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The Medical Home

*Disruptive Innovation for
a New Primary Care Model*

Produced by the
Deloitte Center
for Health Solutions

Audit • Tax • Consulting • Financial Advisory

Time to Address a Chronic Problem in U.S. Health Care



There is widespread recognition that the U.S. health care system falls short in its efforts to effectively manage chronic conditions. Currently, 45 percent of the population has a chronic medical condition (half of these are polymorbid).¹ Among the Medicare population the statistics are even worse: 83 percent of individuals have at least one chronic condition, and almost a quarter have at least five co-morbidities.²

A good starting point for reducing U.S. health care expenses overall is to implement a long-term strategy to reduce the costs associated with unmanaged chronic conditions. This paper from the Deloitte Center for Health Solutions (the “Center”), part of Deloitte & Touche USA LLP, offers a strategic perspective on the medical home, a disruptive innovation for a new primary care model to address the challenge of chronic care management.

In a medical home model, primary care clinicians and allied professionals provide conventional diagnostic and therapeutic services, as well as coordination of care for patients that require services not available in primary care settings. The primary care clinicians serve as advocates for patients and are paid to coordinate their care, thus averting unnecessary tests and procedures, hospital admissions and avoidable complications.

This paper examines medical home models, their savings potential, and the implications for policymakers and key industry stakeholders. It is a logical solution to a chronic problem in U.S. health care.

A handwritten signature in black ink that reads "Paul H. Keckley". The signature is fluid and cursive, with a long, sweeping tail that curves under the name.

Paul H. Keckley, PhD
Executive Director
Deloitte Center for Health Solutions

¹ Wu S, Green A. Projection of Chronic Illness Prevalence and Cost Inflation. Santa Monica, CA: *RAND Health*. October 2000

² Anderson GF. Medicare and Chronic Conditions. *Sounding Board. NEJM*. 32005;53(3):305-9

There's No Place Like Home

A "medical home" is not a house, hospital or other building. Rather, it is a term used to describe a health care model in which individuals use primary care practices as the basis for accessible, continuous, comprehensive and integrated care. The goal of the medical home is to provide a patient with a broad spectrum of care, both preventive and curative, over a period of time and to coordinate all of the care the patient receives.³

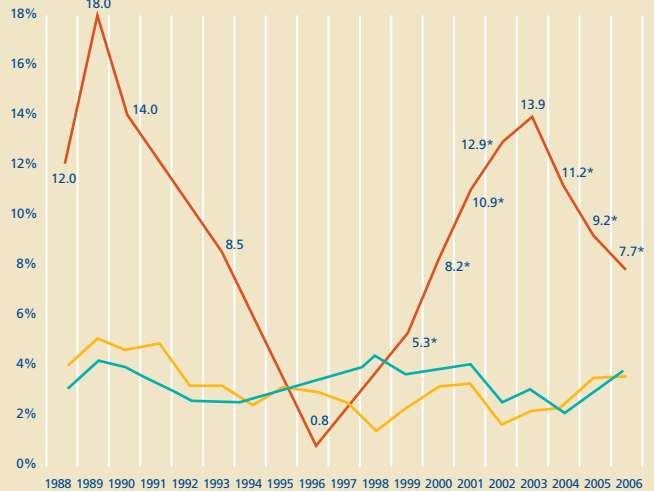
Two trends are helping to build momentum around the medical home model: 1) a growing shortage of primary care clinicians due to adverse practice conditions; and 2) the increasing prevalence of chronic diseases among the U.S. population. It is important to note, however, that the medical home model is not without controversy. The disease management industry has successfully carved a niche between primary care practices and chronic care patients by calling attention to physicians' lack of attention to patient coaching. Also, studies by RAND researchers and Dartmouth University have quantified the degrees of inaccuracy and misdiagnosis associated with chronic care patients treated in primary care settings. However, Vanderbilt studies and others confirm that patients prefer coaching by their primary care physician, even while acknowledging that most provide little follow-up support for self-management.

The medical home model is promising because it has the potential to reduce overall costs in the U.S. health system. However, the concept is also problematic given the system's current lack of incentives around chronic care coordination and preventive health programs, as well as the divergent interests of specialists and acute care practitioners.

Chronic Care Coordination: The Burning Platform

In an environment where health costs are growing faster than employee wages and the economy at large, the U.S. health care system is ill-prepared to meet the current and emerging health needs of the population due, in great measure, to the growing prevalence of chronic conditions and lackluster success in managing their progression to more costly acute episodes and long-term care settings. Kaiser data reflect spiraling health insurance premiums for the past twenty years that far outpace overall inflation rates and worker earnings. As Figure 1 indicates, health care costs continue to grow faster than overall worker wages and inflation (note the largest gaps in 1989 and 2003), with patients shouldering an increasing share of these costs through higher co-payments and deductibles.

Figure 1. Percentage Increase in Health Insurance Premiums Compared to Other Indicators, 1988-2006



1988	1989	1990	1993	1996	1999	2000	2001	2002	2003	2004	2005	2006
12.0	18.0	14.0	8.5	0.8	5.3*	8.2*	10.9*	12.9*	13.9	11.2*	9.2*	7.7*
3.9	5.1	4.7	3.2	2.9	2.3	3.1	3.3	1.6	2.2	2.3	3.5	3.5
3.1	4.2	3.9	2.5	3.3	3.6	3.9	4.0	2.6	3.0	2.1	2.7	3.8

■ Health Insurance Premiums
■ Overall Inflation
■ Workers Earnings*

Source: Kaiser/HRET Survey of Employer Sponsored Health Benefits, 1999-2006; KPMG Survey of Employer-Sponsored Health Benefits, 1993, 1996; The Health Insurance Association of America [HIAA], 1988, 1989, 1990; Bureau of Labor Statistics, Consumer Price Index, U.S. City Average of Annual Inflation [April to April], 1988-2006; Bureau of Labor Statistics, Seasonally Adjusted Data from the Current Employment Statistics Survey [April to April], 1988-2006.

³ <http://www.MedicineNet.com>

A major reason for escalating costs is the growing prevalence of chronic conditions, which now impact every portion of the population, from children to the elderly (Figure 2). In fact, nine of 15 diagnoses for hospital admissions are directly related to chronic conditions.

