The Advanced Medical Home:
A Patient-Centered, Physician-Guided Model of Health Care

Policy Monograph
of the
American College of Physicians
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Executive Summary

This policy monograph highlights some of the major problems with the health care system in the United States today and proposes a fundamental change in the way that principal – or primary care – is delivered and financed. It recommends voluntary certification and recognition of primary care and specialty medical practices that: provide patient-centered care based on the principles of the Chronic Care Model; use evidence-based guidelines; apply appropriate health information technology; and demonstrate the use of "best practices" to consistently and reliably meet the needs of patients while being accountable for the quality and value of care provided. The American College of Physicians introduces the term "Advanced Medical Home" to distinguish these practices and calls for consideration and testing of this model of care. The issues identified and positions offered in this monograph address major concerns about the status of the U.S. health care system. The monograph contains the following four policy positions:

Position 1. ACP calls for a comprehensive public policy initiative that would fundamentally change the way that primary care and principal care (whether provided by primary care or specialty care physicians) are delivered to patients by linking patients to a personal physician in a practice that qualifies as an advanced medical home.

Position 2. Fundamental changes should be made in third party financing, reimbursement, coding and coverage policies to support practices that qualify as advanced medical homes.

Position 3: Fundamental changes should be made in workforce and training policies to assure an adequate supply of physicians who are trained to deliver care consistent with the advanced medical home model, including internists and family physicians.

Position 4: Further research on the "Advanced Medical Home" model and a revised reimbursement system to support practices structured according to this model should be conducted and should include national pilot testing.

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An Environment for Change

The U.S. health care system is poorly prepared to meet the current, let alone the future health care needs of an aging population. Health care costs are continuing to grow faster than the economy, and employers, government, and individuals are straining under the financial burden. Patients are dissatisfied,[1,2,3] physicians are dissatisfied,[4,5,6,7] and employers are cutting back on worker and retiree health insurance coverage and benefits.[8,9,10] At the same time, 45.8 million Americans are uninsured and the number is rising. The Medicare Hospital Insurance Trust Fund will soon be insolvent[11], and funding the remainder of the Medicare program is being accomplished through cutbacks in services, decreasing reimbursements to physicians and passing premium increases along to beneficiaries. The states and the federal government are also reducing Medicaid benefits and coverage, while costs continue to escalate.

In this environment, physicians are pressured to see more patients in less time[12]; they are inundated with administrative paperwork and regulatory requirements; they have added pressure to stay current with an overload of information in a medical environment that is increasingly more technical and complicated, and they struggle to keep their practices afloat in the face of declining revenues and increasing costs. Trusting, intimate relationships with patients have suffered as physicians and patients struggle with the financial and bureaucratic complexities of public and private insurance coverage issues which can cause substantial stress within patient–physician relationships.[13]

Many young physicians also must deal with paying off substantial medical education debts. The median indebtedness of medical school students graduating this year is expected to be $120,000 for students in public medical schools and $160,000 for students attending private medical schools. About 5% of all medical students will graduate with debts of $200,000 or more. [14] Physicians also must stay current with ever expanding medical knowledge and technology in accord with evolving medical standards of quality. To make matters worse, insufficient numbers of young physicians are entering careers in primary care, and increasing numbers of older physicians are dissatisfied with their careers and indicate that they will soon discontinue practice.

In addition, health care outcomes in the United States contrast poorly with those of other industrialized countries[1516]. In too many instances, unnecessary or inappropriate health care services are provided because there is little coordination of patient care among providers or across sites of service.[17] Medical care at the end of life consumes more than a quarter of the Medicare budget. [18] Avoidable errors and safety issues are common. Indefensible disparities in the quality of health care persist along geographic, racial, ethnic, and socioeconomic lines.[19,20]

Our system of private health insurance and governmental programs emphasizes episodic treatment for acute care. Care management, proactive or planned care, active cross-discipline management, and even some preventive care are often uncovered services or are poorly reimbursed. Yet, 45 percent of the U.S. population has a chronic medical condition and about half of these, 60 million people, have multiple chronic conditions.[21] For the Medicare program, 83 percent of beneficiaries have one or more chronic conditions and 23 percent have five or more chronic conditions.[22] Within ten years (2015) an estimated 150 million Americans will have at least one chronic condition. [23] The organization of health care as well as payment and reimbursement policies needs to change to accommodate this shift from acute to chronic care. But, who will care for the chronically ill and elderly patients, if current trends continue and there are not enough primary care physicians?

In this paper, ACP proposes consideration of an "Advanced Medical Home" model that offers the potential to improve U.S. health care by focusing on strengthening and supporting the patient-physician relationship. This model entails a central resource (the Advanced Medical Home) with a competent team that includes a physician specialist in complex, chronic care management and coordination and active involvement by informed patients. The ACP position paper, "Patient-Centered, Physician-Guided Care for the Chronically Ill" introduced this concept for patients with chronic disease.[24] This monograph builds upon the positions expressed in that paper and expands the scope to address the needs of patients as they navigate the health care system. A framework for redesigning the reimbursement system to support the recommendations is described and will be developed further in a paper to be released in mid-2006. Macro-level policy reforms (financing, coverage, reimbursement, physician education and training, and workforce distribution) will be needed to support this model, but the first step is to define the principles that deserve support. Development of the macro-level changes that are required to implement and sustain the model will follow.

<u>Position 1</u>. ACP calls for a comprehensive public policy initiative that would fundamentally change the way that primary care and principal care (whether provided by primary care or specialty care physicians) are delivered to patients by linking patients to a personal physician in a practice that qualifies as an advanced medical home.

The Advanced Medical Home Model

The medical home concept has been previously described as early as 1967 by the American Academy of Pediatrics' Council on Pediatric Practice and the effectiveness of the model in caring for children with special needs has been demonstrated. [25,26] The American Academy of Family Physicians described the medical home in its Future of Family Medicine project.[27] The "Advanced Medical Home" builds on these concepts, which are based on a vision of health care from the perspective of a patient and his/her family – and describes the model in the context of redesigning the reimbursement system to support the evolution of care according to these principles.

The advanced medical home acknowledges that the best quality of care is provided not in episodic, illness-oriented, complaint-based care—but through patient-centered, physician-guided, cost-efficient, longitudinal care that encompasses and values both the art and science of

medicine. Attributes of the advanced medical home include promotion of continuous healing relationships through delivery of care in a variety of care settings according to the needs of the patient and skills of the medical provider. Physicians are once again partners in coordinating and facilitating care to help patients navigate the complex and often confusing health care system by providing guidance, insight and advice in language that is informative and specific to patients' needs.

