2008

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Predicting, Preparing for, and Creating the Future: What Will Happen to Internal Medicine?

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It is the year 2025. During the past 20 years, internal medicine as a discipline continued to become less prestigious, less respected, and more fragmented. As fewer medical students chose internal medicine as a career, residency programs began to close. Those that remained open filled with fewer graduates of US medical schools but filled with more US citizens who graduated from international medical schools, more graduates of osteopathic medical schools, and more foreign graduates of international medical schools. Due to lack of adequate remuneration and a shift of primary care provision from generalist physicians to nurse practitioners and physician assistants, training in general internal medicine as a patient care specialty ceased. Generalist internal medicine careers have been replaced by tracks designed to foster health services research or academic careers; internal medicine training graduates subspecialty physicians.

Although the projected collapse of Medicare in 2019 was avoided, severe cuts in federal funding for undergraduate and graduate medical education programs forced medical schools and residency programs to compete for federal funds. As a result, medical school tuition became prohibitive, for-profit health care systems viewed medical education as a significant cost center and chose to limit the size of their residency programs, and community-based training programs could not withstand the financial pressures and closed. The result was a reduced supply of internists. Furthermore, compliance with the regulatory burden imposed by accrediting organizations—such as the Accreditation Council for Graduate Medical Education—drove individuals from sustained careers in education, further impacting the viability of training programs.

At the same time, federal funding for the National Institutes of Health (NIH) has been severely restricted, and the US research enterprise has become increasingly dependent on the pharmaceutical industry, the private sector (including foundations), or specific projects endorsed by federal research supporters. Few internists opt for research careers because the risk is high while the funding levels are low. More research is performed by basic scientists and PhDs in departments of internal medicine.

In 2025, it appears that the quality and safety of inpatient care may have improved as more residents have chosen hospital medicine as a career; however, patients complain about the lack of continuity in their care in both the ambulatory and inpatient setting. More than one half

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0002-9343/$ -see front matter
doi:10.1016/j.amjmed.2007.09.013

of the nation's citizens have insufficient or no health insurance; the failure to address the obesity epidemic has resulted in an enormous burden of complex illness in ambulatory and inpatient settings. The cost of health care now exceeds 20% of the gross national product.

This bleak scenario is the current trajectory of internal medicine in the United States and represents a logical outcome of maintaining the status quo. Unless the discipline as a whole is willing to change, internal medicine will likely become increasingly insignificant in the practice and provision of medical care. But what might the other possible futures of internal medicine look like and in which direction should the discipline head?

PERSPECTIVES VIEWPOINTS

- Using the basic tenets of scenario planning, several potential outcomes for the future of internal medicine are presented.
- The scenarios cover a range of possibilities, from the collapse of academic medicine to the technology-driven "superinternist."
- The common themes apparent for the future of academic internal medicine are examined as well as the necessity for internists to consider how to shape the future.

In fall 2005, the Alliance for Academic Internal Medicine (AAIM) charged a task force to consider the possible futures of internal medicine. As the largest academically focused specialty organization, AAIM is uniquely positioned to influence internal medicine and the health care system through its roles in education, research, and patient care. Represented by AAIM, departments of internal medicine at medical schools and teaching hospitals represent 27% of full-time clinical faculty,[1] teach nearly 30% of all residents and fellows,[2] and conduct the most industry and NIH-sponsored research (28% of all extramural awards).[3]

Inspired by the International Campaign to Revitalise Academic Medicine,[4] the task force used the technique of scenario planning to develop and reflect on the possible changes for internal medicine. Scenario planning is "a disciplined method for imagining possible futures" that examines multiple aspects of an issue, considers multiple, simultaneous changes, and applies subjective interpretations of objective analyses.[5] According to Paul J.H. Schoemaker, "scenario planning attempts to capture the richness and range of possibilities, stimulating decision makers to consider changes they would otherwise ignore. At the same time, scenario planning organizes those possibilities into narratives that are easier to grasp and use than great volumes of data. Above all, the scenarios are aimed at challenging the prevailing mind-set."[5]

