Maryland Medicine
The Maryland Medical Journal Volume 15, Issue 3

Physician Version 3.0

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Blue Ribbon Commission on Physician Roles

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Where Do We Go From Here? Envisioning Physician Version 3.0

PRESIDENT'S MESSAGE & INTRODUCTION

Tyler Cymet, DO
Guest Editor

From the perspective of today's physician, the healthcare landscape is awash with inefficiencies and shortfalls propped up by individual physician excellence in science and patient care.

Physicians aren't the only ones who notice a system in which information exists in silos and is rarely used on a scale larger than the individual office visit. The federal government and the American public are now pushing toward better use of information and greater efficiencies in the healthcare system.

The gaps of the healthcare system are exemplified in the training of physicians today. Data on patient needs do not have a major influence on the number of graduate medical residency positions, or the content of residency training.

Leadership skills—teamwork, patient and health advocacy—are skills that a physician needs to be successful and has to learn outside of the formal educational training of physicians. Better healthcare delivery means that physicians need to be outside of a hospital, where the majority of patients in America receive care. However, it is only in the last twenty-five years that allopathic medical schools did a significant amount of training outside of tertiary care facilities.

Physicians of today must learn to combine content and technology effectively. This is as basic as understanding that delivery of healthcare has to be linked to a payment and financing system—even if the payment system is not a direct fee for service model.

The current system focuses on prevention and public health only in times of crisis or public demand. Incentives and disincentives for health and healthcare are inconsistent and do not have broad agreement, acceptance, or backing.

People haven't changed, but their needs have. New technology, new medications, better communications, and the easy availability of information have all had an effect on the relationship between physicians and patients.

The time has come to examine the landscape and do some major renovations! There doesn't seem to be a hospital in America without at least one wing supported by construction cranes, so, yes, many renovations are already underway. Global budgets, big data, apportioned risk all have roles in the new system. The choice architecture that our patients go through in receiving care will change things for better and worse. Adjustments, while difficult, will be necessary.

Building a new house will not fix one family's problems; new structures for healthcare delivery will not fix the problems physicians face today. After forty years of providing healthcare under the same philosophical structure, it will take more than minor tweaks to get it on track. If we are to build something new, we need a vision. To develop a vision, we must survey the landscape and decide what is needed, possible and probable.

We can begin by looking at the past. Before 1910, medical schools were of poor quality and consistency. After the Flexner Report, standards were put into place so that graduating from a medical school meant something. Medical schools provided "Physician Version 2.0" to the public. A hundred years later it is time to move past "Physician 2.0" to "Physician 3.0"—a system-savvy, science-based professional who will advocate for patients on par with payers and administrators.

There is a sense of urgency now. In 2014, for the first time, there may be more non-physician providers than physicians graduating from American schools in the health professions. We have reached a critical point in time. What will a healthcare system look like with more nurse practitioners and physician assistants than physicians? These different types of professionals in this system bring different cultures, different worldviews, and different answers.

Our value as physicians has never been more threatened. The system appears to be able to function, run by administrators on

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algorithms. The experience of physicians is needed to prevent problems, and to advocate for individuals. An algorithm may give the best answer for most, but it won't provide the best answer for each individual. What seems clear is that change is inevitable. It will make us uncomfortable in the short term. In the long term, we will have a more logical and integrated system.

We need a physician answer. We must develop a vision and better define the value of physicians. In America, the best and brightest students become physicians. As professionals, we were guaranteed the ability to support ourselves without having to focus on the finances. The profession resided in our heads and hands. Our overhead was education. The possession and acquisition of knowledge bestowed professional status on us. And we gained the ability to understand people from the skin inward, and from the mind to the muscles.

Physicians learn to think from the ground up, and all around. We need to understand the physiology, biochemistry, anatomy, pathology, histology, and sometimes even the embryology of a problem. The patient's problems need to make sense from all of those perspectives. If the story doesn't make sense, we continue to question and search. It may be an expensive way to arrive at answers, but it has yielded tremendous success and made America the leader in medicine since the late 1900s.

To respond to the challenges and opportunities our profession faces, MedChi's Blue Ribbon Commission began by studying the role of the physician in the healthcare system of the future. The Blue Ribbon Commission, established by Russell Wright and chaired by me, named fifteen commissioners who are now studying these timely issues. The Commission is looking at concepts of "disruptive innovation" and its influence on healthcare, and particularly the physician's role in these advancements. "Futuring," or envisioning, is a difficult endeavor and one central to building an agenda for MedChi.

We know what we want for the physician workforce and for healthcare: (1) to use all available knowledge to make life easier and more comfortable for the people we care for, (2) to help people to live at the top of their abilities, and (3) to deliver the best healthcare there is, as efficiently as possible. The power to practice with patients at the center will need to be protected, and will be, only if we ask for it, and put it into law and practice.

This issue of *Maryland Medicine* profiles the Blue Ribbon Commission physicians who are putting time and expertise into the process of redefining what it means for a physician to practice medicine. I look forward to their continued input and the thoughts and ideas of our readers.

This issue of *Maryland Medicine* profiles the Blue Ribbon Commission physicians who are putting time and expertise into the process of redefining what it means for a physician to practice medicine. I look forward to their continued input and the thoughts and ideas of our readers. Autonomy and leadership are going to be important issues in the future. Whether physicians are the ones responsible, accountable, informed, or consulted on health issues is still being determined. Articles by M.J. Hajjar and Eric Goldwaser address the issue of authority and decision making from different perspectives. Decision-making is going to involve the variables of cost and comparisons with alternative decisions; Alissa Craft and Bill Blazey explore how that plays out. An article on how big data will be used in healthcare, the "silica research" where data are the focus, is dissected by Ricky Kalia et al. As we move toward a more collaborative system with people taking on new roles, working together and understanding what others can contribute is key. Tom Smyth's article is a terrific case review of how teamwork can be used to advance the care we provide to our patients. Possible paradigms for where healthcare is going are outlined in the work of the Blue Ribbon Commission; their initial meeting is shared in the article "How Healthcare Will Change." Taylor DesRosiers looks at telemedicine, ehealth, and the developing role of technology in healthcare.

Tyler Cymet, DO, FACP is President of MedChi and a member of the Maryland Medicine *Editorial Board. He works for the University of Maryland Emergency Medicine Physician group seeing patients at Prince George's Hospital Emergency Department, and is the Chief of Clinical Medical Education for the American Association of Colleges of Osteopathic Medicine. He can be reached at tcymet@aacom.org.*

New Waiver Implementation Will Change Maryland Healthcare

CEO'S MESSAGE

Gene Ransom, III, Esq.

MedChi President, Tyler Cymet, DO, appointed a Blue Ribbon Commission to study the future of medicine. The timing of this planning effort is perfect, as Maryland is at the center of change, working to implement the Medicare waiver creating a new All-Payer Model for hospital payment. The state of Maryland's waiver application, submitted to the Center for Medicare and Medicaid Innovation in October 2013, was approved effective January 1, 2014.

The Maryland Medicare waiver is being implemented by the Health Services Cost Review Commission (HSCRC). The new waiver creates new approaches to rate regulation, moving Maryland from Medicare, inpatient, per admission test to an all payer, total hospital payment per capita test. The new test shifts the focus to population health and delivery system redesign. The old payment system and waiver that was in place in Maryland for more than forty years put the emphasis on cost per case. The old waiver test focused only on hospital inpatient services, not overall health care spending. The new test changes Maryland hospitals to global budgets, significantly changing their incentives.

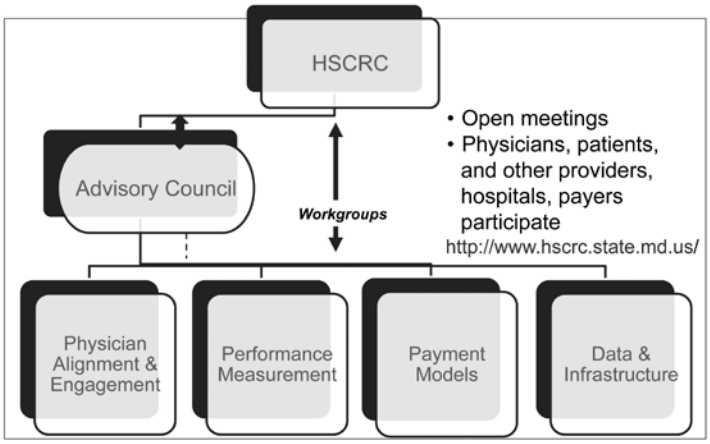
The state has said that the new model will be implemented in two phases. Phase 1 (five-year model) will focus on the Maryland all-payer hospital model and will develop in alignment with the broader health care system. Phase 2 will require new approvals from the state and the federal government and will be submitted in Phase 1, near the end of year three according to the HSCRC. Phase 2 will further expand reach to a broader health care system.

The new waiver test as approved includes the following features for Maryland and its hospitals:

- **All-Payer total hospital per capita revenue growth ceiling** for Maryland residents tied to long-term state economic growth (GSP) per capita. Growth is capped at a 3.58% annual growth rate for the first three years.
- **Medicare payment savings** for Maryland beneficiaries set at a minimum of $330 million in savings.
- **Patient and population centered-measures and targets** to promote population health improvement.
    - Medicare readmission reductions to national average;
    - 30% reduction in preventable conditions under Maryland's Hospital Acquired Condition program (MHAC) over a five-year period;
    - Many other quality improvement targets.

The new model represents the most significant change in nearly forty years for Maryland hospitals. The new test shifts the focus to gain control of the revenue budget. The hope is to gain the right volumes and reduce avoidable utilization resulting from care improvement. Potential for excess capacity will demand focus on cost control and opportunities to optimize capacity, and opens up new avenues for innovation. Increased efficiency creates opportunities for improved care and better population health, and creates threats and opportunities for physicians.

Stakeholder Input



MedChi's Blue Ribbon Panel's timing couldn't be better as the HSCRC implements this new hospital payment program in Maryland. The HSCRC decided to work to implement the new waiver with the appointment of an Advisory Council and four workgroups that are working on recommendations and reports. MedChi is very engaged in the implementation process, as we have members serving on the Advisory Council and all four workgroups.

MedChi will remain focused on this major change to healthcare service in Maryland. To learn more about the waiver and how it affects your practice, visit http://www.medchi.org/medicare-waiver.

Here are 10 Key Considerations

1. Do I need an ***attorney***? How do I find the right one?
2. How will my ***compensation*** be determined? Salary plus bonus model? Output? Quality?
3. Will I ***earn more or less*** than in private practice?
4. Who is responsible for selling, buying, or leasing my ***office and equipment***? What are the tax implications?
5. If I'm leaving a private practice, what are the ***departure issues***? Can I take my current office staff with me? How much control will I have?
6. Who will pay for my ***insurance***? Malpractice? Insurance Tail? Life? Disability?
7. How will my ***quality of life*** be affected? Coverage? Call schedule? Vacations?
8. What are my ***hospital obligations***? Will I be expected to serve on hospital committees?
9. How will any ***disputes*** be handled?
10. How will a ***non-compete clause*** factor if I wish to later choose private practice? Whose patients are they?

MedChi is here to inform and guide you in making the best possible decision for you and your patients. Consider all aspects of the decision to enter into an employment agreement or to remain in an employed situation.

Visit MedChi for details at www.medchi.org or contact the Membership Department at 410-539-0872.

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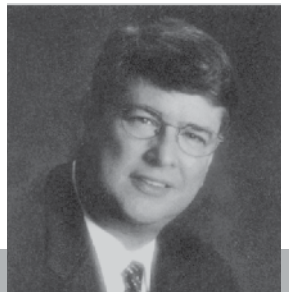

EDITOR'S CORNER

Bruce M. Smoller, MD

Where are we going in our often demanding, sometimes frustrating, stressful, wonderful, rewarding, infuriating, roller coaster of a profession? That is the question posed by this issue of *Maryland Medicine*. Where we are going, how we are getting there, why we are going there, and what is to become of both our profession and our professional life in the process are the stuff of our dreams and our nightmares. It occupies much more of our time than any of us who went to medical school before 1990 ever thought. For us, it was go to medical school, do an internship and then residency, open an office, join the medical society, and see patients. There were issues then, of course…insurers who wouldn't pay, bureaucracies that caused ulcers, hospital administrators who frequently displayed a paucity of common medical sense. What we didn't do, however, was question the basics of the direction and tenor of the profession. The vector of progress and experience in our chosen work was upwards, with maybe a few twists here and there, and we controlled that vector's path.

Contrast that with our present. If the Ghosts of Medicine Future had taken us on a Dickensian journey to present times in, say, 1979, we would have had the life scared out of us like old Scrooge and, when we awoke, would have become accountants and engineers as quickly as our SATs could carry us. We wouldn't have become lawyers, because that would have been worse than Scrooge's worst imaginings, but that is a topic for a different nightmare.

Many professions go through orderly changes, but I am aware of very few professions as important as ours, in which so many people try in so many ways to wrest control from us. The essence of our particular dilemma is multidimensional, but certainly is defined in great measure as a loss of control to those not as qualified as we to determine our destiny.

We are continually on the defensive. We guard against incursions from all directions and from many different actors, who are bent on shaping a profession they know nothing about. And we let them. We are always on the defensive because…well, we almost never go on the offense. We speak about the welfare of our patients, and the good of science, and public health issues. Of course these are all important. But rarely do we speak about the fact that our level of training, and our skills, and the importance of the work we do demands a level of remuneration and control commensurate with the vital nature of what we do. We agree too easily to changes imposed by outside agencies that we know are unworkable, venal, bureaucratic, or just plain stupid.