Figure. 2⁴ Unhealthy Lifestyles and Aging Demographics Drive Costs Up

EXHIBIT 3 Decomposition of Changes in Nominal Health Care Spending, Fifteen Most Costly Medical Conditions, 1987-2000				
Condition	Total change in spending (millions of dollars)	Percent changes in spending attributes to		
		Increased cost per treated case	Rise in treated prevalence	Increased population
Heart disease	26,228.5	68.6	1.1	30.3
Pulmonary conditions	24,792.0	37.5	41.9	20.6
Mental disorders	24,503.3	21.1	59.2	19.7
Cancer	17,734.3	41.9	27.4	30.7
Hypertension	15,385.8	59.8	18.9	21.3
Trauma	14,596.6	169.1	-108.5	39.5
Cerebrovascular disease	11,078.9	20.8	60.3	18.9
Arthritis	10,282.8	44.3	31.6	24.1
Diabetes	9,626.8	23.6	49.8	26.6
Back problems	9,486.4	21.7	52.6	25.8
Skin disorders	7,286.5	54.8	22.0	23.2
Pneumonia	7,203.8	9.38	-18.4	24.6
Infectious disease	6,191.6	95.2	-17.5	22.3
Endocrine	5,029.1	28.0	43.4	28.6
Kidney	3,231.4	8.8	55.8	35.4

Source: 1967 National Medical Expenditure Survey (NMES) and 2000 Medical Expenditures Panel Survey, Household Components (MEPS-HC)

Note: All changes were statistically significant at the .05 level except for changes in spending, kidney disease (at the .10 level); rise in treated prevalence, heart disease (not significant); and increased cost per treated case, endocrine and kidney disease (not significant). Medical conditions ranked by change in spending between 1987 and 2000.

The problem is expected to worsen as the prevalence of chronic disease increases and could debilitate the entire U.S. health care system. Consider the current landscape...

- Physicians are frustrated because complications from chronic co-morbidities make their jobs more difficult even as they are reimbursed less for the care they provide. The situation is particularly trying for primary care physicians because they know what care is needed to be effective in managing chronic patients, but they lack the necessary tools and incentives.

- Employers see profits that could be applied to enhance global competitiveness being consumed by health care costs that are largely avoidable. Unfortunately, employers acknowledge that their employee benefits plans have had lackluster success in reducing the cost spiral driven by chronic conditions.
- Regulators and policymakers realize that there is a disconnect between incentives, the management of chronic conditions, and the overall effectiveness of the nation's health system. This disconnect is cited as a rationale for independent, state-led health reforms that focus on preventive and chronic care (California, Pennsylvania, Tennessee, Texas, etc.), as well as the recent medical home demonstration in the Tax Relief and Health Reform Act of 2006.
- Consumers with chronic conditions understand the importance of care coordination while also acknowledging limited success in their own self-care.

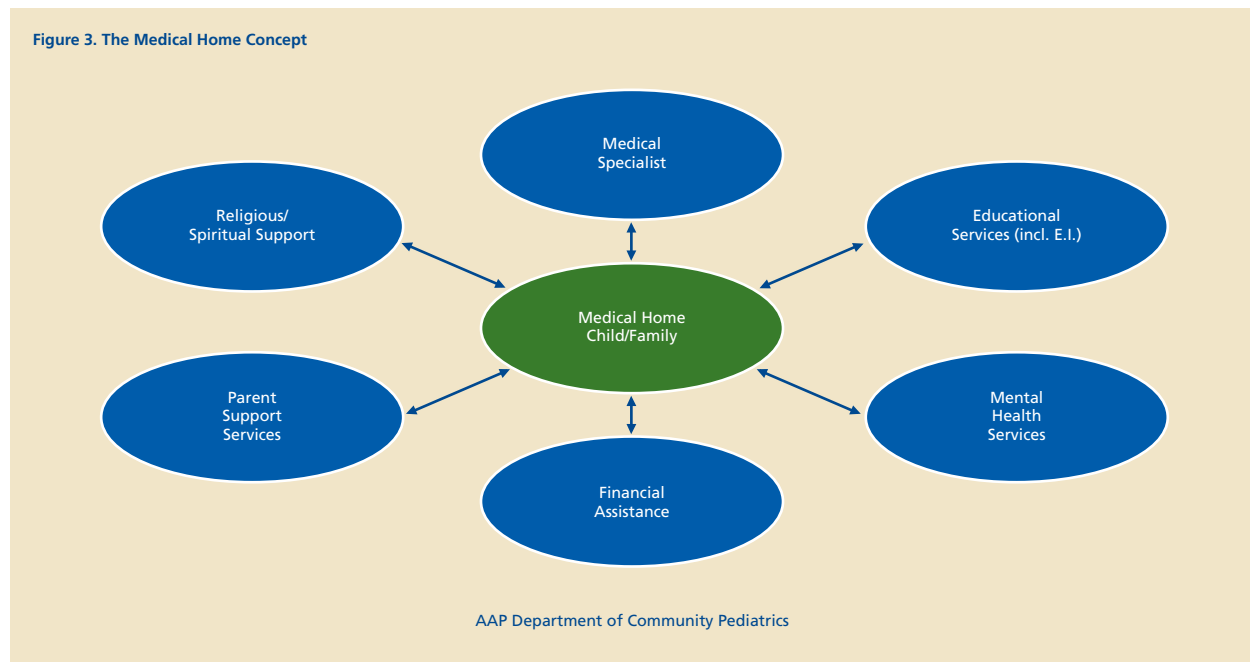
It's popular to decry the health care system for problems of access, cost and quality. According to media reports, there are currently 47 million uninsured in America. Employers understand the cost issue; many can no longer afford to provide health insurance to employees. Health services researchers have appropriately zeroed in on the quality chasm, noting a systemic lack of safe practices and the growing gap between science and practice. The problems are apparent, considerable and progressing without meaningful solutions.

A good starting point for reducing U.S. health care expenses overall is to implement a long-term strategy to reduce the costs associated with unmanaged chronic conditions. As RAND and Dartmouth researchers have revealed, the return on investment is potentially significant – enough to fund expansion of insurance (increase access) and reduce demand for specialty care and acute services (reduced costs). Unfortunately, incentives to arrest the progression of chronic disease do not exist in the current health care system. In fact, it rewards acute episodic care while proactive care, care management, active integrated inter-specialty management, and even some preventative care services are not reimbursed.

This paper from the Deloitte Center for Health Solutions offers a strategic perspective on the Medical Home, a new primary care model to address current shortcomings in chronic care management. Specifically, this paper examines medical home models, their potential for cost savings, and their implications for stakeholders.

The Medical Home: An Innovative Model to Reduce Costs and Improve the Population's Health Status

The American Academy of Pediatrics (AAP) introduced the medical home concept in 1967, initially using it to refer to a central location for archiving a child's medical record (Figure 3), with connections to specialty services and support functions.