In beginning its work, the task force found it useful to describe 2 extremes. In the "Doomsday" scenario, terrorism and the federal debt have reduced the government to focusing on only what is essential, with all funding eliminated for education and research, limited interventions to sustain life (eg, no dialysis and limited use of intensive care units), the end of health care insurance for Americans, and virtually no internists. In "Utopia," medical education and research are fully funded, all Americans have full and equal access to care, and internal medicine is the model for education, research, and patient care, leading to resurgence in respect and interest in the discipline.

Envisioning these unlikely extremes led to the development of 6 scenarios for the future of internal medicine: Status Quo, Evolution, Revolution, Science Fiction, The Generalist Returns, and Global. In each scenario, the task force tried to address the effects of the envisioned future on education, research, patient care, academic internal medicine, and the discipline of internal medicine itself. Neither the task force nor AAIM endorses any of these scenarios but simply provides the scenarios as a stimulus for continued discussion. If even one aspect of a single scenario becomes reality, internal medicine as whole will be better prepared for having considered the myriad possibilities.

EVOLUTION

An enlightenment on the part of legislators and consumers about the importance and role of internal medicine results in a more specialized hierarchy of care. Primary care is provided by midlevel providers, such as physician assistants and nurse practitioners, working on a team with an ambulatory internist. Secondary care (which involves the care of patients with complex medical problems and includes geriatric medicine) is provided by internists outside the hospital. Tertiary care is provided by internists (including hospitalists and subspecialists) in the hospital. Quarternary care, such as transplant medicine, occurs only in regional centers.

Redistribution of public and private funding ensures that all internists—general internists and subspecialists alike—are paid more equitably. Performance-based pay becomes the standard. Procedural subspecialties become more cognitive because of technological advances that allow midlevel providers to do many of the procedures.

Undergraduate and graduate medical education programs develop innovative ways to improve accessibility to teachers, provide better role models, train office-based professionals for their roles, and ensure that students and residents have equal access to training in

the hospital and the ambulatory setting. Residents receive explicit training in principles of effective ambulatory team leadership and management practices, with an emphasis on health services delivery.

Research is directed toward outcomes-based care, patient safety, and quality. Few internists perform basic science or clinical research because of increasing requirements for patient care. However, translational research, especially from bench to patient, increases. To meet the demands of ensuring and measuring outcomes and performance, combined medical doctor-masters of public health (MD-MPH) programs become more prevalent.

Patient safety and quality of care increase as does efficiency, access, and patient satisfaction. As physician outcome data become more readily available, patients use this information to choose providers and practices. Ambulatory internists will have greater oversight responsibilities as more care is conducted by midlevel providers. Advances in technology will improve patient information portability, make telemedicine more feasible, and advance rural health care.

REVOLUTION

Public demand for more internists and the crushing burden of student debt combine to call for shorter, more specialized training. In response, the internal medicine community elects to focus almost entirely on inpatient care; as a direct result, internal medicine education fragments. Hospital medicine and subspecialty internal medicine create their own residencies, to which medical students match directly out of medical school.

Meanwhile, the internal medicine clerkship disappears and is replaced by 2 months of inpatient adult care; a requirement to follow *x* number of patients or families during the course of a year; rotations in subspecialty disciplines for *x* number of weeks, or a combination of these models. For example, a standard set of subspecialty experiences embedded in a longitudinal clinical experience becomes the standard. The last 6 months of medical school become a "real" subinternship as students matched to a subspecialty residency begin to fulfill core requirements and competencies for residency in the final months of medical school.

During residency training, no continuity outpatient exposure occurs beyond the context of the selected subspecialty training. Ambulatory competencies common to the care of all adults would be expanded in subspecialty-specific education. The current model of reimbursing residents and fellows would likely extend to subspecialty residents. As a result of these changes, the overall length of training decreases, which requires less graduate medical education funding and allows graduates to begin to repay their loans more quickly.