More life stress is engendered by loss of the locus of control than by most other factors of employment. To be told what to do is acceptable up to a point. We passed that point a long time ago. To be very clear, this is not about money. This is about who controls the profession.

This is also not about reasonable rules and strictures. There should be—and often isn't—a backlash against those who attempt to thwart the adoption of judicious medical guidelines aimed at improving the standards of care. Under the leadership of MedChi, we are often able to persuade legislators to modify or eliminate rules that are inordinately arbitrary, contradictory, or inane. But we are not always successful.

This is about making sure that as we move through the various permutations of medical systems, we do so with the recognition that unless control of our profession rests with us, we will all continue to experience functional dissonance. That dissonance, born out of a lack of control over the profession for which we trained so hard and at which we are the experts, will grow and cause continued misery for all of us.

The stress of medicine is often "good stress," involving the solving of diagnostic and therapeutic enigmas, the application of refined knowledge and the certainty that what we do matters. I can think of no better way to spend one's working life. The stress caused by loss of control leads to just the reverse…an unrequited anger, time devoted to silly administrative tasks, and the knowledge that even as we apply our hard-won skills to curing disease, it may not count nearly as much because others control its direction and application.

As we think about the future of the medical system, let's not forget that the future of our place in that evolution must lie directly at the center.

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MedChi's Blue Ribbon Commission:
Examining the Future Role of the Physician

In September of 2013, MedChi's House of Delegates authorized the formation of the Blue Ribbon Commission: The Physician Role in Future Healthcare Systems. Its purpose is to help physicians prepare for the fluctuating state of health care. The Commission's chief responsibility is to develop strategies that allow physicians to continue providing optimal care to their patients, while also preserving the physician's role in health care.

Composed of fourteen members and chaired by Tyler Cymet, DO, president of MedChi, the Commission will submit a report on its findings in April 2015 to the House of Delegates. The current members are Chuck Albrecht, MD, Zaneb Beams, MD, Dobbin Chow, MD, Tyler Cymet, DO, Taylor DesRosiers, Ramsay Farah, MD, Alan Harvey, MD, Mark Jameson, MD, Jeff Kaplan, MD, Joneigh Khaldun, MD, Dan Morhaim, MD, Michele Manahan, MD, Thomas Smyth, MD, and Eric Wargotz, MD. You can follow their thinking and research at www.medchi.org/blueribboncommission.

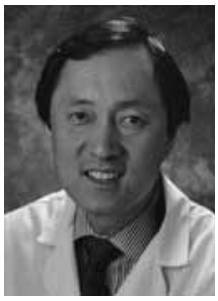
Chuck Albrecht, MD

Chuck Albrecht, MD, graduated from Dundalk High School, Baltimore, and has remained in the area. He received his medical degree from the University of Maryland School of Medicine before joining Sinai Hospital of Baltimore for residency. He is a general internist and ran the Academic Hospitalist Program at Sinai before becoming Division Director of General Internal Medicine and eventually Chief of Medicine. Additionally, Chuck served as Residency Program Director before accepting his current role as Chief Quality Officer, Sinai Hospital of Baltimore.

Zaneb Beams, MD

Zaneb Beams, MD, is board certified by the American Board of Pediatrics and fully licensed in the state of Maryland as a pediatrician and general practitioner. She has been on staff at Howard County General Hospital since 2008. She completed her undergraduate studies at Swarthmore College and subsequently graduated from Rush Medical College in Chicago. She is an active member of the medical community and has held previous positions with the Governor's Salary Commission, the Board of Directors of Doctors for America, and the Board of Directors of Evergreen Health/Your Health Network.

Dobbin Chow, MD



Dobbin Chow, MD, received his undergraduate degree from Stanford University and medical degree from the University of Pennsylvania School of Medicine. Upon graduation, he completed a primary care internal medicine residency at the Rhode Island Hospital of the Brown University School of Medicine. He has practiced and taught general internal medicine in Baltimore since 1987 and has held several leadership positions. He served as the Director of General Internal Medicine and the Associate Program Director at Sinai Hospital of Baltimore for fifteen years. Dr. Chow was then named Vice-Chair of Medicine and the Program Director at MedStar Good Samaritan Hospital, a position he held until 2014. He also served as the Governor of the Maryland Chapter of the American College of Physicians from 2010 to 2014. Currently, Dr. Chow is the Program Director at University of Maryland Midtown Campus.

Tyler Cymet, DO

Tyler Cymet, DO, received his Doctor of Osteopathic Medicine from Nova Southeastern University College of Osteopathic Medicine in 1988. After completing medical school, he did a research fellowship and rotating osteopathic internship at the Chicago College of Osteopathic Medicine. He finished his residency in internal medicine at the Yale University School of Medicine as the first Osteopathic physician in their program. After providing family medicine care to a diverse population, ranging from billionaire private care services to the homeless uninsured population, he followed his passion of teaching to Johns Hopkins School of Medicine. Currently, he is the Associate VP for Medical Education and Chief of Clinical Medical Education at the American Association of Colleges of Osteopathic Medicine (AACOM). Dr. Cymet has developed programs, such as Medical Managed Care that links medical care and government support, and pioneered several educational programs in community and public health. His research focused on the structure and function of the musculoskeletal system, but he is best known for his work identifying a previously unknown genetic syndrome. He was also one of the first physicians to report cases of anthrax during the Postal Anthrax Attack of 2001.

Dr. Cymet is currently the President of MedChi, the Maryland State Medical Society. He previously served as president of the Baltimore City Medical Society, BCMS Foundation, The Maryland Association of Osteopathic Physicians, and the Lister Society of Baltimore. He also served as National President of Docare International (2011–2013), where he was instrumental in opening up shared continuity clinics in Guatemala and Nicaragua. He is the father of a young daughter named Ilana and husband to Holly Cymet, PhD, a biophysicist and consultant for Booze Allen Hamilton.

Taylor DesRosiers, Fourth-Year Medical Student

Taylor DesRosiers is in her fourth year of medical school at Johns Hopkins and currently works for the American Medical Association as a Government Relations Advocacy Fellow. She has a deep passion for policy and health care advocacy and plans on pursuing a career in emergency medicine, while remaining engaged in relevant policy initiatives on both a local and national level. Ms. DesRosiers also serves her country as an officer in the Navy, where she will serve as a physician upon graduation.

Ramsay Farah, MD

Ramsay Farah, MD, is a certified Physician Executive and Medical Review Officer and a Fellow of the American Society of Addiction Medicine, American College of Preventive Medicine, and the American Academy of Pediatrics. Additionally, Dr. Farah is the Regional Medical Director of United Healthcare Clinical Services, NE, the Chief Medical Officer of Phoenix of Health and Phoenix Health Center, L.L.C., and the Region V Director of the American Society of Addiction Medicine. He is board certified in pediatrics and Diplomate of the American Board of Medicine. He has chaired the ASAM Council on Bylaws and served as a Fellow of the U.S. Federation of Medical Examiners. Currently, Dr. Farah serves as the Chair for the Development Council.

Alan Harvey, MD

Alan M. Harvey, MD, MBA, is the Medical Director of Dimensions Healthcare System's Department of Anesthesiology. He has an extensive background in quality, patient safety, physician leadership, and health systems, having been an AMA Delegate and elected President of the 25,000 physician-member Massachusetts Medical Society and its journal, *The New England Journal of Medicine*. Dr. Harvey was a Chief Medical Officer at Johns Hopkins Medicine International Division at Tawam Hospital, UAE Medical School in Abu Dhabi. He recently served in the past presidential election on one of the candidate's national health policy teams and is active in state and national health policy initiatives. In addition to his extensive work in health care, Dr. Harvey also received his MBA, with a concentration in health systems management, from the University of Connecticut, and is an alumnus of the Advanced Management Program (AMP) at Harvard Business School.

Mark Jameson, MD

Mark Jameson, MD, graduated from the University of Nebraska College of Medicine. After finishing his residency in Internal Medicine at Johns Hopkins Hospital, he obtained his degree in public health. Dr. Jameson is currently employed with the Washington County Health Department in Hagerstown, Maryland, and serves on the Editorial Board for *Maryland Medicine*.

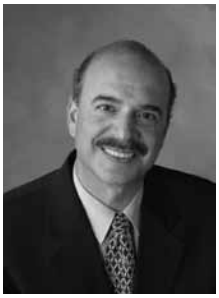
Jeff Kaplan, MD

Jeffrey R. Kaplan, MD, was born in Geneva, Switzerland, where his father was working for the World Health Organization. Following graduation from high school, he pursued his medical studies in London, England. After completing his BSc (with honors) from King's College in London, where he obtained his MBBS at St. Bartholomew's Hospital Medical College, University of London, Dr. Kaplan completed his residency in internal medicine in Ohio, moving to Baltimore in 1989. Board certified in internal medicine, he runs his own solo private practice in Ellicott City. As a member of MedChi, the Maryland State Medical Society, he has headed the International Medical Graduate (IMG) section and serves on MedChi's Board as IMG Trustee. He also chairs MedChi's Public Health Committee. Dr. Kaplan has represented MedChi on the Maryland Statewide Commission on Immunization and the Practitioner Performance Measurement Work Group. He served as President of Baltimore City Medical Society in 2007.

Joneigh Khaldun, MD

Joneigh S. Khaldun, MD, MPH, FAAEM, is a Clinical Assistant Professor and Director of Health Policy in the University of Maryland Department of Emergency Medicine, and the Founder and Director of the Department's Fellowship in Health Policy and Leadership. Her expertise in policy advocacy, health reform implementation, injury and violence prevention, and community health has led her to hold several leadership positions both locally and nationally. In 2012 she worked as a Fellow in the U.S. Department of Health and Human Services' Office of Health Reform, and she was recently appointed Chairman of the Institutional Review Board of Prince George's Hospital Center in Cheverly, Maryland. Dr. Khaldun practices emergency medicine at the Dimensions Healthcare System and is an active member of the Montgomery County, Maryland Commission on Health.

Dan Morhaim, MD



Dan Morhaim, MD, is a practicing physician, Maryland state legislator, faculty member at Johns Hopkins University and the University of Maryland, and author. Dr. Morhaim's clinical experience includes more than thirty years of front-line emergency medicine service. First elected in 1994, Dr. Morhaim also serves as Deputy Majority Leader in the Maryland House of Delegates. He has published numerous articles for both the general media and peer-reviewed publications, and his book *The Better End* has earned endorsements from Maya Angelou, Dr. Ben Carson, and Johns Hopkins' Dean Dr. Michael Klag.

Michele Manahan, MD

Michele Manahan, MD, is a board certified plastic surgeon, practicing reconstructive and cosmetic surgery. She is an active leader in both national and state medical organizations, such as the American Society of Plastic Surgeons and MedChi, where she serves as the Vice Speaker of the House of Delegates. She is also a member of the Baltimore City Medical Board of Trustees. Dr. Manahan is originally from Atlanta, Georgia, where she graduated valedictorian from Norcross High School. She completed her undergraduate studies in just three years at Harvard University, graduating summa cum laude. She was also elected to the Phi Beta Kappa honors society and Alpha Omega Medical Honor Society. Dr. Manahan attended medical school and completed her residency at Johns Hopkins University School of Medicine.

Thomas Smyth, MD

Thomas B. Smyth, MD, is a partner and Vice President of Chesapeake Urology Associates PA. He is leading several innovative programs as Director of Integrated Care, Physician Practice Development and Chair of the Physician Wellness Initiative. Dr. Smyth still enjoys a robust clinical practice in general urology, with a special focus on prostate disease. Currently, he is responsible for a clinical initiative that combines 3D ultrasound and MRI fusion of the prostate to allow enhanced detection and treatment of prostate cancer.

Eric Wargotz, MD

Eric S. Wargotz, MD, practices pathology and laboratory medicine in Princes George's County as a founding member and partner of Elliott & Wargotz Pathologists LLC. He is a Clinical Professor of Pathology at George Washington University and has served as Medical Laboratory Director and Chief of Pathology at Doctors Community Hospital for more than twenty years. Dr. Wargotz is an active member and leader for the Maryland Board of Physician Quality Assurance, MedChi Board of Trustees, and the ACCME ARC Board. He was recently elected to the Board of County Commissioners of Queen Anne's County.

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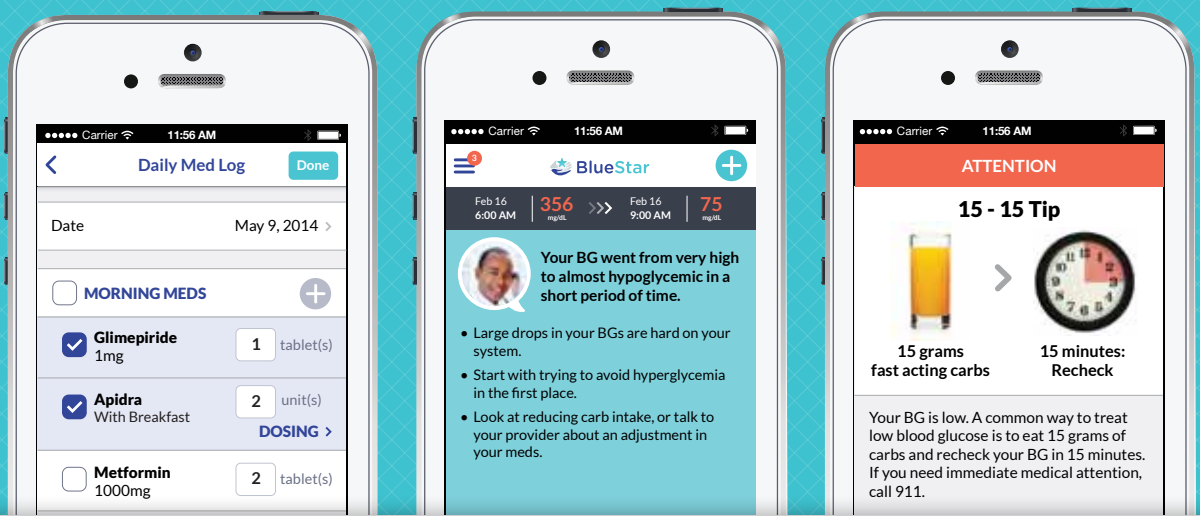

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Physician Autonomy in the Future—An Introspective Analysis

M.J. Hajjar, MD, Kate Hirsch, and Tyler Cymet, DO

Introduction

It is rare to have a question with only one correct answer. Different perspectives and interests create unique answers for individuals. Even timing can create different answers. Physicians are regularly required to evaluate a patient and determine optimal treatment given the situation and factoring in all circumstances. It is knowledge, experience, and professionalism that grant physicians autonomy to provide answers to critical questions in medicine and to steer the ship in the right direction in moving forward. Significantly, organizations such as MedChi, which provide resources for physicians and serve as physician advocates, will be at the helm of redefining and restructuring healthcare.