In the advanced medical home model, patients will have a personal physician working with a team of healthcare professionals in a practice that is organized according to the principles of the advanced medical home. For most patients the personal physician would most appropriately be a primary care physician, but it could be a specialist or sub-specialist for patients requiring on-going care for certain conditions (e.g., severe asthma, complex diabetes, complicated cardiovascular disease, rheumatologic disorders, and malignancies). Primary care physicians are defined as physicians who are trained to provide first contact, continuous, and comprehensive care.[28] Principal care, that is, the predominant source of care for a patient based on his/her needs, can be provided by a primary care physician or medical specialist. In most cases, primary care physicians, with their office care team, are ideally suited to provide principal care and be a patient's care coordinator – a personal physician, in the advanced medical home model. However, a medical specialist with his/her office care team can fulfill the role of personal physician as defined in this paper if he/she so chooses. Rather than being a "gatekeeper" who restricts patient access to services, a personal physician leverages the key attributes of the advanced medical home to coordinate, and facilitate the care of patients and is directly accountable to each patient. Personal physicians advocate for and provide guidance to patients and their families as they negotiate the complex health care system.

Key Attributes of the Advanced Medical Home

Practices and physicians that adopt the advanced medical home structure, a) use evidence-based medicine and clinical decision support tools to guide decision-making at the point-of-care based on patient-specific factors; b) organize the delivery of that care according to the Chronic Care Model (CCM), but leverage the core functions of the CCM to provide enhanced care for all patients with or without a chronic condition; c) create an integrated, coherent plan for ongoing medical care in partnership with patients and their families; d) provide enhanced and convenient access to care not only through face-to-face visits, but via telephone, email and other modes of communication; e) identify and measure key quality indicators to demonstrate continuous improvement in health status indicators for individuals and populations treated; f) adopt and implement technology to promote safety, security, information exchange and portals for patient access to their health information; and g) participate in programs that provide feedback and guidance on the overall performance of the practice and its physicians.

Drs. Ed Wagner, Michael von Korff and colleagues at Group Health Cooperative initially described the Chronic Care Model (CCM).[29] The American College of Physicians believes that the CCM can be equally applied across all clinical situations and offers a valuable framework for the redesign of the care delivery system. Therefore, this monograph will subsequently refer to the CCM as simply the "Care Model" to emphasize that the elements of the model can apply to all patients, not just those with a chronic illness. The Care Model (CM) emphasizes that improved functional and clinical outcomes are the product of an informed, activated patient and

a prepared, proactive practice team. A full description of the components of the CCM is included as an appendix to the "Patient-Centered, Physician-Guided Care for the Chronically Ill" paper from October 2004.[30]

In brief, the key practice-based components of the CM include encouraging patients to engage in the management of their own health (self-management) and providing them with resources and skills to obtain appropriate health care services; designing the delivery system to assure the provision of effective, efficient clinical care; embedding clinical decision support tools into daily practice; and using information technology to support patient education, patient care planning, coordination of care, and monitoring of performance. The system-level attributes of the CM include the use of community resources, partnerships, and policies to support the health care system, and organization of health care to create a culture of safe and high-quality care. These elements of the CM are central to the distinct advantages of a health care delivery system that supports the economic viability of practices structured to be a patient's advanced medical home.

Health care provided through a medical home is distinctly different from disease management programs. Typical disease management programs utilize "case managers" provided by the patient's health plan or a contracted disease management company.[31] The best programs attempt to include the treating physician and his/her team, but the emphasis is usually on the relationship between the patient and the case manager with periodic input requested from the patient's physician. In the advanced medical home model, the care and coordination of that care continually resides with the patient's personal physician and his/her health care team. The patient and physician decide on specific health care objectives and then choose the best way to achieve these objectives. Advanced medical home practices will provide a range of options for their patients to support their personal health goals (e.g., health education, nutrition services, disease management) either directly or through established relationships with external providers of these services such as disease management companies. The patient, with support from the physician and other members of the health care team, which may include nurses, social workers, care managers, dietitians, pharmacists, physical and occupational therapists, and other allied health care professionals, then becomes engaged in his/her health care, and the health care system better serves the needs of each individual patient.

[Please see the Appendix for three scenarios illustrating how patient care might be provided in physician practices using the advanced medical home model.]

Position 2. Fundamental changes should be made in third party financing, reimbursement, coding and coverage policies to support practices that qualify as advanced medical homes.

A Reimbursement System to Support the Advanced Medical Home

The American College of Physicians believes that the advanced medical home model offers an opportunity to demonstrate the value of coordinated, patient-centered, physician-directed care that is enabled by health information technology and accountable for achieving measurable improvements in the quality of care provided. However, the current reimbursement system does not provide the financial support for practices and physicians to adopt, implement, and maintain the infrastructure and processes necessary for this model of care, except in integrated group

practices which are largely funded through prepayments. The scenarios in the Appendix illustrate modes of care delivery that would not be reimbursed under the current reimbursement system. Therefore, a revised reimbursement model is absolutely essential for the advanced medical home to be adopted widely.

A revised reimbursement system would acknowledge the value of both providing and receiving coordinated care in a system that incorporates the elements of the Care Model (CM) organized according to the advanced medical home model. Further, such a system would align incentives so physicians and patients would choose medical practices that deliver care according to these concepts. Physicians would elect to redesign their practices because the model is supported by enhanced reimbursement for system-based care in the advanced medical home, rather than the volume-based, episodic, fee-for-service system currently in place. Patients would select an advanced medical home based on service attributes such as the patient-centeredness of a practice, improved access, and coordinated care – as well as value attributes as demonstrated by publicly available reports on quality and cost.

The revised reimbursement system would start with the identification of physicians and practices that can demonstrate consistent application of the key attributes described for the advanced medical home, as well as accomplishment of training in the principles of the CM and systems-based care. The American College of Physicians envisions a voluntary process to qualify practices for this designation prior to becoming eligible for the revised reimbursement model. As part of this practice qualification process, physicians in the practice would need to complete a self-paced educational module on the care model and systems-based care provision such as the Practice Improvement Modules of the American Board of Internal Medicine or comparable educational programs.