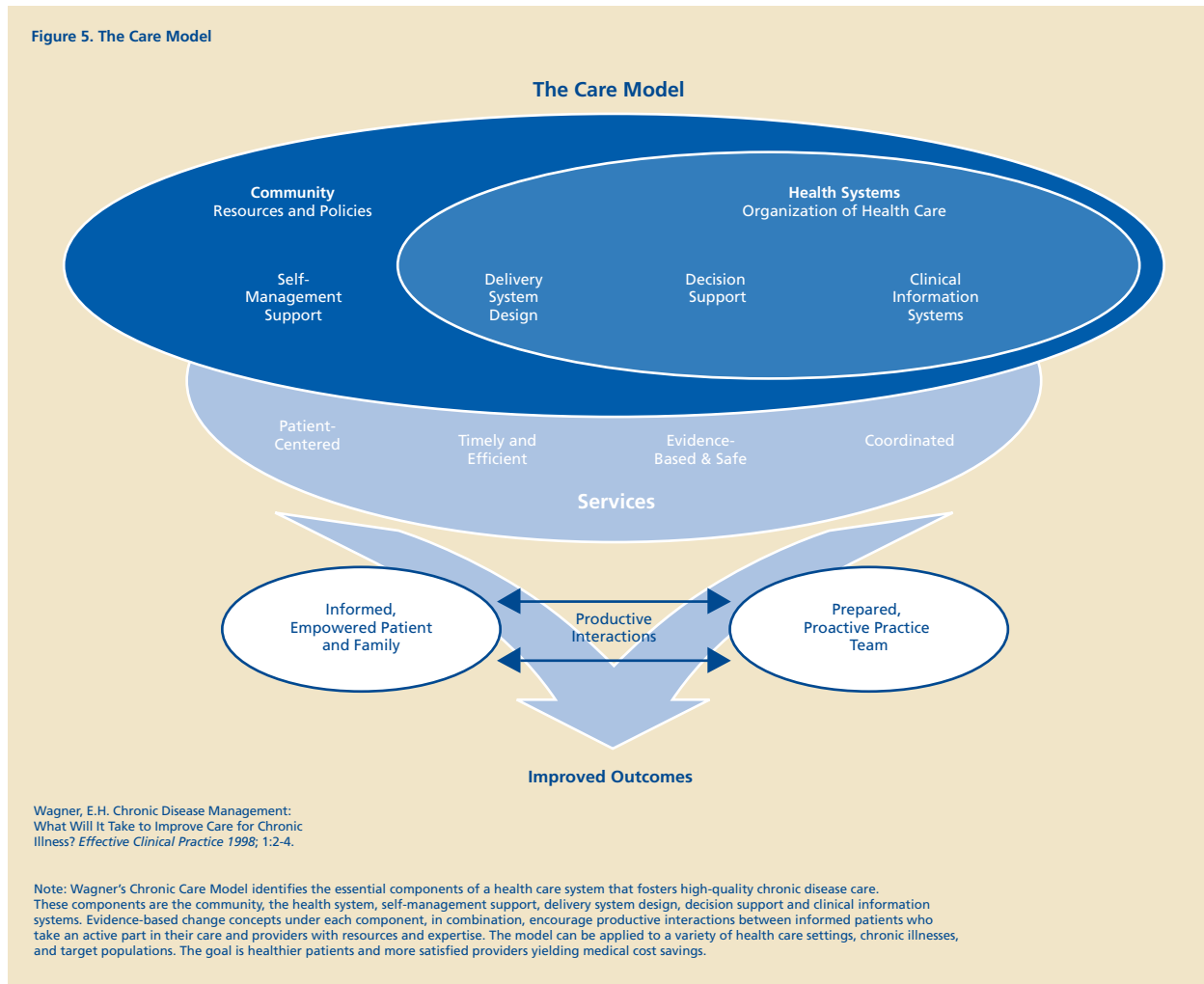
In 2002, the AAP expanded its model to include operational characteristics: The medical home offers accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective care (Figure 4).

Figure 4. A medical home is defined as primary care that is:

<p>Accessible</p> <ul style="list-style-type: none"> • Care is provided in the child's community • All insurance, including Medicaid, is accepted and changes are accommodated <p>Family-Centered</p> <ul style="list-style-type: none"> • Mutual responsibility and trust exist between the patient and family and the medical home <p>Continuous</p> <ul style="list-style-type: none"> • Same primary pediatric health care professionals are available from infancy through adolescence and young adulthood • Assistance with transitions (to school, home, adult services) is provided • The medical home provider participates to the fullest extent allowed in care and discharge planning when the child is hospitalized or care is provided at another facility or by another provider 	<p>Coordinated</p> <ul style="list-style-type: none"> • A plan of care is developed by the physician, child or youth, and family and is shared with other providers, agencies, and organizations involved with the care of the patient • A central record or database containing all pertinent medical information, including hospitalizations and specialty care, is maintained at the practice. The record is accessible, but confidentiality is preserved <p>Compassionate</p> <ul style="list-style-type: none"> • Concern for well-being of child and family is expressed and demonstrated in verbal and nonverbal interactions <p>Culturally Effective</p> <ul style="list-style-type: none"> • All efforts are made to ensure that the child or youth and family understand the results of the medical encounter and the care plan, including the provision of (para) professional translators or interpreters, as needed • Written materials are provided in the family's primary language.
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-1. The Medical Home. Pediatrics. 2002: 184-186.

The American Academy of Family Physicians (AAFP) and the American College of Physicians (ACP) have since developed models referred to as “advanced medical homes” (ACP, 2006) and the “medical home” (AAFP, 2004).^{5,6} Both enhance the AAP model by integrating care coordination features with pay for coordination and performance, as in Wagner’s Chronic Care Model⁷ (Figure 5).



5 American College of Physicians. *The Advanced Medical Home: A Patient-Centered Physician-Guided Model of Health Care*, 2006 [online] http://www.acponline.org/hpp/adv_med.pdf

6 American Academy of Family Physicians. *The Future of Family Medicine: A Collaborative Project of the Family Medicine Community*, 2004 [online] http://www.annfammed.org/cgi/reprint/2/suppl_1/s3.pdf

7 American College of Physicians. *Patient-Centered, Physician-Guided Care for the Chronically Ill: The American College of Physicians Prescription for Change*. Philadelphia: American College of Physicians; 2004 Public Policy Paper [online] http://www.worldcongress.com/events/nw600/pdf/luminarySeriesPDF/Tooker_1.pdf