Autonomy for a physician is contingent on maintaining a "specialized knowledge base, public trust, organized professional advocacy, and governmental support."[1] The modern version of the Hippocratic Oath justifies autonomy by reminding physicians that their obligation is to serve the best interests of the patient during treatment.[2] This is the foundation of the trust and the unique relationship between patients and physicians. Physicians need the ability to "exercise liberty to promote…patient's best interests [,] not their own interests" to maintain and strengthen the bonds of this relationship.[3] Thus, physician autonomy is best described as "…freedom to determine both the conditions of practice and the care delivered with the principal goal that care decisions are aimed at promoting the patient's well-being."[4]

Discussion

Moses and colleagues capture the "iron triangle of conflicting expectations among patients, clinicians, and public health and government policy makers" (see Figure 1).[5] The changes in the position and power of stakeholders can affect a physician's autonomy. With the changing healthcare system, it is expected that physician autonomy will change. The transformations will evolve around seven key factors: the Affordable Care Act (ACA), accountable care organizations, Health Information Technology (HIT), self-regulation, advancement of knowledge, a physician's ability to adapt to change, and the patient-physician relationship's ability to adapt to the changes.

Anticipated Changes in Physician Autonomy

The move from the current fee-for-service to bundled payments allows considerable flexibility to "redesign [health]care delivery" and gives physicians the discretion to tailor a patient's treatment regimen using modes of care not previously available.[6] The consolidation of current insurers, and the resulting bundled payment structure, give us the term *Big Pay*, signifying the unification and industrialization of the business of healthcare.[7] According to Moses and colleagues, decreased autonomy can "breed professional dissatisfaction, spawn dependency, and have the potential to frustrate goals to integrate care by increasing fragmentation."[8] Experts proffer that the provisions of the Affordable Care Act (ACA) will increase physician autonomy in the future.[9]

Modifications to Autonomy Secondary to Physician Groups (Accountable Care Organizations)

The medical profession has seen an increasing number of solo or partners practice shift to larger group practices or to conglomerate hospital-based healthcare systems. In the past ten years the number of physicians in large groups has increased from 41% in 2000 to 72% in 2010.[10]

This transition to "Big Med" represents a systematic approach of integrated communication and control in a patient's healthcare management. "Big Med" has regulation over a patient's healthcare dollars by administering all aspects of patient care. As physicians in larger group practices lose the ability to choose treatments and providers as needed,[11] physicians perceive "lower levels of autonomy in logistic based decisions." Hospital-based healthcare systems promote medical home(s), an interprofessional healthcare team, where the physicians may not have the authority to make healthcare decisions. In contrast, physicians in smaller practices perceive lower levels of autonomy in knowledge-based decisions,[12] as the lack of specialized resources and professionals may not be widely available. Thus, professionals are forced to adapt to fluctuations of healthcare systems, as they experience changes in traditional perceptions of autonomy. Physicians should remember throughout this process that "working together…is not antithetical to exercising individual autonomy."[13]

New systems in healthcare afford incentives for physicians to work in groups, or accountable care organizations (ACOs), which help augment autonomy for every size group of physicians.[14] Solo practitioners can voluntarily join a group with like-minded healthcare providers to provide care with a wide range of payment

options. The ACO holds the physician accountable for not only the quality of care but also the cost factoring. The primary care physician plays the distinctive role of quarterback, deciding how best to coordinate care to give the patient the best care possible. This paradigm shift will redefine autonomy in medicine through new working relationships.

Health Information Technology (HIT)

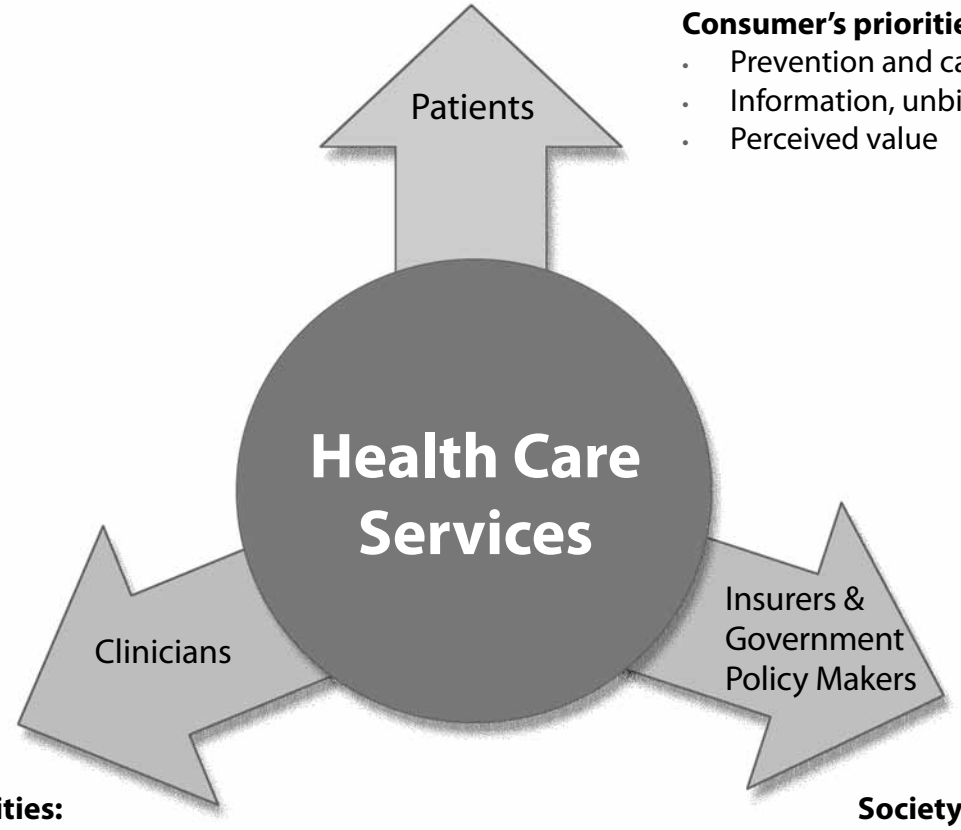
Electronic health records (EHRs) are omnipresent in the medical arena and are quickly replacing the traditional patient chart. EHRs require patience and increased time for the physician and staff, to reach an envisioned utopia of synchrony and sharing (as implausible as it sounds, there are areas of EHRs in which that is possible), which to date remains a work in progress. As knowledge is power, such knowledge sharing should promote greater physician autonomy. The Chesapeake Regional Information System for our Patients (CRISP), the state of Maryland's designated health information exchange, provides a good example. CRISP permits physicians to gather information from the EHRs for any registered patient, a valuable tool for obtaining medical history of an unconscious, or unresponsive, patient and as a check of the validity of a patient's self-reported data.

Many clinicians have embraced EHRs to "foster communication across increasingly large and complex industrial enterprises".[15] Significantly, physicians "need to leverage the explosion of information by installing electronic health records with decision supports, integrating the added information into their practice design and clinical decisions."[16] Since 2000, "95% of hospitals have now adopted electronic medical records."[17] EHRs require tremendous patience to transfer data from traditional charting systems, standardize the information, share the information, and make it clinically useful. The goal is for value to exceed overall investment into our IT systems.[18] Presently, the new focus is to make healthcare "truly better and safer" through the use of "Big Data," the "use of massive databases and data-mining capabilities to find…key opportunities for care improvement and refine solutions to them."[19] Overall, it is a promising process, and will reduce fragmentation in the system as the number of healthcare facilities has increased from 765,729 in 2000 to 935,872 in 2011.[20]

EMRs paired with advances in telemedicine will enable providers to provide treatment to patients without the formality of office visits. Telemedicine provides insight and clinical judgment in a manner not feasible in the recent past.[21] Further mobile technology will increase patient and physician autonomy. Apple's HealthKit, used by millions of patients, will permit monitoring of patients' "abnormal health results" and "sync its apps with providers' electronic health records" (e.g., integration with MyChart from Epic).[22]

Self-Regulation and Modifications to Autonomy

Methods of self-regulation, which govern rules and regulations, imposed by the changing healthcare system will affect physician autonomy. The patient–physician relationship of trust



Consumer's priorities:
- Prevention and care
- Information, unbiased guidance
- Perceived value

Medicine's priorities:
- Professionalism
- Autonomy
- Science and technology

Society's priorities:
- Measured effectiveness
- Access
- Cost

FIGURE 1

is founded in the governing rules and regulations of ethics codes, guidelines and standards for practice, and the requirements for medical training.[23] Reservoirs of performance data developed by the U.S. Congress, such as the National Practitioner Data Bank, to track physicians with possible problems of competency[24] provide further confidence in the physician–patient relationship.

The governing rules and regulations are set forth in medical school by the Liaison Committee on Medical Education (LCME) and the AOA Commission on Osteopathic College Accreditation (COCA), as charged by the U.S. Department of Education. Recent debates over the eighty-hour workweek restrictions mandated by the Accreditation Council for Graduate Medical Education (ACGME) and the milestones developed for residency, will have broad implications for graduating physicians learning autonomy. The introduction of Entrustable Professional Activities as a requirement to start graduate medical education is another system being put into place to ensure that autonomy is earned and occurs. Any potential legislative changes on Medicare resident limits will also have substantial effects on autonomy, as industrial care models rely on a large supply of physicians.[25]

Securing Public Trust Through Advancement of Knowledge

Another initiative being developed as a result of the ACA is the Patient-Centered Outcomes Research Institute (PCORI). PCORI is designed to assist physicians customizing treatment for individual patients, "enhance decision making," and determine how best to allocate limited resources within ACOs. This program is being crafted to increase physicians with limited resources autonomy.[26]

Physician's Plasticity to Transformations in Autonomy

To attain positive results during transition of the healthcare system, physicians need to adopt a more "proactive" stance. Physician leadership initiatives to redesign "[health] care delivery systems," rather than waiting on payers or clearinghouse[s], is critical. These models should include "cost and quality indicators" and designate individual(s) to be held responsible for results of quality control.[27]

Physician–Patient Dynamic and its Influences on Autonomy

As physician practices move toward conglomerate hospital-based systems, there is an increasing focus on groups of patients in terms of metrics. Patients are voicing their concerns that individuals may be viewed less prominently in favor of more generalized care. More and more, "patient influence is expressed principally outside the traditional health care establishment, particularly using social media and other new [media] channels," thus making patient "preferences…potential obstacles" to the entire process with "unanticipated consequences."[28] Mirvis opines that healthcare is "the appropriate domain of all professionals with an interest in public policy and of every person affected by public decisions."[29] Therefore, patient input should be sought throughout this transformative period to obtain the most favorable outcomes.

Conclusion

To capture changes to the physician autonomy in the future healthcare system is daunting. The review and analysis of pertinent published literature presents the key factors of changes in physician autonomy in a condensed and concise format, with the hope of generating discussion and debate among patients, physicians, and experts. The analysis is neither complete nor conclusive. Further ideas are currently being generated by professionals, physicians, and policymakers and are under study in academic centers. It is wise to systematically and methodically study and test chosen pathways selected based on this mutual collaboration. Positive constructive discussion and debate, including all parties involved, will optimistically steer the profession in the right direction in the evolving healthcare system.

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The Era of Big Data

Ricky Kalia, Third-Year Osteopathic Medical Student; Carisa Lippmann, Fourth-Year Osteopathic Medical Student; Houston Lui, Third-Year Osteopathic Medical Student; Tyler Cymet, DO

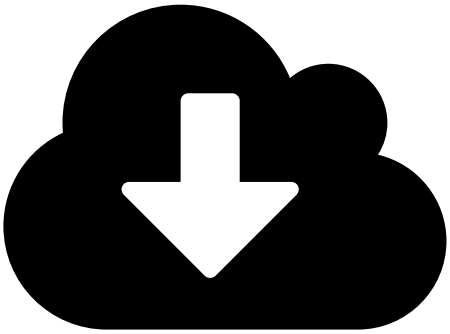
The era of big data has begun. Computer scientists, physicists, economists, mathematicians, political scientists, bio-informaticists, sociologists, and many others are clamoring for access to the massive quantities of information produced by and about people, things, and their interactions.[1] Medicine, as never before in human history, finds itself beholden to this era as the digital revolution becomes more applicable to the human being itself. We are now able to generate data on a variety of health metrics, such as blood pressure and sleep patterns, in real time via web-enabled devices. Additionally, the various "omics" fields (e.g., genomics, proteomics, pharmacogenomics, oncogenomics) allow us to measure molecular entities on all relevant biological levels and examine our respective blueprints with astonishing levels of accuracy. Over the last decade, pharmaceutical companies have been aggregating years of research and development data into medical databases, while payors and providers currently digitize patient records. The federal government and other public stakeholders also have accelerated the move toward transparency by making decades of stored data from clinical trials and information on patients covered under public insurance programs available to the healthcare sector as a whole.[1, 2] Ultimately, the challenge is to amalgamate this complex assortment of information with clinical data, specifically through the use of Electronic health records (EHRs) and Clinical Decision Support (CDS) systems, to enable physicians to identify problems early and reduce costs and inefficiencies, and to move toward a more targeted and personalized patient care model.

