modification. Payers and the federal government must fully reward use of appropriate nonpatentable therapies and support research on the development and dissemination of prevention strategies.

To change our reductionist way of thinking, we must teach aspiring physicians about systems science that addresses psychological, social, and economic determinants of disease. Taking a patient-centered, whole-person approach focused on long-term functional status will also help to address the current fragmentation of care and allow for standardization of prevention strategies.

Medical school curricula should emphasize homeostasis and health, rather than only disease and diagnosis, and provide training in the science and practice of cost-effective health promotion. In turn, payers will need to reimburse for health maintenance and prevention activities, primary care physicians will have to act as health coaches, and all health care professionals will need to embrace a coordinated multidisciplinary team approach. Systematic steps must also be taken to change the culture of medicine so that primary care is valued. Renewing primary care will require increasing ambulatory care training in community settings and reallocating funding for residency training away from hospitals to reimburse appropriately for innovative models such as medical homes. Furthermore, we must compensate primary care physicians for their work as care coordinators by establishing reimbursement parity for cognitive and procedural care and accounting for long-term costs and benefits.

The new approach to medicine endorsed by the Flexner report succeeded because it was based on sound science and a radical restructuring of the way medicine was taught, organized, and practiced. Today, we face a similar challenge that requires another fundamental reordering of our health care system. Although the need for acute care will remain, centering our efforts on prevention is the only way to thwart the emerging pandemic of chronic disease.

Current health care reform efforts will bring incremental improvement, but reengineering prevention into health care will require deeper changes, including reconnecting medicine to public health services and integrating prevention into the management and delivery of care. Though change is painful, the successful transformation of medicine at the turn of the last century shows that it is possible. Ultimately, embedding prevention in the teaching, organization, and practice of medicine can stem the unabated, economically unsustainable burden of chronic disease.

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1. Fuster V, Kelly BB, eds. Promoting cardiovascular health in the developing world: a critical challenge to achieve global health. Washington, DC: National Academies Press, 2010.
2. Healthy People 2020. Washington, DC: Department of Health and Human Services, 2010 (http://www.healthypeople.gov/2020/default.aspx).
3. Fries JF. Aging, natural death, and the compression of morbidity. N Engl J Med 1980; 303:130-5.
4. Fleming D. William H. Welch and the rise of modern medicine. Boston: Little, Brown, 1954.
5. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. JAMA 2004;291:1238-45. [Errata, JAMA 2005;293:293-4, 298.]

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BECOMING A PHYSICIAN

The Developing Vision of Primary Care

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Reactive at best, unyielding at worst, the U.S. health care system has struggled over the past century to respond to the shifting burden of disease, improvements in technology, and population growth. But times are changing. Americans know that our system costs too much, reaches too few, and provides too little high-value service. Ideas for improvement have been percolating.

The Affordable Care Act (ACA) expands coverage, emphasizes population health and primary care services, and establishes accountable care organizations that require strong primary care foundations.[1] The patient-centered medical home model that is spreading across the country entails a commitment to promoting health rather than merely treating disease.[2] With funding available from the Center for Medicare and Medicaid Innovation for experimenting with new ways of delivering health care, we believe the revolution has begun and that primary care has

become exciting again. As three primary care physicians-in-training, representing both coasts and the Midwest, we share a vision of primary care as the key to improving health and health care in the United States.

In the primary care future as we and others envision it — and as a few pioneers are beginning to create it — a day in a primary care office would begin with a team huddle of medical assistants (MAs), registered nurses (RNs), nurse practitioners, physician assistants, front-desk staff, behavioral therapists, clinic managers, social workers, nutritionists, and physicians. The team would discuss the day's patients and their concerns. They would review quality metrics, emphasize their quality-improvement cycle for the week, and celebrate the team's progress in caring for its community of patients. Because everyone would feel responsible for patients' health, coordinating care and teamwork would take on new importance.