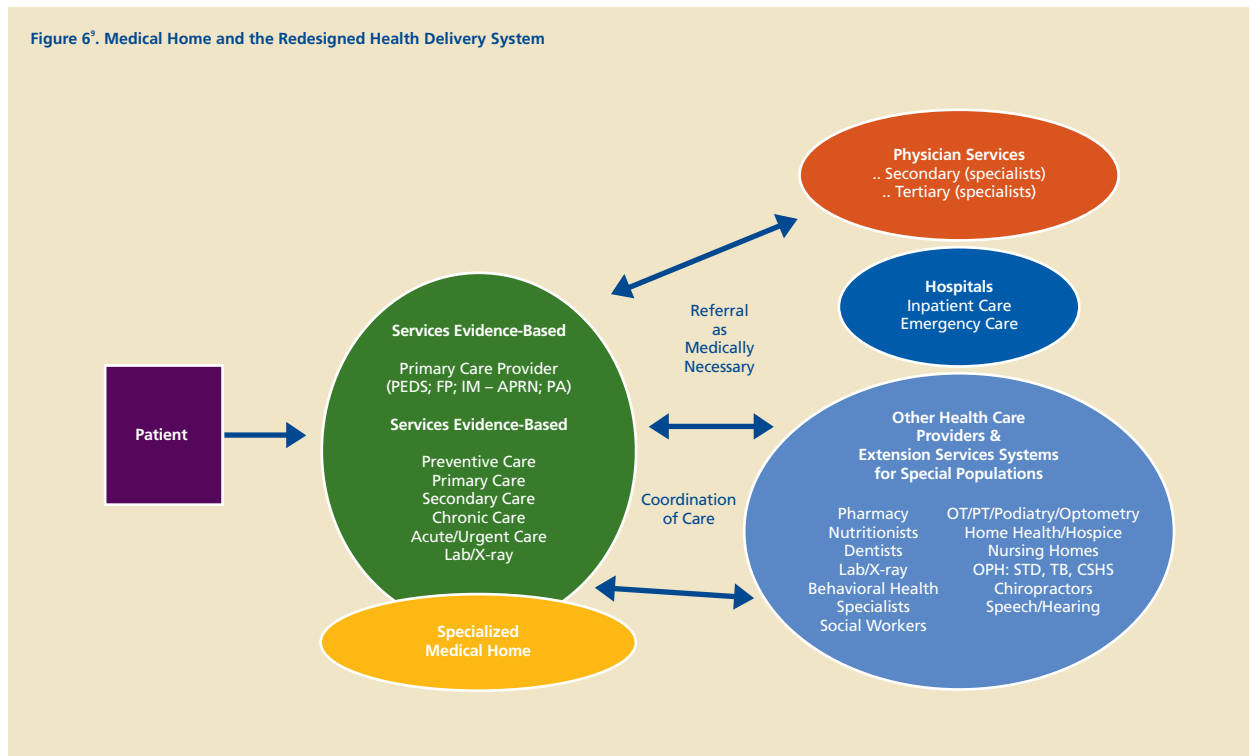
In February 2007, the ACP and AAFP were joined by the American Osteopathic Association (AOA) and the AAP (representing in total 330,000 physicians) in issuing joint principles for the patient-centered medical home (PC-MH)⁸, a health care setting that facilitates partnerships between individual patients and their personal physicians and, when appropriate, the patient’s family. Their PC-MH principles describe a practice-based care model for providing comprehensive primary care in a health care setting, in which each patient will have an ongoing relationship with a personal physician who will:

- Lead a team of individuals at the practice level who collectively take responsibility for the ongoing care of patients (“Physician-Directed Medical Practice”);

- Provide first-contact, continuous, and comprehensive care (“Personal Physician”);
- Take responsibility for providing for all of the patient’s health care needs – including acute, chronic, preventive, and end-of-life care – or arrange for that care with other qualified professionals (“Whole-Person Orientation”).

The PC-MH will integrate and coordinate care across all elements of the health care system and the community, will ensure that patients get the indicated care when and where they want and need it, and that the care is linguistically and culturally appropriate.

Figure 6 illustrates the role that a medical home plays in a redesigned health care delivery system:



8 American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. Joint Principles of the Patient-Centered Medical Home, 2007 [online] <http://www.medicalhomeinfo.org/Joint%20Statement.pdf>.
 9 <http://www.dhh.louisiana.gov/offices/publications/pubs-300/Medical%20Home%20Final%20Report%20v9.pdf>

This framework reflects the value of health care services that take place outside a face-to-face visit, including care coordination and the use of health information technology. The PC-MH principles also recognize the value of work associated with remote monitoring of clinical data and adjust for case-mix differences in the patient population being treated within the practice.

Optimally, the components of a medical home incorporate the following capability categories:

Critical Features of the Medical Home: A Platform for Guided Self-Care Management

- **Personal physician** – Each patient has an ongoing relationship with a Primary Care Physician (PCP), as well as clinician health coaches, who are trained to provide first-contact, continuous and comprehensive care. These clinicians are competent in the use of active listening, health coaching, evidence-based holistic medicine, clinical information technology, population-based outcome improvement and measurement, care team recruitment and leadership.
- **Physician-directed primary care professional organization** – A physician leads a team of health coaches who collectively take responsibility for the ongoing care of patients. The day-to-day operation of the practice is focused on managing population-based outcomes and maximizing individual patient adherence to a distinct, customized self-care management program that leverages information technology. Note: A health coach is an allied professional (nurse/patient educator) with specialized training in patient behavior modification and motivational interviewing to match patient values, preferences and triggers to specific, measurable, short-term, self-care lifestyle modifications.
- **“Whole person” orientation toward adherence, not compliance, incorporating holistic methods with conventional allopathic interventions** – The primary care team is responsible for providing all of the patient’s health care needs and appropriately arranging care with other qualified professionals. This includes care for all stages of life: acute care, chronic care, preventive services, and end-of-life care, with strong consideration for the individual’s value system, personal preferences and level of engagement in decision making. A key focus is the dispensation of directives (prompts, alerts, reminders) in teachable moments to patients and family members/significant influencers to expedite adherence to self-care suggestions (not just compliance to directives). In these clinical models, holistic therapeutic interventions, such as mindful daily practices, are integrated with traditional therapeutic interventions.
- **Monitored, coordinated and integrated care using electronic medical records and personal health records** – Care is facilitated across all elements of the complex health system (e.g., subspecialty care, hospitals, home health agencies, nursing homes) and the patient’s community (e.g., family, public and private community-based services) by registries, health information exchanges, and other electronic means to assure that patients get the indicated care when and where they need and want it, in a culturally and linguistically appropriate manner. The information exchanges among members of the patient’s care team are synchronized and real-time. These technologies are also used to reduce unnecessary visits, tests and referrals. Sharing information among medical homes and other providers in the local and regional care system is indicative of an advanced medical home model.
- **Measured and managed adherence to evidence-based practices by the care team and the patient** – Results measures are hallmarks of the medical home. They range from measures of processes and outcomes to patient satisfaction and success rates in changing behavior:
 - Evidence-based medicine and clinical decision-support tools guide decision making. Non-adherence by the care team and/or the patient is monitored and measured, and root-cause analysis is conducted to assess errors and near-misses.
 - Physicians in the practice accept accountability for continuous quality improvement by voluntarily engaging in performance measurement and improvement.
 - Patients actively participate in decision-making, and feedback is sought to ensure patients’ expectations are being met.
 - Information technology is used to appropriately support optimal patient care, performance measurement, patient education, and enhanced communication.
 - Patients and families participate in quality improvement activities at the practice level.
- **Enhanced accessibility: care anywhere, anytime** – Care is available via open scheduling, expanded hours and new communications options among patients, their personal physician and practice staff. Innovations such as group visits, cyber-visits, robust customized educational tools and self-monitoring devices are available through the practice.
- **Emphasis on physician incentives for improvements in self-care management** – Physician reimbursements appropriately recognize the added value provided to patients who have a patient-centered medical home. The payment structure should:
 - Reflect the value of patient-centered care management work that falls outside of the face-to-face visit.
 - Pay for services associated with care coordination within a given practice and among consultants, ancillary providers, and community resources.
 - Support adoption and use of health information technology for quality improvement.
 - Support enhanced communication access such as secure e-mail and telephone consultation.
 - Recognize the value of technology-based physician work associated with remote monitoring of clinical data.
 - Allow for separate fee-for-service payments for face-to-face visits. (Payments for care management services that fall outside of the face-to-face visit, as described above, should not result in reduced payments for face-to-face visits.)
 - Recognize case mix differences in the patient population being treated within the practice.
 - Allow physicians to share in savings from reduced hospitalizations associated with physician-guided care management in the office setting.
 - Allow additional payments for achieving measurable and continuous quality improvements.