Further research and policy development will be necessary to determine a reasonable process for certifying practices that meet criteria as an advanced medical home (see position 4). Once qualified, a practice would become eligible for reimbursement that is based on the provision of care according to the advanced medical home concept. An analysis of potential reimbursement mechanisms will be the subject of a subsequent ACP monograph. However, the key elements of a revised reimbursement system should include compensation for: a) the coordination of care both within a given practice and between consultants, ancillary providers and community resources; b) adoption and use of health information technology for quality improvement; c) provision of enhanced communication access such as secure email and telephone consultation; d) remote monitoring of clinical data using technology; and e) pay-for-reporting/pay-for-performance. Examples of other features of a revised reimbursement model to consider include: a) providing enhanced coverage for beneficiaries and reducing co-insurance for patients who select an advanced medical home for their principal care; and b) reducing administrative burdens for physicians and practices (e.g., modification of documentation requirements for coding, elimination of need for advanced beneficiary notices).

A reimbursement model that supports the development of the advanced medical home would provide some of the financial benefits of the retainer or boutique model of care. However, access to these benefits would be more widely available, not just to those patients who could afford to pay an additional annual fee. If done correctly, by incorporating the elements of a

revised reimbursement model cited above, qualified practices would benefit from reduced practice hassles and improved revenue – while building systems of care to meet the challenges of an aging population. This model of reimbursement to support practice redesign would provide an alternative for physicians who might otherwise become part of the niche market of concierge primary care[32] – an important consideration given the anticipated shortfall in physicians able to meet the growing needs of the US population. Further, since this reimbursement system would recognize and compensate primary care physician practices for the quality of care delivered while reducing the typical administrative hassles, it may also help reverse the trends cited below that document a significant decline in medical students choosing primary care specialties.

Position 3: Fundamental changes should be made in workforce and training policies to assure an adequate supply of physicians who are trained to deliver care consistent with the advanced medical home model, including internists and family physicians.

The Crucial Role of Primary Care Physicians

Primary care physicians play an essential role in the advanced medical home model. While specialists may choose to provide care according to this model, in the vast majority of cases a primary care physician will serve as the patient's personal physician and will generally be the one who coordinates comprehensive and continuous care.

Internists are especially well prepared to evaluate and manage all aspects of illness – biomedical and psychosocial – in the whole patient, and thus are uniquely qualified to be the personal physician for patients in qualified advanced medical home practices. Internists are expert diagnosticians who can treat and manage chronically ill patients with one or multiple complex and interactive illnesses. Internists also are experts in evidence-based disease prevention, early detection of disease, medication management, and health promotion. They serve as consultants when patients have difficult, undifferentiated problems and may also have special areas of expertise.[33] With some additional training, they will be well equipped to assemble and guide care teams in an advanced medical home practice in the community, where they will prescribe necessary services and serve as the patient's guide and advocate in a complex health care environment. The advanced medical home model would utilize the internist's skill as a coordinator of services patients need from multiple other diagnostic and therapeutic specialties. Practices following the advanced medical home model would value the internist's familiarity with the science of clinical epidemiology and evidence-based medicine. Such a practice would also value the internist's thoughtful, cost-effective practice style for evaluation and management. A physician practice that qualifies as an advanced medical home would also be able to utilize the internist's skills as a clinical information manager who can take full advantage of health information technology.

As more practices adopt the medical home model, the value of internists and other primary care physicians may be enhanced. However, there may not be enough of these physicians to meet the growing needs of the US population. The need for physicians to care for patients with chronic and complex illnesses will increase substantially as the U.S. population ages. Within only five years, the first of a wave of 76 million baby boomers will begin to be eligible for Medicare. The population age 85 and over, which is most likely to require chronic care services for multiple

conditions, will increase 50 percent from 2000 to 2010. It will more than double by 2030, and more than quadruple by 2050.[34]

For the nation to have a sufficient supply of primary care physicians to meet future needs for preventive care, the diagnosis and management of undifferentiated symptoms, and skill in designing unique plans for patients with multi-system problems,, strong public financial support will be needed for primary care training and for innovative programs to increase the appeal of careers in primary care. Widespread adoption of the advanced medical home model will further enhance the need for training in primary care.

An Impending Crisis in Primary Care

There is growing evidence that shortages are developing for primary care physicians in the United States, particularly among general internists, geriatricians, family physicians and for certain subspecialists in internal medicine. Previous expectations of an excess supply of physicians have not materialized. Current projections indicate that the future supply of physicians will be inadequate to meet the health care needs of the aging U.S. population, especially as "Baby Boomers" are beginning to reach retirement age in 2011 when they will be at increased risk for needing health care services. One recent study projects a shortage of 200,000 physicians by 2020. [35]

The American College of Physicians is particularly concerned about emerging shortages in internal medicine and its subspecialties. Over the past several years, numerous studies have found that shortages are occurring in internal medicine. [36] [37] [38] Additionally, several internal medicine subspecialty societies—including the American College of Cardiology, the Committee on Manpower for Pulmonary and Critical Care Societies, and the American Geriatrics Society—have asserted that they are in or on the cusp of a workforce shortage.[39] [40] [41]

Yet, interest of medical students in careers in the primary care specialties of internal medicine, family medicine, pediatrics and obstetrics/gynecology has been declining. [42] The trend away from primary care has been well documented by the annual residency training match sponsored by the National Resident Matching Program (NRMP). The number of U.S. medical school graduates who choose to enter generalist residency training has decreased from 50 percent in 1998 to less than 40 percent in 2004. The decline has been greatest in family medicine training programs, which has declined 41 percent. Internal medicine and pediatrics declined by 9 percent and 8 percent respectively. It should be recognized that these data include physicians who began residency training in internal medicine and pediatrics but will go on to sub-specialize. Consequently, the number of physicians who enter practice in primary care will be much lower. There also are a relatively small number of residency programs that provide a specific training track for primary care, but the number of trainees in these programs has also declined: primary care track internal medicine residents declined 46% from 347 in 1999 to 188 in 2004, and primary care pediatrics declined 24%, from 63 in 1999 to only 48 in 2005. [43]

A recently-published study of the career plans of internal medicine residents documents the steep decline in the willingness of physicians to enter training for primary care. In 2003, only 19% of first year internal medicine residents planned to pursue careers in general medicine. Among third

year internal medicine residents, only 27% planned to practice general internal medicine compared to 54% in 1998.[44]

The Advanced Medical Home Model: Implications for Physician Education, Training, and Practice

The long pipeline of medical education and training and the retirement and career changes of older physicians require that the nation have a constant influx of new students embarking on medical careers as well as training and continuing medical education for those already in practice. The demand for primary care physicians of all types will continue to increase as the population ages and its health care needs increase, and as the demand for acute, chronic and long-term care increases. To better prepare physicians for practice in settings using the advanced medical home model, changes in training will be needed in undergraduate and graduate medical education as well as in continuing medical education. Funding also will be needed to develop training settings that use principles of the model.