Historically, collecting data has been hard, time consuming, and resource intensive.[3] However, as the use of smartphones, social networking sites, and wearable technology become ubiquitous, collecting data has become much easier. Wearable technology, such as wristbands and other biometric devices, enable constant monitoring and data collection, allowing providers to look at data over time and understand patterns of patient behavior. This is paramount as a deeper understanding of patient behavior is one of the cornerstones of improving health, especially in managing chronic conditions that are primarily driven by unhealthy lifestyle choices. To realize their full potential in healthcare, these data collecting devices must cross the boundary from consumer electronics devices to regulated medical devices that can potentially be integrated into patient health records.[4] Furthermore, if data generated by these devices can be accessed, analyzed, or translated into actionable information and subsequently leveraged into making predictions about future events and trends, they will be of particular value as the healthcare industry transitions toward new payment models based on outcomes, rather than the quantity of care delivered. A recent study by McKinsey & Company proposes that by using big data creatively and effectively to drive efficiency and quality, the healthcare industry could save approximately $300 to $450 billion annually in reduced healthcare spending, or 12 to 17 percent of the $2.6 trillion baseline in U.S. healthcare costs.[5, 6, 7]

> "There is great potential for integrating genetic information into EHRs, to improve management decisions at the point of care."

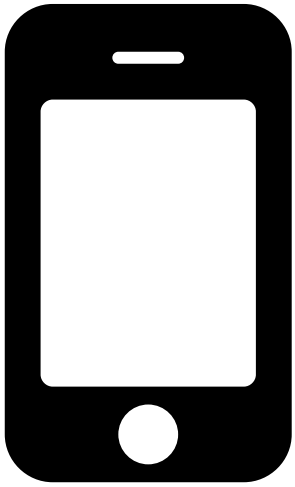
Physicians have traditionally used their judgment when making treatment decisions, but in recent decades there has been a move toward evidence-based medicine, which involves systematically reviewing clinical data and making treatment decisions based on the best available information.[8,9] In the data rich world of today, it is vital that physicians take an active role in using and evaluating various data collections to better guide their practice. Cloud-based analytics systems allow physicians to compare their performances and identify patients who may benefit from proactive outreach strategies and subsequent follow-up visits. The Mid Hudson Medical Group has used such analytics to examine their patient records and identify diabetic patients with HgA1c readings above 7% who have not been seen in more than twelve months. As a result, approximately one-third of the patients identified in the baseline group were seen one or more times within the first eight months of the program. In this group of diabetics, one-third achieved an HgA1c of < 8%, and 60% of those with very high HgA1c (>9%) are now being intensively managed through more frequent visits with their primary care physician.[10] Researchers at Duke University recently compared the benefits of collecting real-world data directly from patients with the benefits of gathering such data through randomized controlled trials. The report found that patient-generated data are critical to developing the evidence base that informs decisions made by patients, providers, and policymakers. Specifically, the researchers wrote that the key to high-quality, patient-generated data is to have immediate and actionable data that allow patients to realize the importance of the data for research, as well as their personal care.[11]

The era of big data potentially illustrates the most accurate picture of indi-

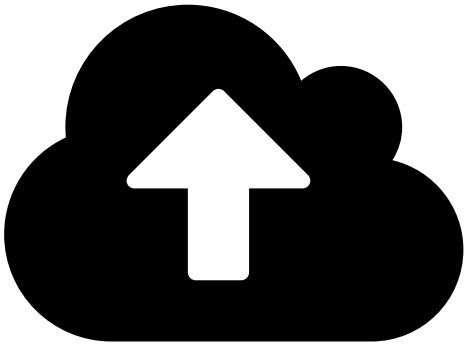


vidual health to date, as data generated from smartphones and biometric devices are better integrated with electronic health records. According to the U.S. Food and Drug Administration (FDA), 500 million smartphone users worldwide will be using a healthcare application by 2015, and by 2018, 50% of the more than 3.4 billion smartphone and tablet users will have downloaded mobile health applications.[12] In June of 2014, Apple introduced a new mobile application and platform, HealthKit, that aims to consolidate health data tracked by various health applications into one central location. Furthermore, Apple announced partnerships with EHR provider Epic Systems, Mayo Clinic, and a number of hospitals. These partnerships will allow the dozens of healthcare systems that use Epic to integrate patient information via HealthKit into MyChart, Epic's personal online health management system.[13] In March 2014, Practice Fusion, the fourth largest vendor of EHRs in the country, announced a partnership with AliveCor, Inc., maker of a smartphone heart monitor, and Diasend, an online diabetes management system. Following patient approval, the shared data from these sources will be accessible to physicians through Practice Fusion medical records.[14] Such advances have the potential to notify physicians if key health metrics, such as blood pressure and blood glucose levels, move into unhealthy ranges, and thus allow them to make appropriate management decisions in a more effective and timely manner.

In addition to integrating Internet based data from smartphone applications with EHRs, there is great potential for integrating genetic information into EHRs, to improve management decisions at the point of care. Imagine the potential of a healthcare system that allows seamless and rapid integration of genetic information into EHRs where CDS systems provide patient specific and intelligently filtered information at appropriate times to enhance management decisions. To investigate such a system, the National Human Genome Research Institute funded a consortium, The Electronic Medical Records and Genomics (eMERGE) Network, to develop methods for the use of EHRs as a tool for genomic research. Phase I of the project (September 2007–July 2011) had three major aims: (1) to use EHR data for robust electronic phenotyping, (2) to conduct genome-wide association studies (GWAS) using the phenotypes derived in the first aim, and (3) to explore the ethical, legal, and social implications associated with EHR-based GWAS and wide-scale data sharing.[15] Following the success of Phase I, the network transitioned into Phase II (August 2011–July 2015) to explore best avenues and practices of incorporating genetic variants into EHRs for use in clinical care.[16, 17] A central goal of this phase was the generation of an expansive and diverse biobank that housed rich EMR-linked phenotypic data. A Phase II project, eMERGE PGx, is currently using this data to investigate the ability of CDS systems to provide clinicians with relevant pharmcogenomic variants before prescribing certain medications, such as clopidogrel, warfarin, or simvastatin. Researches will preemptively genotype drug-naive patients who have an increased probability of receiving such target drugs. Subsequently, the placement of the drug prescription in a computerized order entry system will automatically trigger processing of patient data. If predefined rules are met, information will be presented to the ordering clinician that could inform dosing or medication choice. Clinicians' decisions to use or disregard the information will be analyzed along with feedback to identify factors that promote or impede implementation.[18]



A recent recommendation from the Health IT Policy Committee Meaningful Use Workgroup would require practices with EHRs to allow 10 percent of patients to report patient generated health data electronically. If approved in meaningful use stage 3, the final stage of HealthIT.gov's EHR incentive program, it could push hospitals to incorporate patient-generated data.[19] However, certain technical and ethical concerns remain before adequate implementation. For instance, data standardization is required for accurate and efficient entry and interpretation into EHRs; likewise, the development of a secure mode of transmission between EHRs is absolutely vital. Furthermore, computerized training programs in genetics and statistics, better patient consent tools, and enhanced educational focus on statistics is necessary.[20] The CDS rules of the EMERGE PGx project do not incorporate clinically relevant non-genomic information into the decision process. Likewise, as the CDS for this project was developed and built into the EHR by an internal panel of experts, its scalability is limited beyond their own institution.[21] Further research regarding integration of both genetic and non-genetic information into CDS systems, the ability of the CDS systems to support multiple EHR platforms, establishing a degree of data standardization for accuracy and efficiency purpose, as well as developing secure modes of transmission between EHRs, must be conducted for physicians to truly use EHRs to provide cost-effective, personalized targeted therapies.



To reward quality care and penalize non-performance, the Patient Protection and Affordable Care Act regulates that organizations collect and submit an increasing amount of data to earn maximum reimbursements and to avoid penalties for non-compliance.[22] The collection, integration, and distribution of medical information will play a vital role, as the industry transitions from a one-size fits all model to that of precision medicine and personalized healthcare. Healthcare providers find themselves immersed in an environment that incentivizes collaboration and quality across the continuum of care. The ability to leverage big data to promote wellness and provide patient-specific treatment options will be of critical importance. While drug discovery and novel therapeutics will remain important, diagnostics and personalized therapies, which combine molecular profiling of patient genomic information with clinical and pathological data, will identify which patients respond positively to specific drugs or vaccines, thereby offering the most effective treatment with minimized consequences. By using these modalities, physicians can help with the health maintenance of their patients and ultimately have a positive effect on health outcomes.

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Comparative Effectiveness and Value-Based Purchasing:
Can We Improve Quality and Cost?

Alissa Craft, DO, MBA, and William Blazey, DO

There is little or no scientific evidence to support much of U.S. healthcare. More than half the treatments provided to patients lack clear evidence that they are effective, according to the Institute of Medicine (IOM). Experts estimate that perhaps one-third of all U.S. healthcare spending produces no benefit to the patient—and some of it actually results in harm.

Overuse of healthcare services is estimated to affect 30 percent of healthcare services. Misuse of drugs and treatments may cost $52.2 billion and overuse of antibiotics for respiratory infections may cost $1.1 billion. The IOM's Committee on Quality of Health Care in America defines *overuse* and *misuse* in the context of health care services. Overuse is the use of healthcare resources and procedures in the absence of evidence that the service could help patients. Misuse is the failure to properly execute clinical care plans and procedures.

Overuse and misuse may be curtailed in two ways: (1) through the application of comparative effectiveness research, and (2) through value based purchasing of health care.

What is Comparative Effectiveness Research?

The IOM has defined *comparative effectiveness research* (CER) as "the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or improve the delivery of care." An analysis of comparative effectiveness is simply a rigorous evaluation of the different treatment options available for a given medical condition or a particular set of patients, and their effects.

CER aims to provide high-quality evidence to help patients and clinicians make informed clinical decisions and to assist health systems in improving the quality and cost-effectiveness of clinical care. CER forms the first of two critical arms of evidence-informed health policymaking.

What is Value-Based Purchasing?

Value-based purchasing involves the actions of coalitions, employer purchasers, public sector purchasers, health plans, and individual consumers in making decisions based on a combination of access, price, quality, efficiency, and alignment of incentives. Effective services and high performing providers are rewarded through public reporting, enhanced payments, and increased market share. Criteria for value-based purchasing include an assessment of relative risk to patient safety, frequency and cost of the condition, ability to report the extent of the problem, practice variation, available literature on the extent of overuse, and available evidence-based clinical pathways.

Value-based purchasing can help shift employer health benefits from a recruitment and retention tool, to a chance to improve population health and increase productivity, which will ultimately increase the employer's bottom line. Purchasers of health care are responsible for implementing value-based purchasing. The move to purchase for quality, service, and cost, rather than cost alone, will improve the health and health management of the population, and will achieve a higher quality of care at the lowest possible price.

The Current Approaches

Oregon, Washington, and New York are actively involved in efforts to improve quality and reduce cost by participating in systematic evidence reviews. The first program of this type was the Oregon Health Plan (OHP), a Medicaid-funded plan administered by private health plans. The principle behind the OHP stated that when funds are limited, the state should deliver fewer services to more people rather than more services to fewer people. Services were placed on a prioritized list, and when costs rose or revenues diminished, cuts were made to lower-priority services, not to the number of people covered.

During its first five years of operation, Oregon's prioritized list of services saved the state only 2 percent of total expenditures based on the amount that it would have spent under the previous system. However, during that same timeframe, Oregon managed to expand health insurance coverage to more than 600,000 people, reducing the state's uninsured rate from 17 percent in 1992 to 11 percent in 1997. By 2007, the prioritized list of health services was adopted as the basis for a benefits package proposed for universal coverage within the state of Oregon. While that did not occur under a new legislature, by 2011 the state of Oregon had established a newer system for implementing comparative effectiveness research.

The Oregon Health Evidence Review Commission is designed to review clinical evidence to guide the Oregon Health Authority in making benefit-related decisions for its health plans. Its main products are the Prioritized List of Health Services, used by the legislature to guide funding decisions for the Oregon Health Plan, and evidence-based reports on specific topics of interest to Oregon health payers and providers as well as members of the public.

The Washington Health Technology Assessment program relies on scientific evidence to make the coverage decisions of state agencies more consistent, and health care safer. The thought is that state

purchased health care will be more cost effective as the state will pay only for medical tools and procedures that are proven to work. Washington has reported that its efforts resulted in a 94 percent reduction in bariatric surgery spending, a $10 million reduction in enteral nutrition spending, and a 3-to-1 return on its investment to reduce spending on drugs prescribed for attention deficit disorder by requiring second opinions.

A Plan for our Healthcare Future

There are two main components of a medical or health policy decision. The first component is an analysis of the evidence, or the scientific judgment about the quality of the evidence. The second component is the value judgment that must be made based on knowledge of the population being served and the preferences of that population. Together, these components comprise implementable comparative effectiveness research and value-based purchasing program.