Medical home principles were clearly embedded in recent pilot programs funded by Medicare (via the Tax Relief and Health Reform Act of 2006) to test the concept (Figure 7). Results of these programs will be available to policymakers in 2009, just as a new administration takes office.

**Figure 7. Medicare Medical Home Demonstration
Tax Relief and Health Care Act 2006; Sec. 204**

The Secretary of Health and Human Services will establish a medical home demonstration project to redesign the health care delivery system to provide targeted, accessible, continuous and coordinated, family-oriented care to high-need populations.

- Care management fees will be paid to personal physicians, and
- Incentive payments will be paid to physicians participating in practices that provide services as a medical home

“High-need population” means individuals with multiple chronic illnesses that require regular medical monitoring, advising, or treatment.

The project will operate for a period of three years and will include urban, rural, and underserved areas in a total of no more than 8 States.

A personal physician will perform or provide for the performance of at least the following services:

- Advocates for and provides ongoing support, oversight, and guidance to implement a plan of care developed in partnership with patients, other physicians furnishing care to the patient, and other appropriate medical personnel or agencies
- Uses evidence-based medicine and clinical decision support tools to guide decision-making at the point-of-care based on patient-specific factors
- Uses health information technology, which may include remote monitoring and patient registries, to monitor and track the health status of patients and to provide patients with enhanced and convenient access to health care services
- Encourages patients to engage in the management of their own health through education and support systems

A medical home means a physician practice that:

- is in charge of targeting beneficiaries for participants in the project; and
- Is responsible for:
 - providing safe and secure technology to promote patient access to personal health information;
 - developing a health assessment tool for the individuals targeted; and
 - providing training programs for personnel involved in the coordination of care.

The project will provide for payment of a care management fee to personnel physicians.

80 percent of the reductions in expenditures resulting from participation of individuals that are attributable to the medical home (as reduced by the total care management fees paid to the medical home under the project) will be paid to the medical home. The amount of such reductions in expenditures will be determined by using assumptions with respect to reductions in the occurrence of health complications, hospitalization rates, medical errors, and adverse drug reactions.

Calculating the Value of the Medical Home

The chronic care management industry has burgeoned over the last decade; however, it has largely overlooked the role of physicians as care coordinators. The traditional care management model consists of a centralized call center staffed by nurses who are assigned patients by health plans and paid to contact those patients on a regular basis.^{10,11,12,13} Physicians typically are not included in the process. Nurses make care judgments for the patients, and the sponsoring health plans are the primary beneficiaries of any savings achieved. The disconnect between physicians and patients has proved to be a major flaw in this traditional care management model.^{14,15}

As the medical home is promoted by the AAFP, ACP, AAFP, AOA and others as an alternative to the traditional chronic care management model, the obvious question centers on its value proposition: Can the medical home save money while improving the health status of its chronic populations?

The Deloitte Center for Health Solutions has developed a medical home savings model to quantify the value obtained when primary care medical homes play leadership roles in care coordination for two populations: individuals with chronic disease management conditions (heart failure, COPD, asthma, hypertension and diabetes) and individuals with highly complex conditions requiring case management services (the top one percent of expensive conditions). This model enables sensitivity analysis of value drivers if the PC-MH were to be adopted, based upon assumptions to determine expected medical cost savings.

10 Sidorov J. “Disease Management and Its Implications for Outpatient Physician Practice,” *Disease Management Healthy Outcomes* 2006, 14(5):259-63.

11 DMAA. Roundtable Summary Explores Physician Views on Disease Management, 2006 http://dmaa.org/pdf/DMAA_Physician_Roundtable.pdf

12 Whellan D, Cohen E, Matchar D, et al. “Disease Management in Healthcare Organizations: Results of In-depth Interviews with Disease Management Decision Makers,” *Am J Manag Care* 2002; 8(7): 633-41

13 Berenson R. *Challenging the Status Quo in Chronic Disease Care: Seven Case Studies*, <http://www.chcf.org/topics/chronicdisease/index.cfm?itemID=125226>

14 Keckley, PH: “The Role of Evidence-based Medicine in Disease Management,” *Disease Management and Health Outcomes* 2003.11 (7): 429-437

15 Vanderbilt Center for Evidence-based Medicine “Core Beliefs of Health Consumers” Subcontract Agreement 6275-Vanderbilt-01, Agency for Healthcare Research and Quality Contract 290-04-0016 “AHRQ’s National Resource Center for Health Information Technology” NORC Project 6275 (August, 2006) (pending publication)

The following chart frames the major differences between the current state of chronic care management and a future-state medical home model:

	Current State	Future State
Primary provider	Primary care physician	Primary care clinician with health coaches
Primary incentive	Visits (volume)	Increased patient adherence to self-care regimen
Infrastructure investments	None	Electronic Medical Record (EMR) with registry function and knowledge management tools, and Personal Health Records (PHRs) for patients; required infrastructure investments in practice operations that support coaching platforms, including patient classroom facilities, Web sites with blog and social networking capabilities, and redesigned educational materials reflecting customized self-care regimen for discrete patient groups (total one-time investment costs of approximately \$80,000 to \$120,000).
Incremental costs	None	\$100,000-\$115,000 per primary care clinician, \$78,000 per health coach; 56 percent load ¹⁶ for coaching tools (data collection, telephones, IT systems, etc.); 33 percent FTE data manager at \$65,000 per data manager; and \$5,000-\$20,000 for health IT and Web site technical support annual maintenance.
Panel size	5,000-7,000 charts (1,500-2,500 active patient records)	1,000-2,000 patients, depending on prevalence and intensity of chronic care management requirements. **Does not include case-managed population.
Net revenues (annual, per physician)	\$350,000-600,000 ¹⁷	\$500,000-1,000,000 (\$500/patient in panel) inclusive of performance bonus

Source: Deloitte Center for Health Solutions, 2007

Based on the contrasting picture these two models present, a systemic application of the medical home approach would need to reduce annual net costs by at least \$148,347-\$163,347 per primary care physician to break even. For a panel of 1,000 patients who need care coordination, net costs for health services must be reduced by at least \$150 per patient per month to break even – a plausible amount, considering the potential avoidance of costly hospital admissions, emergency room visits and related services.