The workforce needs of the advanced medical home model have yet to be determined. If in response to adoption of the model, physicians reduce their practice panels in order to provide more time for each patient, there will be an even greater need to increase the supply of primary care physicians. On the other hand, adoption of the model could result in positive changes in physician career satisfaction that could result in more physicians entering and remaining in primary care careers.

In either case, medical education and training will need to change to better prepare young physicians for practice under the advanced medical home model. In a recent position paper of principles and goals for re-designing training in Internal Medicine, ACP identified some of the kinds of changes that will be needed in medical school training:

> Training, particularly in the ambulatory setting, must occur in well-functioning practice environments that demonstrate a patient-centered, service-oriented approach. The fourth year is a time when students should receive "translational education" that allows them to translate the knowledge they have learned into effective and high quality care of patients. This involves an understanding of the shortcomings of current healthcare delivery, the need for effective and efficient systems of delivery of care, and the value of a team-based approach. Students should understand the principles of best models of care, and should have an opportunity to see how such models are effectively utilized. [45]

To improve the attractiveness of careers in primary care, medical education and training will need to provide students, residents, and practicing physicians with the key skills necessary for successful and satisfying practices in the 21st century. These include an understanding of the importance of a multidisciplinary team-based approach in both in inpatient and outpatient care, learning how to assemble and work with non-physician members of the health care team, innovative practice management concepts, and an adequate framework for understanding and adapting to evolving health care policy issues. Training for the advanced medical home model will need to prepare residents and practicing physicians to function as integral members of a health care team that may include nurses, social workers, care managers, dietitians, physical and occupational therapists, and other allied health care professionals.

<u>Position 4:</u> Further research on the "Advanced Medical Home" model and a revised reimbursement system to support practices structured according to this model should be conducted and should include national pilot testing.

The Center for Medicaid and Medicare Services (CMS) should, in 2007, conduct a national pilot program in various primary care settings to determine the feasibility, cost effectiveness and impact on patient care of the advanced medical home. This effort should specifically address the advanced medical home model, but would complement ongoing and planned CMS pilot programs such as the Medicare Physician Group Practice Project, the Medicare Care Management Performance Demonstration (MMA Section 649), and Medicare Health Support Pilot (MMA Section 721) and Medicare Health Quality Demonstration Program (MMA Section 646). The Advanced Medical Home Demonstration Program should help determine appropriate criteria for qualifying a medical practice as an advanced medical home. The pilot should also identify and test various payment options to support practices that qualify as advanced medical homes. Metrics for evaluation of the pilot should include patient satisfaction, physician and staff satisfaction, clinical process and outcome measures, payment costs as well as cost offsets, and the potential economic impact on physicians who adopt the advanced medical home structure.

Modeling and testing of the advanced medical home should also consider its potential impact and ramifications on patient access to health care, health care costs, physician supply and specialty mix, physician practice costs and practice patterns, health insurance coverage, and medical education and training.

Conclusion

Donald Berwick described four levels of the American health care system: the experience of patients (Level A); the functioning of small units of care delivery ("microsystems") (Level B); the functioning of the organizations that house or support microsystems (Level C) and the environment of policy, payment, regulation, etc. (Level D) which influences Levels B and C.[46] This monograph highlights the significant issues our health care system is currently facing, and will continue to experience, in Level D. Policies, payments and the regulations that codify these processes are ill suited to the challenges outlined. The current dysfunctional physician payment system fosters an environment that is leading to declining access, accelerating costs and mediocre quality—trends that are clearly contrary to the needs and desires of patients, physicians, and society. The current method of physician payment rewards quantity rather than quality and undervalues primary and preventive care. The current system cannot support the patient-centered care envisioned by the advanced medical care model.

The American College of Physicians believes that the advanced medical home model, applied in the context of a revised reimbursement system addresses all four (4) of Berwick's levels.

- It will revitalize the patient-physician relationship and place the patient and his/her family at the center of care;
- It will stimulate practice-level innovation to provide enhanced quality, effectiveness, safety, efficiency and value because practices will be able to invest in systems-based care and measurement of that care;

- It will enhance coordination of care across all domains of the healthcare system (hospitals, home health agencies, nursing homes, consultants and other components of our complex healthcare network); and
- It will recognize that care provided by a personal physician, operating in accord with the advanced medical home model is a highly valuable service.
- It will lead to the macro system changes required to support this enriched healthcare model (financing, coverage, reimbursement, physician education and training, and workforce distribution).

APPENDIX

The following scenarios illustrate how three different medical practices might implement the Advanced Medical Home model. The scenarios were designed to highlight the key attributes of the model recognizing that the current reimbursement system limits many practices from investing in the systems and technology described.

Scenario #1: Dr. X and Ms. Jones

Practice setting: Dr. X is a solo practitioner in an established practice supported by a full-time administrative assistant and a full-time clinical assistant. The practice uses a fairly typical practice management system, but does not have an electronic medical record. However, Dr. X and her team implemented a free registry program she obtained from the state Quality Improvement Organization (QIO). The registry is a simple database that Dr. X and her team use to keep track of a limited number of patient-specific clinical indicators. While the database is capable of tracking many parameters, Dr. X uses it just to enter data pertaining to the performance measures endorsed by the Ambulatory Care Quality Alliance (AQA) for diabetes mellitus, congestive heart failure and coronary artery disease. The registry also allows Dr. X to create clinical rules for preventative health care. Dr. X uses an internet-based e-prescribing program associated with a national laboratory vendor for a monthly fee. On-line lab ordering and retrieval are free.