Employers and health plans know that buying health care on price alone might save some money in the short-term, but is neither a sound nor sustainable strategy if they want to bend the healthcare cost curve. Value-based purchasing is the necessary catalyst for transforming the healthcare delivery system and reaching the goal of a high-quality and affordable system. No single employer, coalition, or health plan can succeed alone; we need to work together if we are to achieve improved health care, improved population health, and reduced costs.

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Teamwork and Integrated Care Programs: A Way Forward

Thomas B. Smyth, MD

The Importance of Teamwork

We physicians cheer for teams all the time—the Redskins and the Ravens, the Baltimore Symphony, the Orioles, the Senators, the Terps and the Greyhounds—even though we tend to lead our professional lives in isolation. It is true that we manage small teams, like MAs in the office and nurses in the OR, but we rarely recognize that we are leading a team. Professionally, we live in silos. Every task and decision lands squarely on our individual shoulders, depending primarily on our singular efficiencies and knowledge base. As sports fans and political observers, we take it for granted that success depends on effective teamwork. As clinicians, we feel responsible for devising clinical strategies on our own.

It's time for self-reflection. Physicians in Maryland need to look in the mirror and inquire—how can we be better? The healthcare workforce in Maryland is changing rapidly. In 2012 only 46 percent of individuals training to be healthcare professionals were studying to be MDs and DOs. The remaining individuals were IMGs, NPs, and PAs.[1] How can we use this trend to our advantage? In this article, we consider the importance of teamwork, the physician as Clinical COO (chief operating officer), and the creation of integrated care programs (ICPs).

> "Physicians will need to warmly embrace the concept of 'team' if we are going to remain relevant as leaders of healthcare delivery in Maryland."

The unique synergy of a fully aligned team creates remarkable power and exponentially added value. I marvel when I think of pediatricians or internists toiling in their office in Cumberland or Easton, suddenly confronting a challenge and reacting with staff members to move a sick patient to the ER, or using finely honed skills to resolve the issue and avert the ER visit. I enjoy watching my fellow Chesapeake Urology physicians work with our staff to reach the ultimate goal of providing the superior patient experience. Few feelings rival the thrill of participating on a truly successful team.

During medical school and residency, the team concept was not a formal part of my curriculum. Teamwork was not a requirement, in the classroom or on the floor. The emphasis placed on teamwork depended entirely on the personality of the resident leading the group on rounds.

The lack of emphasis on teamwork is an inevitable result of the individualism that made American medicine great in the 20th century. By the 1980s, physicians in the United States had established a long tradition of unparalleled success. Mortality from infectious diseases had plummeted. Innovations in cardiac surgery prolonged the lives of children and adults, and transplantation medicine revolutionized the care of patients with kidney and liver disease. We were trained to believe that medical breakthroughs emanated from individual effort, individual sacrifice, and individual intellect.

We attributed our success as physicians to our individual effort. Did I get my work done? How did I score on that test? Teams lurked in the background, while individuals tended to be recognized as diseases, and surgical procedures and instruments were named for individuals, not teams.

When we reached "attending" status, the feeling of individuality was reinforced in many ways, including the way we were reimbursed. Our individual productivity, often measured in financial terms and Relative Value Units (RVUs), became the overriding measure of value. Incentives are important, but they have been focused on the individual.

Our "individualized" training and current incentives will do little to prepare us for the future. Physicians will need to warmly embrace the concept of "team" if we are going to remain relevant as leaders of healthcare delivery in Maryland. The perpetual flow of information cannot be assimilated by any individual practitioner, changes in technology are too sophisticated for any one person to become fully proficient and experienced with each one, regulatory requirements are so numerous and complicated that individuals cannot hope to learn them, and the EMR systems that we must traverse as we travel from offices to hospitals are too diverse and complex to commit to memory. Outcomes analysis over the past fifteen years has awakened us to the daunting reality of medical errors. One in seven Medicare inpatients experience a medical error.[2] Stress and frustration will force many physicians to quit or hunker down. Our best hope is to reach out to each other. Teamwork is the key strategy to our future success.

Teamwork as a strategy may mean that some will need to give up long-cherished individual advantages in the short term. The brass ring will be a future in which we achieve the cost containment our country needs, the enhanced care our patients seek, and the stabilization of value and control that physicians deserve as clinical COOs in the unique U.S. healthcare industry. If we

SEVEN CRITICAL INGREDIENTS OF AN ICP

Sponsorship: from the CEO to specific ICP team leaders to the clinical arenas where the work gets done, physician champions are critical. The organization must provide strong, visible support for ICPs.

Alignment: To drive ICP innovation efficiently, there must be an aligned vision adopted by all stakeholders so the entire system is moving toward the same goal.

Trust: Successful integration requires physicians to take a leap of faith to change their ingrained processes and habits. Leaders of ICPs need to build trust so that physicians and staff believe that their concerns will be heard, and that their participation is valued during the creation and continuous improvement phases of ICPs.

Infrastructure: A simple, reproducible yet flexible framework will provide the best chance for ICP success. Whirlpool, the famous maker of appliances, proved this when they successfully embedded innovation among their 54,000 employees stationed across the globe. Their simple framework has been beautifully described by Whirlpool's Chief Innovation Officer, Nancy Tennant Snyder, in her book: *Unleashing Innovation: How Whirlpool Transformed an Industry* (see Graph 1). We have been able to use this framework successfully at Chesapeake Urology.[3]

Inclusion: Make the program inclusive for physicians who are willing to accept the parameters of measurable clinical outcomes and efficient care. Board certified physicians don't like to be excluded.

Communication: ICPs will require a partnership between physicians and staff across specialties as well as within specific specialties, often across wide geographic areas. This partnership will only work if we emphasize communication. We will need to over communicate.

Teamwork: An individual cannot get it all done. The ICPs at Cheapeake Urology that have made the most progress have strong leaders who listen and advisory team members who are willing to do the work and accept compromise. In this environment, front line physicians and staff enact change and provide critical feedback.

can cross the bridge from "me" to "team," we may also gain an additional benefit: relief from the incredible levels of stress that are currently ravaging physicians, contributing to higher rates of disease, substance abuse, divorce, and suicide when compared with our professional peers in other industries.

Integrated Care Programs: A Tactical Framework for the Team Strategy

Although I harbor no illusions that the transition to integrated care will be easy, I do believe the goal is achievable if we physicians work to modify our behavior in four ways:

1. Embrace the concept of "team";
2. Build training programs that teach trust, communication, and team leadership—the keys to being a successful "clinical chief operating officer";
3. Build incentives that reward team behavior; and
4. Build tactical frameworks, called "integrated care programs," around disease states that dissolve the traditional silos that have existed between physicians in all specialties.

If teamwork is the future strategy for physicians, then ICPs will be the tactical framework that will allow teams to function effectively.

Three years ago I was asked to build ICPs for our five most common urologic disease states. These programs would be built on the values expressed in Chesapeake Urology's vision statement, which seeks to create and enhance value for all stakeholders: patient, physician, staff, industry, and country. At this point, I don't have all of the answers, but I have learned seven critical lessons (see Box, Seven Critical Ingredients, and Graph 1: Building Something New Is Not Easy):

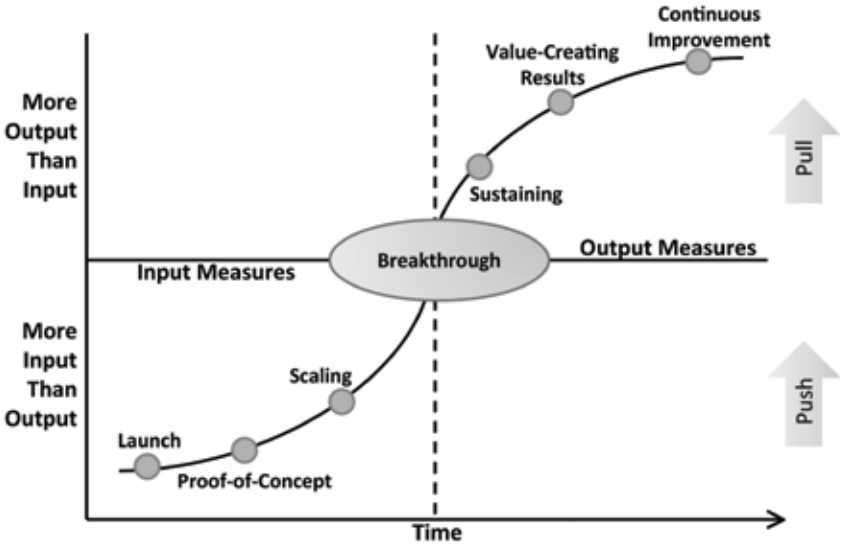
1. Sponsorship is critical.
2. Alignment is crucial.
3. Trust is earned and essential.
4. The infrastructure plan must be simple, focused, scalable, and reproducible.
5. Rely on inclusion.
6. Don't forget to communicate.
7. Teams work well.

Our programs are not even close to maturity (see Graph 2), and yet we have made significant progress with many components. Table 1 highlights wonderful examples of successful teamwork.

A challenge for the Blue Ribbon Commission to consider is how to make the ICP concept successfully fit the various shapes and sizes of physician practices in Maryland, from the solo internist working in rural Worcester County to the small group of pediatricians working in suburban Howard County to the expansive group of multispecialty physicians at a large medical center such as St. Joseph's Hospital in Towson. How do we build inclusive teams from this disparate group of geographically dispersed and sometimes isolated practitioners? If Whirlpool can do it with 54,000 employees spread around the world, we can figure this out. We just need to trust the teamwork path. The good news is that the U.S. healthcare industry is populated with the hardest working, most dedicated, most intelligent workforce in the world: physicians. Let's get to work and figure out how to remain relevant and valued.

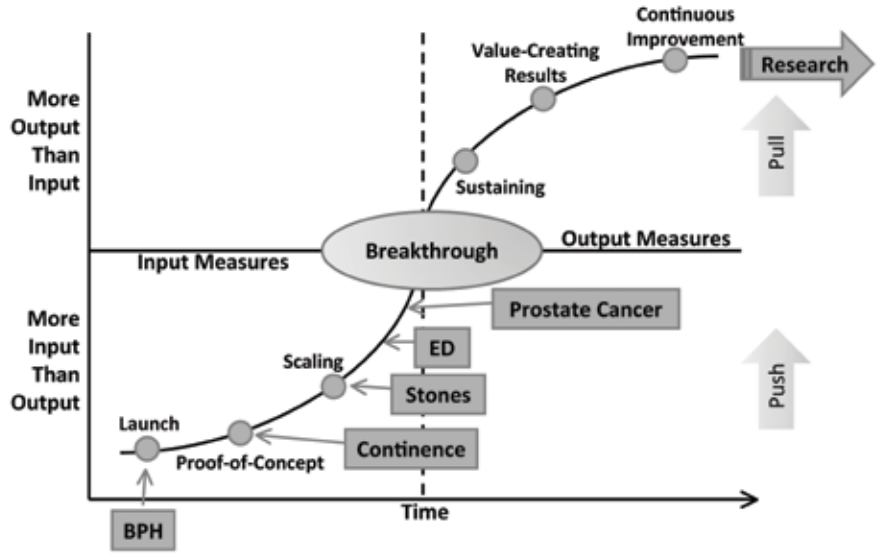
Physician, heal thyself through teamwork.

Graph 1: Building Something New is Not Easy



The "S" curve used by Whirlpool's Chief Innovation Officer: the framework used to imbed innovation can be employed as a model for building ICPs (N. T. Snyder & D. L. Duarte, 2008).

Graph 2: Status of Overall Integrated Care Programs



ICPs at Chesapeake Urology are still in the "PUSH" stage.

"Pushing and Pulling" - Status of Components of Various Programs

Launch	Proof of Concept	Scaling	Breakthrough	Sustaining	Value Creating Results	Continuous Improvement
Penile Injection Clinic	Xofigo	Ureteroscopy			Urodynamics	The Prostate Center
Metabolic Stone Program		A.D.T. Clinic			Penile Prosthesis	Research Studies
		Pharmacy Program			3D MRI/ Ultrasound Fusion	Provenge

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CRISP

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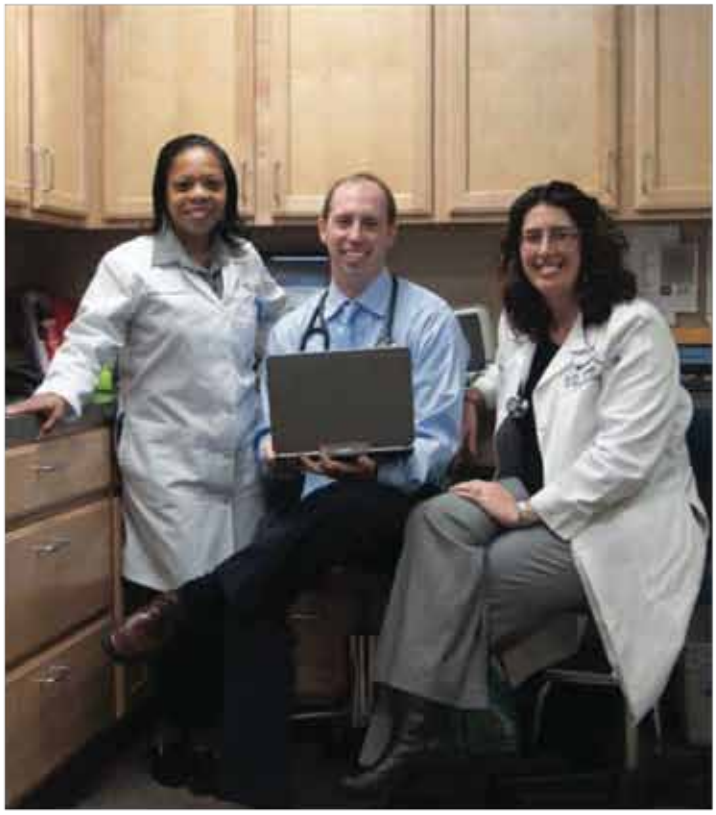

CRISP is a non-profit health information exchange organization serving Maryland and the District of Columbia.