16 Internal Deloitte references

17 http://books.google.com/books?id=_JalaC-TrkUC&dq=revenue+per+physician+for+primary+care+practice&pg=PA239&ots=90rwwLwP7s&sig=KvqhX_NdPcV5z0Q55Ve3XIMaQ_g&prev=http://www.google.com/search%3Fhl%3Den%26q%3Drevenue%2Bper%2Bphysician%2Bfor%2Bprimary%2Bcare%2Bpractice&sa=X&oi=print&ct=result&cd=2&cad=legacy#PPA239,M1

The model below attempts to rationalize the medical home as a systemic reform; that is, what costs would be borne and what savings might be achieved if it were adopted in a broad-based revamping of the U.S. primary care system.

The Medical Home: A Systemic Model to Assess Potential ROI

Assumptions:

The Deloitte Center for Health Solutions' medical home model assumes chronic disease prevalences for CHF, diabetes, asthma/COPD, and hypertension of 0.2 percent, 5 percent, 3.2 percent, and 25 percent respectively,¹⁸ along with 0 percent growth in future chronic symptom prevalence to be conservative, and models the most prevalent chronic conditions. Of course, more savings would accrue if additional conditions are included. (Note: For purposes of estimating current-state costs, this analysis focused on the most prevalent chronic conditions. However, health services researchers believe that, low back pain, depression and anxiety disorders, neurologic disorders such as Parkinsons and Alzheimers, and many cancers caught in their early stages, are responsive to the same regimen as traditional chronic conditions profiled in this analysis.)

Impacts on Care Delivery Resulting in Medical Cost Savings:

- Since there is no documented ROI in the literature for the medical home, the Center used current disease management assumptions to model the impact of medical home care coordination.
- Health coaching and increased effectiveness in patient enrollment in disease management programs is a major driver for care coordination.
 - Currently, disease management organizations are typically enrolling 10-15 percent of eligible patients for their programs. The Center's model assumes 15 percent. Furthermore, the model assumes that at any point in time, 75 percent of the patients eligible for disease management would be actionable; i.e., resulting in an outreach that could improve their health and result in medical cost savings. In the future-state medical home, with health coaching and better physician/patient connectedness, the model assumes 50 percent improvement in enrollment of eligible patients.

Additional Assumptions:

- Based on Deloitte Consulting LLP's experience in serving clients and helping implement care management strategies, the model assumes a health coach can manage 250 disease management patients on average.
- The model also assumes the following incremental costs (per panel):
 - Each health coach is paid \$78,000, with an additional 56 percent load on this salary for coaching tools – data collection, telephones, IT systems, etc.
 - Medical home physician is compensated an additional \$100,000 for care coordination.
 - 1/3 FTE data manager (annual salary \$65,000).
 - Initial HCIT implementation costs \$25,000 and ongoing annual HCIT maintenance costs \$5,000.
- There will be 150,000 new medical homes (300 million U.S. population/2,000 panel size). For the resulting impact on the aggregate U.S. health care system, multiply the above costs by 150,000 new medical homes for the total system cost.
- Future non-medical cost inflation will be 4 percent. Future medical cost trend will be 8 percent.
- The model assumes an additional \$100,000 in revenue due to reimbursement for care coordination to offset the \$100,000 increase in physician compensation.

The model further assumes net impact of the medical home model (from reduced hospital readmissions, emergency department utilization, specialist visits, fewer diagnostic tests and injectables, surgeries, waste and gaps in care, from improvements in lengths of inpatient hospital stays, with better investments in pharmaceutical, hospice utilization, and care coordination with discharge planning, prior authorization, and concurrent review) is as follows:

- Care coordination from disease management results in ~ 30 percent savings to inpatient and physician reimbursement,¹⁹ 10 percent fewer hospital admissions, 20 percent fewer emergency room visits, and 10 percent less absenteeism.²⁰
- Disease management results to date have been mixed, according to published studies and articles (see table). The Center for Health Solutions' model assumes monthly savings of \$170 per patient enrolled in disease management programs.²¹

18 www.cdc.gov

19 http://www.dartmouthatlas.org/atlas/2006_Chronic_Care_Atlas.pdf

20 Gold, W. & Kongstvedt, P. (2003). "How broadening DM's focus helped shrink one plan's costs," *Managed Care Magazine*. www.managedcaremag.com