General internal medicine as a unique outpatient expertise ceases to exist. In the inpatient setting, hospitalists—with subspecialty consultation—care for patients with complex, multisystem disease. Family physicians, physician assistants, and nurse practitioners provide routine ambulatory care as well as preventive and primary care for noncomplex problems, including acute illnesses (such as urinary tract infections) and chronic diseases (such as stable asthma and dyslipidemia). With assistance from midlevel providers, subspecialists care for more complex and unstable illnesses in a disease management model.

Departments of internal medicine disappear as subspecialties have their own departments and residency programs. Interdisciplinary, disease-specific centers proliferate, as do departments of hospital medicine led by the "general internist." The American Board of Internal Medicine evolves to certify subspecialties and hospital medicine. The Liaison Committee on Medical Education and Accreditation Council for Graduate Medical Education work collaboratively to ensure that end-of-medical school experiences fulfill residency entrance requirements.

In conjunction with interdisciplinary and disease-specific centers, a new emphasis on translational medicine appears. New methods and technologies are tested across subspecialties. The current structure of NIH (specialty-directed institutes) transitions into more disease-specific institutes.

The change in training increases competency but decreases scope of practice. Patients have direct access to subspecialists, but this access, combined with a lack of knowledge among the patient population, increases emergency department utilization or use of urgent care facilities managed by family physicians, physician assistants, and nurse practitioners. Providers seeking a different practice environment will promote "boutique medicine," but such practices are in the minority.[6] Subspecialists often provide principal care to adult patients known to them through earlier subspecialty-related care.

SCIENCE FICTION

Given the drastic changes witnessed between 1985 and 2005, subsequent advances in technology by the year 2025 will completely alter the face of internal medicine. The proliferation of technology will decrease the workforce needs of subspecialties, especially procedure-based subspecialists. The prevalence of genetic information, proteomics, imaging, pharmacogenetics, robotics, nanotechnology, laser surgery, and noninvasive surgery make telemedicine and distance care mainstream. Testing and procedures are executed by technicians; the internist becomes "Dr. McCoy": diagnostician, interpreter, and manager for the patient.

Despite access to software and databases to help manage the proliferation of science, internists require advanced understanding of modern scientific princi-

ples, medical technology, and emerging as well as classic disease entities. The specific internal medicine competency remains "finely honed diagnostic reasoning." Internal medicine attracts "the best of the best," restoring the respect and prestige of the discipline. Medical school curricula meld basic science with clinical science throughout all years of medical school, effectively reversing the trend of the late 20th century decrease in basic science education. Collaboration among colleges of medicine, nursing, pharmacy, and allied medical professions becomes commonplace. Scientific education is central to postgraduate and continuing professional education; clinical experience reverts to an apprenticeship model.

Translational research increases significantly; integrative departments grow at the expense of traditional physiology, cell biology, and molecular biology. Clinical internists take an active role in developing the research agenda, establishing quality outcome parameters, and changing guidelines. Basic science is executed through collaborative, cross-institution teams.

Employers and federal government provide access to health care through wellness centers. Results of diagnostic investigations executed in the wellness center triggers necessary physician visits. Costs are kept acceptable by incorporating only evidence-based testing in cost-effective centers. No personal physicians exist. Patients accept the bulk of responsibility for their own health; technology provides in-home monitoring and the ability to "plug in" for testing and diagnostics (blood draw, heart rate monitors). Preventive care and primary care are provided by wellness centers. After preliminary diagnostics to address problems are completed in the local wellness center, patient data is uplinked to an internal medicine physician.

The internist is responsible for diagnosis, clinical reasoning, and decision-making. Other medical and surgical interventions are assigned to procedural technicians. Specialist care is available only at regional care centers, which may be accessed through distance technology.