Prescription Drug Monitoring Program
Monitor the prescribing and dispensing of drugs that contain controlled dangerous substances

Encounter Notification Service (ENS)
Be notified in real time about patient visits to the hospital, qualify for transitional care reimbursement

Query Portal
Search for your patients' prior hospital and medication records

Direct Secure Messaging
Use secure email instead of fax/phone for referrals and other care coordination

To learn more about these free services,
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The Autonomous Automaton: A Physician's Role in the Patient's Decision

Eric Goldwaser, Fourth-Year Osteopathic Medical Student, and Tyler Cymet, DO

Introduction

What does a 21st century doctor look like? What uniquely identifies the qualifications of a physician nowadays is evolving. In this fast-paced age, we have the Internet in our pockets and a medical diagnosis at our fingertips. Patients can be milliseconds and kilobytes of data away from almost anything they could want to know about medicine.

So what, then, necessitates the terse, sometimes awkward visit to the doctor's office? Do both doctor and patient still have the same goals? With the free availability of such significant and deep medical information, at what point is the out-sourcing of health care services going to divert the flow of healthcare out of the physician's office?

Physicians and the Healthcare Team

Starting from the top—let us think about what makes the physician and visits to the physician unique. Is it the long-white coat? Not anymore. Pharmacists and other professionals now often wear white coats as well. Is it the physician's ability to diagnose disease given a set of symptoms? Not quite. Physician assistants and physical therapists can be adept Google searchers on symptomatology, diagnosis, and treatment. Is it the fact that they are called *doctor*s? Nope. Not even the word *doctor* is enough to identify a physician now that the graduate nursing degree allows them the title of doctor (hence the push in recent years to use the word *physician* instead of doctor for a DO or MD). To figure out what it is that identifies the DO or MD, aside from a two-letter acronym, we must understand what transforms mere medical students into physicians during training and what distinguishes them from other health professionals.

The only people walking around the hospital who are physicians are those who went to medical school. If so many aspects of healthcare are seemingly taken care of by any other member of the interprofessional team, what is it about medical school that renders the medical student of the past to be an indispensible element for quality healthcare, as physicians claim? Not long ago, the answer was undoubtedly a physician's knowledge. Although medical "knowledge" is now easily and readily available to anyone with wi-fi, knowledge itself is not enough. Medical school differs from other forms of training in the experience it provides to the student and the perspective and thought processes expected of each student.

Questioning and Critical Thinking

Scientific theory is rooted firmly in the ground beneath Sir Isaac Newton's apple tree; it ever evolves with technology and is always a victim to scrutiny, especially from academia. In the medical sciences, we are taught to decipher science from pseudoscience—or in more accepted terms, fact from fiction. Such a quintessential skillset is honed over many years; it is taught and studied, learned and conceptualized, and harped over. Then it is studied again and meticulously questioned. As it is easy for one to find medical information and communicate, it is also easy for one to be led astray.

The Internet is marveled at for its vastness, its opportunity, and its freedom. With said freedom, however, come the risks of erroneous claims. On the Internet, wishful thinking can drive a search to the destination sought by the searcher.

It is immensely important to look critically at the knowledge that provides physicians, in all their wisdom shared by the Internet, intellectual shelter. It is the oversight and handholding by physician educators for each new resident that ensures the physicians look critically at what is being shared as knowledge. With 10,000 hours of training, with scientific theory as a guiding principle and standard—oftentimes unbeknownst to the medical student at the time—a powerful skillset is harvested. Such an ability, or rather capability, enables the physician to think critically and evaluate claims made by those with dissenting opinions, based on data or objective and even anecdotal experiences. Thereafter, a "niche" of sorts is carved out for the physician, one that patients should value. The objective and fair evaluation of knowledge outside of one's own involvement provides an honest and fair prediction of an individual's future health. The witnessing of disease, sharing of knowledge, and collective prediction of what the future holds umbrellas what our experience allows us to share.

New Relationships

We are not saying that the patient lacks the ability to decipher true from false, but rather making the distinction that physicians are trained as experts in the field. An expert is able to validate assertions when needed, to be the voice of reason on divided issues, to explain complicated topics to the layman, and perhaps, most important, to be versed enough to know current and past practices. An expert is defined by his or

her experience—experience that is gained through training and supervision, and not from knowledge alone.

With medical knowledge freely available, relationships will change. Patients can become as informed as possible about whatever they are going through, possible diagnoses, prognostic outcomes, and treatment options. Informed, autonomously educated patients are the future, and the reality of what walks in the hospital or physician's office requesting, possibly demanding, a third generation cephalosporin for their child's ear ache, sore throat, fever, and incessant cough. A model of healthcare that incorporates the informed patient decision can be defined along a continuum, rather than by absolutes and unilateralism. Patients and doctors need to come to an agreement on issues that fall under the realm of treatment options, quality of life, and financial obligations.

> "Although medical 'knowledge' is now easily and readily available to anyone with wi-fi, knowledge itself is not enough."

The patient of the present, and future, watches the latest news report linking all lipid-soluble vitamin use to infertility, and informs you that she stopped taking the 5000 units of vitamin D prescribed a year ago by her neurologist. She then sends you a primary article from a PubMed search, which makes the same claim, about mice that were exposed to vitamins and did not live as long as mice not given vitamins, developed cancer, and became infertile. As a physician you feel handcuffed. On the one hand, you are proud that your patient is trying to take control of her lifestyle and choices to better herself, essentially performing "healthy" (albeit misguided) modifications. On the other hand, you are upset that your training to provide medical care has just been undermined by a quick Internet search and a two-minute news story.

The middle ground lies in doctors understanding that it is not the medical knowledge they are sharing that patients seek, but the rational and personal application of the medical knowledge. Informing patients about how such knowledge can be used is a starting point for opening the lines of communication. Opinion, experience, and expertise provide perspective into the studies to which patients refer, all in a succinct and eloquent conjecture that will drive the patient-centered, bilateral decision.

Medical school training cultivates an acutely fine-tuned thought methodology for evaluating data and medical sciences to determine practice guidelines and provides a perspective that remains unmatched and elusive to the non-physician patient. This perspective comes from the other side of what a medical student and doctor-in-training experiences, outside of rote studying and memorization. This perspective—achieved by reading countless foundational articles, by being around patients for years, and by gathering anecdotal and empirical evidence on all aspects and nuances of a diagnosis or treatment—compliments the ability and capability awarded to the physician.

The well-informed, autonomous patient plays a complimentary role in his or her healthcare. The medical information available allows patients to reject what was once

a paternalistic model for healthcare, built on the physician having a superior grasp of medical knowledge. Of perhaps utmost importance is the paradigm shift away from the indispensability of the physician's medical knowledge to the unequivocal perspective gained from 10,000 hours of experience. While patient preference has remained a fundamental facet of this system, the will of the physician continues to be backed by medical experience, rather than medical knowledge. Moving forward with this notion of patient-centered decision making, it is crucial that the physician be adequately equipped to deal with the patient's medical knowledge base. As the age of the ever-accessible Internet reaches unimaginable heights, the role of physicians in their own patient care decisions, too, will evolve. A complimentary and collaborative effort between the patient and the physician becomes more important as the healthcare system adapts to the current and emerging technologies.

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How Healthcare Will Change:

Envisioning Our World 30 Years From Now

Tyler Cymet, DO; Zaneb K. Beams, MD; Michele Manahan, MD; J. Ramsay Farah, MD; Thomas B. Smyth, MD; Eric Wargotz, MD; Taylor DesRosiers, Fourth-Year Medical Student

Healthcare has a tremendous impact on society and individual well-being. Changes to healthcare will affect how people look at the institutions that define them and their world. While we know that healthcare will not stay the same, the future direction is unclear.

MedChi's Blue Ribbon Commission has met to study where we are now and predict where we will be in thirty years. To make such a prediction, physicians have to *imagineer* how future physicians will contribute to the healthcare of the future and consider their responsibilities in the system that develops.

Physicians in the Future

As healthcare is transforming, physicians will continue to play an active role and should begin planning for change now. Medical education traditionally focused on the production and transmission of medical knowledge.[1] Increasingly, it is only the transmission that matters. It will continue to be important for physicians to have a deep understanding of people, both healthy and ill. Increasingly, the emphasis will be on the answers and not how we arrived at the answers. Maintaining physician skill by valuing the ability to understand the why of what we do will be a hallmark of physician care and will allow for care to be individualized and go "off the algorithm." Physicians will fit into the system differently in the future, with a lot to be determined.

Potential futures predicted by the Blue Ribbon Commission include the following:

1. A System to Meet Individualized Needs: A Person-Centered Model

In this model, the ultimate goal is available and equitable care. Patient-centered medical homes are developed to achieve cost efficiency, driving competition and collaboration among physicians and other professionals and compelling them to practice at the "top of their license." The person-centered model also allows an integrated system to co-exist with fee-for-service systems, but then requires a safety net for those individuals who are unable to afford care. The expansion of community health centers and Area Health Education Centers (AHECs) are a likely occurrence in this model. Electronic medical records help create a library of information but lack a central repository or outlet to access those resources. Employers cease to cover employees' health insurance as the healthcare system moves to a more cost-effective structure. Health insurance exchanges become an indispensable tool in the purchase of healthcare services, which will vary significantly from state to state, as each state determines its own health care priorities.

2. A System that Makes Sense: A Coordinated Model

The coordinated model concentrates on the development of a single, ideal system, in which a uniform understanding of health and illness is adopted, to be modified only by a majority of decision-makers. In this model, healthcare is a combined effort of integrated, capitated, community systems and larger information and care systems. A central system of data, including patient records, allows professionals to diagnose, address, and map "hot spots" of population health issues. Covered services will be agreed on, with disagreements resolved through an established appeals process. Finally, managers are responsible for fixing and maintaining the standards of care.

3. A System for the Self-Sufficient: An Independent Model

The independent model uses all the tools that technology can provide. The definitions of health and healthcare are so fluid that an attitude toward healthcare is synonymous with an attitude toward health. An increase in Bayesian thinking standardizes the use of bio-monitoring and genomic mapping as tools for risk assessment and preventative treatment, allowing an individual to *remain* healthy. Healthcare services are no longer provided in physicians' offices alone. Because of the relationships established between big data and small data, information is externalized, and social media and crowdsourcing will "take over" conditions such as Fibromyalgia, chronic fatigue, interstitial cystitis, and IBS. The public also will turn to complementary and alternative medicine and simpler solutions to treat their illnesses.

Conclusion

Physicians see an expanded role for themselves in the future. Population health, big data, and coordination of care are going to be much more important, and

A PERSON-CENTERED MODEL

- Available, equitable care;
- Increase in cost-efficiency, competition, and collaboration among medical professionals;
- An integrated system, combined with a fee-for-service system;
- Safety net for those who cannot afford care;
- Expansion of community health centers and Area Health Education Centers;
- A library of electronic health information without a central repository or outlet;
- Lack of employer-covered health insurance; and
- Rise in significance for health insurance exchanges as a purchasing tool.

"Imagineering is letting your imagination soar, and then engineering it down to earth."

A COORDINATED MODEL

- Single, ideal system;
- Uniform understanding of health and illness;
- Decisions made by a majority vote;
- Successful combination of integrated, capitated, community systems, with larger information and care systems;
- Central system of data, which allows professionals to diagnose, address, and track pressing health concerns;
- Agreed upon covered services, with an established appeals process; and
- Designated managers responsible for maintaining standards of care.

"The future is what will happen in the time after the present. Its arrival is considered inevitable due to the existence of time and the laws of physics."

AN INDEPENDENT MODEL

- Increase in Bayesian thinking;
- Growth in health technology, including bio-monitoring and genomic mapping tools;
- Shift to preventative treatment and risk assessment;
- Expansion in health care services provided by social media and crowdsourcing; and
- Pursuit for simpler treatments in complementary and alternative medicine.

"Why should I memorize something when I know where to find it?"

— Albert Einstein

the role of the leader in those areas is yet to be determined.[2] We still need to have discussions on health services to which every individual should have access. In the future, specific answers on health questions are more likely to be answered with larger populations in mind. Healthcare will focus on what is the best for the most, instead of what is the best for each. It will be up to physicians to advocate for their patients.[3] The quality of care received will depend on having a knowledgeable advocate.

Contact and biographical information for the co-authors of "How Healthcare Will Change" appears elsewhere in this issue.

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Navigating the Telefuture

PERSONAL PERSPECTIVE

Taylor DesRosiers, Fourth Year Medical Student

Supplemental technology has the potential to revolutionize the way in which patients access primary care, by augmenting the standard physician–patient relationship. Telehealth, defined as "health care services provided directly to patients using telecommunications technology, including the internet and telephone…to remotely diagnose, treat, and manage the care of… patients," allows the opportunity to directly connect physicians and patients outside of the standard fifteen-minute office visit.[1] Imagine, for instance, real-time monitoring of vital signs, or dynamic visit scheduling for when changes in care are actually needed. These novel technologies are quickly becoming the standard of care, and it is essential that physicians define their role and assert their value in a world in which health information is being generated, shared, and used in a multitude of new ways.