21 <http://www.ajmc.com/Article.cfm?Menu=1&ID=2779>

Disease Management's Mixed Results to Date

Study	Conditions	Findings
http://www.soa.org/research/files/pdf/Paper3-Literature-Review.pdf	Heart Disease, Diabetes, Asthma	ROIs range from 1.2-6.4:1. Highest savings in heart disease. Moderate savings in diabetes, and mixed (some results no savings) for asthma. A recent randomized control study showed no discernible savings.
Villagra, V. & Ahmed, T. (2004). "Effectiveness of a disease management program for patients with diabetes," <i>Health Affairs</i> , 23(4): 255-266	Diabetes	Overall costs for full-year participants in the pre-post analysis were \$39 (8.1 percent) less per diabetic member per month when compared to non-participants. <ul style="list-style-type: none"> • In the parallel group comparison, overall costs for full-year participants were \$137 (24.7 percent) less per diabetic member per month when compared to non-participants. • The most important source of savings was a 22-30 percent reduction in hospitalization.
Wheeler, J. (2003). "Can a disease self-management program reduce health care costs? The case of older women with heart disease," <i>Medical Care</i> . 41(6): 706-715	Chronic Heart Failure	Results demonstrated that hospital cost savings exceeded program costs by a ratio of nearly 5:1. <ul style="list-style-type: none"> • Program participants experienced 46 percent fewer inpatient days and 49 percent lower inpatient costs than the control group, but no significant differences between the two groups were reported in ER utilization.
Gold, W. & Kongstvedt, P. (2003). "How broadening DM's focus helped shrink one plan's costs," <i>Managed Care Magazine</i> . www.managedcaremag.com .	17 Chronic Conditions or Diseases	A return of at least \$2.90 for every dollar invested in the program: <ul style="list-style-type: none"> • Average overall savings of \$41 per program member per month • 14 percent fewer hospital admissions • 18 percent fewer ER visits • Significant improvement in diabetics' HbA1c levels • Absenteeism from work or school was reduced significantly (7-11 percent) among members participating in the program.
AHIP Survey http://www.ahipresearch.org/pdfs/3_DMCBO.pdf	Various	Disease management programs reduce utilization and costs associated with chronic conditions common in the Medicare population. For example: <ul style="list-style-type: none"> • Commercial and Medicare members enrolled in one health plan's program for congestive heart failure had total per-member, per-month costs that were 33 percent lower than those for members in the control group. Inpatient admissions and emergency room visits were reduced by 33 percent in the intervention group. Pharmacy costs were 5 percent higher in the intervention group. • A disease management program for patients with diabetes enrolled in a health plan and an employer's self-insured plan found that in one year, total costs fell 6.4 percent; inpatient costs decreased 14.4 percent; pharmacy costs were reduced 3.3 percent; inpatient admissions declined 5.9 percent; and total return on investment was estimated to be between 1.75:1 and 2:1. • In a disease management program for patients with lower back pain enrolled in a health plan and an employer's self-insured plan, return on investment was estimated to be between 1.3 and 1.5:1. • In a disease management program for commercial, Medicare, and Medicaid health plan members that addressed multiple chronic conditions (including diabetes, coronary artery disease, and asthma), preliminary analysis found a net savings of 90 cents per member, per month and an estimated return on investment of 2.94:1. While findings in these health plans may not be generalizable to the health sector as a whole, they provide examples of the magnitude of savings that can be achieved with disease management programs.
http://www.ajmc.com/Article.cfm?Menu=1&ID=2779	Asthma	Total costs for asthma and non-asthma care plus the cost of the program were \$220.84 PMPM. Return on investment was calculated as follows: (\$351.97 minus \$179.17) divided by \$41.67 equals \$4.15.
Cousins, M. & Liu, Y. (2003). "Cost savings for a preferred provider organization population with multi-condition disease management: Evaluating program impact using predictive modeling with a control group," <i>Disease Management</i> . 6(4): 207-217	Asthma, Diabetes, and Coronary Artery Disease	Preliminary results show that the program produced a return on investment of \$2.84:\$1.00. Savings were calculated by comparing expected medical costs predicted by a model based on a control group (n=2,491) to actual medical claims costs for the study group (n=1,009). <ul style="list-style-type: none"> • Financial data used in the analysis included all claims costs for program participants; it was not limited to specific conditions.



Implications of the Medical Home for Key Stakeholders:

- *For an individual primary care physician:*
Establishing a medical home program would require a one-time investment of ~\$100,000 and ongoing expenses would increase ~\$150,000 or more. To offset the risk associated with the opportunity would likely require a long-term bonus structure and up-front capital from a strategic partner to operationalize the model. It also would require revamping practice operations and streamlining processes to focus on coordination of care and patient adherence (rather than visits). The projected risk level for an individual clinician could be high relative to the return unless the physician is part of a community-based care management model supported through a strategic collaboration among local payors and a community-based health information exchange. (Level of Risk: High)

- *For a hospital with a substantial primary care referral network:*
If the medical home model is structured within a hospital's existing primary care network, the hospital would risk losing revenue from 10 percent fewer admissions and 20 percent fewer ED visits. It would also risk its relationships with community-based specialists whose volumes might be reduced through coordination of care. Before implementing the medical home, therefore, a hospital should consider the long-term implications to its competitive position and verify that population-based care management efforts leveraging the medical home make strategic sense to its key stakeholder, the community. A medical home model sponsored by a hospital could be the basis for expanding community-based chronic and preventive health programs, and offer local payors a long-term solution to cost containment. However, the required up-front investments and anxieties around specialists' reactions would require special consideration and expert tactical execution. It is the Center's view that, in spite of the risks, hospitals likely will migrate to the medical home model, leveraging their investments in clinical information technology to facilitate their transformation from hospital to care management organization. (Level of Risk: Moderate)
- *For a commercial health plan:*
The medical home has the potential to shift costs from acute care to preventive and chronic care over a period of years. However, the concept could be unsettling to a community if it is sponsored by a single health plan that is deemed to be "disintermediating" relationships between traditional patient-practice dynamics. On the other hand, the medical home could be a positive, disruptive strategy in a community where a health plan wishes to provide a value-added service to a group of large employers that hold substantial liability for retiree health costs (FASB 106 requirements).

There is a perception that physicians distrust health plans. To that end, it would probably be necessary for the sponsoring health plan to make the up-front investment in the medical home and provide a bonus structure tied to cost savings and population-based outcomes. In addition, the introduction of the health plan's medical home model would likely encourage hospitals and local physician groups to consider similar models. (Level of Risk: Moderate to High depending on market conditions)

- *For public payors:*

Public payors face a situation very similar to that of commercial health plans. The medical home's potential to shift the industry from its current reactive (acute) reimbursement approach to one of prevention and care coordination could pay large dividends, particularly for at-risk populations. Also, rewarding providers to more effectively coordinate care via direct accountability could strengthen the physician-patient relationship in addition to achieving better clinical and financial outcomes. The spirit of the current Medicare Medical Home Demonstration, as promulgated in Section 204 of the Tax Relief and Health Act of 2006, encourages broad participation in pilot programs to help determine where the medical home has the best opportunities for success. There could be much knowledge to leverage from the current HHS activity in value-based health care and CMS' pay-for-performance activities to bring to a medical home model.

Moving Forward with a Medical Home Model

The U.S. health care system's current operating model is not sustainable, particularly as the nation's uninsured and aging Baby Boomers add more demands to an already stressed system. Adopting a medical home model for chronic care management will help to ease the situation, but there are challenges to overcome:

- Most physicians lack training and experience to implement a medical home model. Can physicians provide care coordination services more effectively than care management vendors, health plans or hospital systems? Physicians currently lack training and experience with care coordination while vendors and health plans have developed niche expertise. Also, physicians are trained in medicine, not business or management. Most do not have great interest in broadening their service offerings to include the comprehensive care coordination required in a medical home model.
- The medical home model could hold considerable policy implications for federal and state governments. With evidence-based medicine (EBM) serving as the medical home's lifeblood, what happens if a physician practicing EBM still has a bad clinical outcome? Legislatures should consider the use of medical courts to address malpractice issues and encourage the practice of EBM.
- The nation's shortage of primary care providers could delay adoption of the medical home. Currently, the U.S. has 87 PCPs/100,000 lives, but this ratio has been trending down as primary care residency positions go unfilled and current PCPs leave medicine.²² State legislatures should follow the lead of Pennsylvania Governor Rendell in his "Prescription for Pennsylvania" mandate to support the expansion of ancillary care provider credentialing standards by broadening their practice scope to address PCP shortages. The government needs to consider ways to encourage growth in retail medicine which could come from programs such as financial incentives or tax breaks, or by relaxing immigration restrictions to encourage more primary care medical graduates from other countries to practice in the U.S.