Clinical Care: Each month, Dr. X's assistant runs a query built into the registry to generate a list of patients who are due for a condition-specific intervention. This month, the assistant notes that among the patients who need to be seen is Ms. Jones, a 67-year-old diabetic, who is due for a visit and needs her hemoglobin A1c checked. Dr. X's assistant notes that the registry also has prompted her that Ms. Jones is due for her tetanus vaccine, mammogram and a lipid profile. The assistant enters the laboratory orders on-line and contacts the patient to discuss the need for these laboratory tests, the mammography and tetanus vaccine. Once she sets up an appointment with Dr X, the assistant schedules the laboratory tests for anytime the week prior to the appointment as well as a mammography appointment for later on the same day as the appointment with Dr. X. On the day of Ms. Jones' appointment, the clinical assistant makes sure that the laboratory results from the week prior are in the chart. Ms. Jones arrives for the appointment. Because Dr. X has an established standing order for routine vaccinations, the clinical assistant is able to provide Ms. Jones with the tetanus vaccine while Dr. X finishes up with the previous patient. The assistant also asks Ms. Jones to update her self-management goal checklist and to self-address a fold-over result notification card. As the assistant leaves the room, she takes Ms. Jones' home glucose monitoring log to enter results into the registry database, and reminds Ms. Jones to remove her shoes and stockings so that Dr. X can do a diabetic foot exam. The assistant enters representative glucose values from the log into the registry and checks off that a tetanus vaccination was provided. Later she will take the self-addressed fold-over card and place it in a weekly file to prompt her that there are outstanding test results pending.

Dr. X enters the room after reviewing the laboratory tests attached to the chart, the registry-generated data sheet indicating the need for Ms. Jones' annual breast exam, Ms. Jones' home monitoring log, and the graph of the home glucose monitoring results printed out by his assistant. She hands Ms. Jones her log and congratulates her on how well she is keeping track of her home

testing results. Dr. X reviews Ms. Jones' chart and the self-management checklist that they agreed upon at the last visit. After noting that Ms. Jones' weight has increased (as well as a slight increase in her hemoglobin A1c and LDL), Dr. X and Ms. Jones briefly discuss nutrition, exercise and Dr. X asks Ms. Jones if she would like to speak to a Certified Diabetic Educator (CDE). After some initial hesitation, Ms. Jones agrees to meet with the CDE. Dr. X has contracted (along with two other community physicians in solo practice) with a local CDE who visits each of their offices on a rotating basis to provide consultation for patients. Dr. X completes the rest of her history taking and physical exam including a diabetic foot exam and breast exam at which time Dr. X also provides Ms. Jones with a refresher course on breast self-examination. As the visit draws to a close, Dr. X asks Ms. Jones if she has any questions. They also review her self-management goals and agree to set up a telephone visit every two weeks for the next 6 weeks so that Dr. X can answer her questions and provide encouragement for Ms. Jones. The assistant arranges an appointment with the CDE for Ms. Jones and provides her with a reminder card for her next appointment – a telephone visit in two weeks. Ms. Jones leaves the office and proceeds to her mammography appointment. When Dr. X receives the normal mammography report, she initials the result and forwards it to her assistant – who then completes the result notification card self-addressed by the patient and mails it to the patient.

Scenario #2: Dr. Y and Mr. Smith

Practice Setting: Dr. Y is in a group of three physicians and a nurse practitioner. The practice uses a practice management that is integrated with electronic medical records. The system provides access for patients online to request appointments, referrals, and medication refills. The practice website also includes a link to a Personal Health Record program controlled by each patient, but customized to receive data from the practice. The practice uses advanced scheduling (i.e., Open Access) so that patients who call prior to 1pm can be seen on the same day; no appointments are booked more than two weeks in advance.

Clinical Care: Mr. Smith is a 42-year-old man with long-standing asthma and fairly erratic medical care because of his busy schedule. Approximately six months ago he had a pretty severe exacerbation of his asthma that required a visit to the local emergency department for several hours. Once he was stable, the emergency department physician gave him Dr. Y's office number and encouraged him to call to establish himself with Dr. Y. Mr. Smith was not too anxious to see a physician since he typically was able to manage his asthma fairly well on his own, but this visit to the emergency department was his third one in the past 4 months. Mr. Smith calls Dr. Y's office expecting to be told that the next available appointment is in two months. He is surprised when the receptionist asks if he could come in later that day. After Mr. Smith agrees to come in that day, the receptionist places him on hold briefly until Dr. Y's clinical assistant gets on the phone to ask Mr. Smith a few questions about his medical history, medication, allergies, current symptoms and health maintenance. Mr. Smith is encouraged to arrive approximately 15 minutes in advance of his appointment time. When he arrives, the receptionist asks him a few questions and then directs him to a nearby kiosk to complete, via touch screen, a questionnaire about his health. He notes that the clinical assistant and the receptionist have already entered the information he provided previously. Mr. Smith is able to complete the computer-generated forms in about 5 minutes. Shortly thereafter he is escorted to an examination room.

The clinical assistant asks him a few additional questions and then does some pulmonary function tests pre and post-bronchodilator. The assistant asks whether Mr. Smith monitors his peak flow at home. Mr. Smith indicates that he used to do that but didn't understand what to do with the information – so he just stopped doing it. The assistant takes the opportunity to coach Mr. Smith on the proper technique of doing peak flows at home – and how to properly use the metered dose inhaler. She also provides Mr. Smith with a copy of a generic asthma action plan to review while he waits for Dr. Y. Dr. Y walks in a few minutes later and already seems quite familiar with the information Mr. Smith provided on the phone and through interactions with the receptionist, clinical assistant and computer kiosk. Dr. Y completes his history and physical. Dr. Y explains what an asthma action plan is and how to use peak flow results to adjust his medication regimen in order to minimize asthma exacerbations. Dr. Y is able to provide Mr. Smith customized patient education material generated by the electronic medical records clinical decision support function. In addition, the clinical decision support module generates an alert for Dr. Y indicating that a recent study suggested that long-acting beta agonist inhalers might cause asthma exacerbations in some patients. Dr. Y reviews Mr. Smith's medication again and notes that approximately 6 months ago, a physician he saw just once prescribed Mr. Smith such an inhaler. Dr. Y recommends that Mr. Smith discontinue the long-acting beta agonist and prescribes a medication regimen that includes short-acting bronchodilators and inhaled corticosteroids with instructions on Mr. Smith's action plan about what to do if his peak flow drops below a certain number. Dr. Y provides Mr. Smith with information about the practices' website and personal health record. With Mr. Smith's permission, Dr. Y is able to send key clinical information to Mr. Smith's personal health record including treatment recommendations, medications prescribed through the e-prescribing module in the electronic health record, and health maintenance reminders. Dr. Y also encourages Mr. Smith to email him any non-urgent questions or concerns. Mr. Smith agrees to send his morning peak flow results via email to Dr. Y in 3-5 days – but to call if his peak flow drops below a certain value or if his asthma symptoms get worse despite following the asthma action plan. Dr. Y contemplates enrolling Mr. Smith in a remote monitoring program whereby his daily peak flow results will be transmitted electronically to a contracted disease management firm with nurse case managers, but decides to see how Mr. Smith does before taking that next step. However, Dr. Y does review a self-management checklist with Mr. Smith that includes the need for Mr. Smith to assess his home environment, do daily aerobic exercise, and commit to using the asthma action plan guide. Dr. Y asks his assistant to provide Mr. Smith a reminder card to call his office in approximately 2-3 weeks before noon for a same day appointment or to call and schedule an appointment up to two weeks in advance.