As a rising fourth-year medical student at Johns Hopkins, I have often considered the future in which technology and medicine are inextricably connected. Raised in a generation that has swum along the crest of technological advance, I can naturally envision applications of digital advancement across a full spectrum of medical delivery. It appears logical that we should look to implement these efforts in areas that have an impact on our patients and the health of our populations, areas like primary care. However, it is the physician-in-training's duty to recognize that experienced physicians may not share this comfort with technology. Therefore, we must not only help shape exactly how telehealth will be incorporated in a meaningful manner into daily practice, but also make this transition palatable and useful for our seasoned counterparts, as well as our patients.

To unite the veteran regime of experienced physicians with the newer regime of technophiles will take multiple steps, but there are certainly aspects of telehealth that all parties could support, such as the benefits these services will ultimately provide. Picture a mobile system in which a patient's smart phone could record and synthesize information such as when and where each reading occurred, instead of having a patient haphazardly keep blood pressure or glucose journals. Quantified CARE has already developed pressure cuffs and glucometers, along with sundry additional medical tools, that can be integrated into any iPhone and readings directly uploaded onto its platform.[2] WellDoc, a mobile prescription therapy for adults with Type 2 Diabetes, also received FDA approval for its BlueStar technology last year and has already proven itself by successfully predicting episodes of hypoglycemia for its users.[3]

> "Telehealth will allow the physician to remotely monitor patients and will harness the power of a mobile platform to reinforce the messages discussed during in person appointments."

The health information from mobile platforms can be aggregated and sent to physicians. However, instead of receiving an alert every time a patient logs a value, algorithms are being developed to flag only the alarming trends. Physicians would have access to empowering data, allowing them to make better-informed treatment plans individualized to the patient's unique needs. Currently, many patients make numerous visits to achieve sizeable gains in health. Telehealth will allow the physician to remotely monitor patients, and will harness the power of a mobile platform to reinforce the messages discussed during in-person appointments. Office visits could be scheduled at productive time intervals—when changes in care are actually needed—instead of running short on visit time with those who need more counseling, or the flip side, misappropriating time on well-visits. Imagine the unlimited possibilities that exist in these potential telehealth spaces, widened to a number of diseases and used on a macro scale.

Significant hurdles remain—finances, resources, and systems adoption of telemedicine. Providers should be proactive in ensuring that new technologies are of value and both acceptable and meaningful to the physician community. Further considerations include how mobile technology will navigate state-based licensure, as well as reimbursement rates. The rapid innovations and associated challenges have been dizzying for physicians, discouraging many doctors who believe this technology will take over tasks they have mastered. The hesitation to accept, and even outright resistance to, medical advancement through technology, should pass as doctors recognize the power of telehealth. Physicians are uniquely positioned now, in a field relatively untouched by legislation, to revolutionize the delivery of care by coming together as professionals to sow the very foundation of this new land.

Seasoned practitioners must ensure that, even in the face of the newest app, the revered patient–physician relationship and the practice of medicine continue to be valid and meaningful. Healthcare needs to focus on the individual as well as the system, and different people will require different techniques to develop comfort and confidence in the care provided. The new physician generation is eager to play a part in helping current practitioners ride this wave of the future. Thus, both sides have skills and knowledge needed to create telehealth solutions to problems known and unknown, real and imagined. If we fail to guide this future, the Targets and Walgreens will certainly be eager at the prospects of delivering and profiting from primary care services.

Telehealth is not here to replace the Oslerian practice, and new technology is

not here to rip practitioners away from the bedside. Telehealth is simply the next step in ensuring that our patients receive the best level of care available. I urge my peers to look up from their iPhones and Androids, to join hands with practicing physicians. In return, I request that my seasoned counterparts view the future relationship of healthcare and technology with an open mind. The potentials that exist to streamline quality, cost, and access to primary care are out there. Let us realize this bright future of telehealth and medicine, together.

Taylor DesRosiers is between her third and fourth year of medical school at Johns Hopkins, currently working for the American Medical Association as their Government Relations Advocacy Fellow. Ms. DesRosiers also serves her country as an officer in the Navy, where she will serve as a physician upon graduation from medical school. The views expressed in this piece are solely her own and do not represent the views of the U.S. Navy or the American Medical Association in any way. She can be reached at taylor@jhmi.edu.

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A Message from the Editorial Board of *Maryland Medicine*

Just a few short months ago, the Ebola virus was beginning its ravages across sections of West Africa. We had become used to periodic outbreaks in Africa, but they were always contained. This year the strain of Ebola virus has been more virulent with more deaths occurring from Ebola this year then in the 20 previous outbreaks combined.[1]

The country and its medical resources are currently inundated with stories related to Ebola, its possible spread throughout the rest of Africa, Europe, North America and the rest of the world, and efforts to contain it. It is not an understatement to say that people are frightened. Nor is it an exaggeration to say that because of confusing directions given early in the public health response to this virus, that our patients, and perhaps we ourselves, are unclear on the response to this public health issue. The anxiety bred by this disease appearing on our doorstep is evident in our patients' questions, and our own search for answers.

Maryland Medicine is following this story closely. If necessary, we will share supplemental information devoted to the rapidly changing events of the virus's effects. We have heard from the CDC, NIH, specialty societies, AMA, ANA, the Public Health organizations, local health departments, and many many more. The editorial board of Maryland Medicine has elected to reproduce a concise and informative announcement from MedChi, quoting from the AMA, American Nurses Association, and the American Hospital Association and listing a number of further resources.

Maryland Medicine will continue to monitor this public health "event." In the meantime, MedChi's Monday email blast (reprinted below from October 20, 2014) offers timely information.

MedChi will produce special editions and "extras" when and if necessary. Please make sure that MedChi has your current email address.

Healthcare workers are in the highest risk category for Ebola. We pay special tribute to all the health care workers here and abroad who put their lives on the line daily to combat this and other diseases for the good of their patients and their neighbors.

Ebola Facts, Resources, and Protocols

In a joint statement from the healthcare leadership organizations, the American Hospital Association, the American Medical Association, and the American Nurses Association, stated "As our nation's strategy to address the Ebola virus continues to evolve, hospitals and their partners in nursing and medicine are coming together to emphasize that a solution-oriented, collaborative approach to Ebola preparedness is essential to effectively manage care of Ebola patients in the U.S. Ensuring safe care for patients, healthcare workers, and communities demands the combined efforts of inter-professional, state, and federal organizations. In addition to domestic efforts to prepare for and treat Ebola, an enhanced focus on the part of the United States and the international community to contain the outbreak in West Africa is fundamental to stopping the spread of this virus. ...Hospitals, physicians, and nurses have the same goals in addressing any Ebola case: to ensure that all hospital and clinical staff are able to safely provide high-quality, appropriate, patient care. We are committed to ensuring that nurses, physicians and all frontline healthcare providers have the proper training, equipment and protocols to remain safe and provide the highest quality care for the patient."

MedChi concurs with the statement and to that end directs physicians to the following information from the Centers for Disease Control and Prevention (CDC). The CDC websites contain helpful and accurate information regarding Ebola (Ebola Virus Disease). Select components of the Websites are available in French and Spanish. Please review and share this information to help alleviate questions, concerns, or misinformation regarding Ebola.

- Ebola Information in English (http://www.cdc.gov/vhf/ebola/)
- Ebola Communication Resources (http://www.cdc.gov/vhf/ebola/resources/index.html)

Reference:

"The 2014 Ebola outbreak is worse than all other Ebola outbreaks combined" (http://www.vox.com/cards/ebola-facts-you-need-to-know/what-is-the-ebola-virus).

RESOURCES ON EBOLA

The following links contain helpful information specific to Maryland:

Maryland Department of Health and Mental Hygiene (DHMH) Ebola Virus Information Page
http://phpa.dhmh.maryland.gov/OIDEOR/SIPOR/SitePages/ebola.aspx

MedChi's Disaster Preparedness Page for Ebola resource information http://www.medchi.org/disaster-preparedness

The American Hospital Association (AHA) has provided the following additional educational materials:

Ebola Facts: Hospital Preparedness Checklist http://www.accme.org/news-publications/publications/public-health-resources/ebola-facts-hospital-preparedness-checklist

Ebola Facts: Surgical Protocol—Possible or Confirmed Ebola Cases
http://www.accme.org/news-publications/publications/public-health-resources/ebola-facts-surgical-protocol-%E2%80%94-possible-or

The AHA has also revised its informational PowerPoint:
Ebola Facts http://www.accme.org/news-publications/publications/public-health-resources/ebola-facts (initially posted on October 14).

The materials contain information that the American Hospital Association believes would be useful to healthcare providers and institutions right now.

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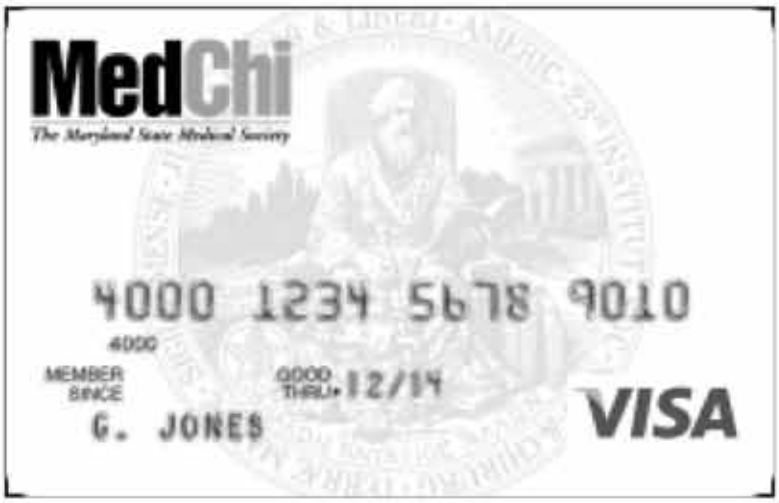

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The Metamorphosis of Words

WORD ROUNDS

Barton J. Gershen, MD
Editor Emeritus

A word begins its career with one definition, but its meaning often changes after years of human usage and lexical manipulation. In fact, if we think about it, all of us have witnessed some of these changes within our lifetime. Take the common term **cool**, which started out as an adjective meaning "chilly," then became a reference to someone who was "calm and unruffled," and has finally morphed into a slang interjection meaning "great, wonderful"—as in "Wow!! That's cool!" A similar route was taken by the word **neat**, which began its career as an adjective signifying something that was "tidy or orderly," but is now most often used as an interjection—"That's neat!" or alternatively, "Neato!" meaning "that was superb"!

The Greek physician Herophilos (325–280 BCE) is considered to be the world's first anatomist. Among his many descriptions was that of the first portion of the small bowel, which he termed the *intestīnum duodēnum digitōrum* ("twelve-fingered intestine"), since he had found it to be twelve finger widths in length (his fingers, of course). **Duodenum** stems from Latin *duodeni*, meaning "twelve each," which in turn derives from *duo*: "two" plus *decem*: "ten." Thus, the term duodenum has morphed from a numerical value into an intestinal segment.

Decem is also found in such terms as **deciliter**: "a tenth of a liter," **decimal**: "a tenth of a number," and **decibel**: "a tenth of a bel." **December** was the tenth month of the original Roman calendar: March, April, May, June, Qunitilis (the fifth month), Sextilis (the sixth month), September, October, November, and December. Unfortunately, the Roman year consisted of only 304 days, so that it eventually became asynchronous with the seasons. Therefore, their calendar had to be corrected. This was accomplished during the reign of Julius Caesar, and became known as the Julian calendar. January and February were added at the beginning of the year, which made the last four months nine, ten, eleven, and twelve—instead of their original positions at seven (***Sept***ember), eight (***Oct***ober), nine (***Nov***ember), and ten (***Dec***ember). Julius Caesar and his protégé Augustus Caesar—supreme egoists—had already renamed the original fifth and sixth months (Quintilis and Sextilis) for themselves—July and August—thus completing the monthly names of our present calendar.

A millennium after Herophilos, a Dutchman named Andries van Wezel (1514–1564 CE), considered to be the founder of modern-day anatomy, became Professor of Anatomy at the University of Padua. As was the custom in those neoclassical times, van Wezel had Latinized his name, becoming **Andreas Vesalius**, the author of that famous anatomic text: *De humani corporis fabrica libri septem* ("On the Fabric of the Human Body in Seven Books").

While illustrating the arteries that originate from the aortic arch, the ancient Greek anatomist Galen (129–200 CE) had inadvertently failed to name the arterial branch which arose from the right side of the arch. Aware of this fact—and in a jocular mood—Andreas Vesalius proceeded to name that vessel the Innominate Artery: "the un-named artery." Another word had shape-shifted its meaning.

In Latin, the word for tailor is Sartorius, which gives rise to the English expression "sartorial splendor"—to be dressed in the finest tailored fashion. The longest muscle in the human body is the **Sartorius Muscle**, attaching proximally to the anterior superior iliac spine, traveling downward and medially, and inserting onto the upper surface of the Tibia. The function of this muscle is to flex the knee, abduct and laterally rotate the hip. This muscle received its name from the cross-legged position that tailors preferred, as they were sewing—a position requiring the use of both left and right Sartorius muscles. A "tailor" thus was transmuted into a "muscle."

The Superficial **Temporal** Artery is a major branch of the External Carotid Artery. It arises within the Parotid Gland, and its pulsations are easily felt in front of the ear. The term temporal stems from Latin *tempus*: "time," which in turn derives from Greek *temnein*: "to cut." Time is "cut" into segments—such as day and night, or the seasons of the year—and then measured. Prior to the invention and widespread use of clocks and watches, pulsations of the Superficial Temporal Artery were often used (rather imprecisely) to measure intervals of time, which is how that artery earned its name.

