonstration may continue, as long as they continue to receive primary care services from the medical home.

The RUC has provided CMS with its recommendations for Relative Value Units (RVUs) for the care management fee. For Tier 1 patients, CMS will provide a fee of $40.40 per month to the practice. For Tier 2, the fee is $51.70 per month.

The National Quality Forum (NQF), which defines measures for a variety of quality and pay for performance programs, is in the process of defining the parameters for care coordination. These will likely refine the definitions for Medicare and other payers. The medical community is invited to provide input for these measures at the NQF website.[55]

On November 8, 2008, Senator Max Baucus of Montana released "Call for Action: Health Reform 2009". One of the components of his plan is "encouraging further testing and implementation of the medical home model" [56] In a section of this white paper on the Patient-Centered Medical Home, he puts forward the premise that the medical home would promote quality and efficiency in the health care system. Senator Baucus' plan is the first of many that are likely to come forward from the legislative and executive branches of government in the next few weeks to months.

Conclusion

In late 2007, the Commonwealth Fund encouraged all the presidential candidates to "Transform the US health care system into one that helps everyone, to the extent possible, lead long, healthy, and productive lives."[5] The Patient-Centered Medical Home is a model that once evaluated, may prove to be an important component of such a health care system. Making the PCMH model a reality is not out of reach. In fact, most of us incorporate many of these concepts into our practices despite our current system's barriers. There is evidence in the literature that if we can help our patients better control their chronic diseases we can decrease the frequency—and associated costs—of the life-altering complications of those diseases.

Fortunately, internists are problem solvers. Our current dysfunctional health care system is a big problem that needs to be solved for our profession and especially for our patients. It's time to work on the details of how to accomplish that.

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