THE GENERALIST RETURNS

The "medical home" for the adult patient is the general internist and a practice team.[7] Internal medicine returns to the pre-NIH funding, pre-Medicare funding, pre-specialty boards model of the 1960s and early 1970s: all nonsurgical physicians who care for adults are internists. In a 4-year paradigm for residency training, 24 months are dedicated to core training and 24 months are an individualized track in an area of special interest; additional training beyond 4 years would be required for "invasive" aspects of a subspecialty or for a research track. Generalist reimbursement is more equivalent to specialty reimbursement, with incentives based on outcomes and efficiency.

In undergraduate medical education, internal medicine returns to power within the medical school structure, teaching preclinical and clinical students. Students are increasingly interested in internal medicine because internists truly manage patient problems, are paid appropriately for their expertise, and work in true collaboration with subspecialists. Medical school is structured like law school: the goal is only to teach students, not worry about other academic issues (such as NIH rankings). Faculty members are full-time educators. The medical school becomes smaller and more integrated into the university. Private practitioners teach and supervise students and residents in community practices and community hospitals. Faculty precept and supervise in the medical centers. Internal medicine residents spend their final (fourth) year of residency tailoring their education to future practice (for example, pursuing masters' degrees in business or public health); general internal medicine "fellowships" are commonplace. Current federal funding for residency and fellowship would be redistributed to fund the 4 years of training. The model could also allow for full tuition funding by the government; students would "pay back" loans with money or service.

Generalists increase their participation in translational research, both inpatient and outpatient. Subspecialists routinely include a generalist expert on every outcomes research collaborative. The removal of formal research as an essential component of training changes the expectation of the "triple threat" internist. However, the training model—which offers additional funded training for individuals interested in research careers—increases the number of physician-scientists.

Well-coordinated adult care becomes the norm. Patient access to care increases, care delivery is more efficient, and costs of health care decrease as referrals decrease. This model provides better "holistic" care as well as offers a broader span of care by an individual internist.

GLOBAL

The United Nations agrees to manage and deliver basic health care to all people in the world. All nations, including the United States, agree to fund the effort as disease and terrorism pose threats to all. Each country is assessed according to its resources. Additionally, global foundations contribute funds to pay for health care. Cost-efficiency and effectiveness are the basis of decisions about what services are delivered. Wealthier countries and affluent individuals are able to buy health care above and beyond the basic provisions. Care delivery systems require a significant increase in nonphysician providers.

The United Nations implements worldwide medical school standards, competencies, and core curricula. Education incorporates increased use of technology, in-

cluding the "virtual medical school."[8] Worldwide medical school accreditation, certification, and licensing also exist. Admission to medical school is available only through regional competition, effectively ending "buying" admission. A single-language medium and standardized entrance examination and training are established. Greater emphasis is placed on public health, which becomes a core medical student competency and leads to a proliferation of MD-MPH and MD-Doctor of Public Health programs.

Technology allows for worldwide collaborative research efforts. Through global collaboration, translational research studies incorporate patient populations with greater genetic and cultural diversity. Funds for public health and epidemiological research increase. Grants from foundations and individuals play a substantial role in funding disease eradication efforts.

Worldwide patient care improves but individuals in former first world countries become disgruntled, believing care has regressed to the mean. "VIP care" disappears although boutique medicine becomes available for alternative health care delivery. Internal medicine is the core coordinator of adult health care, including care of the elderly.

DISCUSSION

Internal medicine is the largest specialty, including some 200,000 of 800,000 physicians in the United States. The pressures being exerted on medicine in general, and internal medicine specifically, are numerous and will force change. Given the decline in medical student and resident interest in internal medicine,[9] the lack of career satisfaction among practicing internists who are leaving internal medicine at an alarming rate,[10] an aging and retiring cohort of internists,[10] the rapidly aging population,[11] the rising cost of health care, and the increased concerns about future funding for education and research, internal medicine must be proactive in shaping the health care system of the future.