In early Greek and Roman times, monarchs employed an **auspex** to predict future events, such as foretelling the outcome of an approaching battle. This priestly fortuneteller scrutinized the behavior of birds to make his prophecy. His title was derived from Latin: *avis*: "bird" and *specere*: "to observe"—as in our words **spectator** and **inspector**. The term *auspex* can be found in **auspicious:** "favored by good fortune" and **auspices**: "under a favorable sign."

This clairvoyant Auspex would observe his winged tarot cards from a dedicated area, one that had been "cut out" especially for that purpose. Such a sacred area was known in Greek as a *temenos* (from Greek *temnein*) and in Latin as a *templum*, each meaning "a section of ground that had been demarcated (cut out) and dedicated to augury and the veneration of gods." The word **temple** stems directly from the Latin term. Thus, the names of an artery, and a place of worship, both derive from the measurement of time—and mutually stem from the Greek "to cut."

[Not to be overlooked, the suffix **–tome** derives from *temnein*, and we find it in words such as **ana<u>tomy</u>** (Greek *ana*: "up" plus *temnein*: "to cut"—that is to "cut up"). An **<u>atom</u>** is so small that it cannot be further partitioned (Greek "*a*": "not" plus *temnein*). Of course, the word "atom" was

coined long before Niels Bohr, Max Planck, Werner Heisenberg, and the entire company of quantum physicists had demonstrated that the atom could indeed be further divided.]

Accoucheur, the French term for a male **obstetrician**, was first used in the 17th century. It derives from French *ad*: "on" plus *coucher*:"to lie," that is "to lie upon," and refers to one who attends the parturient female (lying in bed) during labor. (The word **couch** also derives from *coucher*.) One of the key indications of hypocalcemic tetany is the **accoucheur's hand**, in which the patient's metacarpophalangeal joints are flexed as his fingers are extended. It is named for the presumed position of an obstetrician's hand as he delivers a baby. We therefore have another word that has mutated—from a bed, to an obstetrician, to a sign of tetany.

Not all words that have undergone a metamorphosis originate from the medical lexicon. For example, there is the true story of Congressman Felix Walker of North Carolina. In 1820, during a heated legislative debate on whether to admit Missouri as a free or slave state, Walker rose to speak. However, instead of addressing the critical question before the House, he began a long, meandering, tiresome speech. Although his irate colleagues attempted to shout him down, Walker completed his prolonged monologue. Later, when asked what he had been attempting to accomplish, Walker simply stated that he was not speaking to the Congress, he was addressing his constituents in **Buncombe County**, North Carolina. He wanted them to appreciate that he was an active member of Congress, always speaking on their behalf. Soon "talking to Buncombe County" became simply "Buncombe," meaning hogwash or baloney. Gradually Buncombe was shortened to "bunc" and finally to "bunk"—another example of the transformation of a term, this time from the name of an American county to pure nonsense.

In French, the term for a Crane (the long-legged bird) is *grue*. In examining standard illustrations of a family tree, some imaginative viewer thought that the branching lines which join kinships resembled the long, thin legs and claws of a standing Crane. This, in French, was *pied de grue*: "feet of a crane." In English, it became the word **pedigree**. From a bird to a genealogic diagram—we have another dramatic word mutation.

In Latin, the infinitive "to speak" is *fari*. Someone who cannot speak is referred to as *in*: "not" plus *fari*: "not speaking, or incapable of speech." From this, Latin developed the word for a very young child who cannot yet speak: *infans*. In Italian, this word became *infante*: "a child or youngster," from which English **infant** derived. During the Middle Ages, the military relied largely on their cavalry, who were always followed on foot by aides carrying armor and supplies. These subordinates were usually young boys. Such children became known as the *infanteria*—too young and inexperienced to be cavalrymen. Thus, English derived our word **infantry**.

From babies to soldiers, from beds to obstetricians, and from tailors to muscles, words are constantly transformed by the humans who speak them. Language is forever being modified, undergoing metamorphoses created by all of us, its inventive speakers.

Barton J. Gershen, MD, Editor Emeritus of Maryland Medicine, *retired from medical practice in December 2003. He specialized in cardiology and internal medicine in Rockville, Maryland.*

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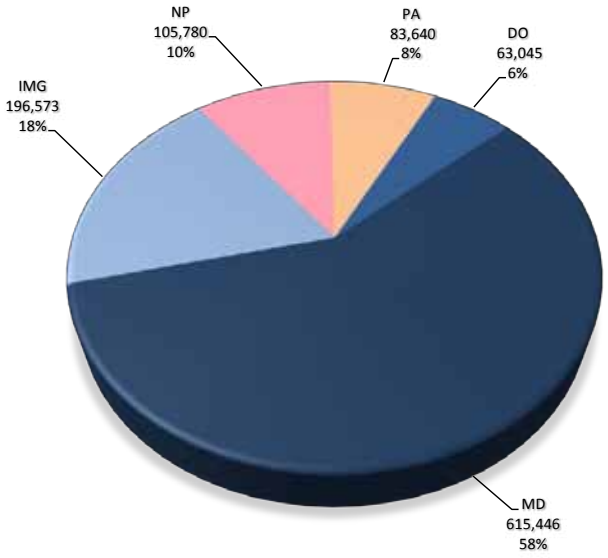
Structure of Medical Care

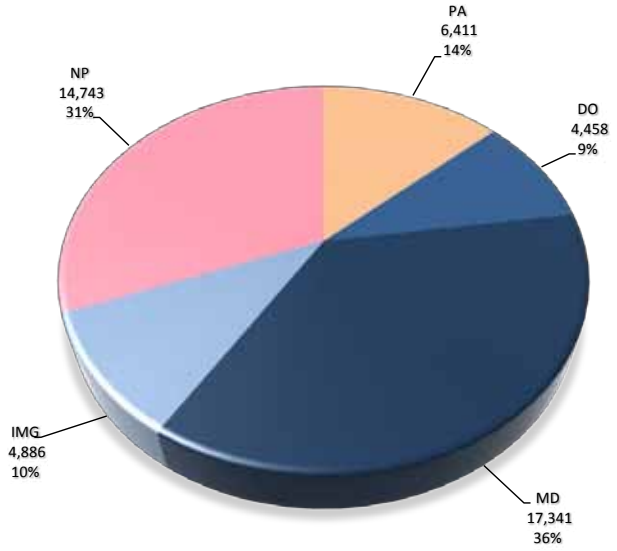
Who is providing healthcare to the American people?

Current Practicing Healthcare Providers 2012



Source: A Census of Actively Licensed Physicians in the United States, 2012; U.S. Bureau of Labor Statistics, 2012

Healthcare Providers Entering the Workforce 2012

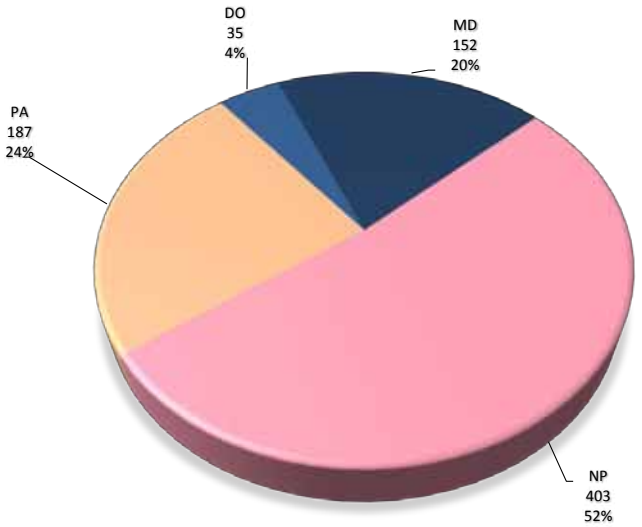


Source: AACOM 2011-12 Academic Year Graduating Seniors Survey Summary Report; 28th PAEA Annual Report on Physician Assistant Educational Programs in the United States; IMG Performance in the 2012 Match , ECFMG 2012; Table 27: Total Graduates by U.S. Medical School and Sex, 2008-2012; AACN Annual 2012-2013 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing

Structure of Healthcare Education

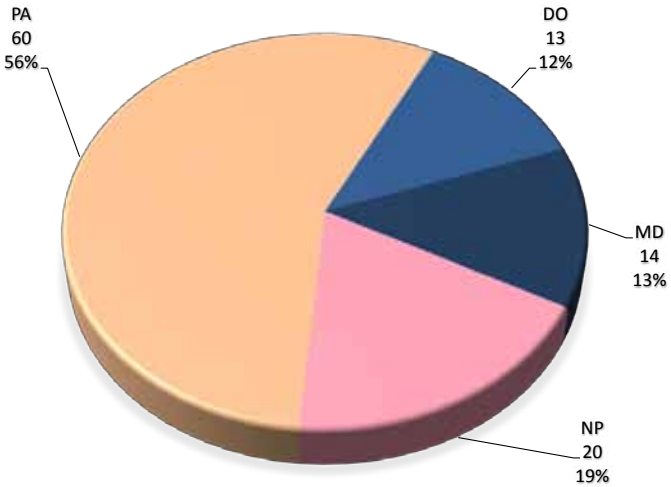
How are we educating America's future healthcare providers?

Number of Colleges/Programs 2013

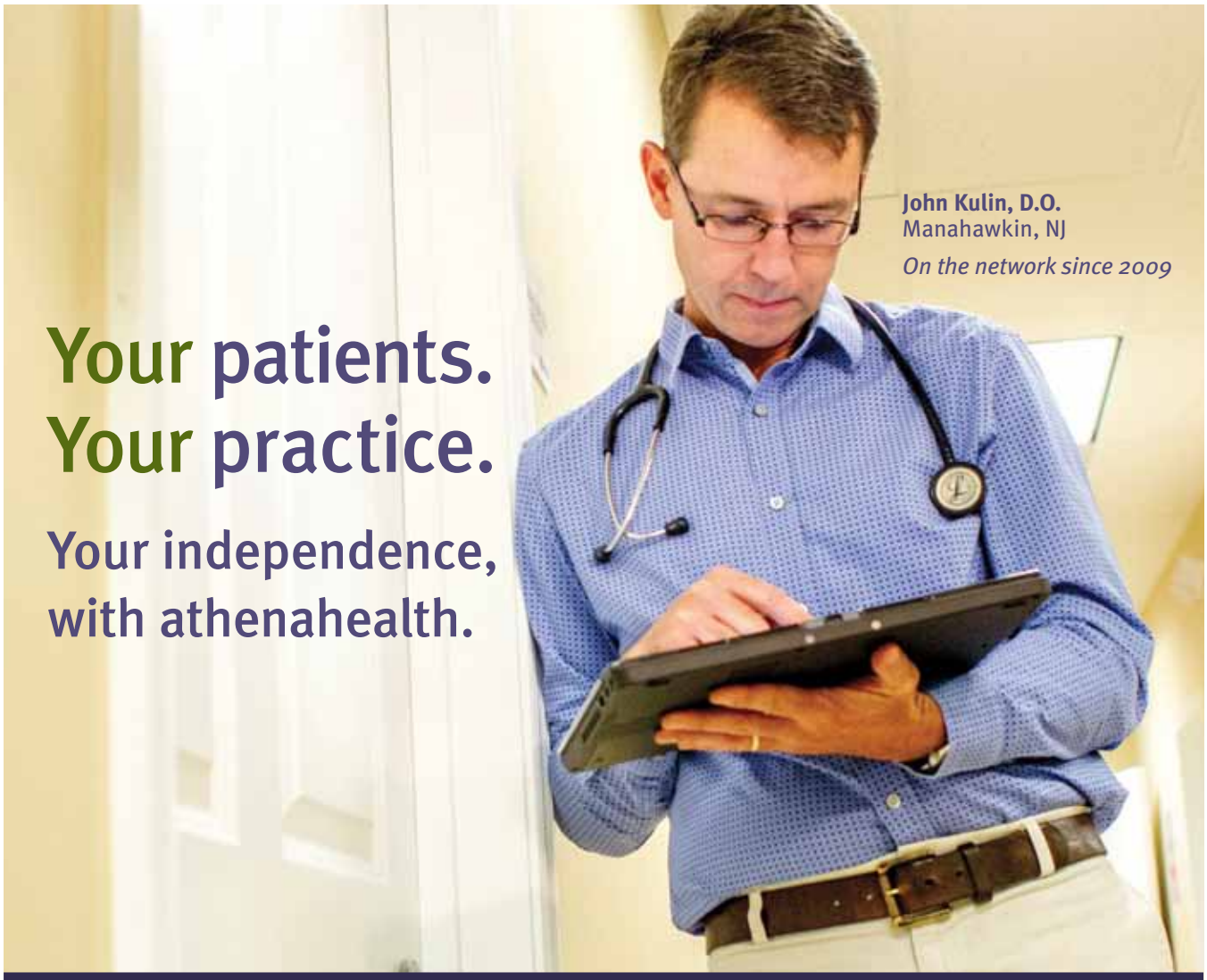


Source: AACOM Osteopathic Medical College Location Feb 2015, AAMC Table 26: Total Enrollment by U.S. Medical School and Sex, 2009-2013, AACN;2013-2014 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing, PAEA Twenty-Ninth Annual Report on Physician Assistant Educational Programs publication pending

Number of Colleges/Programs in Formation 2013



Source: AOA New and Developing COMs and Campuses June 2014; LCME Medical school directory July 2014; AACN, 2013-2014 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing; PAEA Twenty-Ninth Annual Report on Physician Assistant Educational Programs 2013- 2014 publication pending



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