After the meeting, the staff would begin its work, using approaches that enhance patient care and improve job satisfaction. Stable teamlets composed of a physician and two MAs would sit together and work on coordinating the processes of the clinic day. The MAs would do more than check vital signs; thanks to a restructured reimbursement system, they would have protected time to provide health coaching for behavior change and to ensure that the patients on their panel were current with their preventive care. The RN would manage his or her own panel of patients with stable chronic disease, calling them with personal reminders and using physician-directed protocols to refill prescriptions independently. The social worker, nutritionist, and behavioral therapist would work with the physician to address the layers of complexity involved in keeping patients healthy. Everyone would be engaged in improving the health of the patients and be empowered to provide integrated, high-quality care.[3]

There are a few important reasons why we expect this new generation of health professionals to be so invested and energized. First, the global payment system would allow staff to set aside time for services that keep patients healthy. Second, the clinic staff would be given real responsibility and an opportunity for professional growth. MAs, for example, would have a path to follow that would allow them to gain experience within the health system so they could work toward higher levels of licensure. Third, all participants would be accountable for their performance. Team and individual metrics might be posted in the clinic and become part of the electronic medical record. And ideally, participants would know that they were making a real difference in patients' lives — that patients were healthier and that patient feedback was positive. Staff members' attitudes would improve with their increased agency and the reduced siloing of professional roles.

Physicians' jobs would change as well, as they took on new roles and shed some old ones. No longer would the physician run from room to room, pushed by the clock and the paycheck. Reimbursed through global payments linking hospitals to primary care practices, the physician, too, would have a financial incentive to keep patients healthy and to prioritize services with that goal in mind. The physician would now see fewer patients in the office, leaving time for responding to questions e-mailed by patients the previous night and for calling those who would otherwise be headed to the emergency department. Clinic visits would ideally be nearly twice as long as they are now, since physicians would focus on patients with complex conditions and would have time to address care coordination, answer patients' questions fully, and understand their personal health goals in order to guide treatment. Timely follow-up after hospital discharge would be a high priority, and some visit slots would be reserved for that purpose. Savings from reduced hospitalizations could be reinvested in these high-value primary care services.

After lunch, the clinical pharmacist might lead a group visit for patients receiving long-term opioid therapy. Such visits would focus on restoring function and emphasize evidence-based monitoring and treatment plans. The clinic might also have shared medical appointments for pregnant patients or for patients with such conditions as diabetes and obesity. Patient groups would aim to support and hold each other accountable for behavior change to maximize their health potential. Physicians would participate in groups, coaching the clinic staff in motivational and leadership skills and helping to monitor quality. The clinic team would evaluate the effects of these group visits as one step in researching new models of delivery in the primary care setting. These shared medical appointments could bridge a gap in the primary care network by emphasizing the so-

cial, behavioral, and community components of health.

The primary care physician's job would no longer end at the door of the medical home. To achieve true patient centeredness, the health care system must strive to affect more than the 10% of premature mortality that is influenced by medical treatment.[4] Fully 40% of premature mortality is determined by patients' behavior, and 15% by societal factors. We cannot pretend to do what is best for the patient by ignoring more than half of what makes a patient healthy. The answer is not to focus on the 10% we most easily control when a patient is sick. We must extend our care of the community into the community, understanding the upstream determinants of downstream sickness.[5] This effort might include advocating for the local farmer's market to accept food stamps, organizing walking clubs for physical exercise, and lobbying both to reduce emissions to improve air quality and to increase public health funding for the fight against childhood obesity. Primary care cannot be primary without the recognition that it is communities that experience health and sickness. Providing better health care is imperative but insufficient.

It is vital to our country's health to cultivate the future of primary care. As learners and aspiring leaders in this field, we recognize that improving the health of our country must begin with transforming primary care. That transformation requires leadership, teamwork, and willingness to change. We are here to engage in and advance the movement.

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1. Rittenhouse DR, Shortell SM, Fisher ES. Primary care and accountable care — two essential elements of delivery-system reform. N Engl J Med 2009;361:2301-3.
2. Berenson RA, Hammons T, Gans DN, et al. A house is not a home: keeping patients at the center of practice redesign. Health Aff (Millwood) 2008;27:1219-30.
3. Willard R, Bodenheimer T. The building blocks of high-performing primary care: lessons from the field. Oakland: California HealthCare Foundation, 2012.
4. McGinnis JM, Williams-Russo P, Knickman JR. The case for more active policy attention to health promotion. Health Aff (Millwood) 2002;21(2):78-93.
5. Schroeder SA. Shattuck Lecture. We can do better — improving the health of the American people. N Engl J Med 2007;357:1221-8.

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