By using scenario planning, the AAIM Task Force on the Future of Internal Medicine sought to anticipate what might be true in the future, given today's trends. Although no single scenario is likely to come to fruition, aspects of several different ones might occur. Despite the differences among the scenarios, several common themes emerge.

- An overall decrease in federal funding for medical education at the undergraduate and graduate levels as well as for basic and clinical science research will occur. The loss of Title VII funding, the reductions in NIH funding, the growing rate of "earmarked" research endeavors, and the looming bankruptcy in Medicare (the single largest source of government funding for education) are all clear harbingers of significant reductions in governmental support of medical education.
- The lack of funds for research and education also will alter the practice of primary care and access to health care.
- Technology will alter subspecialty care and the role of subspecialists.
- Internists will practice more subspecialty care and less primary care, which will be turned over to others who are likely to be nonphysicians. As a result, the delivery of primary/preventive principal care for patients will change substantially in the future.
- Successes in basic science research necessitate clinicians trained to possess competence in translational research.
- The processes for and requirements by government, licensing, regulatory, accreditation, and certifying bodies are strong forces that will continue to shape medical education and the practice of medicine in unanticipated ways.
- Generational changes in the workforce and medical students will have a profound influence on career choice.

From support of medical education and residency training to physician payment and support of the research enterprise, whether from the federal or private sector, financing plays an enormous role in the future of internal medicine. Societal needs and demands will remain a powerful factor on wide-ranging issues of patient safety, quality of care, measures of performance and success in patient care and education, access to care, and continuity of care.

The task force believes that some aspects of the scenarios should guide current efforts, such as redesigning internal medicine education and increasing student interest in internal medicine. For example, how would undergraduate medical education look with a shift from subspecialty fellowships to subspecialty residencies? Would this change raise the appeal of internal medicine for medical students? If the internal medicine community truly values the role that general internists play in patient care, education, and research, then such statements should be made public and accompanied by strategies to enhance that career choice; internists themselves must refrain from portraying and referring to general internal medicine as a "fall back" or an inferior option to a subspecialty career.

It is in the best interest of internal medicine to direct and lead the change, rather than be forced to react to change driven by the federal government, regulatory agencies, and finances. The five member organizations of AAIM—the Association of Professors of Medicine, the Association of Program Directors in Internal Medicine, the Association of Specialty Professors, the Clerkship Directors in Internal Medicine, and the Administrators of Internal Medicine—have different roles within the internal medicine community. Within AAIM, however, the associations share common goals of pre-

serving financing of medical education and research as well as ensuring high-quality care for patients and adequate reimbursement for internists.

AAIM represents the interests and concerns of the continuum of academic internal medicine. The alliance and its constituent organizations have developed critical relationships and collaborations with the American College of Physicians, the nearly 40 internal medicine specialty societies, and the organizations responsible for evaluating the quality of internal medicine and internists (such as the American Board of Internal Medicine), as well as federal legislative and regulatory agencies, to change accreditation, increase funding for education and research, and redesign the educational continuum (with an initial focus on residency and fellowship training). These relationships provide the foundation for addressing future challenges and shaping the future of health care. Admittedly, initial efforts have been aimed at "evolutionary" changes, which may be insufficient to address future challenges.

But how will the scenarios described guide internal medicine efforts for the future? The task force hopes that these scenarios do not become a typical "strategic plan" that sits idly on a shelf, but rather generate debate and discussion within the internal medicine community. The task force does not seek to engage in endless circular conversations about nuances of the individual scenarios; such discussions only promote limited evolution of internal medicine. But debate and discussion are necessary to understand the limits of the scenarios, recognize major oversights, force people to think broadly about issues, and generate innovative solutions.

ACKNOWLEDGMENTS

The authors thank Tod Ibrahim, Steven M. Humphrey, and Tayloe H. Loftus, MD, for their contributions to this article. The statements and opinions detailed in this article belong solely to the authors and are not representative of AAIM, its constituent organizations, the Department of Defense or any other federal agencies, or the authors' affiliated institutions.

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