During the subsequent week, Dr. Y receives 2-3 emails from Mr. Smith indicating worsening of his asthma symptoms and a slight decrease in peak flow despite adjustments in medications according to the asthma action plan reviewed in the office. Dr. Y schedules a telephone consultation with Mr. Smith to review his medication regimen and to discuss Mr. Smith's evaluation of his home environment. Based on Mr. Smith's worsening condition and the absence of an identifiable cause, Dr. Y recommends to Mr. Smith a referral to an Allergist to help identify potential environmental triggers for the exacerbation of his asthma. Though Mr. Smith is somewhat reluctant to see another physician, Dr. Y explains that the Allergist sees a number of his patients and has specially trained asthma educators to help get his asthma under control. The Allergist will receive an electronic summary of Mr. Smith's records in advance of his visit which

will be incorporated into the Allergist's electronic health record for review. The report of Mr. Smith's visit to the Allergist will likewise be sent securely back to Dr. Y for his electronic health record so that Dr. Y can coordinate the follow-up management of Mr. Smith's asthma once the consultation is complete.

Scenario #3: Dr. Z and Mrs. Murphy

Practice Setting: Dr. Z is an internist in a multi-specialty practice with several internists, cardiologists, an endocrinologist, and several other medical subspecialists. The practice, just like the smaller group described in Scenario #2, uses an electronic medical record (EMR) integrated with a practice management system. The EMR is used across all specialties in the practice and also provides secure access to authorized external providers through a health information exchange portal.

Clinical Care: Mrs. Murphy is an 85-year-old woman with several chronic medical problems including Type II diabetes mellitus, congestive heart failure, atrial fibrillation, and based on a recent assessment by Dr. Z, mild dementia. For these conditions, Mrs. Murphy takes several medications including oral medication for diabetes, an anticoagulant (warfarin) and digoxin for her atrial fibrillation, a diuretic ("water pill") and a beta-blocker for her congestive heart failure, and an angiotensin converting enzyme inhibitor. While Mrs. Murphy has been generally compliant with her visits, Dr. Z is somewhat concerned because she missed an appointment with him today – and as his assistant reviewed the practice management system, she noted that Mrs. Murphy also missed a telephone follow-up visit with the cardiologist, and a laboratory visit at which time a test for her anticoagulation status (ordered by a doctor in the practices' After Hours Clinic) and a chemistry profile (ordered by the cardiologist) were to be done. Dr. Z reviews the note from the most recent cardiology visit and becomes even more concerned when he sees that the cardiologist increased the dose of Mrs. Murphy's diuretic because of some shortness of breath, weight gain, and swelling during the last visit. Dr. Z also notes that Mrs. Murphy was seen in the practice's After Hours Clinic five days previously with a fever and a cough and was prescribed an antibiotic. The After Hours physician coordinated the anticoagulation test with the scheduled visit to Dr. Z since she could see the appointment in the system and was prompted to consider the test by the EMR's clinical decision support program which reminded her of the potential for antibiotics to interact with anticoagulation medication. As Dr. Z contemplates the best course of action, he receives a secure email from the pharmacist managing Mrs. Murphy's anticoagulation indicating some concern because he was aware of her visit to the After Hours clinic and expected Mrs. Murphy to get her laboratory test earlier that morning.

Dr. Z calls Mrs. Murphy – and after several rings she picks up the phone. Mrs. Murphy is clearly somewhat out of breath but professes to be doing well. She indicates that her cough is better, but doesn't recall her appointment today or the scheduled laboratory tests. Dr. Z knows that the practice management system automatically calls to remind patients one day in advance for every appointment – including important scheduled laboratory tests such as anticoagulation monitoring. His assistant confirms by checking the system that Mrs. Murphy was called and answered the phone yesterday afternoon. Based on his conversation with Mrs. Murphy, Dr. Z decides that rather than upset her by calling an ambulance or asking her granddaughter, who is her primary family caregiver, to take her to the Emergency Department, he will ask the home health agency nurse to make a visit this afternoon. Through a secure email exchange, Dr. Z

initiates an urgent referral to the affiliated home health agency to set up a visit for that afternoon to check on Mrs. Murphy. Within a few minutes, the Home Health Agency confirms that Nurse A, with whom Dr. Z usually works, is available and will make a point to see Mrs. Murphy within the next 2-3 hours.

Dr. Z returns to seeing patients. About 3 hours later he receives a secure email notification from Nurse A indicating that she wants to "meet" with Dr. Z urgently. Dr. Z excuses himself from the patient he is seeing and calls his assistant into the examination room to provide some just-in-time education to his patient while he meets with Nurse A. After going to his office, Dr. Z clicks on the video link to Nurse A and simultaneously opens up the progress note already started by Nurse A. He can see immediately that Mrs. Murphy has a temperature of 101ºF, has gained about four pounds, and has an elevated blood pressure. The whole blood glucose done by Nurse A is also recorded and is significantly higher than her usual random glucose. Nurse A joins the video call and shares that Mrs. Murphy is in moderate distress – and pans the video cam to Mrs. Murphy sitting on the edge of her bed, leaning forward. Nurse A points out that Mrs. Murphy has some bruising on her arms and lower extremities and raises the potential that Mrs. Murphy may be over-anticoagulated. Dr. Z can clearly see that the mild shortness of breath he heard over the phone is either worse than he perceived, or Mrs. Murphy's condition has deteriorated in the past few hours. Dr. Z decides that the best and safest way to quickly manage Mrs. Murphy multiple medical problems is to admit her to the hospital. Nurse A agrees to call the ambulance transport company and remain with Mrs. Murphy until they arrive. During that time she completes her assessment and contacts Mrs. Murphy's granddaughter.