22 http://www.commonwealthfund.org/publications/publications_show.htm?doc_id=50808



- The health care industry's support structure may be deficient to facilitate medical home implementations on a large scale. Can U.S. life sciences companies scale-up medical devices, medications and technologies to support robust care coordination? Would the exponential growth in demand for life sciences products further threaten the safety and integrity of their supply chains? Will the nation's current technology infrastructure and electronic power grids support the explosion of information systems and devices that will be needed to operate the medical home?
- Physicians often lack capital and incentives to adopt required information technologies. Scaling physician practices to accommodate medical homes will require considerable investments in information technology. However, physicians historically have been slow to fund and adopt IT advancements.

- An increased number of care management providers could generate turf wars. Where do care management vendors/health plans stop and medical homes start in care coordination? Will the various care providers collaborate or create a more fragmented market? The medical home could affect health care financing, resulting in changes to reimbursement distributions between physicians and the care management industry.
- Financial savings are still questionable. Can individual medical homes offer financial guarantees to payors? Many purchasers of care management services demand proof of financial savings; however, this is not yet included in any of the proposed medical home models. Also, physicians have participated in capitated contracts in the past with mixed acceptance rates. Currently, an individual medical home doesn't have the expertise or capital to support financial guarantees.

Despite these and other challenges, there are compelling arguments in favor of medical home adoption:

- The medical home is a better delivery model. By adopting Wagner's Chronic Care Model, the medical home will provide a more comprehensive approach to primary care, more holistic and integrated care, and a more collaborative physician-patient relationship. During physicians' teachable moments with their patients, the medical home model should help to reinforce information and knowledge sharing.
- Reforming health care reimbursement processes to pay physicians for care coordination should result in more adherence to evidence-based medicine and higher-quality care overall.
- Physicians could partner with care management vendors and hospitals to achieve economies of scale for purchasing the technologies needed for care coordination; i.e., call centers, health coaching, patient advocacy, etc.
- Realigned incentives supporting evidence-based medicine would address the mis/over/under use quality issues currently plaguing the U.S. health care system, resulting in fewer safety issues and improved clinical and financial outcomes.
- Improved clinical and financial outcomes would help produce a more productive and competitive workforce in an increasingly global economy.

As the Center's model indicates, medical homes could more than pay for themselves. Additionally, their benefits could inspire the industry to address the challenges to implementation. Empowering primary care physicians with direct accountability for all care for their patients could help to re-establish the collaborative doctor-patient relationship that this nation has been sorely missing.

Implications of Medical Home for Key Stakeholders

Primary Care Physicians	<ul style="list-style-type: none"> Practice revenue would increase by \$100,000 for care coordination accountabilities, with \$20,000 at risk in incentives for clinical performance. Physicians would face more responsibility and a learning curve to manage care coordination. Clinical resource expenses would increase as health coaches are added to the practice to help the physician coordinate care. The physician's office would have an EMR to track clinical data to identify care coordination opportunities. The EMR would also support follow-up for patients' e-mails, medication adherence and other direct outcomes of care. Medical homes would add to the prestige of primary care physicians and help to stem the brain drain in the field.
Large Multi-specialty Groups	<ul style="list-style-type: none"> Large multi-specialty groups could lose power and prestige as PCPs control more of the clinical activity via the medical home. With the enhanced care coordination medical homes provide, more patients could control their chronic conditions, resulting in fewer referrals to specialists. Hospitals could face up to a 30 percent decrease in revenue. In response, they will need to consider ways to diversify traditional revenue streams. Should hospitals decide to become medical homes themselves, primary care physicians could become employees of the hospital if they don't want to assume total responsibility for managing their medical home patient panels. Hospitals, in turn, would need to develop reward systems to align physician incentives for care coordination services. Hospitals could also provide the registries, decision support, expert systems and knowledge management capabilities needed to support the medical home and its new role in the community.
Health Plans	<ul style="list-style-type: none"> Crisp work flows would be needed to integrate with the medical home care coordinators to minimize any duplicated services or gaps in care. If the medical home is responsible for care coordination, health plans may need to redirect their care coordination services elsewhere since they wouldn't be compensated – unless employers bought-up additional clinical services beyond those provided by the medical home. If the health plan has insourced care management that is sold as a standalone product, there could be risk to the medical management revenue stream, as the medical home would be in direct competition for care coordination with health plans. Health plans would need to offer more real-time, bi-directional data flows between their systems and medical homes to leverage the homes' clinical tracking and decision support systems. The health plan could maintain its role as data aggregator but offer better IT interfaces to the medical homes' EMRs so that physicians have a more up-to-date clinical record with outcomes. Utilization could decrease as a health plan's network medical homes deliver better care coordination, resulting in improved profitability and decreased loss ratios. One note of caution: Health plans could find themselves under fire for excessive profits, which might prompt additional competitors to enter their market.
Employers	<ul style="list-style-type: none"> As health care purchasers, employers will benefit from a more rational care delivery system that incentivizes providers for clinical outcomes. Medical homes could help to stabilize rising health care costs, thus making it easier for employers to continue providing employee health benefits. Lower health care costs would enable U.S. companies to compete more effectively in an international marketplace. Employers could see that their investments in employee health are efficient, effective and improve the bottom line.
Life Sciences and Technology Companies	<ul style="list-style-type: none"> The resulting medical cost savings from the focus on care coordination could free-up funding from acute care to invest in start-up ventures to supply the medical home. The need for new technologies to support medical homes' information and expert systems could lead to a new era in product innovation. As the use of EMRs becomes widespread, a push for health information exchanges (HIEs) as a conduit to share the resulting data could ensue. HIEs would be better supported as society appreciates health information technology investments and their direct results on improved health. As savvy computer users age, they will want to "medically wire" their homes to synch them up to their medical home and help them better adhere to their physicians' recommendations.
State Government	<ul style="list-style-type: none"> Public health programs could develop initiatives to better support physicians and their medical home responsibilities. Indigent care should improve as medical homes better coordinate care to keep patients out of expensive inpatient settings. Crime could decrease as behavioral health patients are better tracked via care coordination.
Federal Government	<ul style="list-style-type: none"> The medical home could help the U.S. economy achieve a fixed ratio of medical cost growth to GDP growth and help to sustain the country's health care financing model. Supporting a medical home model could result in more rational physician workforce planning with a redirection of residency training support to more primary care specialties.

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