Dr. Z documents his assessment and plan in the EMR and then sends a clinical record summary to the hospital admitting department with his initial admitting orders via secure email. The email is also sent to the cardiologist and endocrinologist with a copy to the pharmacist to alert them that Mrs. Murphy is to be admitted and requesting that the cardiologist assist in the management of what he expects to be complications related to worsening congestive heart failure. Dr. Z is sent a secure email when Mrs. Murphy arrives at the hospital. Mrs. Murphy is taken to an assessment area where laboratory tests, an electrocardiogram and a chest x-ray are completed per Dr. Z's orders. Shortly thereafter, Dr. Z arrives to see Mrs. Murphy and accompanies her up to the hospital room.

Mrs. Murphy is treated for pneumonia, congestive heart failure and excess anticoagulation. The morning after her admission, a hospital discharge planner visits her and reviews her clinical record. The discharge planner notes that Mrs. Murphy lives alone and sees the recent diagnosis of mild dementia. At the multidisciplinary hospital discharge planning team meeting that afternoon, Mrs. Murphy's case is discussed and the planners decide to recommend a new remote monitoring program to Dr. Z for Mrs. Murphy. At the time of discharge, Mrs. Murphy is accompanied home by Nurse A. When they arrive at Mrs. Murphy's apartment, a technician from the remote monitoring program is already waiting for them. While Nurse A reviews Mrs. Murphy's medication and self-management goals, the technician installs a wireless network hooked up to a secure internet connection. He places a scale in Mrs. Murphy's bathroom, a docking station for Mrs. Murphy's pill bottles, and a home glucose monitor – all connected wirelessly to the computer. Nurse A explains to Mrs. Murphy that Dr. Z will monitor her condition through the computer and that Nurse A will be helping Dr. Z. Mrs. Murphy doesn't

understand how it all works, but she agrees to weigh herself in the morning, take her pills when she hears the reminder from the pill bottle docking station, and check her sugar in the morning. Mrs. Murphy agrees that her granddaughter will be informed about these new interventions.

A couple of days later, both Dr. Z and Nurse A get an automated alert via secure email that Mrs. Murphy has gained 2 pounds in the past two days. After a quick email exchange, Nurse A calls Mrs. Murphy and per Dr. Z's order, asks Mrs. Murphy to take an extra diuretic pill now and one at 6pm tonight. Via the internet, Nurse A is able to re-program the medication reminder system to prompt Mrs. Murphy to take the correct dose at the correct time. At 6:30pm, Nurse A receives a notification from Mrs. Murphy's computer that the diuretic pill bottle has not been opened or moved since noon. Nurse A calls Mrs. Murphy who admits that she has been entertaining a friend and hadn't taken her pill yet, but promises to do so in the next few minutes.

These three scenarios illustrate how patient-centered care could be provided through solo, small and multi-specialty practices based on the advanced medical care model. In the above examples, patient-centered care is provided through a combination of face-to-face visits, telephone and e-mail consultations, and referrals to other health professionals as appropriate. Evidence-based clinical decision-making is aided by utilization of health information technology, such as PIER (Physicians' Information and Education Resource), a web-based decision-support tool developed by ACP that provides physicians with rapid, up-to-date, evidence-based guidance at the point of care. Electronic medical records, electronic prescribing, and open scheduling further add to the improvement of patient care and enable care to be provided more efficiently and in a manner that values the time of patient and physicians. This markedly contrasts with traditional patient care where patients often must schedule multiple office visits, where preventive and educational services are not covered by insurance and therefore are not provided, evidence-based care is not always provided, avoidable errors occur, and where the time of patients and physicians is under-valued.

REFERENCES

[1] Grumbach, Kevin and Bodenheimer, Thomas. A Primary Care Home for Americans: putting the house in order, *JAMA*. 2002; 288: 889-893; *citing* Murphy J, Chang H, Montgomery JE, Rogers WH, Safran DG. The quality of physician-patient relationships: patients' experiences, 1996-1999. *J Fam Pract*. 2001;50:123-129

[2] Kalpana MN, Dolovich LR, Ciliska DK, Lee HN. The Perception of Continuity of Care from the Perspective of Patients with Diabetes, *Fam Med*. 2005;37(2):118-24.

[3] Taking the Pulse of Health Care Systems: Experiences of Patients with Health Problems in Six Countries, Cathy Schoen, M.S., Robin Osborn, M.B.A., Phuong Trang Huynh, Ph.D., Michelle Doty, Ph.D., Kinga Zapert, Ph.D., Jordon Peugh, M.A., Karen Davis, Ph.D., *Health Affairs* Web Exclusive, November 3, 2005, W5-509–W5-525

[4] Grumbach, Kevin and Bodenheimer, Thomas. A Primary Care Home for Americans: putting the house in order, *JAMA*. 2002; 288: 889-893; *citing* Sommers LS, Hacker TW, Schneider DM, Pugno PA, Garrett JB. A descriptive study of managed care hassles in 26 practices. *West J Med*. 2001;174:175-179.

[5] Freeborn, Donald K. Satisfaction, Commitment and Psychological Well-being Among HMO Physicians. *The Permanente Journal*. Spring 1998;2:22-30.

[6] Pathman DE, Konrad TR, Williams ES, Scheckler WE, Linzer M, Douglas J, Career Satisfaction Study Group. Physician satisfaction, dissatisfaction, and turnover. *J Fam Pract*. 2002 Jul;51(7):593.

[7] Larson EB, Fihn SD, Kirk LM, Levinson W, Loge RV, et al. The Future of General Internal Medicine: Report and Recommendations from the Society of General Internal Medicine (SGIM) Task Force on the Domain of General Internal Medicine. J of Genl Int Med.;2004:19:69-77.

[8] Gabel, Jon; Claxton, Gary; Gil, Isadora; Pickreign, Jeremy; Whitmore, Heidi; Finder, Benjamin; Hawkins, Samantha; and Rowland, Diane. Health Benefits in 2005: Premium Increases Slow Down, Coverage Continues to Erode. *Health Affairs*. 2005;24(5):1273-1280.

[9] Edwards JN, How S, Whitmore H, Gabel JR, Hawkins S, Pickreign JD. Employer-sponsored Health Insurance in New York (findings from the 2003 Commonwealth Fund/HRET Survey). The Commonwealth Fund Issue Brief. 2004 May: www.cmwf.org

[10] Gilmer, Todd and Kronick, Richard. It's the Premiums, Stupid: projections of the uninsured through 2013. Health Affairs (web exclusive). 2005 April 5;W5-143-151. http://content.healthaffairs.org/cgi/content/long/hlthaff.w5.143/DC1

[11] 2005 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds

[12] Braddock CH, Snyder L. The Doctor Will See You shortly. The Ethical Significance of Time for the Patient-Physician Relationship. JGIM. 2005;20:1057-62. Accessible at

[13] American College of Physicians. Medical Professionalism in the Changing Health Care Environment: Revitalizing Internal Medicine by Focusing on the Patient–Physician Relationship. Philadelphia: American College of Physicians; 2005: Position Paper. (Available from American College of Physicians, 190 N. Independence Mall West, Philadelphia, PA 19106)

[14] Association of American Medical Colleges. Medical Education Costs and Student Debt. AAMC, March 2005. Accessible at https://services.aamc.org/Publications/showfile.cfm?file=version35.pdf&prd_id=121&prv_id=137&pdf_id=35

[15] Anderson G and Hussey PS. Comparing Health System Performance In OECD Countries: Cross-national comparisons can determine whether additional health care spending results in better outcomes. Health Affairs, May/June 2001;20(3):219-32.

[16] Starfield B and Shi L. Policy Relevant Determinants of Health: An International Perspective. Health Policy, 2002;60:201-18.

[17] Institute of Medicine, Crossing the Quality Chasm: A New Health System for the 21st Century, National Academy Press, Washington, D.C. (2001).

[18] Hogan, C et. al., Medicare Beneficiaries' Costs Of Care In The Last Year Of Life. Health Affairs, 20;4

[19] American College of Physicians. Racial and Ethnic Disparities in Health Care. March 2003.

[20] Larson EB. Medicine as a Profession—Back to Basics: Preserving the Physician-Patient Relationship in a Challenging Medical Marketplace. Amer J of Med. 2003; 114:168-72.

[21] Wu S, Green A. Projection of chronic illness prevalence and cost inflation. Santa Monica, CA: RAND Health, Oct. 2000.

[22] Anderson GF. Medicare and Chronic Conditions. Sounding Board. N Engl J of Med. 353;3:305-09,2005.

[23] Wu S, Green A. Projection of chronic illness prevalence and cost inflation. Santa Monica, CA: RAND Health, Oct. 2000.

[24] American College of Physicians. Patient-Centered, Physican-Guided Care for the Chronically Ill: The American College of Physicians Prescription for Change. October 2004.

[25] Starfield B and Shi L. The Advanced medical home, Access to Care, and Insurance: A Review of Evidence. [Review] [49 refs]. Pediatrics; 113 (5 Supple):1493-98, May 2004.

[26] Sia C, Tonniges TF, Osterhus E, Taba S. History of the Advanced medical home Concept. Pediatrics. 2004;113:1473-1478.

[27] Future of Family Medicine Project Leadership Committee. The future of family medicine: a collaborative project of the family medicine community. Ann Fam Med. 2004;2(Suppl 1):S3–S32.

[28] National Academy of Sciences, Institute of Medicine. A Manpower Policy for Primary Care. Washington, DC; May 1978.

[29] M. Von Korff, J. Gruman, J. Schaefer, S.J. Curry, and E.H. Wagner. 1997. Collaborative Management of Chronic Illness. *Annals of Internal Medicine* 127: 1097-1102. [Also see Patients

as Effective Collaborators in Managing Chronic Conditions. Milbank Memorial Fund July 1999 accessible at http://www.milbank.org/reports/990811chronic.html#7]

[30] American College of Physicians. Patient-Centered, Physician-Guided Care for the Chronically Ill: The American College of Physicians Prescription for Change. October 2004.

[31] Rothman AA, Wagner EH. Chronic Illness Management: What Is the Role of Primary Care? 2003 Feb 4;138(3): 256-262.

[32] Brennan TA. Luxury Primary Care – Market Innovation or Threat to Access? NEJM. 2002 April;346(15):1165-1168.

[33] American College of Physicians. "The Evolving Role of the General Internist," Statement approved by Board of Regents, April 2005.

[34] U.S. Census Bureau, "U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin," <http://www.census.gov/ipc/www/usinterimproj/>

[35] Cooper RA, Gretzen TE, McKee HJ, LaudP. Economic and demographic trends signal an impending physician shortage. Health Aff. 2002;21:140-54 [PMID: 11900066]

[36] Rizza RA, Vigersky RA, Rodbard HW, Ladenson PW, Young Jr WF, Surks MI, Kahn R, Hogan PF 2003 A model to determine workforce needs for endocrinologists in the United States until 2020. *J Clin Endocrinol Metab* 88:1979–1987

[37] Moore G, Showstack J. Primary care medicine in crisis: toward reconstruction and renewal Ann Intern Med. 2003;138:244-7

[38] Fye WB. Cardiology's Workforce Shortage: Implications for Patient Care and Research. *Circulation* 2004;109:813-816.

[39] Angus DC, Kelly MA, Schmitz RJ, White A, and Popovich J. Current and Projected Workforce Requirements for Care of the Critically Ill and Patients with Pulmonary Disease: Can We Meet the Requirements of an Aging Population? *JAMA*. 2000;284:2762-70.

[40] Fye WB. Cardiology's Workforce Shortage: Implications For Patient Care And Research. *Circulation*. 2004;109:813-6. [PMID: 14981011].

[41] American Geriatrics Society. Caring for Older Americans: The Future of Geriatric Medicine. *J Amer Ger Soc.* 2005;53:S245-56.

[42] AAMC Medical School Graduation Questionnaires: All School Reports 1999-2004, Table 25b Choice of Specialty/Subspecialty. http://www.aamc.org/data/gq/allschoolsreports/2004.pdf

[43] Schwartz MD, Basco WT, Grey MR, Elmore JG, and Rubenstein A. Rekindling Student Interest in Generalist Careers. *Annals of Internal Medicine,* 142:715-24;April 2005

[44] Garibaldi RA, Popkave C, and Bylsma W. Career Plans for Trainees in Internal Medicine Residency Programs. Academic Med. 2005;80:507-12.

[45] American College of Physicians. Re-Design Of Training In Internal Medicine: Principles and Goals. September 2005.

[46] Berwick, D. A User's Manual for the IOM's 'Quality Chasm' Report. Health Affairs 21(3); 80-90, 2002.